



# CITY OF SEATTLE

## City Council

### Agenda

#### Public Hearing

Monday, December 6, 2021

2:00 PM

Remote Meeting. Call 253-215-8782; Meeting ID: 586 416 9164; or  
Seattle Channel online.

M. Lorena González, President

Lisa Herbold, Member

Debora Juarez, Member

Andrew J. Lewis, Member

Tammy J. Morales, Member

Teresa Mosqueda, Member

Alex Pedersen, Member

Kshama Sawant, Member

Dan Strauss, Member

Chair Info: 206-684-8809; [Lorena.González@seattle.gov](mailto:Lorena.González@seattle.gov)

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<http://seattle.gov/cityclerk/accommodations>.





**CITY OF SEATTLE**  
**City Council**  
**Agenda**  
**Public Hearing**  
**December 6, 2021 - 2:00 PM**

**Meeting Location:**

Remote Meeting. Call 253-215-8782; Meeting ID: 586 416 9164; or Seattle Channel online.

**Committee Website:**

<http://www.seattle.gov/council>

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*Pursuant to Washington State Governor's Proclamation No. 20-28.15 and Senate Concurrent Resolution 8402, this public meeting will be held remotely. Meeting participation is limited to access by the telephone number provided on the meeting agenda, and the meeting is accessible via telephone and Seattle Channel online.*

Register online to speak during the Public Comment period and the Public Hearing on Council Bill 120213 at the 2:00 p.m. City Council meeting at

<http://www.seattle.gov/council/committees/public-comment>.

Online registration to speak at the City Council meeting will begin two hours before the 2:00 p.m. meeting start time, and registration will end at the conclusion of the Public Comment period or the Public Hearing during the meeting. Speakers must be registered in order to be recognized by the Chair.

Submit written comments to all Councilmembers at

[Council@seattle.gov](mailto:Council@seattle.gov)

Sign-up to provide Public Comment or to speak during the Public Hearing at the meeting at

<http://www.seattle.gov/council/committees/public-comment>

Watch live streaming video of the meeting at

<http://www.seattle.gov/council/watch-council-live>

Listen to the meeting by calling the Council Chamber Listen Line at 253-215-8782 Meeting ID: 586 416 9164

One Tap Mobile No. US: +12532158782,,5864169164#

**A. CALL TO ORDER**



**B. ROLL CALL****C. PRESENTATIONS****D. APPROVAL OF THE JOURNAL**

[Min 355](#) November 15, 2021

**Attachments:** [Minutes](#)

[Min 356](#) November 22, 2021

**Attachments:** [Minutes](#)

[Min 357](#) November 29, 2021

**Attachments:** [Minutes](#)

**E. ADOPTION OF INTRODUCTION AND REFERRAL CALENDAR**

Introduction and referral to Council committees of Council Bills (CB), Resolutions (Res), Appointments (Appt), and Clerk Files (CF) for committee recommendation.

[IRC 328](#) December 6, 2021

**Attachments:** [Introduction and Referral Calendar](#)

**F. APPROVAL OF THE AGENDA****G. PUBLIC COMMENT**

*Members of the public may sign up to address the Council for up to 2 minutes on matters on this agenda; total time allotted to public comment at this meeting is 20 minutes.*

Register online to speak during the Public Comment period at the 2:00 p.m. City Council meeting at <http://www.seattle.gov/council/committees/public-comment>.

Online registration to speak at the City Council meeting will begin two hours before the 2:00 p.m. meeting start time, and registration will end at the conclusion of the Public Comment period during the meeting. Speakers must be registered in order to be recognized by the Chair.



**H. PAYMENT OF BILLS**

*These are the only Bills which the City Charter allows to be introduced and passed at the same meeting.*

**[CB 120240](#)**

AN ORDINANCE appropriating money to pay certain audited claims for the week of November 22, 2021 through November 26, 2021 and ordering the payment thereof.

**I. COMMITTEE REPORTS**

*Discussion and vote on Council Bills (CB), Resolutions (Res), Appointments (Appt), and Clerk Files (CF).*

**CITY COUNCIL:****1. [CB 120213](#)**

AN ORDINANCE relating to land use and zoning; extending for six months a moratorium established by Ordinance 125764, and extended by Ordinances 126006, 126090, 126241, and 126362, on the filing, acceptance, processing, and/or approval of any application to establish a new principal or accessory use, or change a principal or accessory use, for any site currently used as a mobile home park, as defined in Section 23.84A.032 of the Seattle Municipal Code; and ratifying and confirming certain prior acts.

**Supporting Documents:**

[Summary and Fiscal Note](#)

**Public Hearing**

*Register online to speak during this Public Hearing at <http://www.seattle.gov/council/committees/public-comment>.*

*Sign-up registration will begin two hours before the 2:00 p.m. meeting start time and registration will end at the conclusion of the Public Hearing during the meeting. Speakers must be registered in order to be recognized by the Chair.*

*If you are unable to participate remotely, please submit written comments to all Councilmembers at [Council@seattle.gov](mailto:Council@seattle.gov).*



2. [CB 120236](#) AN ORDINANCE relating to City streets; changing the name of the portion of Thomas St between 1st Ave N and 2nd Ave N to Lenny Wilkens Way; and superseding the relevant portions of Ordinance 4044, Ordinance 89910, Ordinance 102981, and any other ordinance to the extent inconsistent; and ratifying and confirming certain prior acts.

**Supporting  
Documents:**

[Summary and Fiscal Note](#)

3. [CB 120231](#) AN ORDINANCE relating to City employment; authorizing the execution of an agreement between The City of Seattle and Seattle Fire Chiefs Association, International Association of Fire Fighters (IAFF) Local 2898; and ratifying and confirming certain prior acts.

**Attachments:** [Att 1 - Memorandum of Agreement](#)

**Supporting  
Documents:**

[Summary and Fiscal Note](#)

[Central Staff Memo](#)

4. [CB 120237](#) AN ORDINANCE relating to City employment, commonly referred to as the Fourth Quarter 2021 Employment Ordinance; designating positions as exempt from the civil service system; and returning positions to the civil service system; all by a 2/3 vote of the City Council.

**Supporting  
Documents:**

[Summary and Fiscal Note](#)

[Central Staff Memo](#)

**TRANSPORTATION AND UTILITIES COMMITTEE:**



5.     [CB 120233](#)     AN ORDINANCE relating to the City Light Department; directing the transfer of certain funds in the Light Fund into the Rate Stabilization Account in 2021; and amending Section 21.49.086 of the Seattle Municipal Code to simplify the operation of the Rate Stabilization Account.

**The Committee recommends that City Council pass the Council Bill (CB).**

**In Favor: 5 - Pedersen, Strauss, González , Herbold, Morales**

**Opposed: None**

**Supporting**

**Documents:**

[Summary and Fiscal Note](#)

6.     [Res 32031](#)     A RESOLUTION ratifying the 2021 Update to the Green/Duwamish and Central Puget Sound Watershed or Water Resource Inventory Area (WRIA 9) Salmon Habitat Plan, Making Our Watershed Fit for a King.

**The Committee recommends that City Council adopt the Resolution (Res).**

**In Favor: 5 - Pedersen, Strauss, González , Herbold, Morales**

**Opposed: None**

**Attachments:**

[Att 1 - Salmon Habitat Plan 2021 Update](#)

**Supporting**

**Documents:**

[Summary and Fiscal Note](#)

[Proposed Amendment](#)

7.     [Res 32030](#)     A RESOLUTION relating to the City Light Department; acknowledging and approving the City Light Department's adoption of a biennial energy conservation target for 2022-2023 and ten-year conservation potential.

**The Committee recommends that City Council adopt the Resolution (Res).**

**In Favor: 5 - Pedersen, Strauss, González , Herbold, Morales**

**Opposed: None**

**Supporting**

**Documents:**

[Summary and Fiscal Note](#)

[Summary Att A - 2022 Conservation Potential](#)

[Assessment—Volume I](#)



8. [Appt 02072](#) Appointment of Jose Ulises Nino Rivera as member, Seattle Bicycle Advisory Board, for a term to August 31, 2023.

**The Committee recommends that City Council confirm the Appointment (Appt).**

**In Favor: 5 - Pedersen, Strauss, González , Herbold, Morales**

**Opposed: None**

**Attachments:** [Appointment Packet](#)

9. [Appt 02073](#) Appointment of Diane Teh-Mei Walsh as member, Seattle Bicycle Advisory Board, for a term to August 31, 2023.

**The Committee recommends that City Council confirm the Appointment (Appt).**

**In Favor: 5 - Pedersen, Strauss, González , Herbold, Morales**

**Opposed: None**

**Attachments:** [Appointment Packet](#)

10. [Appt 02074](#) Appointment of Amin Amos as member, Seattle Transit Advisory Board, for a term to August 2, 2023.

**The Committee recommends that City Council confirm the Appointment (Appt).**

**In Favor: 5 - Pedersen, Strauss, González , Herbold, Morales**

**Opposed: None**

**Attachments:** [Appointment Packet](#)

11. [Appt 02076](#) Appointment of Robin Schwartz as member, Seattle School Traffic Safety Committee, for a term to March 31, 2023.

**The Committee recommends that City Council confirm the Appointment (Appt).**

**In Favor: 5 - Pedersen, Strauss, González , Herbold, Morales**

**Opposed: None**

**Attachments:** [Appointment Packet](#)

## J. ADOPTION OF OTHER RESOLUTIONS

## K. OTHER BUSINESS

## L. ADJOURNMENT





## Legislation Text

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**File #:** Min 355, **Version:** 1

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November 15, 2021



# SEATTLE CITY COUNCIL

600 Fourth Ave. 2nd Floor  
Seattle, WA 98104



## Journal of the Proceedings of the Seattle City Council

Monday, November 15, 2021

2:00 PM

Remote Meeting. Call 253-215-8782; Meeting ID: 586 416 9164; or  
Seattle Channel online.

### City Council

*M. Lorena González, President*

*Lisa Herbold, Member*

*Debora Juarez, Member*

*Andrew J. Lewis, Member*

*Tammy J. Morales, Member*

*Teresa Mosqueda, Member*

*Alex Pedersen, Member*

*Kshama Sawant, Member*

*Dan Strauss, Member*

Chair Info: 206-684-8809; [Lorena.González@seattle.gov](mailto:Lorena.González@seattle.gov)



*Pursuant to Washington State Governor's Proclamation No. 20-28.15 and Senate Concurrent Resolution 8402, this public meeting will be held remotely. Meeting participation is limited to access by the telephone number provided on the meeting agenda, and the meeting is accessible via telephone and Seattle Channel online.*

#### **A. CALL TO ORDER**

The City Council of The City of Seattle met remotely pursuant to Washington State Governor's Proclamation 20-28.15, and guidance provided by the Attorney General's Office, on November 15, 2021, pursuant to the provisions of the City Charter. The meeting was called to order at 2:02 p.m., with Council President González presiding.

#### **B. ROLL CALL**

**The following Councilmembers were present and participating electronically:**

**Present:** 8 - González , Herbold, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

**Excused:** 1 - Juarez

Motion was made, duly seconded and carried, to excuse Councilmember Juarez from the November 15, 2021 City Council meeting.

#### **C. PRESENTATIONS**

There were none.

#### **D. APPROVAL OF THE JOURNAL**

There were no Minutes presented for approval.

#### **E. ADOPTION OF INTRODUCTION AND REFERRAL CALENDAR**

[IRC 325](#)

**November 15, 2021**

**Motion was made, duly seconded and carried, to adopt the proposed Introduction and Referral Calendar (IRC) by the following vote:**

**In Favor:** 8 - González , Herbold, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

**Opposed:** None



**F. APPROVAL OF THE AGENDA**

Motion was made, duly seconded and carried, to adopt the proposed Agenda.

**G. PUBLIC COMMENT**

By unanimous consent, the Council Rules were suspended to provide a 30 minute Public Comment period.

The following individuals addressed the Council:

Danielle Alvarado  
Howard Gale  
Kim England  
David Haines  
Maria Suchilt  
Martha Barrientos  
Ana Torres  
Stacy Kono  
Jonny Arenas  
Andrew Kashyap  
Joe Kunzler  
Theodore Ellis

**H. PAYMENT OF BILLS**

[CB 120219](#) **AN ORDINANCE appropriating money to pay certain audited claims for the week of November 1, 2021 through November 5, 2021 and ordering the payment thereof.**

Motion was made and duly seconded to pass Council Bill 120219.

**The Motion carried, the Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):**

**In Favor:** 8 - González , Herbold, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

**Opposed:** None

**I. COMMITTEE REPORTS**



**LAND USE AND NEIGHBORHOODS:**

1. [CF 314367](#) Application of 14302 Development, LLC, and the Seattle Housing Authority, to rezone portions of the lot located at 14302 30th Avenue NE and portions of the lot located at 14330 30th Avenue NE from Single Family 7200 (SF 7200) to Lowrise 3 with a Mandatory Housing Affordability 2 suffix (LR3 (M2)) (Project No. 3023581, Type IV).

The Committee recommends that City Council grant as conditioned the amended Clerk File (CF).

In Favor: 4 - Strauss, Juarez, Lewis, Pedersen

Opposed: None

The Clerk File (CF) was granted as conditioned by the following vote, and the President signed the Conditions of the City Council:

In Favor: 8 - González , Herbold, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

Opposed: None

**CITY COUNCIL:**

2. [CB 120216](#) AN ORDINANCE relating to land use and zoning; amending Chapter 23.32 of the Seattle Municipal Code at page 8 of the Official Land Use Map to rezone portions of the lot located at 14302 30th Avenue NE and portions of the lot located at 14330 30th Avenue NE from Single Family 7200 (SF 7200) to Lowrise 3 with a Mandatory Housing Affordability 2 suffix (LR3 (M2)) and accepting Property Use and Development Agreements as a condition of rezone approval. (Petition by 14302 Development and the Seattle Housing Authority, C.F. 314367, SDCI Project 3023581-LU)

Motion was made and duly seconded to pass Council Bill 120216.

The Motion carried, the Council Bill (CB) passed by the following vote, and the President signed the Council Bill (CB):

In Favor: 8 - González , Herbold, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

Opposed: None



3. [CF 314459](#) **Petition of Grand Street Commons LLC, for the vacation of the alley in Block 14, Jos C. Kinnear's Addition to the City of Seattle, being the block bounded by South Grand Street, 22rd Avenue South, South Holgate Street and 23rd Avenue South.**

**The Clerk File (CF) was discussed in Committee.**

ACTION 1:

Motion was made by Councilmember González and duly seconded to grant Clerk File 314459.

ACTION 2:

Motion was made by Councilmember Pedersen and duly seconded, to amend CF 314459, by adding the Council Conditions to the Clerk File.

ACTION 3:

Motion was made by Councilmember Mosqueda, duly seconded and carried, to amend the Conditions by adding a 13th Condition, as shown in the underlined language below:

13. Mount Baker Housing Association, Grand Street Commons GP MBH LLC, and Grand Street Commons MBH LLLP shall be exempt from the required compensation for the appraised value of the right of way, but shall pay to the City all costs incurred by the City in processing the vacation request.

ACTION 4:

Motion was made by Councilmember Pedersen, duly seconded and carried, to amend the Conditions by amending the ninth Condition, second bullet, as shown in the underlined language below:

9. Additional review by the SDC shall include the following:

\*\*\*

- Before issuing any Certificate of Occupancy for GSC South, the SDC's Executive Director shall review and approve the agreement to between the Office of Arts & Culture and the Cultural Space PDA to create a condominium or otherwise set aside for the life of the building a space of



approximately 1,500 square feet for the PDA to use as a community focused space that will help activate the public plaza throughout the year.

ACTION 5:

Motion was made, duly seconded and carried, to include the amended Conditions in Clerk File 314459.

ACTION 6:

Motion was made and duly seconded, to grant as conditioned the amended Clerk File.

**The Motion carried, the amended Clerk File was granted as conditioned by the following vote, and the President signed the Conditions of the City Council:**

**In Favor:** 8 - González , Herbold, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

**Opposed:** None

4. [CB 120218](#) **AN ORDINANCE relating to property at Sand Point; authorizing the Director of Housing to execute an easement agreement for a sanitary sewer main line with the University of Washington; authorizing related agreements and actions to support the development of cottages for people experiencing homelessness on a parcel owned by the City and leased to SP Cottages LLC; and ratifying and confirming certain prior acts.**

Motion was made and duly seconded to pass Council Bill 120218.

**The Motion carried, the Council Bill (CB) passed by the following vote, and the President signed the Council Bill (CB):**

**In Favor:** 8 - González , Herbold, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

**Opposed:** None

## **J. ADOPTION OF OTHER RESOLUTIONS**

There were none.

## **K. OTHER BUSINESS**

There was none.



**L. ADJOURNMENT**

There being no further business to come before the Council, the meeting was adjourned at 3:06 p.m.

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**Linda Barron, Deputy City Clerk**

**Signed by me in Open Session, upon approval of the Council, on December 6, 2021.**

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**Lisa Herbold, Council President Pro Tem of the City Council**

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**Monica Martinez Simmons, City Clerk**





## Legislation Text

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**File #:** Min 356, **Version:** 1

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November 22, 2021



# SEATTLE CITY COUNCIL

600 Fourth Ave. 2nd Floor  
Seattle, WA 98104



## Journal of the Proceedings of the Seattle City Council

Monday, November 22, 2021

2:00 PM

Remote Meeting. Call 253-215-8782; Meeting ID: 586 416 9164; or  
Seattle Channel online.

### City Council

*M. Lorena González, President*

*Lisa Herbold, Member*

*Debora Juarez, Member*

*Andrew J. Lewis, Member*

*Tammy J. Morales, Member*

*Teresa Mosqueda, Member*

*Alex Pedersen, Member*

*Kshama Sawant, Member*

*Dan Strauss, Member*

Chair Info: 206-684-8809; [Lorena.González@seattle.gov](mailto:Lorena.González@seattle.gov)



*Pursuant to Washington State Governor's Proclamation No. 20-28.15 and Senate Concurrent Resolution 8402, this public meeting will be held remotely. Meeting participation is limited to access by the telephone number provided on the meeting agenda, and the meeting is accessible via telephone and Seattle Channel online.*

#### **A. CALL TO ORDER**

The City Council of The City of Seattle met remotely pursuant to Washington State Governor's Proclamation 20-28.15, and guidance provided by the Attorney General's Office, on November 22, 2021, pursuant to the provisions of the City Charter. The meeting was called to order at 2:01 p.m., with Council President González presiding

#### **B. ROLL CALL**

**The following Councilmembers were present and participating electronically:**

**Present:** 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

#### **C. PRESENTATIONS**

There were none.

#### **D. APPROVAL OF THE JOURNAL**

[Min 354](#)

**November 8, 2021**

**Motion was made, duly seconded and carried, to adopt the proposed Minutes by the following vote, and the President signed the Minutes**

**In Favor:** 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

**Opposed:** None

#### **E. ADOPTION OF INTRODUCTION AND REFERRAL CALENDAR**

[IRC 326](#)

**November 22, 2021**

**Motion was made, duly seconded and carried, to adopt the proposed Introduction and Referral Calendar (IRC) by the following vote:**

**In Favor:** 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss



**Opposed:** None

#### **F. APPROVAL OF THE AGENDA**

Motion was made, duly seconded and carried, to adopt the proposed Agenda.

#### **G. PUBLIC COMMENT**

The following individuals addressed the Council:

Howard Gale  
Josh Castle  
Amarinthia Torres  
David\* Haines  
Madeline Olson  
Silvia Gonzalez  
Nshan Burns  
Daniel Kavanaugh

#### **H. PAYMENT OF BILLS**

[CB 120229](#) **AN ORDINANCE appropriating money to pay certain audited claims for the week of November 8, 2021 through November 12, 2021 and ordering the payment thereof.**

Motion was made and duly seconded to pass Council Bill 120229.

**The Motion carried, the Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):**

**In Favor:** 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

**Opposed:** None

#### **I. COMMITTEE REPORTS**

**CITY COUNCIL:**



1. [CB 120210](#) **AN ORDINANCE relating to the Department of Finance and Administrative Services; authorizing the Director of the Department of Finance and Administrative Services or the Director's designee to negotiate and execute a real property lease renewal with the United States Army for The City of Seattle's continued interim use and occupancy of 33.95 acres at the Fort Lawton Army Reserve Center; and ratifying and confirming certain prior acts.**

ACTION 1

Motion was made and duly seconded to pass Council Bill 120210.

ACTION 2

Motion was made by Councilmember Mosqueda, and duly seconded to amend Council Bill 120210 by substituting Version 2 for Version D1a, substituting Attachment 1, substituting Exhibits B, C, E, and F to Attachment 1, as presented on the Agenda, and by removing Exhibits G and H from Attachment 1.

ACTION 3

Motion was made and duly seconded to pass as amended Council Bill 120210.

**The Motion carried, the Council Bill (CB) was passed as amended by the following vote, and the President signed the Council Bill (CB):**

**In Favor:** 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

**Opposed:** None

**SELECT BUDGET COMMITTEE:**



2. [CB 120220](#) **AN ORDINANCE authorizing, in 2021, acceptance of funding from non-City sources; authorizing the heads of the Executive Department, Department of Education and Early Learning, Human Services Department, Department of Transportation, Seattle Public Library, Fire Department, City Attorney's Office, Seattle Center, Seattle Parks and Recreation, and Police Department to accept specified grants, private funding, and subsidized loans and to execute, deliver, and perform corresponding agreements; and ratifying and confirming certain prior acts.**

**The Committee recommends that City Council pass the Council Bill (CB).**

**In Favor: 7 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Strauss**

**Opposed: None**

**Abstain: 1 - Pedersen**

**The Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):**

**In Favor: 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss**

**Opposed: None**

3. [CB 120221](#) **AN ORDINANCE amending Ordinance 126237, which adopted the 2021 Budget, including the 2021-2026 Capital Improvement Program (CIP); changing appropriations to various departments and budget control levels, and from various funds in the Budget; revising project allocations for certain projects in the 2021-2026 CIP; creating positions; modifying positions; abrogating positions; and ratifying and confirming certain prior acts; all by a 3/4 vote of the City Council.**

**The Committee recommends that City Council pass as amended the Council Bill (CB).**

**In Favor: 9 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Pedersen, Sawant, Strauss**

**Opposed: None**

**The Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):**

**In Favor: 8 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Strauss**



**Opposed:** 1 - Sawant

4. [CB 120040](#) **AN ORDINANCE amending Ordinance 126000, which adopted the 2020 Budget, including the 2020-2025 Capital Improvement Program (CIP); changing appropriations to various departments and budget control levels, and from various funds in the Budget; and ratifying and confirming certain prior acts; all by a 3/4 vote of the City Council.**

**The Committee recommends that City Council pass the Council Bill (CB).**

**In Favor: 7 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Strauss**

**Opposed: None**

**Abstain: 1 - Pedersen**

**The Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):**

**In Favor:** 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

**Opposed:** None

5. [Res 32026](#) **A RESOLUTION requesting King County and the State of Washington to increase services to address behavioral health conditions.**

**The Committee recommends that City Council adopt as amended the Resolution (Res).**

**In Favor: 9 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Pedersen, Sawant, Strauss**

**Opposed: None**

**The Resolution (Res) was adopted by the following vote, and the President signed the Resolution (Res):**

**In Favor:** 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

**Opposed:** None



6. [Res 32027](#) **A RESOLUTION modifying the Mayoral Civil Emergency Order of October 29, 2021, related to hiring incentives for public safety emergency response.**

**The Committee recommends that City Council adopt as amended the Resolution (Res).**

**In Favor: 4 - Herbold, González , Lewis, Morales**

**Opposed: 2 - Mosqueda, Sawant**

**Abstain: 3 - Juarez, Pedersen, Strauss**

**The Resolution (Res) was adopted by the following vote, and the President signed the Resolution (Res):**

**In Favor: 8 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Strauss**

**Opposed: 1 - Sawant**

7. [Res 32028](#) **A RESOLUTION concerning the health, well-being, and safety of domestic workers; expressing Council's intent to establish a right to portable Paid Time Off (PTO) for domestic workers in Seattle; and requesting the Office of Labor Standards to work with community stakeholders to draft legislation creating a portable PTO policy for domestic workers.**

**The Committee recommends that City Council adopt the Resolution (Res).**

**In Favor: 7 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Strauss**

**Opposed: None**

**Abstain: 1 - Pedersen**

**The Resolution (Res) was adopted by the following vote, and the President signed the Resolution (Res):**

**In Favor: 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss**

**Opposed: None**



8. [CF 314487](#) **2022 Proposed Budget.**

The Committee recommends that City Council file the Clerk File (CF).

In Favor: 7 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Strauss

Opposed: None

Abstain: 1 - Pedersen

The Clerk File (CF) was filed by the following vote:

In Favor: 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

Opposed: None

9. [CF 314486](#) **2022-2027 Proposed Capital Improvement Program.**

The Committee recommends that City Council file the Clerk File (CF).

In Favor: 7 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Strauss

Opposed: None

Abstain: 1 - Pedersen

The Clerk File (CF) was filed by the following vote:

In Favor: 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

Opposed: None

10. [CB 120189](#) **AN ORDINANCE relating to the 2022 Budget; authorizing Department directors to accept anticipated future grants and enter into revenue-backed service contracts to support appropriations in the 2022 Budget.**

The Committee recommends that City Council pass the Council Bill (CB).

In Favor: 7 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Strauss

Opposed: None

Abstain: 1 - Pedersen

The Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):



**In Favor:** 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

**Opposed:** None

11. [Res 32024](#) **A RESOLUTION adopting revised financial policies for the Emergency Fund.**

The Committee recommends that City Council adopt the Resolution (Res).

**In Favor:** 7 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Strauss

**Opposed:** None

**Abstain:** 1 - Pedersen

**The Resolution (Res) was adopted by the following vote, and the President signed the Resolution (Res):**

**In Favor:** 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

**Opposed:** None

12. [CB 120190](#) **AN ORDINANCE relating to fees and charges for permits and activities of the Seattle Department of Construction and Inspections, related fees by other departments, and technical corrections; amending Sections 22.900D.090, 22.900D.100, and 22.900D.150 of the Seattle Municipal Code (SMC).**

The Committee recommends that City Council pass the Council Bill (CB).

**In Favor:** 7 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Strauss

**Opposed:** None

**Abstain:** 1 - Pedersen

**The Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):**

**In Favor:** 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

**Opposed:** None



13.     [CB 120191](#)     **AN ORDINANCE relating to street and sidewalk use; amending the Street Use Fee Schedule authorized by Section 15.04.074 of the Seattle Municipal Code; and ratifying and confirming certain prior acts.**

The Committee recommends that City Council pass the Council Bill (CB).

In Favor: 7 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Strauss

Opposed: None

Abstain: 1 - Pedersen

The Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):

In Favor: 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

Opposed: None

14.     [CB 120192](#)     **AN ORDINANCE relating to the Department of Parks and Recreation; establishing the 2022 fee schedule for the use of park properties and other park and recreation facilities and services; and superseding previous park and recreation fee schedules.**

The Committee recommends that City Council pass the Council Bill (CB).

In Favor: 7 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Strauss

Opposed: None

Abstain: 1 - Pedersen

The Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):

In Favor: 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

Opposed: None



15.     [CB 120193](#)     **AN ORDINANCE relating to Seattle Parks and Recreation (SPR); authorizing an administrative amendment to Ordinance 115859, which established the Beach Maintenance Trust Fund (70200) as a subsidiary fund of the Shoreline Park Improvement Fund (SPIF) (33110), which fund was established by Ordinance 115496 as part of the settlement agreement with the Municipality of Metropolitan Seattle (“Metro”) for the construction of the West Point and Alki secondary sewage projects, and which expired in January 2011.**

The Committee recommends that City Council pass the Council Bill (CB).

In Favor: 7 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Strauss

Opposed: None

Abstain: 1 - Pedersen

The Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):

In Favor: 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

Opposed: None

16.     [CB 120194](#)     **AN ORDINANCE relating to King County Conservation Futures Levy proceeds; authorizing the Mayor to enter into a new Interlocal Cooperation Agreement between The City of Seattle and King County to allow for the acceptance of Conservation Futures Levy funds; authorizing the deposit of 2020 and 2021 allocations from King County Conservation Futures Levy proceeds into The City of Seattle’s Parks Fund.**

The Committee recommends that City Council pass the Council Bill (CB).

In Favor: 7 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Strauss

Opposed: None

Abstain: 1 - Pedersen

The Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):

In Favor: 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

Opposed: None



17. [CB 120195](#) **AN ORDINANCE relating to the financing of the Finance and Administrative Services Fund; authorizing interfund loans up to a total of \$8,000,000 from the Fleet Capital Fund and \$2,000,000 from the Wheelchair Accessible Fund to the Finance and Administrative Services Fund for financing of FEMA-eligible COVID-19 response expenses.**

**The Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):**

**In Favor:** 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

**Opposed:** None

18. [CB 120198](#) **AN ORDINANCE relating to contracting indebtedness; authorizing and providing for the issuance and sale of limited tax general obligation bonds to pay all or part of the costs of various elements of the City's capital improvement program and for other City purposes approved by ordinance, to provide loans to one or more public development authorities of the City for certain eligible capital purposes, and to pay the costs of issuance of the bonds; providing parameters for the bond sale terms including conditions, covenants, and other sale terms; creating the 2022 Multipurpose LTGO Bond Fund; amending Ordinance 126219; and ratifying and confirming certain prior acts.**

**The Committee recommends that City Council pass the Council Bill (CB).**

**In Favor:** 7 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Pedersen

**Opposed:** None

**Abstain:** 1 - Strauss

**The Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):**

**In Favor:** 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

**Opposed:** None



19.     [CB 120224](#)     **AN ORDINANCE relating to contracting indebtedness; authorizing and providing for the issuance and sale of limited tax general obligation bonds to pay all or part of the costs of certain transportation elements of the City's capital improvement program and for other City purposes approved by ordinance and to pay the costs of issuance of the bonds; providing parameters for the bond sale terms including conditions, covenants, and other sale terms; and ratifying and confirming certain prior acts.**

**The Committee recommends that City Council pass the Council Bill (CB).**

**In Favor: 9 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Pedersen, Sawant, Strauss**

**Opposed: None**

**The Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):**

**In Favor: 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss**

**Opposed: None**

20.     [CB 120196](#)     **AN ORDINANCE relating to the electric system of The City of Seattle; adopting a system or plan of additions and betterments to and extensions of the existing municipal light and electric power generation, transmission, and distribution system of the City; authorizing the issuance and sale of municipal light and power revenue bonds for the purposes of providing funds to pay part of the cost of carrying out that system or plan, providing for the reserve fund requirement (if any), and paying the costs of issuance of the bonds; providing parameters for the bond sale terms including conditions, covenants, and other sale terms; describing the lien of the bonds and authorizing their issuance as either senior lien parity bonds or junior lien bonds; and ratifying and confirming certain prior acts.**

**The Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):**

**In Favor: 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss**

**Opposed: None**



21.     [CB 120197](#)     **AN ORDINANCE relating to the drainage and wastewater system of The City of Seattle; adopting a system or plan of additions and betterments to and extensions of the existing drainage and wastewater system; authorizing the issuance and sale of drainage and wastewater revenue bonds in one or more series for the purposes of paying part of the cost of carrying out that system or plan, providing for the reserve requirement, and paying the costs of issuance of the bonds; providing parameters for the bond sale terms including conditions, covenants, and other sale terms; describing the lien of those bonds; amending certain definitions set forth in Ordinance 125455, the Omnibus Refunding Ordinance; authorizing the issuance of drainage and wastewater system refunding revenue bonds; and ratifying and confirming certain prior acts.**

**The Committee recommends that City Council pass the Council Bill (CB).**

**In Favor: 7 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Strauss**

**Opposed: None**

**Abstain: 1 - Pedersen**

**The Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):**

**In Favor: 8 - González , Herbold, Juarez, Lewis, Mosqueda, Pedersen, Sawant, Strauss**

**Opposed: None**

**Absent(NV): 1 - Morales**



22.     [CB 120199](#)     **AN ORDINANCE relating to the municipal water system of The City of Seattle; adopting a system or plan of additions and betterments to and extensions of the existing municipal water system; authorizing the issuance and sale of water system revenue bonds in one or more series for the purposes of paying part of the cost of carrying out that system or plan, providing for the reserve requirement, and paying the costs of issuance of the bonds; providing parameters for the bond sale terms including conditions, covenants, and other sale terms; describing the lien of the bonds; creating certain accounts of the City relating to the bonds; amending certain definitions set forth in Ordinance 125714, the Omnibus Refunding Ordinance; authorizing the issuance of water system refunding revenue bonds; and ratifying and confirming certain prior acts.**

The Committee recommends that City Council pass the Council Bill (CB).

In Favor: 7 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Strauss

Opposed: None

Abstain: 1 - Pedersen

The Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):

In Favor: 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

Opposed: None

23.     [CB 120200](#)     **AN ORDINANCE relating to the Office of Housing; creating a new Fund in the City Treasury.**

The Council Budget Action (CBA) was approved by the following vote:

In Favor: 7 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Strauss

Opposed: None

Abstain: 1 - Pedersen

The Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):

In Favor: 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss



**Opposed:** None

24. [Res 32022](#) **A RESOLUTION approving interest rates set by the Seattle City Employees' Retirement System (SCERS) Board of Administration for 2022.**

The Committee recommends that City Council adopt the Resolution (Res).

**In Favor:** 7 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Strauss

**Opposed:** None

**Abstain:** 1 - Pedersen

**The Resolution (Res) was adopted by the following vote, and the President signed the Resolution (Res):**

**In Favor:** 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

**Opposed:** None

25. [Res 32023](#) **A RESOLUTION amending Resolution 31334; establishing the City Council's intent to fund the Seattle City Employees' Retirement System (SCERS) as informed by the January 1, 2021, Actuarial Study.**

The Committee recommends that City Council adopt the Resolution (Res).

**In Favor:** 7 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Strauss

**Opposed:** None

**Abstain:** 1 - Pedersen

**The Resolution (Res) was adopted by the following vote, and the President signed the Resolution (Res):**

**In Favor:** 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

**Opposed:** None



26. [CB 120201](#) **AN ORDINANCE relating to City funds; closing certain funds, subfunds, and accounts; authorizing the Department of Finance and Administrative Services to take action pursuant to those closures; authorizing the transfer of all unexpended and unencumbered balances and other assets and liabilities of those funds, subfunds, and accounts; and abandoning appropriation authority from those funds, subfunds, and accounts.**

**The Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):**

**In Favor:** 8 - González , Herbold, Juarez, Lewis, Morales, Pedersen, Sawant, Strauss

**Opposed:** None

**Absent(NV):** 1 - Mosqueda

27. [CB 120202](#) **AN ORDINANCE relating to the Traffic Code; modifying fees associated with car sharing; clarifying certain definitions; establishing Seattle Department of Transportation authority for managing free-floating zone service areas; and amending Sections 11.14.087, 11.23.150, and 11.23.160 of the Seattle Municipal Code.**

**The Committee recommends that City Council pass the Council Bill (CB).**

**In Favor:** 7 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Strauss

**Opposed:** None

**Abstain:** 1 - Pedersen

**The Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):**

**In Favor:** 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

**Opposed:** None



28.     [CB 120223](#)     **AN ORDINANCE relating to the financing of the Transportation Fund; authorizing interfund loans up to a total amount of \$15,000,000 from multiple City funds as bridge financing to be repaid by the proceeds of a future surplus property sale.**

The Committee recommends that City Council pass the Council Bill (CB).

In Favor: 7 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Strauss

Opposed: None

Abstain: 1 - Pedersen

The Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):

In Favor: 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

Opposed: None

29.     [CB 120228](#)     **AN ORDINANCE relating to taxation; increasing the commercial parking tax and amending subsection 5.35.030.B of the Seattle Municipal Code.**

The Committee recommends that City Council pass the Council Bill (CB).

In Favor: 8 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Pedersen, Strauss

Opposed: None

The Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):

In Favor: 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

Opposed: None



30.     [CB 120222](#)     **AN ORDINANCE relating to the financing of the General Fund; amending Ordinance 126407 to increase the authorization of interfund loans up to a total amount of \$275,000,000 from multiple City Funds to the General Fund as bridge financing to be repaid from future tax proceeds and other anticipated revenues; authorizing additional lending funds; and ratifying and confirming certain prior acts.**

**The Committee recommends that City Council pass the Council Bill (CB).**

**In Favor: 7 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Strauss**

**Opposed: None**

**Abstain: 1 - Pedersen**

**The Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):**

**In Favor: 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss**

**Opposed: None**

31.     [CF 314488](#)     **City Council Changes to the 2022 Proposed Budget and the 2022 - 2027 Proposed Capital Improvement Program.**

**The Committee recommends that City Council approve and file the Clerk File (CF).**

**In Favor: 9 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Pedersen, Sawant, Strauss**

**Opposed: None**

**The Clerk File (CF) was filed by the following vote:**

**In Favor: 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss**

**Opposed: None**



32.     [CB 120211](#)     **AN ORDINANCE adopting a budget, including a capital improvement program and position modifications, for The City of Seattle for 2022; and creating positions exempt from civil service; all by a 2/3 vote of the City Council.**

The Committee recommends that City Council pass as amended the Council Bill (CB).

In Favor: 8 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Pedersen, Strauss

Opposed: 1 - Sawant

The Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):

In Favor: 8 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Strauss

Opposed: 1 - Sawant

33.     [CB 120203](#)     **AN ORDINANCE relating to the levy of property taxes; fixing the rates and/or amounts of taxes to be levied, and levying the same upon all taxable property, both real and personal, in The City of Seattle, to finance the departments and activities of City government and to provide for the general obligation bond interest and redemption requirements for the year beginning on the first day of January 2022; and ratifying and confirming certain prior acts.**

The Committee recommends that City Council pass the Council Bill (CB).

In Favor: 7 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Strauss

Opposed: None

Abstain: 1 - Pedersen

The Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):

In Favor: 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

Opposed: None



34.     [CB 120204](#)     **AN ORDINANCE** authorizing the levy of regular property taxes by The City of Seattle for collection in 2022, representing an increase above the regular property taxes levied for collection in 2021; and ratifying and confirming certain prior acts.

The Committee recommends that City Council pass the Council Bill (CB).

In Favor: 7 - Mosqueda, Herbold, González , Juarez, Lewis, Morales, Strauss

Opposed: None

Abstain: 1 - Pedersen

The Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):

In Favor: 9 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant, Strauss

Opposed: None

#### **J. ADOPTION OF OTHER RESOLUTIONS**

There were none.

#### **K. OTHER BUSINESS**

Motion was made, duly seconded and carried, to excuse Councilmember Morales from the December 6, 2021 City Council meeting.

#### **L. ADJOURNMENT**

There being no further business to come before the Council, the meeting was adjourned at 4:47 p.m.



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**Linda Barron, Deputy City Clerk**

**Signed by me in Open Session, upon approval of the Council, on December 6, 2021.**

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**Lisa Herbold, Council President Pro Tem of the City Council**

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**Monica Martinez Simmons, City Clerk**





## Legislation Text

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**File #:** Min 357, **Version:** 1

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November 29, 2021



# SEATTLE CITY COUNCIL

600 Fourth Ave. 2nd Floor  
Seattle, WA 98104



## Journal of the Proceedings of the Seattle City Council

Monday, November 29, 2021

2:00 PM

Remote Meeting. Call 253-215-8782; Meeting ID: 586 416 9164; or  
Seattle Channel online.

### City Council

*M. Lorena González, President*

*Lisa Herbold, Member*

*Debora Juarez, Member*

*Andrew J. Lewis, Member*

*Tammy J. Morales, Member*

*Teresa Mosqueda, Member*

*Alex Pedersen, Member*

*Kshama Sawant, Member*

*Dan Strauss, Member*

Chair Info: 206-684-8809; [Lorena.González@seattle.gov](mailto:Lorena.González@seattle.gov)



*Pursuant to Washington State Governor's Proclamation No. 20-28.15 and Senate Concurrent Resolution 8402, this public meeting will be held remotely. Meeting participation is limited to access by the telephone number provided on the meeting agenda, and the meeting is accessible via telephone and Seattle Channel online.*

#### **A. CALL TO ORDER**

The City Council of The City of Seattle met remotely pursuant to Washington State Governor's Proclamation 20-28.15, and guidance provided by the Attorney General's Office, on November 29, 2021, pursuant to the provisions of the City Charter. The meeting was called to order at 2:01 p.m., with Council President González presiding.

#### **B. ROLL CALL**

**The following Councilmembers were present and participating electronically:**

**Present:** 8 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant

**Excused:** 1 - Strauss

#### **C. PRESENTATIONS**

There were none.

#### **D. APPROVAL OF THE JOURNAL**

There were no Minutes presented for approval.

#### **E. ADOPTION OF INTRODUCTION AND REFERRAL CALENDAR**

[IRC 327](#)

**November 29, 2021**

**Motion was made, duly seconded and carried, to adopt the proposed Introduction and Referral Calendar (IRC) by the following vote:**

**In Favor:** 8 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant

**Opposed:** None



**F. APPROVAL OF THE AGENDA**

Motion was made, duly seconded and carried, to adopt the proposed Agenda.

**G. PUBLIC COMMENT**

The following individuals addressed the Council:

Howard Gale  
David Haines

**H. PAYMENT OF BILLS**

[CB 120234](#) **AN ORDINANCE appropriating money to pay certain audited claims for the week of November 15, 2021 through November 19, 2021 and ordering the payment thereof.**

Motion was made and duly seconded to pass Council Bill 120234.

**The Motion carried, the Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):**

**In Favor:** 8 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant

**Opposed:** None

**I. COMMITTEE REPORTS****CITY COUNCIL:**

1. [CB 120225](#) **AN ORDINANCE relating to the City Light Department; amending terms and conditions pertaining to the emergency bill assistance program and temporarily expanding access to assistance to certain eligible households for a limited time in response to the Coronavirus Disease 2019 ("COVID-19") emergency; and amending Section 21.49.042 of the Seattle Municipal Code.**

Motion was made and duly seconded to pass Council Bill 120225.

**The Motion carried, the Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):**

**In Favor:** 8 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant

**Opposed:** None



2. [CB 120226](#) **AN ORDINANCE relating to Seattle Public Utilities' Emergency Assistance Program; temporarily extending increased assistance related to COVID-induced customer delinquencies; and amending Section 21.76.065 of the Seattle Municipal Code.**

Motion was made and duly seconded to pass Council Bill 120226.

**The Motion carried, the Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):**

**In Favor:** 8 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant

**Opposed:** None

3. [CB 120232](#) **AN ORDINANCE relating to City employment; authorizing the execution of a collective bargaining agreement between The City of Seattle and PROTEC17 Office of Emergency Management unit to be effective through December 31, 2021; and ratifying and confirming certain prior acts.**

Motion was made and duly seconded to pass Council Bill 120232.

**The Motion carried, the Council Bill (CB) was passed by the following vote, and the President signed the Council Bill (CB):**

**In Favor:** 8 - González , Herbold, Juarez, Lewis, Morales, Mosqueda, Pedersen, Sawant

**Opposed:** None

## **J. ADOPTION OF OTHER RESOLUTIONS**

There were none.

## **K. OTHER BUSINESS**

Motion was made, duly seconded and carried, to excuse Councilmember González from the December 6, 2021 City Council meeting.

## **L. ADJOURNMENT**

There being no further business to come before the Council, the meeting was adjourned at 2:19 p.m.



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**Jodee Schwinn, Deputy City Clerk**

**Signed by me in Open Session, upon approval of the Council, on December 6, 2021.**

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**Lisa Herbold, Council President Pro Tem of the City Council**

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**Monica Martinez Simmons, City Clerk**





## Legislation Text

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**File #:** IRC 328, **Version:** 1

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December 6, 2021





## Introduction and Referral Calendar

List of proposed Council Bills (CB), Resolutions (Res), Appointments (Appt) and Clerk Files (CF) to be introduced and referred to a City Council committee

Record No.	Title	Committee Referral
<b><u>By: Mosqueda</u></b>		
1. <a href="#">CB 120240</a>	AN ORDINANCE appropriating money to pay certain audited claims for the week of November 22, 2021 through November 26, 2021 and ordering the payment thereof.	City Council
<b><u>By: González</u></b>		
2. <a href="#">CB 120242</a>	AN ORDINANCE relating to City employment; authorizing the execution of a memorandum of understanding between The City of Seattle and certain City unions; and ratifying and confirming certain prior acts.	City Council
<b><u>By: González</u></b>		
3. <a href="#">CB 120243</a>	AN ORDINANCE relating to City employment; providing salary increases for 2022 for certain non-represented City job titles; and ratifying and confirming certain prior acts.	City Council
<b><u>By: González</u></b>		
4. <a href="#">CB 120244</a>	AN ORDINANCE relating to City employment, to be known as the 2022 Pay Zone Ordinance; adjusting the pay zone structures for 2022 for the City's discretionary pay programs; and ratifying and confirming certain prior acts.	City Council
<b><u>By: No Sponsor Required</u></b>		
5. <a href="#">CB 120246</a>	AN ORDINANCE relating to the City's traffic code; conforming the Seattle Municipal Code with changes in state law; amending Sections 11.14.055, 11.20.040, 11.20.230, 11.30.040, 11.31.120, 11.34.020, 11.40.240, 11.44.020, 11.44.040, 11.50.320, 11.50.340, 11.53.100, 11.53.120, 11.53.140, 11.53.200, 11.53.205, 11.55.010, 11.55.080, 11.56.025, 11.56.050, 11.56.120, 11.56.350, 11.56.355, 11.58.005, 11.58.195, 11.58.230, 11.70.060, 11.82.520, and 11.84.440 of the Seattle Municipal Code; and adding new Sections 11.14.097, 11.14.712, and 11.70.070 to the Seattle Municipal Code.	City Council
<b><u>By: González</u></b>		
6. <a href="#">Res 32032</a>	A RESOLUTION setting forth The City of Seattle's 2022 State Legislative Agenda.	City Council



**By: Morales**

7. [CB 120241](#) AN ORDINANCE relating to human rights; including protections against discrimination based on citizenship and immigration status; adding a definition of race for certain purposes; and amending Sections 3.14.910, 3.14.931, 3.110.260, 4.80.020, 6.02.270, 6.202.230, 14.04.020, 14.04.030, 14.04.040, 14.04.050, 14.06.020, 14.06.030, 14.08.015, 14.08.020, 14.08.045, 14.08.070, 14.08.190, 14.10.010, 14.10.020, and 18.12.280 of the Seattle Municipal Code.
- Community  
Economic  
Development  
Committee

**By: Morales**

8. [Appt 02077](#) Reappointment of Victor Loo as member, Seattle LGBTQ Commission, for a term to October 31, 2023.
- Community  
Economic  
Development  
Committee

**By: Morales**

9. [Appt 02078](#) Appointment of Schuyler Reid as member, Seattle Human Rights Commission, for a term to July 22, 2023.
- Community  
Economic  
Development  
Committee

**By: Morales**

10. [Appt 02079](#) Reappointment of April Snow as member, Seattle Disability Commission, for a term to October 31, 2023.
- Community  
Economic  
Development  
Committee

**By: Mosqueda**

11. [Appt 02080](#) Appointment of Estefana Ramirez De Harry as member, Domestic Workers Standards Board, for a term to February 28, 2022.
- Finance and  
Housing  
Committee

**By: Mosqueda**

12. [Appt 02081](#) Appointment of Diana Salazar as member, Domestic Workers Standards Board for a term to, February 28, 2022.
- Finance and  
Housing  
Committee

**By: Mosqueda**

13. [Appt 02082](#) Appointment of Edna C. Shim as member, Burke Gilman Public Development Authority Governing Council, for a term to December 31, 2023.
- Finance and  
Housing  
Committee

**By: Mosqueda**

14. [Appt 02083](#) Reappointment of Chasten Fulbright as member, Community Roots Housing Public Development Authority Governing Council, for a term to March 31, 2023.
- Finance and  
Housing  
Committee



**By: Mosqueda**

- |                                |  |                               |
|--------------------------------|--|-------------------------------|
| 15. <a href="#">Appt 02084</a> | Reappointment of Shalimar M. Gonzales as member, Community Roots Housing Public Development Authority Governing Council, for a term to March 31, 2023. | Finance and Housing Committee |
|--------------------------------|--|-------------------------------|

**By: Mosqueda**

- |                                |   |                               |
|--------------------------------|---|-------------------------------|
| 16. <a href="#">Appt 02085</a> | Reappointment of Eric Snow as member, Community Roots Housing Public Development Authority Governing Council, for a term to March 31, 2024. | Finance and Housing Committee |
|--------------------------------|---|-------------------------------|

**By: Mosqueda**

- |                                |   |                               |
|--------------------------------|---|-------------------------------|
| 17. <a href="#">Appt 02086</a> | Appointment of Sally J. Clark as member, Seattle Housing Authority Board, for a term to March 20, 2025. | Finance and Housing Committee |
|--------------------------------|---|-------------------------------|

**By: Juarez**

- |               |   |  |
|---------------|---|--|
| 18. Res 32034 | A RESOLUTION relating to Seattle Parks and Recreation; authorizing the Superintendent of Parks and Recreation to act as the authorized representative/agent on behalf of The City of Seattle and to legally bind The City of Seattle with respect to certain projects for which the City seeks grant funding assistance managed through the State Recreation and Conservation Office (RCO). | Public Assets and Native Communities Committee |
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**By: Herbold**

- |                               |  |  |
|-------------------------------|--|--|
| 19. <a href="#">CB 120245</a> | AN ORDINANCE relating to the Seattle Fire Department's fire prevention services; amending Sections 22.602.010, 22.602.020, 22.602.045, 22.602.050, 22.602.070, 22.602.090, and 3.102.010 of, repealing Sections 3.16.130 and 22.600.050 of, and adding a new Section 3.16.131 to the Seattle Municipal Code. | Public Safety and Human Services Committee |
|-------------------------------|--|--|

**By: Lewis, González**

- |                               |  |  |
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| 20. <a href="#">CB 120247</a> | AN ORDINANCE relating to the organization of City government; adding data reporting responsibilities to the City Attorney's Office; and adding a new Chapter 3.46 to the Seattle Municipal Code. | Public Safety and Human Services Committee |
|-------------------------------|--|--|

**By: Herbold**

- |                               |   |  |
|-------------------------------|---|--|
| 21. <a href="#">CB 120248</a> | AN ORDINANCE relating to City employment; creating a compensation program for the position of Fire Chief; specifying provisions for the administration of said compensation program; and ratifying and confirming certain prior acts. | Public Safety and Human Services Committee |
|-------------------------------|---|--|

**By: Herbold**

- |                               |  |  |
|-------------------------------|--|--|
| 22. <a href="#">Res 32033</a> | A RESOLUTION declaring the City Council's and the Mayor's intent to consider strategies to ensure that all unreinforced masonry buildings in Seattle are seismically | Public Safety and Human Services Committee |
|-------------------------------|--|--|



retrofitted.





## Legislation Text

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**File #:** CB 120240, **Version:** 1

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### CITY OF SEATTLE

### ORDINANCE \_\_\_\_\_

### COUNCIL BILL \_\_\_\_\_

AN ORDINANCE appropriating money to pay certain audited claims for the week of November 22, 2021 through November 26, 2021 and ordering the payment thereof.

**BE IT ORDAINED BY THE CITY OF SEATTLE AS FOLLOWS:**

Section 1. Payment of the sum of \$13,832,994.30 on PeopleSoft 9.2 mechanical warrants numbered 4100524283 - 4100526211 plus manual or cancellation issues for claims, E-Payables of \$118,262.28 on PeopleSoft 9.2 9100010693 - 9100010723 and Electronic Financial Transactions (EFT) in the amount of \$38,207,966.69 are presented for ratification by the City Council per RCW 42.24.180.

Section 2. Payment of the sum of \$52,260,058.52 on City General Salary Fund mechanical warrants numbered 51355773 - 51356429 plus manual warrants, agencies warrants, and direct deposits numbered 470001 - 472805 representing Gross Payrolls for payroll ending date November 23, 2021 as detailed in the Payroll Summary Report for claims against the City which were audited by the Auditing Committee and reported by said committee to the City Council December 2, 2021 consistent with appropriations heretofore made for such purpose from the appropriate Funds, is hereby approved.

Section 3. Any act consistent with the authority of this ordinance taken prior to its effective date is hereby ratified and confirmed.



Section 4. This ordinance shall take effect and be in force 30 days after its approval by the Mayor, but if not approved and returned by the Mayor within ten days after presentation, it shall take effect as provided by Seattle Municipal Code Section 1.04.020.

Passed by the City Council the 6<sup>th</sup> day of December 2021, and signed by me in open session in authentication of its passage this 6th day of December 2021.

\_\_\_\_\_  
President \_\_\_\_\_ of the City Council

Approved / returned unsigned / vetoed this \_\_\_\_\_ day of \_\_\_\_\_, 2021.

\_\_\_\_\_  
Jenny A. Durkan, Mayor

Filed by me this \_\_\_\_\_ day of \_\_\_\_\_, 2021.

\_\_\_\_\_  
Monica Martinez Simmons, City Clerk

(Seal)





## Legislation Text

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**File #:** CB 120213, **Version:** 1

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### CITY OF SEATTLE

### ORDINANCE \_\_\_\_\_

### COUNCIL BILL \_\_\_\_\_

AN ORDINANCE relating to land use and zoning; extending for six months a moratorium established by Ordinance 125764, and extended by Ordinances 126006, 126090, 126241, and 126362, on the filing, acceptance, processing, and/or approval of any application to establish a new principal or accessory use, or change a principal or accessory use, for any site currently used as a mobile home park, as defined in Section 23.84A.032 of the Seattle Municipal Code; and ratifying and confirming certain prior acts.

**BE IT ORDAINED BY THE CITY OF SEATTLE AS FOLLOWS:**

Section 1. The City Council makes the following legislative findings of fact and declarations:

A. The Council incorporates by reference the findings of fact contained in Ordinance 125764.

B. In January 2019, the City Council passed Ordinance 125764, establishing a moratorium on the filing, acceptance, processing, and/or approval of any application to establish a new principal or accessory use, or change a principal or accessory use, for any site currently used as a mobile home park, as defined in Section 23.84A.032 of the Seattle Municipal Code.

C. That moratorium was extended for four additional six-month periods by Ordinance 126006 (December 2019), Ordinance 126090 (June 2020), Ordinance 126241 (November 2020), and Ordinance 126362 (June 2021).

D. On April 26, 2021, the Council issued a State Environmental Policy Act (SEPA) threshold determination of non-significance for permanent regulations creating a Mobile Home Park Overlay District to help preserve the remaining mobile home parks in Seattle.

E. That threshold determination of non-significance was appealed to the City Hearing Examiner on May 17, 2021, by Bella Bee, LLC (“Appellant”).



F. The Appellant and the City reached a settlement agreement on the appeal and on September 13, 2021, the appeal was dismissed by the Hearing Examiner.

G. On October 18, 2021, the Council introduced Council Bill 120206, incorporating the terms of the settlement agreement and creating a Mobile Home Park Overlay District.

H. Although the City has worked to develop and propose permanent regulations, the work has not been completed and the City Council will not be able to consider and act on permanent regulations until after the expiration of the moratorium on January 11, 2022.

I. Work on permanent regulations has been limited due to the February 29, 2020, and March 3, 2020, proclamations of civil emergency by Governor Jay Inslee and Mayor Jenny Durkan, respectively, related to the spread of Coronavirus Disease 2019 (“COVID-19”), and due to the SEPA appeal to the City Hearing Examiner.

J. Revised Code of Washington (RCW) 36.70A.390 authorizes the City to extend the duration of a moratorium by ordinance for one or more six-month periods.

Section 2. The moratorium first set forth in Ordinance 125764, and extended by Ordinances 126006, 126090, 126241, and 126362, shall be extended and in effect for a period of six months from the effective date of this ordinance, and shall automatically expire on the earlier of the effective date of the ordinance introduced as Council Bill 120206 creating a Mobile Home Park Overlay District, or after the six-month period unless the same is extended as provided by statute, or unless terminated sooner by the City Council.

Section 3. Any act relating to the filing, acceptance, processing, and/or approval of permits and permit applications consistent with the authority of this ordinance taken after its passage and prior to its effective date is ratified and confirmed.

Section 4. This ordinance shall take effect and be in force 30 days after its approval by the Mayor, but if not approved and returned by the Mayor within ten days after presentation, it shall take effect as provided by Seattle Municipal Code Section 1.04.020.

Passed by the City Council the \_\_\_\_\_ day of \_\_\_\_\_, 2021, and signed by



me in open session in authentication of its passage this \_\_\_\_\_ day of \_\_\_\_\_, 2021.

\_\_\_\_\_  
President \_\_\_\_\_ of the City Council

Approved / returned unsigned / vetoed this \_\_\_\_\_ day of \_\_\_\_\_, 2021.

\_\_\_\_\_  
Jenny A. Durkan, Mayor

Filed by me this \_\_\_\_\_ day of \_\_\_\_\_, 2021.

\_\_\_\_\_  
Monica Martinez Simmons, City Clerk

(Seal)



## **SUMMARY and FISCAL NOTE\***

<b>Department:</b>	<b>Dept. Contact/Phone:</b>	<b>CBO Contact/Phone:</b>
LEG	Freeman / 48178	NA

*\* Note that the Summary and Fiscal Note describes the version of the bill or resolution as introduced; final legislation including amendments may not be fully described.*

### **1. BILL SUMMARY**

#### **Legislation Title:**

AN ORDINANCE relating to land use and zoning; extending for six months a moratorium established by Ordinance 125764, and extended by Ordinances 126006, 126090, 126241, and 126362, on the filing, acceptance, processing, and/or approval of any application to establish a new principal or accessory use, or change a principal or accessory use, for any site currently used as a mobile home park, as defined in Section 23.84A.032 of the Seattle Municipal Code; and ratifying and confirming certain prior acts.

#### **Summary and background of the Legislation:**

The legislation would extend a moratorium established by Ordinance 125764. That moratorium was previously extended by Ordinances 126006, 126090, 126241, and 126362. The extended moratorium will expire in January 2022.

Ordinance 125764 established a moratorium on the filing, acceptance, processing, and/or approval of any application to establish a new principal or accessory use, or change a principal or accessory use, for any site currently used as a mobile home park. The ordinance also established a work program for the Office of Planning and Community Development (OPCD) and the Seattle Department of Construction and Inspections (SDCI) to develop proposed regulations for Council consideration and conduct any required environmental review pursuant to the State Environmental Policy Act (SEPA). Those regulations could include land use regulations that protect residents of mobile home parks who suffer from housing insecurity.

The work program requested that the Executive publish any required SEPA threshold determination by June 2019 and transmit proposed legislation to Council by September 2019. In April 2021, the Council issued a State Environmental Policy Act (SEPA) threshold determination of non-significance for a proposal to create a Mobile Home Park Overlay District. That threshold determination was appealed to the City Hearing Examiner by Bella Bee, LLC in May 2021. The City reached a settlement agreement with Bella Bee, LLC in September 2021 and in October 2021 introduced Council Bill 120206, incorporating the terms of the settlement agreement and creating a Mobile Home Park Overlay District.

The COVID-19 civil emergencies declared by the Governor and Mayor and the SEPA appeal have forestalled the City's efforts to develop a proposal for Council consideration. A six-month extension of the moratorium is necessary to preserve the option for Council to consider future land use regulations related to mobile home parks.



There are currently at least two mobile home parks located in Seattle: (1) the Halcyon mobile home park located at 12234 Stone Av. N. and (2) the Bella B mobile home park located at 1301 N 125<sup>th</sup> St. Mobile homes are a source of market rate affordable housing. The Halcyon mobile home park includes 76 homes, many of which are occupied by lower-income and elderly residents.

## 2. CAPITAL IMPROVEMENT PROGRAM

Does this legislation create, fund, or amend a CIP Project?      ☐ Yes ☒ No

## 3. SUMMARY OF FINANCIAL IMPLICATIONS

Does this legislation amend the Adopted Budget?      ☐ Yes ☒ No

Does the legislation have other financial impacts to The City of Seattle that are not reflected in the above, including direct or indirect, short-term or long-term costs?  
No.

Is there financial cost or other impacts of *not* implementing the legislation?

Existing mobile home parks house many low-income and senior households. Displacement of low-income residents could increase demand for services provided by affordable housing and human services providers.

## 4. OTHER IMPLICATIONS

a. Does this legislation affect any departments besides the originating department?

Yes, the Seattle Department of Construction and Inspections.

b. Is a public hearing required for this legislation?

A public hearing is required. A hearing is tentatively scheduled for December 6, 2021, at the Full Council.

c. Is publication of notice with *The Daily Journal of Commerce* and/or *The Seattle Times* required for this legislation?

Yes, hearing notice is required in the Daily Journal of Commerce.

d. Does this legislation affect a piece of property?

The legislation affects property currently in use as mobile home parks. Those properties include, at least, the Halcyon mobile home park, located at 12234 Stone Av. N. and the Bella Bee mobile home park located at 1301 N. 125<sup>th</sup> St.



- e. **Please describe any perceived implication for the principles of the Race and Social Justice Initiative. Does this legislation impact vulnerable or historically disadvantaged communities? What is the Language Access plan for any communications to the public?**

Mobile home parks offer market rate affordable housing to seniors and low-income households. This legislation extends a moratorium to allow the City to explore options for stabilizing those communities.

- f. **Climate Change Implications**

1. **Emissions: Is this legislation likely to increase or decrease carbon emissions in a material way?**

No. Disclosure of climate change implications for permanent regulations are discussed in the summary to Council Bill 120206.

2. **Resiliency: Will the action(s) proposed by this legislation increase or decrease Seattle's resiliency (or ability to adapt) to climate change in a material way? If so, explain. If it is likely to decrease resiliency in a material way, describe what will or could be done to mitigate the effects.**

No. Disclosure of climate change implications for permanent regulations are discussed in the summary to Council Bill 120206.

- g. **If this legislation includes a new initiative or a major programmatic expansion: What are the specific long-term and measurable goal(s) of the program? How will this legislation help achieve the program's desired goal(s)?**

NA

**List attachments/exhibits below:**





## Legislation Text

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**File #:** CB 120236, **Version:** 1

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### CITY OF SEATTLE

#### ORDINANCE \_\_\_\_\_

#### COUNCIL BILL \_\_\_\_\_

AN ORDINANCE relating to City streets; changing the name of the portion of Thomas St between 1st Ave N and 2nd Ave N to Lenny Wilkens Way; and superseding the relevant portions of Ordinance 4044, Ordinance 89910, Ordinance 102981, and any other ordinance to the extent inconsistent; and ratifying and confirming certain prior acts.

WHEREAS, Lenny Wilkens is a legendary basketball player and coach, having been inducted into the College Basketball Hall of Fame and inducted three times to the Naismith Memorial Basketball Hall of Fame (as an NBA player, NBA coach and assistant coach of the 1992 Olympic “Dream Team”), been named 13 times an NBA All-Star, has won two Olympic Gold Medals in 1992 and 1996 and has coached more games than any other coach in NBA history; and

WHEREAS, Lenny Wilkens played four of his 15 years as an NBA player for the Seattle Supersonics (1969-72), three of which he served as head coach for the team while also continuing as the team’s starting point guard, and then, after returning to the team in 1977 as head coach, he led that season’s team to a Western Conference Championship; followed by another conference championship during the 1978-79 season that culminated in a 5-game NBA Finals win over the Washington Bullets to claim the Sonics’ one and only World Championship title; and

WHEREAS, in addition to continuing to inspire Seattle sports fans, Lenny Wilkens continues to live in and serve the Seattle community as the founder and chair of the Lenny Wilkens Foundation for Children where he has raised over \$7.5 million for the Odessa Brown Clinic, as well as other organizations that provide care and opportunities for local disadvantaged youth in Seattle; and

WHEREAS, City departments have reviewed this proposal and agree that no significant, negative impacts



would result from this proposal; NOW, THEREFORE,

**BE IT ORDAINED BY THE CITY OF SEATTLE AS FOLLOWS:**

Section 1. The name of the portion of Thomas St between 1st Ave N and 2nd Ave N is changed to Lenny Wilkens Way, superseding the relevant portions of Ordinance 4044, Ordinance 89910, Ordinance 102981, and any other ordinance to the extent inconsistent.

Section 2. Any act consistent with the authority of this ordinance taken after its passage and prior to its effective date is ratified and confirmed.

Section 3. This ordinance shall take effect and be in force 30 days after its approval by the Mayor, but if not approved and returned by the Mayor within ten days after presentation, it shall take effect as provided by Seattle Municipal Code Section 1.04.020.

Passed by the City Council the \_\_\_\_\_ day of \_\_\_\_\_, 2021, and signed by me in open session in authentication of its passage this \_\_\_\_\_ day of \_\_\_\_\_, 2021.

\_\_\_\_\_  
President \_\_\_\_\_ of the City Council

Approved / returned unsigned / vetoed this \_\_\_\_\_ day of \_\_\_\_\_, 2021.

\_\_\_\_\_  
Jenny A. Durkan, Mayor

Filed by me this \_\_\_\_\_ day of \_\_\_\_\_, 2021.



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Monica Martinez Simmons, City Clerk

(Seal)



## **SUMMARY and FISCAL NOTE\***

<b>Department:</b>	<b>Dept. Contact/Phone:</b>	<b>CBO Contact/Phone:</b>
SDOT	Bill LaBorde/206.484.8662	Aaron Blumenthal/206.233.2656

*\* Note that the Summary and Fiscal Note describes the version of the bill or resolution as introduced; final legislation including amendments may not be fully described.*

### **1. BILL SUMMARY**

**Legislation Title:** AN ORDINANCE relating to City streets; changing the name of the portion of Thomas St between 1st Ave N and 2nd Ave N to Lenny Wilkens Way; and superseding the relevant portions of Ordinance 4044, Ordinance 89910, Ordinance 102981, and any other ordinance to the extent inconsistent; and ratifying and confirming certain prior acts.

**Summary and background of the Legislation:** This ordinance would supersede the honorary street name resolved by Council earlier this year (Resolution 32019) with a legal street name change. While a legal street name change can often be costly and burdensome for affected businesses and residents, as well as the City, it became clear during the planning for an unveiling event that a legal street name change would be easily feasible at this location due to the lack of any postal addresses on this segment of Thomas St, because the segment fronts only one easily identifiable landmark, and because the renaming would require replacement of only 3 street signs. These conditions are similar to those present when a segment of Atlantic St alongside the Mariners stadium was renamed Edgar Martinez Dr in 2004 (Ordinance 121612).

### **2. CAPITAL IMPROVEMENT PROGRAM**

**Does this legislation create, fund, or amend a CIP Project?** \_\_\_ Yes x No

### **3. SUMMARY OF FINANCIAL IMPLICATIONS**

**Does this legislation amend the Adopted Budget?** \_\_\_ Yes x No

**Does the legislation have other financial impacts to the City of Seattle that are not reflected in the above, including direct or indirect, short-term or long-term costs?**  
The resolution will require SDOT to manufacture and install 3 legal street signs on the 2 block area at a cost of approximately \$6500. These funds will be covered by SDOT's existing budget for street signs.

**Is there financial cost or other impacts of *not* implementing the legislation?**  
No



#### 4. OTHER IMPLICATIONS

- a. **Does this legislation affect any departments besides the originating department?**  
Seattle Center. The honorary street signs will be added to existing sign posts adjacent to Seattle Center's Climate Pledge Arena.
- b. **Is a public hearing required for this legislation?**  
No
- c. **Is publication of notice with *The Daily Journal of Commerce* and/or *The Seattle Times* required for this legislation?**  
No
- d. **Does this legislation affect a piece of property?**  
No
- e. **Please describe any perceived implication for the principles of the Race and Social Justice Initiative. Does this legislation impact vulnerable or historically disadvantaged communities? What is the Language Access plan for any communications to the public?**  
This ordinance would honor a beloved and widely celebrated African-American athlete and coach whose foundation continues to support a pediatric health and dental clinic that primarily serves children of color in central and south Seattle, regardless of their families' ability to pay by naming a street after him. This would be one of the few streets in Seattle named after an African-American.
- f. **Climate Change Implications**
1. **Emissions: Is this legislation likely to increase or decrease carbon emissions in a material way?**  
No.
  2. **Resiliency: Will the action(s) proposed by this legislation increase or decrease Seattle's resiliency (or ability to adapt) to climate change in a material way? If so, explain. If it is likely to decrease resiliency in a material way, describe what will or could be done to mitigate the effects.**  
No.
- g. **If this legislation includes a new initiative or a major programmatic expansion: What are the specific long-term and measurable goal(s) of the program? How will this legislation help achieve the program's desired goal(s).**  
N/A

List attachments/exhibits below:





## Legislation Text

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**File #:** CB 120231, **Version:** 1

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### CITY OF SEATTLE

#### ORDINANCE \_\_\_\_\_

#### COUNCIL BILL \_\_\_\_\_

AN ORDINANCE relating to City employment; authorizing the execution of an agreement between The City of Seattle and Seattle Fire Chiefs Association, International Association of Fire Fighters (IAFF) Local 2898; and ratifying and confirming certain prior acts.

WHEREAS, during the Coronavirus Disease 2019 (“COVID-19”) pandemic, many City employees have been required to perform essential functions and deliver critical services to the community that can only be performed in person; and

WHEREAS, these employees play an essential role in the City and are on the front lines of delivering essential public services; and

WHEREAS, because of COVID-19, these employees may have experienced increased hardship, such as lack of public transit, limited access to childcare, and other challenges; and

WHEREAS, retention of these employees is of the utmost importance, and the City seeks to provide some additional acknowledgment of their extraordinary efforts; and

WHEREAS, the City also seeks to bolster front-line employee morale so they can continue to provide these essential in-person public services through the end of the current public health emergency; and

WHEREAS, collective bargaining has led to an agreement between The City of Seattle and Seattle Fire Chiefs Association, International Association of Fire Fighters (IAFF) Local 2898; and

WHEREAS, the City Budget Office has identified General Fund reserves sufficient to cover the estimated cost resulting from agreements and will submit subsequent legislation to appropriate funds once the departmental totals and payment timing are settled; NOW, THEREFORE,



**BE IT ORDAINED BY THE CITY OF SEATTLE AS FOLLOWS:**

Section 1. As requested by the Seattle Human Resources Director and recommended by the Mayor, the Mayor is authorized on behalf of The City of Seattle (“City”) to execute an agreement between the City and the Seattle Fire Chiefs Association, International Association of Fire Fighters (IAFF) Local 2898, substantially in the form attached to this ordinance as Attachment 1 and identified as “Memorandum of Agreement: Seattle Fire Chiefs Association, IAFF Local 2898 and The City of Seattle.”

Section 2. Any act consistent with the authority of this ordinance taken prior to its effective date is ratified and confirmed.

Section 3. This ordinance shall take effect and be in force 30 days after its approval by the Mayor, but if not approved and returned by the Mayor within ten days after presentation, it shall take effect as provided by Seattle Municipal Code Section 1.04.020.

Passed by the City Council the \_\_\_\_\_ day of \_\_\_\_\_, 2021, and signed by me in open session in authentication of its passage this \_\_\_\_\_ day of \_\_\_\_\_, 2021.

\_\_\_\_\_  
President \_\_\_\_\_ of the City Council

Approved / returned unsigned / vetoed this \_\_\_\_\_ day of \_\_\_\_\_, 2021.

\_\_\_\_\_  
Jenny A. Durkan, Mayor

Filed by me this \_\_\_\_\_ day of \_\_\_\_\_, 2021.



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Monica Martinez Simmons, City Clerk

(Seal)

**Attachments:**

Attachment 1 - Memorandum of Agreement: Seattle Fire Chiefs Association, IAFF Local 2898 and The City of Seattle



## MEMORANDUM OF AGREEMENT

SEATTLE FIRE CHIEFS ASSOCIATION, IAFF LOCAL 2898

and

THE CITY OF SEATTLE

This Memorandum of Agreement (hereinafter called “Memorandum” or “MOA”) is entered into between the City of Seattle (“City”) and IAFF Local 2898. Collectively, the City, and IAFF Local 2898 shall be known as “the Parties”.

- A. **Acknowledgement of Front-Line Worker Pay:** Current City of Seattle employees who have been required to perform work in person at City job sites and offices during the pandemic will be paid a one-time taxable payment of up to \$1,750.00 (pro-rated for part-time employees). Eligible employees must be on the City’s payroll on or after August 1, 2021. Employees who separated prior to August 1, 2021 are not eligible to receive this payment. This payment will be paid to eligible employees no later than March 31, 2022 as long as the employee timely files their paperwork.
- B. **Employee Eligibility Self-Attestation:** To qualify for this Acknowledgement of Front-Line Worker Pay and determine lump sum amount, an employee must certify in writing each of the following:
1. **Eligibility for Work Performed in Person** – Employee was directed by management or the work was required to be performed in-person at any time between March 20, 2020 and December 31, 2021.
  2. **Lump Sum Calculation** – Employee may qualify for either a full monthly payment or partial monthly payment according below:
    - a. **Full Monthly Payment** – For each month between March 20, 2020 through December 31, 2021 if an employee was directed by management or the work was required to be performed in-person greater than 110 regular hours in the month, they shall receive \$100 for that month. For each month if you received 100% of the Telework Stipend, you will not receive the Acknowledgement of Front-Line Worker Pay for that month; or,
    - b. **Partial Monthly Payment** – For each month between March 20, 2020 through December 31, 2021 if an employee was directed by management or the work was required to be performed in-person more than 94 regular hours, but less than or equal to 110 regular hours in the month, they shall receive \$50 for that month. For each month if you received 50% of the Telework Stipend, you will receive 50% of the Acknowledgement of Front-Line Worker Pay for that month.



3. **Total Compensation** – No employee's combined payment of Telework Reimbursement and Front-Line Worker Acknowledgement Pay shall exceed a maximum of \$100 for any month. The total Front-Line Worker Acknowledgement Pay lump sum payment shall not exceed \$1,750.00.
- C. Upon Tentative Agreement of this proposal, the Mayor will modify the current Mayoral Directive #9, creating Directive #10 regarding employees telework to be voluntary effective October 18, 2021 and the Fixed Rate Utility Allowance Memorandum Of Understanding will expire October 18, 2021. Eligible employees may elect to continue their current telework arrangement until January 19, 2022 unless there is a business need for them to return to the worksite. While the parties understand that continued telework will be considered voluntary on the part of the employee after October 18, 2021, the Department will have the sole discretion on when to return an employee providing a legitimate business need which is clearly and succinctly described in a notice to the employee and the union.
- D. This Agreement represents the entire agreement and understanding of the Parties as to the subject of this Agreement.
- E. **SEVERABILITY.** If any of the provisions of this Agreement are held to be invalid or unenforceable, the remaining provisions will nevertheless continue to be valid and enforceable. However, if the payment is deemed unlawful or if this Agreement is not ratified by the City Council, the Agreement shall be null and void and any payments previously paid must be paid back to the City. The provisions of this Agreement will not be construed against any party.
- F. **DISPUTES.** Issues arising over the interpretation, application, or enforceability of the provisions of this agreement shall be addressed during labor management meetings convened and held for all signatory unions, upon request by any Party, and shall not be subject to the grievance procedure set forth in the Parties' collective bargaining agreements.
- G. **NO PRECEDENT.** This Agreement does not constitute a practice or precedent and cannot be used by any of the Parties in any matter or proceeding, except for the purpose of enforcing the Agreement itself. The Parties agree the acknowledgment payment described above is a one-time payment and arises out of the unique circumstances of the public health emergency.
- H. **TERM OF AGREEMENT.** This Agreement shall expire on March 31, 2022.



SIGNED this \_\_\_\_\_ day of \_\_\_\_\_ 2021.

FOR THE CITY OF SEATTLE

\_\_\_\_\_  
Jenny A. Durkan, Mayor

\_\_\_\_\_  
Kimberly Loving, Interim SDHR Director

\_\_\_\_\_  
Jeff Clark, Labor Negotiator

FOR THE UNION

\_\_\_\_\_  
Tom Walsh, President  
Seattle Fire Chiefs Association, IAFF Local 2898



## **SUMMARY and FISCAL NOTE\***

<b>Department:</b>	<b>Dept. Contact/Phone:</b>	<b>CBO Contact/Phone:</b>
Seattle Department of Human Resources	Jeff Clark/206-684-7871 Michael South/206-684-7872	Joe Russell/206-684-8546

*\* Note that the Summary and Fiscal Note describes the version of the bill or resolution as introduced; final legislation including amendments may not be fully described.*

### **1. BILL SUMMARY**

#### **Legislation Title:**

AN ORDINANCE relating to City employment; authorizing the execution of an agreement between The City of Seattle and Seattle Fire Chiefs Association, International Association of Fire Fighters (IAFF) Local 2898; and ratifying and confirming certain prior acts.

#### **Summary and background of the Legislation:**

This legislation authorizes an agreement to provide “acknowledgement pay” to qualifying employees represented by Seattle Fire Chiefs Association, IAFF, Local 2898 (“Local 2898”).

The intent of the legislation is to acknowledge hardships, offset additional costs, and retain front-line Local 2898 members who continued to deliver in-person, essential City services during the COVID-19 public health emergency. Members shall be eligible for a one-time payment of up to \$1,750 (\$100/month), pro-rated by the number of hours and months they worked at a City worksite, retroactive to March 2020. The payment is structured so that employees cannot qualify for both the maximum acknowledgement pay and the telework reimbursement, although it is possible to receive a partial, pro-rated amount if they worked the required in-person hours.

The City Budget Office has calculated a preliminary cost estimate based on the terms in the tentative agreement and is holding reserves in the General Fund. Once an employee attestation and management review process is completed, and the timing for payments is settled, the City Budget Office will appropriate funds to departments in either 2021 or 2022.

### **2. SUMMARY OF FINANCIAL IMPLICATIONS**

**Does this legislation amend the Adopted Budget?**      Yes **X** No

**Does the legislation have other financial impacts to The City of Seattle that are not reflected in the above, including direct or indirect, short-term or long-term costs?**

Yes, this agreement will affect the budget for the Seattle Fire Department (“SFD”). Subsequent legislation is being prepared once the timing of payments and amounts by SFD are determined.



**Is there financial cost or other impacts of *not* implementing the legislation?**

If the agreement is not legislated, members will not be authorized to receive the compensation provided therein. There may be other risks associated with not implementing the legislation.

**3. OTHER IMPLICATIONS**

- a. **Does this legislation affect any departments besides the originating department?**  
Compensation provided for by this legislation will be paid to qualifying employees in SFD.
- b. **Is a public hearing required for this legislation?**  
No.
- c. **Is publication of notice with *The Daily Journal of Commerce* and/or *The Seattle Times* required for this legislation?**  
No.
- d. **Does this legislation affect a piece of property?**  
No.
- e. **Please describe any perceived implication for the principles of the Race and Social Justice Initiative. Does this legislation impact vulnerable or historically disadvantaged communities? What is the Language Access plan for any communications to the public?**  
The City seeks to ensure employees providing in-person services are recognized and compensated for their hardships and their dedication.
- f. **Climate Change Implications**
1. **Emissions: Is this legislation likely to increase or decrease carbon emissions in a material way?**  
N/A
  2. **Resiliency: Will the action(s) proposed by this legislation increase or decrease Seattle's resiliency (or ability to adapt) to climate change in a material way? If so, explain. If it is likely to decrease resiliency in a material way, describe what will or could be done to mitigate the effects.**  
N/A
- g. **If this legislation includes a new initiative or a major programmatic expansion: What are the specific long-term and measurable goal(s) of the program? How will this legislation help achieve the program's desired goal(s)?**  
N/A.

**List attachments/exhibits below:**

None.



December 1, 2021

## MEMORANDUM

**To:** Seattle City Council  
**From:** Dan Eder, Deputy Director and Karina Bull, Analyst  
**Subject:** Council Bill 120231: Frontline Worker Pay  
Seattle Fire Chiefs Association, IAFF, Local 2898

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On December 6, 2021, the Seattle City Council (Council) will discuss and possibly vote on [Council Bill \(CB\) 120231](#), legislation that would authorize additional pay for eligible front-line employees represented by the Seattle Fire Chiefs Association, International Association of Fire Fighters (IAFF), Local 2898 (Local 2898). This memo provides a high-level summary of the bill and identifies next steps. Central Staff has not identified issues or concerns for Council's consideration.

### Summary

This legislation would ratify a tentative agreement with Local 2898 to provide up to \$1,750 in a lump sum payment to eligible front-line employees in the Seattle Fire Department. The terms of this agreement are substantively the same as agreements ratified by Council last month in [Ordinance 126153](#) that authorized front-line worker pay for non-represented eligible employees throughout the City of Seattle (City) and represented eligible employees in the following unions:

1. Coalition of City Unions and other signatory unions,
2. IAFF Local 27, and
3. Public, Professional & Office-Clerical Employees and Driver Union Local 763 (Municipal Court).<sup>1</sup>

The terms of this agreement with Local 2898 would provide a lump sum payment to eligible employees of up to \$100/month, pro-rated by the number of hours and months the employees worked at a City worksite, retroactive to March 2020. In any given month during this period, employees could not qualify for both the maximum telework reimbursement (\$48 per month) and the additional maximum monthly payment amount authorized by this legislation (\$100 per month).

In transmitting the legislation for Council's consideration, the Seattle Department of Human Resources (SDHR) states that the intent of the legislation is to "acknowledge hardships, offset additional costs, and retain front-line City employees who continued to deliver in-person, essential City services during the COVID-19 public health emergency."

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<sup>1</sup> The City and the Seattle Police Officers Guild have not yet reached a tentative agreement.



**Financial Impacts**

The City Budget Office has calculated a preliminary cost for the additional pay covered by the tentative agreement with Local 2898 and has indicated that there are equivalent reserves in the General Fund. Future legislation would be needed before the end of the year or in 2022 to authorize the necessary appropriations to make payments to eligible employees.

**Next Steps**

If the Council votes to approve this legislation, SDHR would execute the tentative agreement with Local 2898. The Mayor's Office expects to transmit separate legislation that appropriates funding needed to make the payments contemplated in this legislation.

Please contact Dan Eder or Karina Bull if you have questions about the proposed legislation.

cc: Esther Handy, Director  
Aly Pennucci, Policy and Budget Manager





## Legislation Text

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**File #:** CB 120237, **Version:** 1

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### CITY OF SEATTLE

### ORDINANCE \_\_\_\_\_

### COUNCIL BILL \_\_\_\_\_

AN ORDINANCE relating to City employment, commonly referred to as the Fourth Quarter 2021 Employment Ordinance; designating positions as exempt from the civil service system; and returning positions to the civil service system; all by a 2/3 vote of the City Council.

**BE IT ORDAINED BY THE CITY OF SEATTLE AS FOLLOWS:**

Section 1. Designating 12 positions as exempt from Civil Service status. As recommended by the Seattle Human Resources Director in the Classification Determination Report specified, the following positions are designated as exempt from Civil Service as noted below, pursuant to Seattle Municipal Code Section 4.13.010:

*Exemption per Seattle Municipal Code subsection 4.13.010.1*

- 1 filled position (00023974) in Seattle City Light, Executive 2, (Report #17271)
- 1 vacant position (00014105) in Seattle City Light, Information Technology Professional A, Exempt (Report #17981)
- 1 filled position (00020757) in Seattle Public Utilities Department, Executive 2 (Report #20-17808)
- 1 filled position (00020925) in Seattle Public Utilities, Executive 1 (Report 18137)
- 1 filled position (00008047) in Seattle Department of Transportation, Executive 2 (Report #20-17812)
- 1 filled position (10001253) in Seattle Department of Transportation, Executive 2 (Report 18188)
- 1 vacant position (00015712) in Finance Administrative Services, Executive 2 (Report #20-17890)
- 1 filled position (00025608) in Seattle Information Technology, Information Technology Professional A,



Exempt (Report #20-17970)

*Exemptions per Seattle Municipal Code subsection 4.13.010.13*

- 1 filled position (00017095) in Law Department, Accountant, (Report #19-17456)

*Exemption Requests*

- 1 filled position (10002037) in Office of Economic Development, Strategic Advisor 2, Exempt (Report #19-17418)
- 1 filled position (00019837) in Seattle Department of Human Resources, Manager 1, Exempt (Report #20-17636)
- 1 filled position (10001287) in Finance Administrative Services, Manager 3, Exempt (Report #20-17982)

Section 2. Returning two positions to Civil Service status. As recommended by the Seattle Human Resources Director in the Classification Determination Report specified, the following positions are returned to Civil Service:

- 1 filled position (10007023) in Office of Emergency Management, Strategic Advisor 2, Finance, Budget, and Accounting (Report #18265)
- 1 filled position (10005531) in Seattle Department of Human Resources, Strategic Advisor 1, General Government (Report #18350)

Section 3. This ordinance shall take effect and be in force 30 days after its approval by the Mayor, but if not approved and returned by the Mayor within ten days after presentation, it shall take effect as provided by Seattle Municipal Code Section 1.04.020.

Passed by a 2/3 vote of all the members of the City Council the \_\_\_\_\_ day of \_\_\_\_\_, 2021, and signed by me in open session in authentication of its passage this



\_\_\_\_\_ day of \_\_\_\_\_, 2021.

\_\_\_\_\_  
President \_\_\_\_\_ of the City Council

Approved / returned unsigned / vetoed this \_\_\_\_\_ day of \_\_\_\_\_, 2021.

\_\_\_\_\_  
Jenny A. Durkan, Mayor

Filed by me this \_\_\_\_\_ day of \_\_\_\_\_, 2021.

\_\_\_\_\_  
Monica Martinez Simmons, City Clerk

(Seal)



## **SUMMARY and FISCAL NOTE\***

<b>Department:</b>	<b>Dept. Contact/Phone:</b>	<b>CBO Contact/Phone:</b>
Seattle Department of Human Resources	Amanda Grumbach/ 206-684-3068	Arushi Kumar/206-684-0025 Joe Russell/206-684-8546

*\* Note that the Summary and Fiscal Note describes the version of the bill or resolution as introduced; final legislation including amendments may not be fully described.*

### **1. BILL SUMMARY**

**Legislation Title:** AN ORDINANCE relating to City employment, commonly referred to as the Fourth Quarter 2021 Employment Ordinance; designating positions as exempt from the civil service system; and returning positions to the civil service system; all by a 2/3 vote of the City Council.

**Summary and background of the Legislation:** If passed, this legislation:

- a. Returns two positions to the civil service system. As a result of a classification review and determination, these positions no longer meet the exemption criteria.
- b. Establishes twelve positions as exempt from the civil service system. Of these positions, eight are exempt per Municipal Code 4.13.010.1. One is exempt per Municipal Code 4.13.010.13. These positions need to be exempt to stay in compliance with the Municipal Code. The final three are exemptions for which the nature of the work to be performed by the positions is consistent with the exemption criteria set forth in Seattle Municipal Code Section 4.13.010 and Personnel Rule 2.2.

### **2. CAPITAL IMPROVEMENT PROGRAM**

**Does this legislation create, fund, or amend a CIP Project?** \_\_\_ Yes X No

### **3. SUMMARY OF FINANCIAL IMPLICATIONS**

**Does this legislation amend the Adopted Budget?** \_\_\_ Yes X No

**Does the legislation have other financial impacts to the City of Seattle that are not reflected in the above, including direct or indirect, short-term or long-term costs?**

There are not costs associated with the designation of any position as exempt or not exempt from the Civil Service. Costs associated with related changes to title or classification will be absorbed by departments' existing budget authority and do not require appropriation of new funds.



**Is there financial cost or other impacts of *not* implementing the legislation?**

This legislation is needed to appropriately designate civil service status, which can have personnel implications.

**3. OTHER IMPLICATIONS**

**a. Does this legislation affect any departments besides the originating department?**

This legislation affects the Office of Emergency Management, Law Department, Seattle Department of Transportation, Finance and Administrative Services, Seattle City Light, Seattle Public Utilities, Office of Economic Development, Seattle Department of Human Resources and Seattle Information Technology.

**b. Is a public hearing required for this legislation?**

No

**c. Is publication of notice with *The Daily Journal of Commerce* and/or *The Seattle Times* required for this legislation?**

No

**d. Does this legislation affect a piece of property?**

N/A

**e. Please describe any perceived implication for the principles of the Race and Social Justice Initiative. Does this legislation impact vulnerable or historically disadvantaged communities? What is the Language Access plan for any communications to the public?**

N/A

**f. Climate Change Implications**

**1. Emissions: Is this legislation likely to increase or decrease carbon emissions in a material way?**

N/A

**2. Resiliency: Will the action(s) proposed by this legislation increase or decrease Seattle's resiliency (or ability to adapt) to climate change in a material way? If so, explain. If it is likely to decrease resiliency in a material way, describe what will or could be done to mitigate the effects.**

N/A

**g. If this legislation includes a new initiative or a major programmatic expansion: What are the specific long-term and measurable goal(s) of the program? How will this legislation help achieve the program's desired goal(s).**

N/A

**List attachments/exhibits below:**

None



December 1, 2021

## MEMORANDUM

**To:** Seattle City Council  
**From:** Karina Bull, Analyst  
**Subject:** Council Bill 120237: Fourth Quarter Employment Ordinance

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On December 6, 2021, the Seattle City Council (Council) will discuss and may vote on [Council Bill \(CB\) 120237](#), the Fourth Quarter Employment Ordinance. This memo summarizes the background and content of the legislation. Central Staff has not identified issues for Council's consideration.

### Background

The Council authorizes certain City of Seattle (City) personnel actions through quarterly employment ordinances. The Seattle Department of Human Resources (SDHR) transmitted the Fourth Quarter Employment Ordinance for Council's authorization to return two positions to civil service and exempt twelve positions from civil service.

Civil service provides a range of job protections for City employees, including merit-based hiring and promotions, opportunity for employees to correct performance issues, and "for cause" termination (*i.e.*, termination based only on unsatisfactory job performance). Employees exempt from civil service may be appointed without a competitive hiring process and are subject to "at will employment" (*i.e.*, employment that may be terminated at any time for any reason not prohibited by law).

The [City Charter Article XVI, Section 3](#) requires civil service membership for all City employees except for those in exempted positions identified by the Charter and [Seattle Municipal Code \(SMC\) 4.13](#). In total, about 90 percent of City employees are in the civil service.

Under the Charter, the following positions are exempted from civil service:

- Elected officers;
- Specified appointive offices;
- Assistant City Attorneys;
- Heads of departments
- Members of boards and commissions; and
- Additional positions exempted by legislation approved by two-thirds vote of the Council.

Under SMC 4.13, "additional positions" exempted from civil service include general categories of positions, such as temporary employees, interns, administrative secretaries, executives,



office/maintenance aides and exempt strategic advisors, managers, and information technology professionals. Specific exempt positions include electric utility executives at Seattle City Light, executive assistants with identified position numbers, and all positions in certain departments except for clerical positions classified in the Administrative Support class series.

The SDHR Director has authority under [Personnel Rule 2.2](#) to determine whether positions merit designation to civil service or exemption. SMC 4.13.010 establishes criteria for this determination by limiting civil service exemption to the following positions:

- Positions requiring a particularly high degree of professional responsiveness and individual accountability;
- Positions requiring a confidential or fiduciary relationship with the appointing authority; or
- Judicial positions requiring insulation as a third branch of government.

After making this determination, the SDHR Director may submit legislation to Council that recommends returning a position to civil service or exempting the position from civil service. The SDHR Director's recommendation for exemptions will only take effect upon approval by two-thirds vote of the Council. Council also has authority to introduce legislation on civil service classification.

#### **CB 120237**

This legislation would establish Council approval for the following personnel actions:

##### **A. Return two positions to the civil service system**

The SDHR Director has determined that the work performed by two positions no longer meets the criteria for civil service exemption and recommends returning these positions to civil service. See Table 1 for a list of these positions.

*Table 1. Two positions that would return to civil service*

	<b>Original Classification (Exempt)</b>	<b>New Classification (Civil Service)</b>	<b>Department</b>	<b>Vacancy Status</b>
1	Strategic Advisor 2, Exempt	Strategic Advisor 2, Finance, Budget, and Accounting	Office of Emergency Management	Filled
2	Strategic Advisor 1, Exempt	Strategic Advisor 1, General Government	SDHR	Filled

##### **B. Exempt 12 positions from the civil service system**

The SDHR Director has determined that the work performed by twelve positions meets the criteria for civil service exemption and recommends exempting these positions from civil service. See Table 2 for a list of these positions.



*Table 2. Twelve positions that would be exempted from civil service*

	<b>Original Classification (Civil Service)</b>	<b>New Classification (Exempt)</b>	<b>Department</b>	<b>Vacancy Status</b>
1	Manager 3, Engineering & Plans Review-Bargaining Unit	Executive 2	Seattle City Light (SCL)	Filled
2	Information Technology Professional B-Bargaining Unit	Information Technology Professional A, Exempt	SCL	Vacant
3	Manager 3, Engineering & Plans Review	Executive 2	Seattle Public Utilities (SPU)	Filled
4	Manager 2, General Government	Executive 1	SPU	Filled
5	Manager 3, Engineering & Plans Review	Executive 2	Seattle Department of Transportation (SDOT)	Filled
6	Civil Engineer, Senior	Executive 2	SDOT	Filled
7	Manager 3, Purchasing, Contracting, and Risk Management	Executive 2	Finance and Administrative Services	Vacant
8	Information Technology Professional B-Bargaining Unit	Information Technology Professional A, Exempt	Seattle Information Technology	Filled
9	Accounting Tech 3	Accountant	Law Department	Filled
10	Management Systems Analyst, Supervisor	Manager 1, Exempt	SDHR	Filled
11	Strategic Advisor 2, General Government	Strategic Advisor 2, Exempt	Office of Economic Development	Filled
12	Manager 3, General Government	Manager 3, Exempt	FAS	Filled

### **Financial Impacts**

There would be no direct costs associated with these personnel actions. Any costs that might be associated with an incumbent's change in civil service status would be absorbed by the department's existing budget authority and would not require appropriation of new funds.

### **Racial Equity Impacts**

This legislation would authorize SDHR to take specific actions related to civil service status. As SDHR has not submitted demographic information for these actions, the following analysis is based on broad observations.



Returning positions to civil service could support the City's commitment to workforce equity. The [City's 2021 Workforce Equity Technical Report](#) finds that Black, Indigenous, People of Color (BIPOC) employees, and especially BIPOC women, are underrepresented at the top levels (e.g., supervisors and high wage earners) of City employment when compared to the general population. Increasing the number of positions, especially higher-paying positions, with civil service protections could achieve more equity for BIPOC employees by removing the barriers that create risk and uncertainty for employees seeking career growth. Further, the two positions in this legislation that would return to civil service are Strategic Advisor positions. According to SDHR, such positions are often the first type of jobs for employees moving out of step-placement positions and seeking career mobility. Strategic Advisor positions that offer job stability and financial security could attract a greater diversity of candidates and/or increase job retention for BIPOC employees in such positions.

Exempting positions from civil service creates greater risk for employees. Notably, the Charter provides a right for any person appointed to an exempt position from civil service to return to the same or a like position in civil service upon termination of the appointment, unless the person is dismissed for cause. Additionally, changing the civil service status for some positions can increase earning potential. Ten of the twelve positions (positions 1-10) recommended for civil service exemption would be assigned a new job classification, automatically exempt under SMC 4.13, with an increased range of compensation. The remaining two positions would be assigned a new job classification with the same earning potential. For both types of actions, SDHR is developing a process that would bring greater clarity to their review of criteria for civil service exemptions to ensure greater consistency and equity in the Director's recommended personnel actions. SHDR estimates completion of this process in the second quarter of 2022.

Please contact me if you have questions about this proposed legislation.

cc: Esther Handy, Director  
Dan Eder, Deputy Director





## Legislation Text

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**File #:** CB 120233, **Version:** 1

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### CITY OF SEATTLE

#### ORDINANCE \_\_\_\_\_

#### COUNCIL BILL \_\_\_\_\_

AN ORDINANCE relating to the City Light Department; directing the transfer of certain funds in the Light Fund into the Rate Stabilization Account in 2021; and amending Section 21.49.086 of the Seattle Municipal Code to simplify the operation of the Rate Stabilization Account.

WHEREAS, the City established the Rate Stabilization Account (RSA) within the Light Fund to buffer the City Light Department (“City Light”) and its customers from deviations of Net Wholesale Revenues (NWR) from those assumed in budgets; and

WHEREAS, over its past decade in operation, the RSA has proven to be a useful and effective mechanism for shielding customer rates from financial risks brought on by uncontrollable external factors like temperatures, rainfall, and wholesale market conditions; and

WHEREAS, the financial risk in NWR is smaller than when the RSA was first introduced due to smaller surplus volumes, lower average market prices and changes to City Light’s contract with the Bonneville Power Administration; and

WHEREAS, the current \$10 million band between surcharge thresholds is not well aligned to current revenue uncertainty and contributes to more frequent rate changes than necessary to buffer NWR risk; and

WHEREAS, in Ordinance 123757 the Council expressed a desire to reduce the likelihood of rate surcharges, as provided for in Seattle Municipal Code (SMC) 21.49.086, should revenue be less than that assumed in budgets; and

WHEREAS, City Light customers participating in focus groups in 2019 expressed a strong desire for rate stability; and



WHEREAS, City Light anticipates better than 1.85 times 2021 debt service coverage due to increased retail revenues, lower power contract costs, and favorable bond pricing; and

WHEREAS, City Light anticipates 2021 NWR will be significantly lower than the level assumed in the 2021 Adopted Budget, primarily due to the impacts of unforeseen and extreme weather and drought conditions, triggering a surcharge under current rules; NOW, THEREFORE,

**BE IT ORDAINED BY THE CITY OF SEATTLE AS FOLLOWS:**

Section 1. The City Light Department may transfer 2021 cash available in the Light Fund for debt service coverage in excess of 1.85 times debt service for 2021 into the Rate Stabilization Account so long as its balance does not exceed \$100 million.

Section 2. Section 21.49.086 of the Seattle Municipal Code, last amended by Ordinance 126194, is amended as follows:

**21.49.086 Rate Stabilization Account**

A. The purpose of the Rate Stabilization Account established by Ordinance 121637 is, among other things, to absorb fluctuations in the Department's annual revenue in any given year due to deviations in net wholesale revenue from the amount assumed in the adopted budget for that year. Deposits into and withdrawals from the Rate Stabilization Account also affect the calculation of "Net Revenue" under certain provisions of ordinances authorizing Department bonds, and can therefore serve to absorb other fluctuations in "Net Revenue" as that term is defined in those bond ordinances. Except as otherwise provided by ordinance, funds in the Rate Stabilization Account cannot be used for any purposes other than those specified herein.

B. ~~((Target size of the Rate Stabilization Account))~~ The target size of the Rate Stabilization Account shall be no less than \$100 million and no greater than \$125 million.

~~((C. Initial funding of the Rate Stabilization Account~~

~~Initial funding of the Rate Stabilization Account will come from a variety of sources including:~~

~~1. The amount remaining in the Department's existing Contingency Reserve Account;~~



- ~~2. Cash from operations in 2010 in excess of that required for operations and debt service;~~
- ~~3. Revenue from the sale of surplus property in 2010 and 2011 not already recognized in the Department's 2010 Adopted Budget;~~
- ~~4. Allowable savings in 2010, 2011, and 2012 from refunding bonds in 2010; and~~
- ~~5. Other sources of revenue as determined by the City Council.~~

~~D. Baseline for the Net Wholesale Revenue forecast:))~~

C. The Net Wholesale Revenue forecast shall be \$60 million in 2021 and \$40 million in 2022 through 2024. The forecast shall be the amount of Net Wholesale Revenue assumed by the City Council for the purpose of establishing Department rates and budgets. The Department shall allocate the forecast by month and document this assumption in annual revenue requirement and budget proposals.

~~((The annual forecast for each year will be distributed over the quarters of the year as follows:~~

- ~~1. Thirty-five percent for January 1 to March 31;~~
- ~~2. Twenty percent for April 1 to June 30;~~
- ~~3. Fifteen percent for July 1 to September 30; and~~
- ~~4. Thirty percent for October 1 to December 31.~~

~~The amounts determined in this way will be the quarterly Net Wholesale Revenue forecasts for the purpose of subsection 21.49.086.E and will be reported by the Department in its annual budget proposals.~~

~~E. Use of the Rate Stabilization Account Effective January 1, 2011:))~~

D. Should the actual Net Wholesale Revenue for any ~~((quarter))~~ month be less than the forecast for that ~~((quarter as determined in subsection 21.49.086.D))~~ month, the Department will transfer the difference ~~((; rounded to the nearest million dollars;))~~ from the Rate Stabilization Account to the Light Fund. Alternatively, should the actual Net Wholesale Revenue for any ~~((quarter))~~ month be greater than the forecast for that ~~((quarter as determined in subsection 21.49.086.D))~~ month, the Department will transfer the difference ~~((; rounded to the nearest million dollars;))~~ from the Light Fund to the Rate Stabilization Account. In each case the



transfer will occur within 30 days of the end of the ~~((quarter))~~ month in question. A true-up may be included if actual net wholesale revenue for any past month is restated or differs from the amount used to calculate a transfer.

No later than ~~((30))~~ 45 days after the end of each quarter, the Department will notify the Mayor and the City Council of the forecast and actual Net Wholesale Revenue ~~((for that quarter and))~~ for the year to date, and of the amount remaining in the Rate Stabilization Account. ~~((after transfers authorized under this subsection 21.49.086.E.))~~

~~((F.))~~ E. Replenishment of the Rate Stabilization Account ~~((.))~~

1. Whenever the amount in the Rate Stabilization Account is ~~(((\$90))~~ \$75 million or less on either March 31 or Sept 30, City Light will impose a surcharge equal to ~~((1.5%))~~ 2.0 percent of base rates. ~~((at the earliest opportunity.))~~ The proceeds from the surcharge adjusted for applicable revenue taxes will be deposited into the Rate Stabilization Account. The surcharge will remain in effect until the amount in the Rate Stabilization Account reaches \$100 million. ~~((and will be removed at the earliest opportunity thereafter.))~~

2. Whenever the amount in the Rate Stabilization Account is ~~(((\$80))~~ \$50 million or less on either March 31 or Sept 30, the Department will impose an additional surcharge equal to ~~((1.5))~~ 2.0 percent of base rates. ~~((at the earliest opportunity.))~~ The proceeds of the additional surcharge adjusted for applicable revenue taxes will be deposited into the Rate Stabilization Account. The additional surcharge will remain in effect until the amount in the Rate Stabilization Account reaches ~~(((\$90))~~ \$100 million. ~~((and will be removed at the earliest opportunity thereafter.))~~

3. ~~((Whenever the amount in the Rate Stabilization Account is \$70 million or less, the Department will impose an additional surcharge equal to 1.5 percent of base rates at the earliest opportunity. The proceeds of the additional surcharge will be deposited into the Rate Stabilization Account. The additional surcharge will remain in effect until the amount in the Rate Stabilization Account reaches \$80 million, and will be removed at the earliest opportunity thereafter.))~~ Surcharges may be initiated twice per year, on either January



1 or June 1. Surcharges should be lifted within 90 days of when the month-end balance has reached the relevant threshold. The Department will notify the Mayor and the Council in writing of ((its intent to impose a surcharge under subsection 21.49.086.F.1, 21.49.086.F.2, or 21.49.086.F.3)) any upcoming surcharge change before it is implemented.

4. ~~((Effective after the fund has reached its minimum target value of \$100 million: If, in spite of the rate surcharges provided for in subsections 21.49.086.F.1, 21.49.086.F.2, and 21.49.086.F.3,))~~ If for any reason the amount in the Rate Stabilization Account is (((\$50)) \$25 million or less at the end of a month, the Department will notify the City Council within 30 days and the City Council will initiate a rate review, if the Mayor has not already done so, within ((forty-five)) 45 days that will increase rates, reduce Department spending, or identify additional sources of funding, or a combination of these measures, to bring the amount in the Account up to \$100 million within a period of ((12)) 24 or fewer months.

~~((Interest earned by the funds in the Rate Stabilization Account will be deposited into that account.))~~

5. Nothing in this Section 21.49.086 shall limit the authority of the City to deposit other amounts into the Rate Stabilization Account as may be authorized by ordinance.

F. If the amount in the Rate Stabilization Account exceeds \$125 million, the Department will reduce its balance to \$110 million by transferring funds to the Operating Account and notify the Mayor and City Council within 30 days of this transfer.

~~((G. Disposition of excess funds in the Rate Stabilization Account~~

~~Effective January 1, 2016: Whenever the amount in the Rate Stabilization Account exceeds \$125 million, the City Council will initiate a rate review, if the Mayor has not already done so, within 45 days that will decrease rates, allow the Department to cover more of its capital expenditures with cash from operations or defease outstanding debt in order to keep future rates low, increase its expenditures, or a combination of these measures, to bring the amount in the Account down to \$125 million within a period of 12 or fewer months.~~



~~H. Consistent with Section 22 of Ordinance 121637, deposits into or withdrawals from the Rate Stabilization Account in respect of any fiscal year may be made up to and including the date 90 days after the end of that fiscal year.))~~

Section 3. This ordinance shall take effect and be in force 30 days after its approval by the Mayor, but if not approved and returned by the Mayor within ten days after presentation, it shall take effect as provided by Seattle Municipal Code Section 1.04.020.

Passed by the City Council the \_\_\_\_\_ day of \_\_\_\_\_, 2021, and signed by me in open session in authentication of its passage this \_\_\_\_\_ day of \_\_\_\_\_, 2021.

\_\_\_\_\_  
President \_\_\_\_\_ of the City Council

Approved / returned unsigned / vetoed this \_\_\_\_\_ day of \_\_\_\_\_, 2021.

\_\_\_\_\_  
Jenny A. Durkan, Mayor

Filed by me this \_\_\_\_\_ day of \_\_\_\_\_, 2021.

\_\_\_\_\_  
Monica Martinez Simmons, City Clerk

(Seal)



## **SUMMARY and FISCAL NOTE\***

<b>Department:</b>	<b>Dept. Contact/Phone:</b>	<b>CBO Contact/Phone:</b>
Seattle City Light	Chris Ruffini/206-684-4649	Greg Shiring/206-386-4085

*\* Note that the Summary and Fiscal Note describes the version of the bill or resolution as introduced; final legislation including amendments may not be fully described.*

### **1. BILL SUMMARY**

**Legislation Title:** AN ORDINANCE relating to the City Light Department; directing the transfer of certain funds in the Light Fund into the Rate Stabilization Account in 2021; and amending Section 21.49.086 of the Seattle Municipal Code to simplify the operation of the Rate Stabilization Account.

#### **Summary and background of the Legislation:**

City Light's Rate Stabilization Account (RSA) is a reserve fund created in 2010 that helps buffer net wholesale revenues (NWR). The amount of NWR City Light earns in any year depends primarily on hydro conditions at its dams and wholesale market prices and both can vary significantly year to year.

A 3.0% RSA surcharge was removed in April 2021 after the RSA reached its target level of \$100 million. In Ordinance 126302, the surcharge was replaced by a permanent 3.0% base rate increase as part of City Light's 2021-2022 rate strategy, smoothing the customer rate path without increasing customer bills in 2021. In early 2021 the outlook for the RSA was strong and no surcharge was expected to come back on within the next year. However, dry hydro conditions, combined with exceptionally hot weather and high wholesale market prices quickly depleted the RSA balance during Q3. By the end of Q3, the RSA balance was \$82 million, which would trigger an automatic 1.5% rate surcharge per SMC 21.49.086.

In keeping with the spirit of Ordinance 126302 - to keep customer bills stable - this legislation would authorize a one-time discretionary deposit into the RSA. City Light anticipates higher than forecast retail revenue in 2021, primarily due to an earlier than expected recovery for electricity demand, power cost savings, and debt service savings from low bond interest rates. 2021's strong retail demand contributed to the lower realized NWR because power was sold retail that would have otherwise been surplus and sold wholesale. City Light can make a deposit to the RSA and still achieve a debt service coverage ratio that would be viewed as prudent by credit rating agencies.

There is precedent for discretionary RSA deposits, City Light has made year-end cash deposits to augment the RSA when it had ample financial cushion in 2011, 2012 and 2013.

In addition, this legislation also updates the RSA mechanism to simplify the surcharge trigger rules both by lowering the trigger balances and by adjusting the surcharge rate. The table below summarizes the proposed changes. City Light believes this amended mechanism will still provide the utility with financial stability while providing customers with more rate certainty. The current \$10 million increments for surcharges result in frequent rate changes which is not



optimal for customers. When the RSA was created in 2010, the expected annual NWR under typical water conditions was well over \$100 million. The current outlook of NWR is expected to be in the \$40 million to \$50 million range, so the magnitude of the volatility is lower. Therefore, the RSA can operate with wider bands and still adequately buffer net wholesale revenue because the overall NWR risk is lower.

Under the proposed changes, the RSA mechanism will operate with fewer changes to customer rates. For example, under the current model, if the RSA balance dipped to as low as \$70 million, three separate surcharges would have been triggered (1.5% triggered at each increment: \$90 million, \$80 million, and again at \$70 million), and a 4.5% surcharge would be in place. Under the proposed model, when the balance dips to \$70 million, only one 2.0% surcharge would be triggered, and it would stay in place until the balance reaches \$100 million. Although the surcharge may need to remain in place longer to replenish the RSA, rate volatility will be greatly reduced while still protecting the overall RSA balance. Rate predictability has consistently been at or near the top of the list of customer preferences in City Light surveys.

	<b>CURRENT</b>	<b>PROPOSED</b>
RSA target balance	\$100M	\$100M
RSA max balance	\$125M	\$125M
Transfer interval	Quarterly	Monthly
Surcharge initiated	Quarterly	Biannually (Jan/Jun)
First surcharge	@ <\$90M 1.5% surcharge	@ <\$75M 2.0% surcharge
Second surcharge	@ <\$80M 3.0% surcharge	@ <\$50M 4.0% surcharge
Third surcharge	@ <\$70M 4.5% surcharge	NA
Surcharge ends when...	RSA balance grows by \$10M	RSA balance reaches \$100M
Council initiates rate review to replenish RSA	@ <\$50M	@ <\$25M
Interest earnings	Transfer to RSA	No administrative requirement

## **2. CAPITAL IMPROVEMENT PROGRAM**

**Does this legislation create, fund, or amend a CIP Project?** ☐ Yes ☒ No

## **3. SUMMARY OF FINANCIAL IMPLICATIONS**

**Does this legislation amend the Adopted Budget?** ☐ Yes ☒ No

**Does the legislation have other financial impacts to The City of Seattle that are not reflected in the above, including direct or indirect, short-term, or long-term costs?**  
Revenue from an RSA surcharge is subject to a 6% Seattle utility tax. The dollar impact to the General Fund would depend on the duration of the RSA surcharge.



**Is there financial cost or other impacts of *not* implementing the legislation?**

There is no direct cost of not implementing the legislation. If not implemented a 1.5% RSA surcharge would be added to customer rates.

**3.a. Appropriations**

\_\_\_ This legislation adds, changes, or deletes appropriations.

**3.b. Revenues/Reimbursements**

\_\_\_ This legislation adds, changes, or deletes revenues or reimbursements.

**Revenue/Reimbursement Notes:** This legislation does not impact planned/budgeted revenues. If this legislation wasn't approved and a 1.5% RSA surcharge was implemented, it would provide additional retail revenue of approximately \$3.5 million per quarter until it is removed or changed. Surcharge revenues would be deposited into the RSA.

**3.c. Positions**

\_\_\_ This legislation adds, changes, or deletes positions.

**4. OTHER IMPLICATIONS**

- a. Does this legislation affect any departments besides the originating department?  
No
- b. Is a public hearing required for this legislation?  
No
- c. Is publication of notice with *The Daily Journal of Commerce* and/or *The Seattle Times* required for this legislation?  
No
- d. Does this legislation affect a piece of property?  
No
- e. Please describe any perceived implication for the principles of the Race and Social Justice Initiative. Does this legislation impact vulnerable or historically disadvantaged communities? What is the Language Access plan for any communications to the public?  
NA
- f. Climate Change Implications
  - 1. Emissions: Is this legislation likely to increase or decrease carbon emissions in a material way?  
No



- 2. Resiliency: Will the action(s) proposed by this legislation increase or decrease Seattle's resiliency (or ability to adapt) to climate change in a material way? If so, explain. If it is likely to decrease resiliency in a material way, describe what will or could be done to mitigate the effects.**

No

- g. If this legislation includes a new initiative or a major programmatic expansion: What are the specific long-term and measurable goal(s) of the program? How will this legislation help achieve the program's desired goal(s)?**

NA

**List attachments/exhibits below:**





## Legislation Text

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**File #:** Res 32031, **Version:** 1

---

### CITY OF SEATTLE

#### RESOLUTION \_\_\_\_\_

A RESOLUTION ratifying the 2021 Update to the Green/Duwamish and Central Puget Sound Watershed or Water Resource Inventory Area (WRIA 9) Salmon Habitat Plan, Making Our Watershed Fit for a King. WHEREAS, the 2021 Update to the WRIA 9 Salmon Habitat Plan (“WRIA 9 Plan”) is an addendum to the

2005 WRIA 9 Salmon Habitat Plan, and includes new science, revised habitat goals and recovery strategies, an updated capital project list, and a monitoring and adaptive management plan; and

WHEREAS, 17 local governments in WRIA 9 (“Parties”) have partnered through an inter-local agreement (“ILA”) since 2001 to jointly fund development and implementation of the WRIA 9 Plan to address a shared interest in, and responsibility for, long-term watershed planning and salmon recovery in the Green/Duwamish and Central Puget Sound Watershed (“Watershed”); and

WHEREAS, in March 1999, the National Oceanic and Atmospheric Administration (“NOAA”) Fisheries listed the Puget Sound Chinook salmon evolutionary significant unit, including the Green River Chinook salmon population, as a threatened species under the Endangered Species Act (“ESA”); and

WHEREAS, local jurisdictions have authority over certain habitat-based aspects of Chinook survival through land use and other policies and programs, and the State of Washington and tribes, who are the legal co-managers of the fishery resource, are responsible for addressing harvest and hatchery management; and

WHEREAS, the WRIA 9 partners recognize participating in the ILA and implementing priorities in the WRIA 9 Plan demonstrates their commitment to address the ESA listing of Chinook salmon; and

WHEREAS, coordination and cooperation among federal, state, and local agencies, tribes, businesses, non-governmental organizations, landowners, citizens, and other interests are essential to implement and



adaptively manage a salmon recovery plan; and

WHEREAS, the Puget Sound Partnership is the Puget Sound region's lead agency for planning and implementing the Puget Sound Salmon Recovery Plan, approved by NOAA Fisheries; and

WHEREAS, the WRIA 9 Plan is one of 15 watershed-based chapters of the Puget Sound Salmon Recovery Plan; and

WHEREAS, The City of Seattle supports cooperation at the WRIA level to set common priorities for actions among partners, efficient use of resources and investments, and distribution of responsibility for actions and expenditures; and

WHEREAS, habitat protection and restoration actions to increase Chinook salmon productivity trends are necessary throughout the watershed, in conjunction with other recovery efforts, to avoid extinction in the near term and restore WRIA 9 Chinook salmon to viability in the long term; and

WHEREAS, salmon recovery is interrelated with flood risk reduction, water quality improvement, open-space protection, recreation, economic development, and tribal treaty rights; and

WHEREAS, The City of Seattle has a strong interest to achieve multiple benefit outcomes for people and fish across the watershed; and

WHEREAS, the WRIA 9 Plan recognizes that salmon recovery is a long-term effort, and focuses on a ten-year implementation time horizon to allow for evaluation of progress and adaptation of goals and implementation strategies; and

WHEREAS, it is important to provide jurisdictions, the private sector, and the public with certainty and predictability regarding salmon recovery actions in WRIA 9; and

WHEREAS, if insufficient action is taken at the local and regional level, Chinook salmon populations in WRIA 9 are unlikely to improve and the federal government could list Puget Sound Chinook salmon as an endangered species, thereby decreasing local flexibility; and

WHEREAS, the Parties previously took formal action to ratify the 2005 Salmon Habitat Plan; NOW,



THEREFORE,

**BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF SEATTLE, THE MAYOR  
CONCURRING, THAT:**

Section 1. The City of Seattle ratifies the Green/Duwamish and Central Puget Sound Watershed, Water Resource Inventory Area 9 Salmon Habitat Plan Update, Making Our Watershed Fit for a King (“WRIA 9 Plan”), attached to this ordinance as Attachment 1. Ratification is intended to convey The City of Seattle’s support for the following:

A. Protecting and restoring habitat based on best available science with the intent to achieve sustainable, resilient, and harvestable populations of naturally spawning Chinook salmon.

B. Pursuing a multi-benefit approach to WRIA 9 Plan implementation that integrates salmon recovery, flood hazard reduction, water quality improvements, open space and recreation, and equity and social justice to improve outcomes for people and fish.

C. Using the WRIA 9 Plan as a source of best available science to inform local government actions, including, but not limited to land use, shoreline, and transportation planning/permitting.

D. Using capital project guidance, programmatic actions, and policy outlined with the WRIA 9 Plan to inform local priorities for implementation via grants, capital improvements, ordinances, and other activities. Ratification does not obligate any partner to implement any specific actions or adhere to specific timelines for such actions.

E. Working collaboratively with local, state, federal partners, and tribes to support and fund implementation of the WRIA 9 Plan, including monitoring and adaptive management to address scientific uncertainty, tracking, and communicating progress, and refining strategies to ensure cost effective investments.

Adopted by the City Council the \_\_\_\_\_ day of \_\_\_\_\_, 2021, and signed by  
me in open session in authentication of its adoption this \_\_\_\_\_ day of \_\_\_\_\_, 2021.



\_\_\_\_\_  
President \_\_\_\_\_ of the City Council

The Mayor concurred the \_\_\_\_\_ day of \_\_\_\_\_, 2021.

\_\_\_\_\_  
Jenny A. Durkan, Mayor

Filed by me this \_\_\_\_\_ day of \_\_\_\_\_, 2021.

\_\_\_\_\_  
Monica Martinez Simmons, City Clerk

(Seal)

**Attachments:**

Attachment 1 - Green/Duwamish and Central Puget Sound Watershed, Water Resource Inventory Area 9  
Salmon Habitat Plan Update



# Salmon Habitat Plan 2021 Update



MAKING OUR WATERSHED FIT FOR A KING



## GREEN/DUWAMISH AND CENTRAL PUGET SOUND WATERSHED Water Resource Inventory Area 9 (WRIA 9)

Approved by the WRIA 9 Watershed Ecosystem Forum on  
February 11, 2021









# Salmon Habitat Plan 2021 Update

## MAKING OUR WATERSHED FIT FOR A KING

### Green/Duwamish and Central Puget Sound Watershed Water Resource Inventory Area 9 (WRIA 9)

Approved by the WRIA 9 Watershed Ecosystem Forum on February 11, 2021

#### Alternate formats available

Voice: 206-296-6519 TTY Relay: 711

#### **For Additional Copies of this Plan:**

King County Water and Land Resources Division  
201 South Jackson Street, Suite 201  
Seattle, WA 98104  
206-296-6519

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Ecosystem Forum February 11, 2021.

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## Foreward

On behalf of the Green Duwamish and Central Puget Sound Watershed (WRIA 9) Watershed Ecosystem Forum, we are pleased to present this update to the 2005 WRIA 9 Salmon Habitat Plan, "Making Our Watershed Fit for a King" (2005 Plan). The 2021 WRIA 9 Salmon Plan Update (Plan Update) represents a renewed commitment to salmon recovery efforts in WRIA 9 and provides a science-based framework for identifying, prioritizing and implementing salmon recovery actions over the next 10-15 years. It refines and adds key recovery strategies based on new science and ensures resources will continue to be directed to where they provide the greatest benefit for Chinook salmon.

The original 2005 Plan translated science into actions. Plan implementation by multiple WRIA 9 entities in the last 15 years helped leverage over \$200 million of local, state and federal funding to realign more than 2 miles of levees to reconnect floodplains, restore over 4,500 feet of marine shoreline and revegetate 500 acres of riparian habitat. While we recognize these achievements, we also acknowledge that salmon recovery is a long-term endeavor that requires continued coordinated action. Chinook salmon numbers remain critically low and human population growth and climate change are only magnifying the challenges we face in salmon recovery.

Chinook salmon are an integral part of our regional identity. The Watershed Ecosystem Forum - a regional partnership of 17 local governments, state resource agencies, business interests and non-profit organizations - is collectively committed to implementing actions that will improve watershed conditions for our salmon populations. Plan implementation supports more than just salmon recovery; it supports tribal treaty rights, community flood hazard reduction, water quality improvement, open space protection, and outdoor recreation.

While the Green/Duwamish and Central Puget Sound Watershed has faced numerous challenges, we are optimistic about the future of our watershed. The downstream fish passage facility at Howard Hansen Dam, clean-up of the Lower Duwamish Waterway Superfund sites, and a regional commitment to integrated floodplain management reflect a projected investment of hundreds of millions of dollars over the next 10-15 years. As we work towards an improved future, we are reminded of a quote from a historical planning guide for the Green River corridor:



**As we look at the Green River corridor, we must say, 'This is the way the people want it to be.' Therefore, in each locality, someone should steadily be asking, 'is this the way we want it to be, now and in the future?' The ultimate condition of the Green River Basin should be the result of informed and far-sighted public decisions.**

*River of Green, 1978*

We look forward to collaborating with all our local, state, federal, and tribal partners in realizing our collective vision for this watershed and welcoming back ever stronger runs of salmon.

Sincerely,



Councilmember Lisa Herbold  
City of Seattle  
Co-Chair  
WRIA 9 Watershed Ecosystem Forum



Councilmember Nancy Tosta  
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## Executive Summary

This document updates the 2005 Green/Duwamish and Central Puget Sound Watershed (WRIA 9), Making Our Watershed Fit for a King, Salmon Habitat Plan. The 2005 Plan served as the blueprint for salmon habitat recovery in WRIA 9 for 15 years. It is fitting that the Puget Sound Regional Council awarded the original 2005 Plan a Vision 2020 Award. Although the Plan Update reflects over a decade of new science regarding salmon conservation and recovery since the award, the core recovery strategies and underlying scientific framework remain largely valid today and continue to provide an important foundation for salmon recovery. The Plan Update – designed to be a stand-alone document – is intended to update, not replace, the 2005 Plan. The two documents, along with the 2014 Duwamish Blueprint and the 2016 Re-green the Green, provide a science-based framework for identifying, prioritizing and implementing salmon recovery actions.

This document provides a status update for Green River Chinook salmon using the National Oceanic and Atmospheric Administration (NOAA)-approved viable salmon population (VSP) criteria. Over 20 years have passed since the listing of the Puget Sound Chinook salmon evolutionarily significant unit (ESU) under the Endangered Species Act (ESA). Despite significant investments and large-scale restoration projects, Green River Chinook salmon remain listed

as Threatened. Population abundance, productivity, diversity and spatial distribution have not improved, and in some cases have continued to decline.

A Strategic Assessment Update summarizes new research findings that address important data gaps identified in the 2005 Plan. New information related to habitat use and fish productivity, climate change, temperature, and contaminants supported a reassessment of functional linkages between priority stressors, habitat conditions, and VSP parameters. This information serves as the foundation for the other core elements of the Plan Update.

Although the Plan Update maintains existing NOAA-approved VSP goals, it introduces new 10-year habitat goals (implementation targets) that represent continued progress towards the long-term necessary future conditions for achieving a viable salmon population, as outlined in 2005 Plan. The numerical targets for key habitats serve as a benchmark for evaluating plan implementation over time and informing ongoing adaptive management.

The Plan Update outlines a portfolio of 12 recovery strategies – including embedded policies and programs – to address priority pressures; increase salmon abundance, productivity, and diversity; and build long-term population resiliency. Successful





PHOTO: ELI BROWNELL

Green River Natural Area

implementation hinges on partner coordination and investment to ensure local land use planning, capital investment programs, and community outreach messaging are consistent with identified watershed priorities.

An updated list of capital projects was developed in partnership with interlocal agreement member jurisdictions, non-profit partners, state agencies, and others engaged in salmon recovery. The updated project list identifies 127 capital habitat projects across the five subwatersheds. Individuals projects are ranked within their specific subwatershed – not across subwatersheds. Projects are tiered based on overall benefit towards recovery and to provide context for the level of financial need. Tier 1 projects have significant potential to advance recovery and substantively contribute to habitat goals. Tier 2 and Tier 3 have moderate and limited potential, respectively, to advance recovery and contribute to achieving habitat goals.

The Monitoring and Adaptive Management Plan (MAMP) outlines monitoring priorities intended to help evaluate progress and inform strategic adaptation of the recovery strategies. The MAMP establishes a framework for (1) tracking implementation goals, (2) assessing project effectiveness, (3) evaluating habitat status and trends, (4) evaluating the population status of Green River Chinook salmon, and (4) prioritizing research and monitoring investments. This framework will guide data collection to support regular assessment of progress and allow the WRIA to reassess prioritization and sequencing of recovery actions.





## Chapter 1: Background

The 2005 Green/Duwamish and Central Puget Sound Watershed Salmon Habitat Plan, *Making Our Watershed Fit for a King*, represented the culmination of over five years of technical reconnaissance, research, and policy development. The Plan was a local watershed-based response to the federal government's 1999 listing of Puget Sound Chinook salmon as "threatened" under the Endangered Species Act. The 2005 Plan – which received a Puget Sound Regional Council Vision 2020 Award – translated a tremendous wealth of science into discrete policy recommendations and management actions necessary to support recovery of natural origin Green River Chinook salmon.

The 2005 Plan provided the blueprint for Chinook salmon recovery in the Green/Duwamish and Central Puget Sound for 15 years. It helped watershed partners leverage upwards of \$200 million dollars of local, state and federal funding for salmon recovery. Plan implementation resulted in nearly 2 miles of levee setbacks, over 4,500 feet of marine shoreline restoration, and approximately 500 acres of revegetation. Despite of these accomplishments, the continued decline of Chinook salmon – both locally and regionally – highlights the urgent need for expanding and accelerating recovery efforts.

This Salmon Habitat Plan Update represents the next chapter of salmon recovery efforts in the Green/Duwamish and Central Puget Sound Watershed. It provides a science-based framework for identifying, prioritizing and implementing salmon recovery actions over the next 10-15 years. The integration of over a decade of new science informed important refinements to recovery priorities and investment strategies outlined in the 2005 Plan. These refinements reflect the watershed's commitment to adaptive management and ensure that limited resources are directed to where they can provide the greatest benefit towards Chinook salmon recovery. Although the focus of this plan is on Chinook salmon recovery, implementation will also provide parallel benefits to other salmon and steelhead.

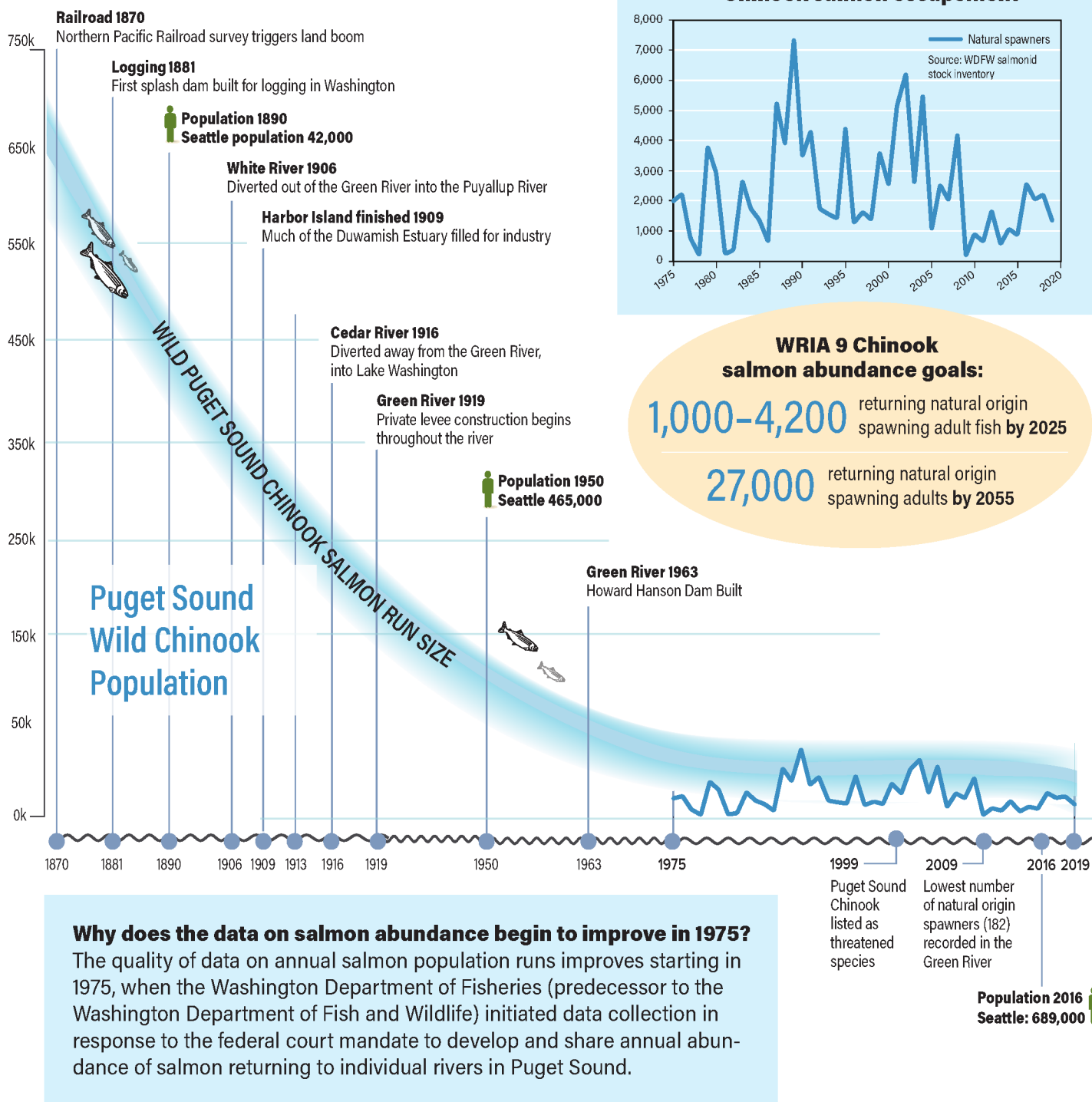
### Regional Salmon Recovery Context

This addendum updates the Green/Duwamish and Central Puget Sound watershed chapter of the National Oceanic and Atmospheric Administration (NOAA)-approved 2007 Puget Sound Salmon Recovery Plan. The Green River Chinook salmon population is one of six Chinook salmon populations in the Central/South sub-basin and one of 22 remaining populations in the Puget Sound Chinook salmon evo-



**Figure 1.** Green/Duwamish and Central Puget Sound Chinook salmon recovery timeline.

## Chinook Salmon Recovery Timeline





lutionary significant unit (ESU). NOAA ESU recovery criteria require status improvement in all populations and two to four viable populations in each of the sub-basins.

The Puget Sound Partnership (Partnership), the state agency leading the region's collective effort to restore and protect Puget Sound, serves as the regional salmon organization for the 15 lead entities within the Puget Sound, advised by the Puget Sound Salmon Recovery Council. The Partnership co-manages the Puget Sound Acquisition and Restoration Fund and works in partnership with the Governor's Salmon Recovery Office and Recreation and Conservation Office (RCO) on statewide salmon recovery issues. The Salmon Recovery Funding Board, facilitated by the RCO, is a Governor-appointed 10-person board with a primary responsibility for making grants and loans for salmon habitat projects and salmon recovery activities. This salmon recovery infrastructure, and the grant and loans for habitat project implementation, is supported through state and federal funds from NOAA's Pacific Coast Salmon Recovery Fund and the State Salmon Recovery Funding. Additionally, within Puget Sound, salmon recovery is supported by the Puget Sound Acquisition and Restoration Fund.

## WRIA 9 Organizational Structure

Water Resource Inventory Area (WRIA) 9 serves as a lead entity for salmon recovery under the State of Washington's watershed-based framework for salmon recovery established under RCW 77.85. It is a watershed-based organization comprised of local, state and federal partners, non-profit organizations, business interests, and citizens. Per statute, WRIA 9 is mandated to "compile a list of habitat projects, establish priorities for individual projects, define the sequence for project implementation, and submit these activities as the habitat project list. The committee shall also identify potential federal, state, local, and private funding sources."

The 17 local governments within the Green/Duwamish and Central Puget Sound Watershed (WRIA 9) formalized a partnership under an interlocal agreement (ILA) (WRIA 9 ILA) in 2000. The initial ILA (2000–2005) funded a strategic, science-based assessment of the watershed and a long-term, comprehensive recovery plan for the Green River Chinook salmon population. Following approval of the 2005

Salmon Habitat Plan, the local government partners forged a 10-year ILA from 2007–2017 intended to guide plan implementation and adaptive management. The ongoing commitment to watershed-based salmon recovery was renewed in 2017. The current ILA extends through 2025.

The WRIA 9 Watershed Ecosystem Forum (WEF) serves as the advisory body for plan implementation and adaptive management. It is comprised of elected officials from the ILA partners and other watershed stakeholders. The Management Committee serves as the executive committee to the WEF. It directs work plan development and manages the ILA budget. The Implementation Technical Committee (ITC) is a technical- and policy-focused subcommittee that supports plan implementation and adaptive management. The ITC defines monitoring and research priorities, interprets new technical information as it relates to salmon recovery, and provides science-based recommendations to WEF.

## Equity and Social Justice

Salmon recovery efforts within the Green/Duwamish and Central Puget Sound watershed overlap with numerous communities experiencing deeply entrenched social, economic, and environmental inequities. Race and place influence opportunity and quality of life. People of color, immigrants, and low-income residents experience inequities in access to key determinants of equity – including access to parks and natural resources. Although best available science drives project identification and prioritization, equity and social justice (ESJ) issues should be carefully considered. Applying an ESJ lens to habitat projects can help ensure salmon recovery efforts align with ESJ initiatives and do not inadvertently reinforce existing inequities. Integrating residents and community-based organizations into project design can help build community support and achieve multi-benefit outcomes that advance equity in the watershed.









## Chapter 2: Green/Duwamish and Central Puget Sound Watershed – A Snapshot

The Green/Duwamish and Central Puget Sound Watershed spans 575 square miles of diverse landscape, ranging from an industrial waterfront to preserved old growth forest. This section provides a high-level overview of the five subwatersheds (Upper Green, Middle Green, Lower Green, Duwamish, and Nearshore) that serve as an overarching framework for salmon recovery. It also provides context for the strategies and actions outlined in subsequent chapters. For a more comprehensive review, please refer to the Chapter 3 of the 2005 Salmon Habitat Plan.

**The Upper Green Subwatershed** extends upstream of Howard Hanson Dam, river mile 64.5, and represents approximately 45 percent of the Green/Duwamish River watershed. Historically, the Upper Green provided important spawning and freshwater rearing habitat for Chinook salmon. It encompasses between 78-165 miles of suitable instream habitat, although fish passage has been blocked by a combination of the Tacoma Headworks Diversion Dam and Howard Hanson Dam since 1911.

Checkered ownership in the subwatershed complicates coordinated land management. Although the primary land use is commercial forestry, the Upper Green also serves as the primary municipal water supply for the City of Tacoma. Additionally, a road and

railroad alignment have constrained the river in places, the Upper Green Subwatershed is largely undeveloped and contains relatively high-quality, yet currently inaccessible, aquatic habitat. Long-term recovery of Chinook salmon depends on providing fish passage to the Upper Watershed.

**The Middle Green Subwatershed** extends between river miles 64.5 and 32. It includes the two largest tributaries to the Green River – Soos and Newaukum Creeks. Low-velocity habitats, including off-channel habitats, sidechannels, floodplain wetlands, and river edge, provide important rearing and refuge habitat for juvenile Chinook.

Land use in the Middle Green is characterized predominantly by agricultural lands and rural residential development. Land use development adjacent to river and tributaries has resulted in loss of riparian habitat contributing to elevated instream temperatures. Modified flow regimes have disrupted natural transport of large wood and sediment. In addition, a network of training levees designed to restrict lateral channel migration – as opposed to prevent flooding – have simplified channel complexity along some reaches. Restoring floodplain connectivity and expanding rearing habitat capacity are critical to increasing Chinook salmon productivity.



**The Lower Green River Subwatershed** flows from river mile 32 downstream to river mile 11. It serves as an important migratory corridor for adult upstream migration and juvenile downstream migration. Available rearing and high-flow refuge habitat is limited compared to the Middle Green – many reaches currently lack large wood, side channels, sloughs, and slow-water edge habitats. The Lower Green River also supports Chinook salmon spawning upstream of approximately river mile 25.

The Lower Green River valley is the second largest warehouse and distribution center on the west coast. The floodplain is heavily developed and characterized by a combination of industrial, commercial, and urban residential development. The 1906 diversion of the White River left the floodplain perched above the mainstem channel and disconnected historic off-channel habitats. An extensive network of flood control facilities (27 miles of levees and revetments) currently restricts floodplain connectivity and limits channel complexity. A corresponding loss of riparian tree canopy contributes to elevated instream temperatures. An integrated, multi-benefit approach to floodplain management is needed to balance fish habitat needs with flood risk reduction and other community priorities in this subwatershed.

**The Duwamish Subwatershed** extends from river mile 11 at the Black River Pump Station downstream to the north end of Harbor Island. The extent of salt influence – as depicted by the saltwater wedge – varies based on flows and tide, but can extend upstream as far as the Foster Bridge (RM 10.2) during low flows and high tides. Juvenile Chinook rear in the estuarine waters of the Duwamish as they undergo the physiological transition from fresh to saltwater habitats.

Extensive dredge and fill of the Duwamish has transformed the estuary into an industrial waterway, characterized by straightened channel with armored banks and a lack of riparian tree canopy. More than 98 percent of the historical tidal wetlands have been transformed into commercial and industrial land uses. The U.S. Environmental Protection Agency declared the Lower Duwamish Waterway a “Superfund” site in 2001 due to legacy contamination, and clean-up is not expected to be complete for another decade. Sediment cleanup and restoration of estuarine habitat are essential to increasing juvenile Chinook salmon survival.

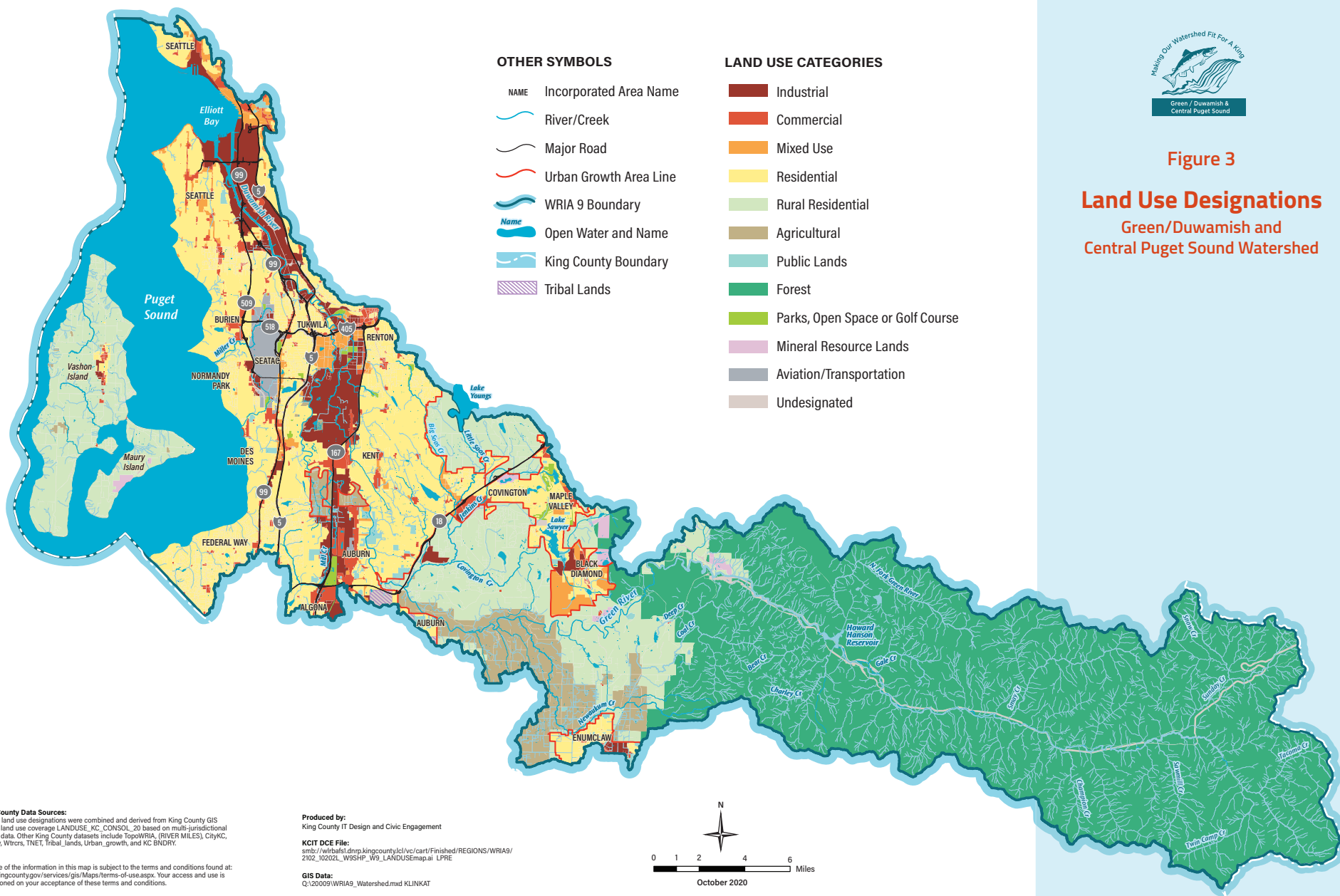
**The Nearshore Subwatershed** extends 92 linear miles from Elliott Bay south to the Pierce County boarder, including Vashon Island. It represents the interface of upland and aquatic habitats; shallow productive zone and deep water habitats; and fresh and marine waters. The nearshore is a dynamic environment – shaped by wave energy and sediment transport that support high species diversity. A variety of habitats, including beaches, eelgrass beds, and pocket estuaries, provide important foraging habitat and a migratory corridor to the Pacific Ocean for juvenile Chinook salmon.

Development along the marine shorelines has altered significant stretches of the nearshore ecosystem. Approximately two-thirds of WRIA 9 shoreline is armored, which has disrupted natural sediment delivery and transport. The intensity of shoreline development varies substantially across the watershed. The highest intensity development is located along the industrial and commercial shores of Elliott Bay. The mainland shoreline from Seattle south to Federal Way is predominantly residential. Vashon Island is predominantly rural. Improving nearshore habitat is essential to increasing juvenile salmon residence times, growth rates, and overall marine survival.













CHRIS GREGERSON

## Chapter 3: The Chinook Salmon Life Cycle – Connecting a Diverse Watershed

The Green/Duwamish and Central Puget Sound Chinook salmon life cycle provides a common thread linking together a diverse watershed. Each of the five distinct subwatersheds plays a critical role in the Chinook salmon life cycle. Recovery of a viable salmon population hinges on collective action across the watershed to improve aquatic habitat. The conceptual life cycle model presented in the 2005 Salmon Habitat Plan remains an important tool for assessing aquatic habitat needs in relationship to priority stressors that adversely impact survival at distinct life history stages and across different life history types. Understanding aquatic habitat needs throughout the life cycle and how they relate observed bottlenecks in survival allows recovery managers to strategically focus limited resources where they are expected to provide the largest benefit to recovery objectives. Figure 5 highlights the relationship between the subwatersheds and specific life history phases.

### Adult Upstream Migration/ Spawning

Chinook salmon enter the Green/Duwamish between July and October. Timing of river entry and upstream migration is impacted by water temperature and flow. Spawning generally occurs mid-September through

October, between approximately river miles 25 and 61. Spawning primarily occurs within the Lower and Middle Mainstem Green River and Newaukum Creeks. Additional spawning occurs in Soos, Burns and Covington Creeks. Fish passage to the upper watershed has been blocked by a combination of the Tacoma Headworks Diversion Dam (1911) and Howard Hanson Dam (1961). Although fish passage was provided at the Tacoma facility in 2007, a downstream fish passage facility has not been completed at Howard Hanson Dam. The dams also block natural gravel delivery and transport; however, available spawning habitat does not appear to be a limiting factor in Chinook recovery.

### Egg Incubation/Emergence

Egg incubation and alevin emergence generally occurs September through January within the same reaches where spawning occurs. Timing is variable and influenced by water temperatures – warmer temperatures drive an earlier emergence. High-flow events and sedimentation during this critical development period can scour redds and result in high mortality. As a result, flow management at Howard Hanson Dam influences incubation/emergence success.



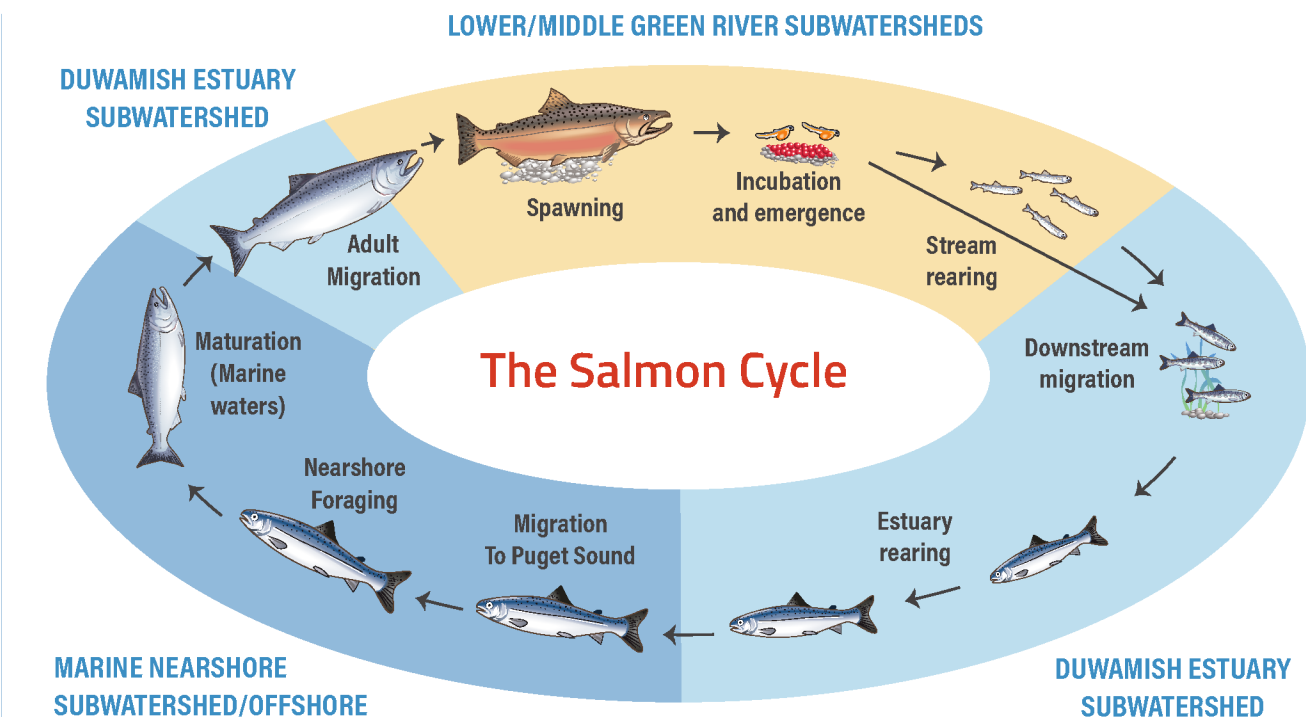
## Juvenile Freshwater Rearing/ Migration

Juvenile Chinook salmon rear in the Lower and Middle Green subwatershed from mid-December to mid-July. The length of the freshwater rearing period varies among life history types (Figure 5) and is influenced by habitat availability and flows. Subyearling Chinook rely on low-velocity habitats, including mainstem river margins, pools, and off-channel habitats. Rearing habitat availability is a limiting factor for Chinook productivity. Extensive flood control facilities and floodplain development have disconnected floodplain habitats, reduced habitat complexity, and eliminated much of the historic freshwater rearing habitat. Instream flows influence accessibility of off-channel rearing habitats. During low-flow periods, off-channel habitats and floodplain wetlands may become disconnected from the mainstem. In contrast, high-flow events may flush juvenile Chinook downstream if they are unable to access suitable refuge habitat. Given the connection to instream flows, flow management at Howard Hanson Dam can impact habitat connectivity/ availability during the rearing period.

## Juvenile Estuary Rearing

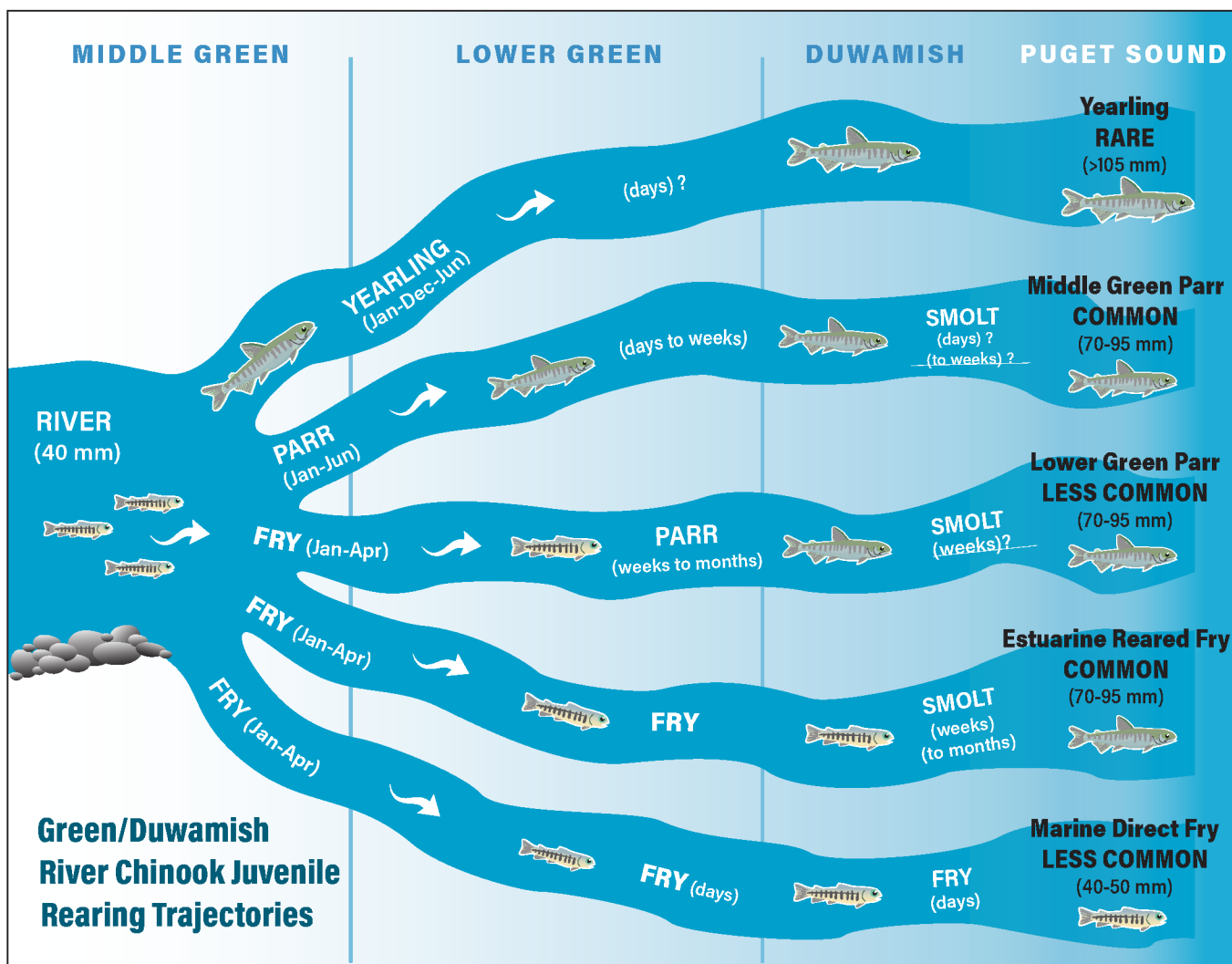
Subyearling Chinook salmon generally migrate downstream into the Duwamish estuary between February and July, with fry-type life histories predominantly entering earlier in the year (Feb-Mar) than parr (May-Jun). Residence times in the Duwamish vary considerably, with some fish spending days and others (i.e., estuarine reared fry) spending weeks to months in the estuary. The Duwamish Estuary – specifically the transition zone (RM 1-9) – is critical for juvenile salmon making the physiological transition from fresh to salt water. Juvenile Chinook salmon rely on shallow, low gradient habitats (e.g., marshes, mudflats, and tidal sloughs) to escape stronger currents and support efficient foraging and growth prior to entering Puget Sound. Extensive industrial development along the Duwamish has transformed the estuary to an industrial waterway, resulting in extensive loss of slow water rearing habitats and contamination of sediments. The lack of high-quality habitat may contribute to accelerated downstream migration and reduced survival upon entry into Puget Sound.

**Figure 4.** *The Salmon Cycle*





**Figure 5.** Primary Chinook salmon life history types in the Green River (updated and modified from Ruggerone and Weitkamp 2004).



## Marine Nearshore Rearing

Juvenile Chinook salmon generally rear in the Puget Sound nearshore from later winter through fall. Shallow nearshore habitats support foraging, growth, and refuge from predators, while also providing a migratory corridor to offshore waters. Although considerable uncertainty surrounds marine nearshore habitat use by juvenile Chinook salmon, it is widely accepted that the early marine rearing period is a critical period of growth that strongly influences long-term survival. The Central Puget Sound marine nearshore waters not only support Green River Chinook, but also at least eight different stocks of Puget Sound Chinook salmon. Shoreline development has extensively modified nearshore habitat and processes in WRIA 9.

The most intense shoreline modifications are located in urbanized Elliott Bay, with more natural shorelines located along the largely rural Vashon Island.

## Ocean Migration

By fall, most Green River Chinook exit the Strait of Juan de Fuca and migrate north along the outer coast of Vancouver Island. While Chinook salmon may spend up to five years in marine waters, most Green River Chinook spend two to three years at sea before returning to spawn. In addition to predators, Chinook salmon are subject to various commercial fisheries during their marine migration.









ROGER TABOR

## Chapter 4: Current Population Status and Recovery Goals

Recovery goals provide a framework from which to evaluate both plan implementation and overall progress towards Chinook recovery. Tracking population metrics and habitat conditions provides important data used to evaluate current population status and overall habitat conditions. This information serves as a key input for informing ongoing adaptive management.

### Viable Salmon Population Criteria – Current Status and Goals

The Viable Salmon Population<sup>1</sup> (VSP) concept – as defined by National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) – provides the foundation for all established recovery goals for Chinook salmon within the Green/Duwamish and Central Puget Sound Watershed. NMFS defines a viable salmon population as a population that has a negligible risk of extinction due to threats from demographic variation, local environmental variation, and genetic diversity changes over a 100-year timeframe (McElhany et al. 2000). The VSP goals outlined in this section remain unchanged from the 2005 Plan and are presented in Table 1. They

are based on recovery planning targets developed by a team of scientists (Puget Sound Technical Recovery Team) appointed by NOAA to support the original 2007 Recovery Plan for Puget Sound Chinook.

Four parameters are used to assess the viability of salmon populations: abundance, productivity, spatial structure and diversity. These parameters are reasonable predictors of extinction risk, reflect general processes important to all salmon populations, and measurable over time.

### Abundance

Abundance is the number of individuals in the population at a given life stage or time. The number of natural origin Green River Chinook spawners is the primary abundance indicator. Chinook abundance indicates an overall decline since before the first plan was adopted in 2005 (Figure 6 and Table 1). In 2009, the number of Natural Origin Spawners (NOS) was the lowest ever recorded, with less than 200 fish. For five of the past 10 years (2010–2019), the number of NOS has been below the planning target range (1,000–4,200 NOS) for WRIA 9.

<sup>1</sup> NOAA technical Memorandum NMFS-NWSSC-42: Viable salmonid populations and the recovery of evolutionarily significant units.



**Table 1.** Viable Salmon Population (VSP) Goals

VSP Parameter	Indicator	2006-2010 (average)	2011-2015 (average)	2016-2019 (average)	10-Year Goal	50-100 Year Goal
Abundance	Natural Origin Spawners	1975 (average)	963 (average)	2041 (average)	1000-4200 <sup>2</sup>	27,000
Productivity	Egg-to-Migrant Survival	2.9%	8.7%	5.3% <sup>a</sup>	>8%	>8%
Diversity	Percent Hatchery Origin	56.4%	60.6%	68.2%	Decreasing	<30%
	Proportion 5-6 yr-old Spawners	19.2	9.6%	N/A	Increasing	>15%
	Relative Abundance of Parr	46%	30.6%	32.8% <sup>a</sup>	No Target <sup>3</sup>	No Target
Spatial Diversity	Spawning Distribution	Spawning in Green River mainstem (below Howard Hanson Dam), Newaukum Creek and Soos Creek			Spawning above Howard Hanson Dam	Maintain spawning distribution

Data Source: WDFW Salmonid Stock Inventory and NOAA Salmon Population Summary Database

<sup>a</sup>2016-2018

2 A range is used because the productivity of each year's run varies depending on a variety of factors. If fish are experiencing high productivity, fewer adults are needed to reach future targets than if they are experiencing low productivity, which would require more fish returning to reach future targets.

3 No target established because it is not considered a reliable metric of diversity. However, relative abundance of fry and parr does provide important information for projecting future abundance.



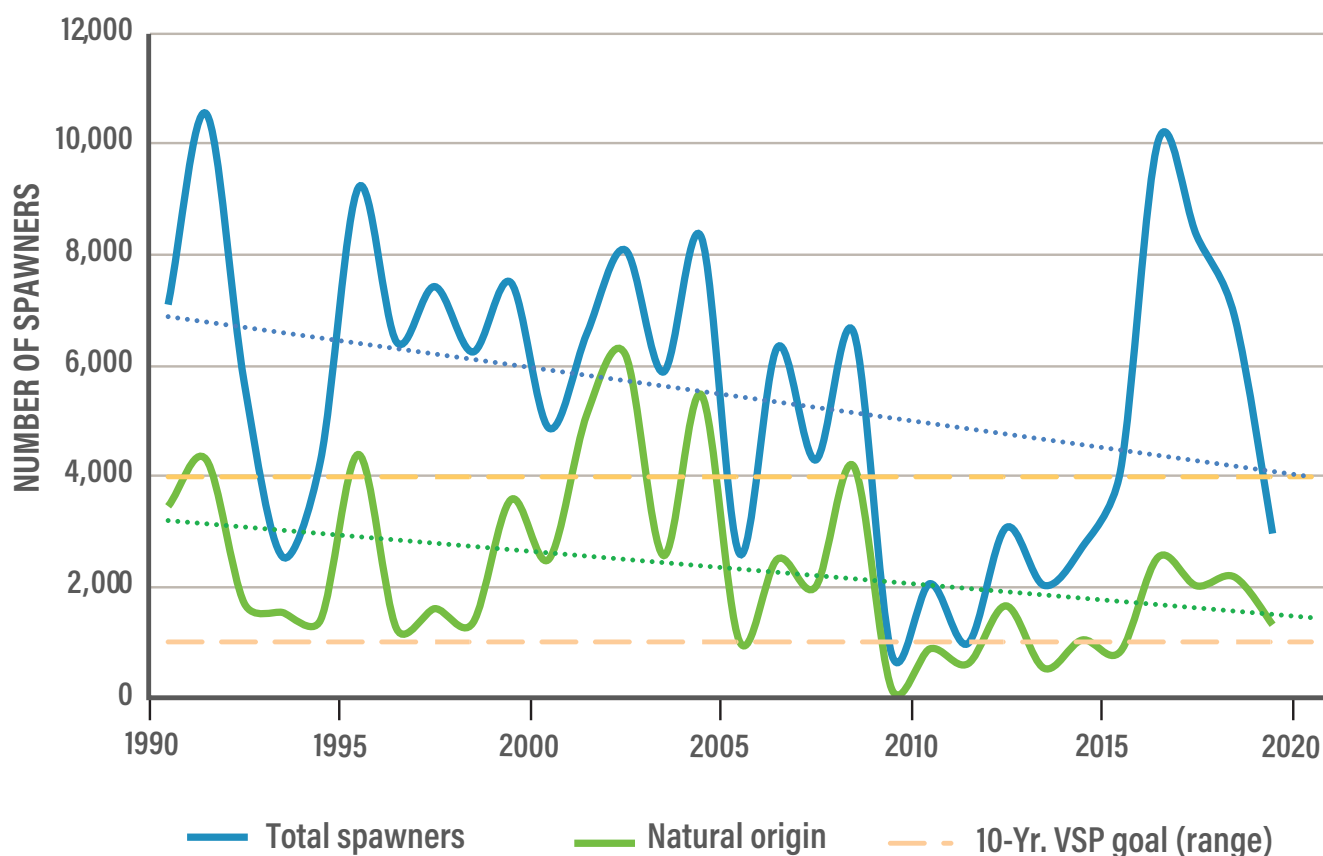
## Productivity

Productivity or population growth rate is the ratio of abundance in the next generation as compared to current abundance. The WRIA uses WDFW data to track egg-to-migrant survival rates as a primary means of evaluating productivity (WRIA 9 ITC 2012). Egg-to-migrant survival rate is defined as the proportion of fertilized eggs that survive to migrate as fry or parr into the Lower Green, as quantified by the Washington Department of Fish and Wildlife (WDFW) smolt trap at river mile 34. Although, the average rate for wild Chinook populations is 10.4 percent (Quinn 2005), the WRIA set a target of 8 percent because the elevated proportion of hatchery fish on the spawning grounds is assumed to reduce reproductive fitness (see VSP diversity metric below). Between 2006 and 2018, the survival rate has ranged from 0.09 percent to 11 percent, with an average of 5.7 percent (Table 1). While the long-term average is below the target, the egg-to-migrant survival rate has exceeded the 8 percent target in five of the last 10 years of data.

## VSP-Spatial Structure

The WRIA has not directly tracked a specific indicator or metric for spatial structure. However, natural origin adults predominantly spawn in Newaukum Creek and the mainstem Green River. Recent changes to hatchery operations will maintain the area in Soos Creek above the weir as a natural production emphasis area with only natural-origin adults passed above the weir. Adult Chinook will not be passed upstream of Howard Hanson Dam (HHD) in order to access the upper watershed until downstream fish passage is provided at HHD. A 2019 Biological Opinion (BiOp) issued by the National Oceanic and Atmospheric Administration (NOAA) found that the construction of a downstream fish passage facility at HHD was necessary for the recovery of Chinook salmon, steelhead, and Southern resident orcas. It sets a 2030 deadline for construction and operation of a downstream fish passage facility. For the spatial structure of the population to improve, natural origin spawners are needed within both of these areas that were part of their historic range.

**Figure 6.** Green River Chinook salmon escapement.



Data Source: WDFW Salmonid Stock Inventory and NOAA Salmon Population Summary Database.



## VSP-Diversity

Diversity is the variety of life histories, sizes, and other characteristics expressed by individuals within a population. WRIA 9 has used three metrics to measure diversity:

- Percentage of hatchery origin spawners. The target is for fewer than 30 percent hatchery origin Chinook spawners (HSRG 2004). The target has not been met since 2002, and since plan adoption in 2005, the proportion of hatchery fish on the spawning grounds has ranged from 35 percent to 75 percent and has appeared to be increasing (Table 1);
- Percentage of juvenile Chinook that outmigrate as parr. Based on recent analyses, this indicator is influenced by basic habitat capacity, the number of natural origin spawners, and the streamflows experienced during rearing (Anderson and Topping 2018). As such, tracking the percentage of parr is no longer recommended as a reliable metric for evaluating diversity of the population. However, the metric does continue to provide important population-level information related to productivity; and
- Proportion of natural origin adults that return as five- and six-year old fish, with a simple target of an increasing percentage of older fish returning over time. Since 2005, there have been no six-year old fish, thus monitoring data reflect only five-year old Chinook. Excluding 2009, which was an outlier year with the lowest return of adults on record, the proportion of five-year olds has ranged from a high of 17 percent to a low of 1 percent (Table 1). The average percent return from 2006 to 2015, 14.4 percent, is similar to the average over the last 46 years of 15.4 percent.

## Habitat Goals – Implementation Targets

Habitat goals outline both the necessary future ecological conditions to support a viable salmon population and shorter term implementation targets designed to assess plan implementation progress. WRIA 9 developed goals for key ecological indicators that reflect priority habitat needs and environmental stressors that span all life stages of Chinook salmon – adult migration, spawning, incubation and emergence, stream rearing, downstream migration, estuary rearing, and nearshore foraging. The indicators and associated goals presented in Table 2 are organized by subwatershed. This Plan Update does not outline specific goals related to marine migration outside of WRIA 9 boundaries.

WRIA 9 developed long-term goals – or necessary future conditions – during the development of the 2005 plan using scientific guidance developed by the Puget Sound Technical Recovery Team. The 2004 WRIA 9 Strategic Assessment and 2005 Salmon Habitat Plan summarize the full suite of necessary future conditions to support a viable salmon population in the Green/Duwamish and Central Puget Sound Watershed. They were not amended as part of this Plan Update. The subset of necessary future conditions outlined in Table 2 represents a strategic subset that can be readily assessed related to project implementation across shorter intervals of time.

Table 2 also outlines updated short term – 10 year – habitat targets used to directly track plan implementation. The 10-year targets were developed by the WRIA 9 Implementation Technical Committee based on a review of priority stressors, limiting factors, implementation progress under the 2005 Plan, and a review of common indicators proposed for regional tracking by the Puget Sound Partnership. Specific targets are intended to be aspirational and reflect the significant level of investment needed to substantively advance recovery within the watershed. The *Monitoring and Adaptive Management* chapter summarizes recommended methodology and timelines for periodic assessments of these and other longer-term status and trends indicators (e.g., water temperature, contamination).



**Table 2.** Green/Duwamish and Central Puget Sound Habitat Goals.

Necessary Future Conditions and Implementation Targets				
Habitat Indicator	Necessary Future Cond. (2005 Plan)	10-year Target 2005 Plan (achieved)	Current Condition	Recommended 10-year Target (2030)
<b>Marine Nearshore</b>				
<b>Shoreline Armor</b>	65% of shoreline in natural condition	Restore 13,500 ft of shoreline (1500 ft restored – net gain of 70 ft of armor).	36%/33 mi of shoreline in natural condition	Remove 3,000 ft of hard armor and achieve a net reduction in hard armor.
<b>Marine Riparian Vegetation</b>	65% of marine shoreline characterized by riparian tree cover	No target developed	40%/36 mi of shoreline has riparian tree cover	Revegetate 60 ac and/or 3.25 mi (~3.5% gain) of shoreline.
<b>Shoreline Conservation</b>	Not applicable	Protect 5 mi of shoreline. (4 mi protected).	9.5 mi of adjacent upland protected as natural lands	Acquire 2 mi of shoreline for permanent protection, prioritizing beaches and feeder bluffs.
<b>Duwamish</b>				
<b>Shallow Water Habitat</b>	173 ac of shallow water habitat in the transition zone (RM 1-10) (30% of historic)	Restore 26.5 ac of shallow water habitat (~6 ac restored)	Unknown	Create 40 ac of shallow water habitat between RM 1-10.
<b>Riparian Forest</b>	65% of each bank of the river has > 165 ft of riparian tree coverage (586 ac total)	No target was developed	69 ac/12% of 165 ft buffer contains tree cover	Revegetate 170 ac (~29% of 165-ft buffer)/9.8 mi of streambank.
<b>Lower Green</b>				
<b>Off-Channel Habitat</b>	45% of historical off-channel habitat. Restore 2.8 mi of side channels, 450 ac of floodplain wetlands, and 5,039 ac of connected 100-yr floodplain habitat (total of 8,839 ac of connected 100-yr floodplain).	Restore 16.5 ac of reconnected off-channel and riparian habitat (20.7 ac restored)	3,800 ac of connected 100-yr floodplain that is accessible to juvenile fish	<b>Restore 240 ac of floodplain habitat.</b>  <b>Side Channels:</b> 550-ft high flow/ 3,740-ft low flow  <b>Floodplain Tributaries:</b> 3,080 ft  <b>Backwater:</b> 75 ac  <b>Floodplain Wetland:</b> 66 ac  <b>Other 100-yr Floodplain:</b> 99 ac
<b>Riparian Forest</b>	75% of each bank of the river to >165 ft wide (828 ac total)	No target was developed	222 ac/27% of 165-ft buffer contains tree cover	Revegetate 250 ac (~30% of 165-ft buffer)/ 8.52 mi of high-priority, unforested shoreline

(continued on next page)



**Table 2.** Green/Duwamish and Central Puget Sound Habitat Goals. (Continued)

Necessary Future Conditions and Implementation Targets, continued				
Habitat Indicator	Necessary Future Cond. (2005 Plan)	10-year Target 2005 Plan (achieved)	Current Condition	Recommended 10-year Target (2030)
<b>Lower Green, continued</b>				
<b>Large woody debris</b>	1,705 pieces per mi (21 key pieces)	No target developed.	<b>2004:</b> 54 pieces/mi. <b>2014:</b> 48.5 pieces/mi.	Achieve 425 pieces/mi.
<b>Bank armor</b>	No new, decreasing amount	No new, decreasing amount	<b>2014:</b> 42 mi of river bank armored (17.7-mi levees; 9.8 mi maintained revetments; 14.5 mi of semi-armored roads acting like levees and natural banks)	Set back 1 mi of levee.
<b>Middle Green</b>				
<b>Floodplain connectivity/lateral channel migration</b>	Floodplain subject to lateral channel migration represents 65% of historical conditions	Restoration of 50 ac of off-channel habitat and riparian vegetation (45 ac restored)	<b>2017:</b> 1,751 ac or 55% of historic floodplain connected	Reconnect 200 ac of floodplain as measured by area subject to lateral channel migration.
<b>Riparian forest</b>	> 65% of Channel Migration Zone (1,424 of 2,190 ac) and up to 165 ft wide where possible	No target developed	<b>2005:</b> 50.3% <b>2009:</b> 50.5% of the Channel Migration Zone forested	Revegetate 175 ac (8% of Channel Migration Zone).
<b>Large wood debris</b>	10 jams/mi	No target developed	<b>2006:</b> 2.2 jams/mi <b>2015:</b> 3.8 jams/mi	Achieve 5 jams/mi.
<b>Bank armor</b>	No new, decreasing amount	No new, decreasing amount (>1% reduction)	<b>2004:</b> 25% armored <b>2009:</b> 24% armored	Set back 1 mi of revetment/levee.
<b>Upper Green</b>				
<b>Fish passage</b>	Up and downstream fish passage at Howard Hanson Dam	Fish passage provided (upstream passage provided)	Upstream passage facility complete. Downstream passage not complete.	Provide downstream passage at Howard Hanson Dam.
<b>Bank armor</b>	No new, decreasing amount	No new, decreasing amount	<b>2004:</b> 15% armored <b>2009:</b> 15% armored	Remove/setback 0.5 mi of bank armoring.





## Chapter 5: Strategic Assessment Update - New Science on Priority Pressures

The 2005 Strategic Assessment provided the scientific foundation for the Salmon Habitat Plan. Although the majority of science remains relevant today, new research findings have refined our understanding of priority pressures and limiting factors related to Viable Salmon Population (VSP) criteria. The 2005 Strategic Assessment evaluated functional linkages between priority pressures; habitat conditions; and Chinook abundance, diversity, productivity and spatial structure. The functional linkages were used to create a series of conservation hypotheses that outlined how improvements in habitat conditions and natural processes will drive changes in VSP parameters.

From 2017-2018, WRIA 9 produced a series of white papers as addendums to summarize new research and address priority data gaps in the original 2005 Strategic Assessment. White papers included *Fish Habitat Use & Productivity* (Higgins 2017); *Water Temperature* (Kubo 2017); *Contamination* (Colton 2018); and *Climate Change* (Engel, Higgins and Ostergaard 2017). This chapter provides a summary of the highlights of those papers as they relate to priority pressures impacting Chinook salmon in the Green/Duwamish Watershed. These refinements in our understanding of priority pressures informed both the recovery strategies presented in Chapter 6 and the prioritization of capital projects in Chapter 7.

### Priority Pressures (Basin of Focus)

Addressing priority habitat stressors is critical to restoring a viable salmon population in the Green/Duwamish and Central Puget Sound Watershed. The following stressors have clear functional linkages to one or more VSP parameters (abundance, productivity, diversity, and spatial structure). Applicable research and monitoring information is highlighted to reflect new research and best available science since the 2005 Plan.

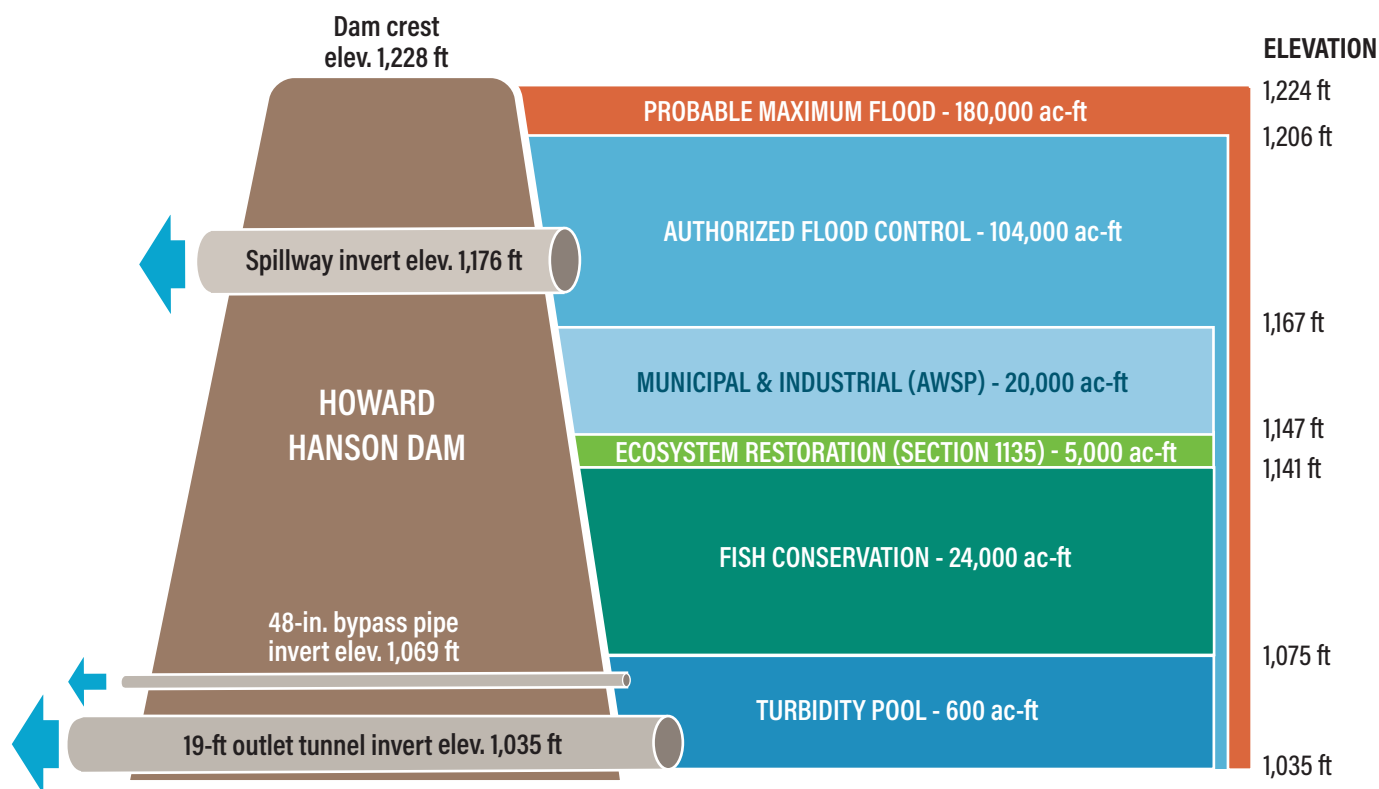
### Altered Instream Flows (Middle Green, Lower Green)

#### *Watershed Status*

Operations at Howard Hanson Dam (HHD) and the Tacoma Headworks diversion dam regulate instream flows within the mainstem Green River below river mile 64.5. Water storage, diversion, and release are jointly managed by the U.S. Army Corps and Tacoma Water utility. Although flood risk reduction is the primary mission of HHD, water storage also supports Tacoma municipal and industrial uses, and fish conservation uses. In 2007, Tacoma Water's Additional Water Storage Project provided capacity to store an additional 20,000 acre-feet (ac-ft) for municipal use.



**Figure 7.** Howard Hanson Dam spring water storage and allocation.



Source: United States Army Corps of Engineers, Seattle District.

Water capture and storage generally occur between late February and June 1. Figure 7 depicts how a spring water storage target of 49,000 ac-ft is legally allocated between municipal and fish conservation uses. Phase 2 of the Additional Water Storage Project (to be completed at a later date following downstream fish passage) would raise the conservation pool to 1,177 feet and store an additional 12,000 ac-ft of water. The U.S. Army Corps convenes a bi-weekly Green River Flows Management Coordination Committee to inform water capture and a subsequent flow augmentation period that extends from July 15 to November depending on fall rainfall. Augmentation of flows is intended to support Chinook salmon migration and spawning, maximize summer rearing habitat, and minimize dewatering of steelhead redds. Limited Fish Conservation and Ecosystem Restoration allotments frequently require tradeoffs among these ecological benefits – especially in dry and/or warm years with low snowpack. The Tacoma Water Habitat Conservation Plan establishes a minimum stream flow of 225 cubic feet per second (cfs) at the Auburn

gauge. During the summer of 2015, the minimum flow at the Auburn gauge reached 226 cfs.

Although flows are not regulated in tributaries, instreams flows are impacted by stream withdrawals and groundwater wells used to support residential and agricultural uses. In 2018, the Washington Legislature passed the Streamflow Restoration Law to offset the impacts of future permit exempt domestic groundwater withdrawals and help restore instream flows. The law was in response to a 2017 Washington State Supreme Court decision (Hirst Decision) that restricted building permits for new residential homes that would be reliant on permit-exempt wells. The legislature appropriated \$300 million over 15 years to support implementation of projects to improve stream flows across the state. The Washington State Department of Ecology is developing a Watershed Restoration and Enhancement Plan to identify and prioritize water offset projects in WRIA 9.



## Research/Monitoring

Flow management at HDD dictates instream habitat conditions within the mainstem Green River. As a result, water storage and subsequent release timing not only impacts natural hydraulic processes, but also influences available salmon habitat and productivity. Maintaining minimum instream flows of 250 cfs during dry summer months provides important benefits to available fish habitat. However, associated water capture and storage has reduced the frequency and magnitude of high – habitat forming – flows while prolonging the duration of moderate flows (Higgins 2017). Moderate flows between 5000-8000 cfs are not sufficient to drive process-based habitat formation, but do have the potential to scour redds (R2 Resource Consultants 2014).

**Flows above 8,800 cfs are needed to initiate lateral channel migration and support creation of off-channel habitats that are critical for juvenile Chinook rearing (Konrad et al. 2011).**

Long-term juvenile Chinook outmigration data collected by WDFW highlights the function relationship between instream flows and Chinook productivity (Anderson and Topping 2018). High flows (between ~8,000–10,000 cfs) from November through mid-January appear to scour eggs, sharply reducing the overall productivity of the number of juveniles per spawner. High flows (~6,000–8,000 cfs) during the typical fry outmigration period (mid-January through the end of March) reduce the number of parr produced in the Middle Green, likely because fish are flushed into habitats downstream of the trap. The frequency of spring flows (April through June) above 1,200 cfs appears to increase the number of parr produced. This is likely due to increased connectivity to off-channel habitats, like side-channels. A separate study (R2 Resource Consultants 2013) showed that, at flows below 1,200 cfs, side channel habitats become less connected to the mainstem and overall habitat complexity decreases.

## Climate Change (Watershed-wide)

### Watershed Status

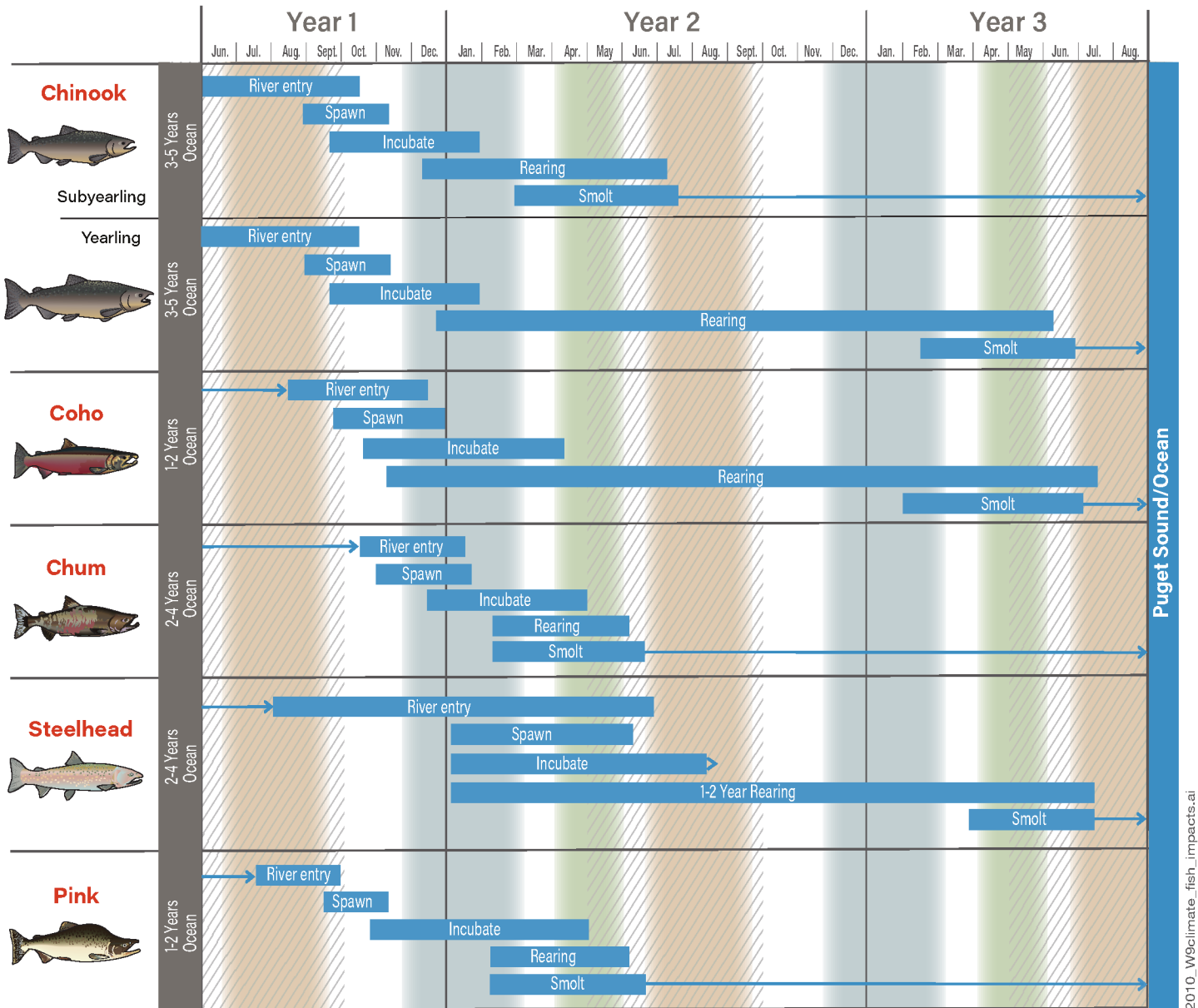
Climate change science was not incorporated into the 2005 Plan because future climate scenarios were unclear. However, climate change has been the focus of intense research, both global and regional, over the last decades. This research highlights the need to prepare for the current and future impacts of climate change and incorporate what we know about climate change into salmon recovery actions.

Climate change will directly impact salmon recovery work in the Green/Duamish and Central Puget Sound watershed. The UW Climate Impacts Group (Mauger et al. 2015) and others predict that Pacific Northwest precipitation patterns will change, bringing warmer, wetter falls, winters, and springs. Floods will be more intense and more frequent, with peak flows expected to increase by 28-34 percent by 2080. As winters become warmer and wetter, the watershed is projected to shift from mixed rain and snow to a rain-dominated basin with less mountain snow melting earlier in the spring. The decrease in amount and earlier disappearance of the snow pack will exacerbate drought-like summer low flow conditions in currently snow-dominated areas of the watershed. Summertime rain is expected to decrease by ~22% by 2050. A projected 4-5°F increase in air temperatures will increase water temperature in both rivers and the ocean. Nearshore and estuary areas will be impacted by sea level rise, food web alteration and ocean acidification. A changing climate will exacerbate typical climate variability, causing environmental conditions that will negatively impact our salmonids and their habitat. The potential impacts to various life histories of salmonids, including Chinook salmon, as a result of climate change are summarized in Figure 8.



# Climate Change Impacts on WRIA 9 Salmonids

Adapted from Beechie et al. (2012). Fish timing represents typical fish behavior.



**Figure 8.** Projected impacts to Green/Duwamish and Central Puget Sound salmon as a result of climate change.

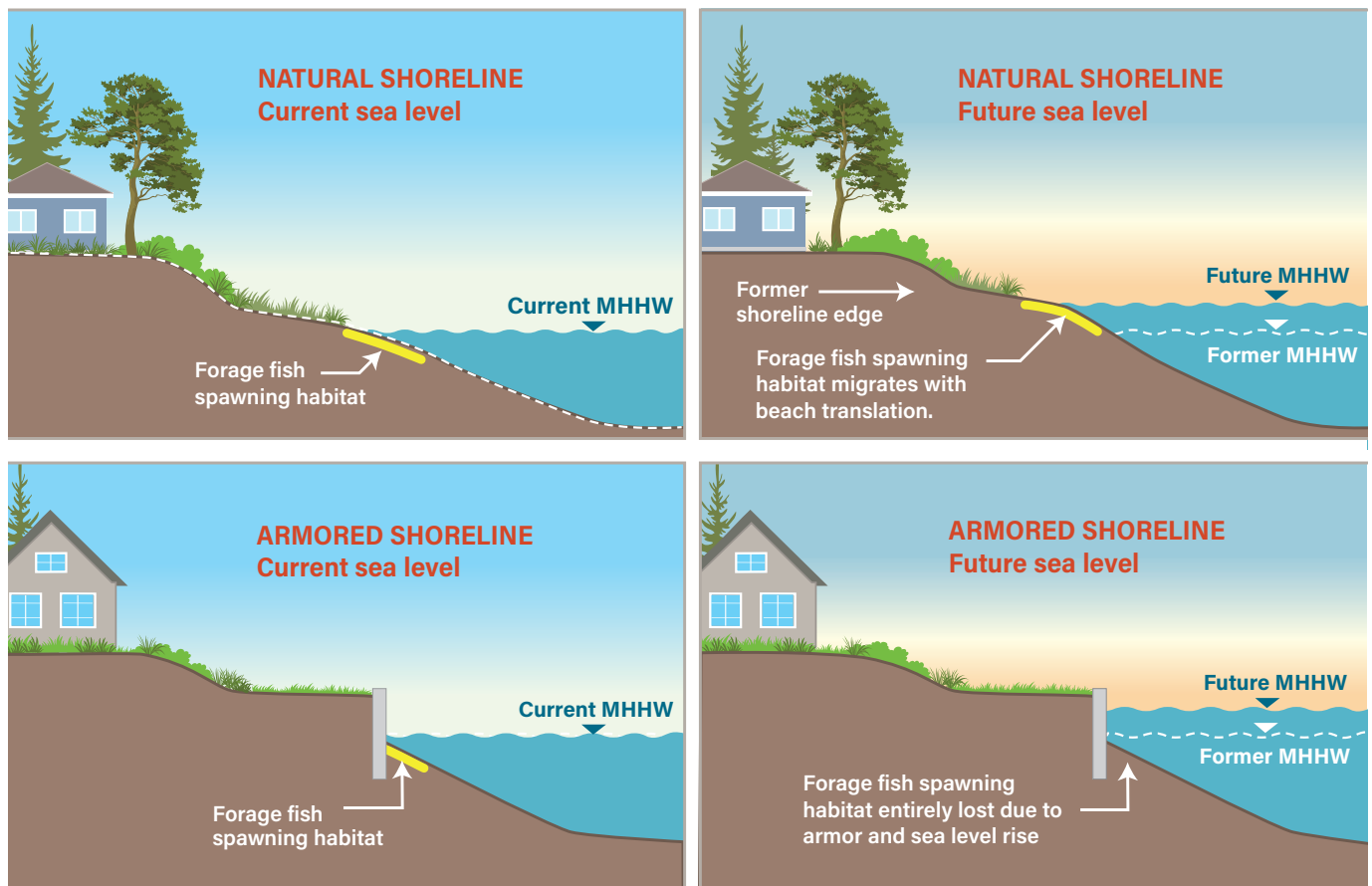


## Research/Monitoring

A changing climate will exacerbate typical climate variability causing environmental conditions that will negatively impact our salmonids and their habitat. The summer of 2015 likely provided a glimpse of the future ecological conditions in the Green/Duwamish watershed. A warm, wet winter with extreme low snowpack levels, coupled with a dry, hot summer, created dire conditions for salmon. (DeGasperi 2017) The Muckleshoot Indian Tribe reported adult Chinook salmon dying in the stream just below the Soos Creek hatchery (H. Coccoli, pers. comm.), and Washington Department of Fish and Wildlife (WDFW) data indicated higher than typical numbers of female Chinook mortality with high egg retention (pre-spawn mortality) (Unpublished WDFW data). Other sublethal impacts associated with temperatures in excess of 17°C can include developmental abnormalities, altered growth rates, and non-fertilization of eggs; altered migration timing; altered predator/prey relationship; and reduced disease resistance.

Sea level in Puget Sound rose 20 centimeters from 1900-2008 and scientists project sea level will rise an additional 0.6 meters by 2100. A 1-foot increase in water surface elevation means an order of magnitude increase in high water events—so a 100-year event turns into a two year event (Mauger et al. 2015). Sea level rise will have myriad effects on the marine nearshore habitats, including increased bank/bluff erosion, landslides, and lost nearshore habitats (e.g., eelgrass, forage fish spawning habitat, estuary mudflats, etc.) due to the “coastal squeeze” adjacent to armored shorelines. In addition, increased risk of erosion could contribute to a growing demand for additional shoreline armoring.

**Water temperatures as measured on July 4, 2015, exceeded the potential lethally threshold (22°C) for salmonids downstream of the Green River Gorge (DeGasperi 2017).**



**Figure 9.** Coastal squeeze in nearshore graphic along the Puget Sound Nearshore refers to the shallow areas where forage fish spawn and are being squeezed out of existence by shoreline armoring and sea level rise (Coastal Geologic Services).



A growing body of research is focusing on the potential impacts of ocean acidification on the Puget Sound ecosystem. Ocean acidification is driven by the absorption of carbon dioxide and is expected to impact survival, growth and behavior of marine organisms. In addition to observed impacts to calcifying organisms (e.g., oysters and crab) there is more recent evidence that ocean acidification may impair sense of smell in salmon, impede growth in herring and other species, and alter plankton populations – which may have a cascading impact on marine food webs. Experiments have shown that coho salmon's ability to avoid predators declines and risk of being eaten increases in low pH waters (Dunagan 2019). Although considerable uncertainty surrounds the potential impacts of ocean acidification on salmon, there is potential for it to exacerbate the issue of marine survival.

## Elevated Water Temperatures (Watershed-wide)

### *Watershed Status*

Water temperature is a key determinant of the biological integrity of a river – especially as it relates to cold-water dependent salmonids. High water temperatures can act as a limiting factor for the distribution, migration, health and performance of salmon. Washington State's water quality standards are protective of viable salmonid habitat in the Green River by assigning a numeric criterion of 16°C, above which the water body is considered impaired (WAC 173-201A-602). A supplemental criterion of 13°C, in effect between September 15 and July 1 further protects salmonid habitat. The widespread removal of tall, native trees along the riparian corridor – especially in the middle and lower Green River – allows solar-atmospheric radiation to rapidly warm water as it moves downstream below HHD. As a result, large stretches of the Green River, Soos Creek and Newaukum Creek regularly exceed established water quality standards for temperature. In 2011, the Washington State Department of Ecology developed total maximum daily loads (TMDLs) for the Green River and Newaukum Creek that outlined an implementation plan for improving temperatures. Another TMDL for Soos Creek is under development.

The Green/Duwamish experienced widespread potentially lethal water temperatures in 2015 (DeGasperi 2017). In response, WRIA 9 led the development of the

*Re-Green the Green: Riparian Revegetation Strategy* (2016) to emphasize the critical need for increasing riparian canopy and to prioritize revegetation efforts within the watershed. The strategy was adopted as an addendum to the 2005 Salmon Habitat Plan. It incorporated solar aspect shade maps published in 2014 by the Muckleshoot Indian Tribe to prioritize areas where increased tree canopy – and thus shade – could provide the largest benefit to preventing elevated water temperatures. It also established revegetation goals that were directly incorporated into this Plan Update. WRIA 9 developed a Re-green the Green grant program using Cooperative Watershed Management funds from the Flood Control District to accelerate revegetation efforts across the watershed.

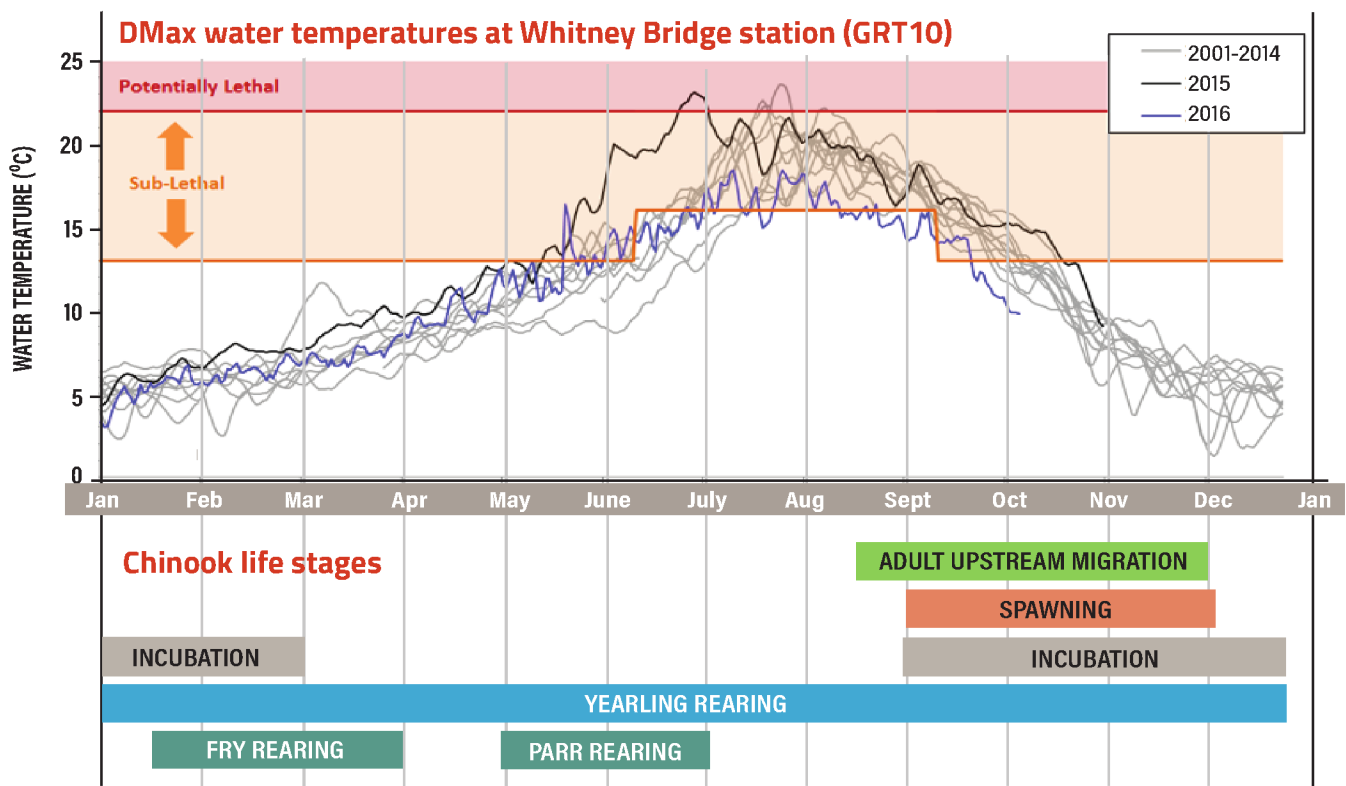
### *Research/Monitoring*

In addition to periodic exceedances of potential lethal water temperatures, a review of 7-DMax water temperatures at Whitney Bridge (RM 41.5) shows that instream temperatures regularly exceed established thresholds for sublethal impacts to salmon. Figure 10 shows 7-DMax temperatures from 2001-2016 in relation to key Chinook salmon life history stages. These data suggest migration, early spawning, egg incubation, yearling and parr rearing all potentially subject to sublethal impacts associated with elevated water temperatures.

A literature review completed for WRIA 9 (Kubo 2017) provides a summary of potential temperature-related impacts to Chinook salmon. Adult fish migrating upstream may be subject to increased metabolic demand, delayed migration, increased disease exposure, decreased disease resistance, and even direct mortality. Spawning fish may experience reduced gamete quality and quantity and reduced fertilization success. Chinook eggs may be subject to reduced embryo survival, decreased hatching-emergence condition, increased abnormalities, and altered metabolic rates. Juveniles and outmigrants may be subject to reduced feeding and growth rates, increased disease susceptibility, and accelerated onset of smoltification and desmoltification. Although many impacts may be sublethal, they can contribute to an increase in delayed mortality.

Protecting and restoring mature riparian tree canopy, protecting cold water sources, and promoting hydrologic exchange between the river/floodplain and the alluvial aquifer are essential to build ecological





**Figure 10.** Plot of 7-DMax water temperatures for the 2015 and 2016 calendar years measured by King County at the Whitney Bridge station (GRT10) compared to 7-DMax temperatures measured from 2001-2014. State standards for designated uses are noted by the orange line and potentially lethal impacts are indicated by the red line. State standards for designated uses include core summer salmonid habitats (July 1 – September 15) as well as spawning and incubation periods (September 16 – July 1). Timing of specific Green River Fall Chinook lifestages included below.

Source: Adapted from King County 2016.

resilience to rising temperatures and moderate the impacts associated with climate change. By 2080, it is expected that the number of river miles exceeding salmonid thermal tolerances (>18°C) will increase by 70 miles in the Green/Duamish watershed (G. Mauger 2016). One study suggests that warming of 2-5.5°C could result in the loss of 5-22 percent of salmon habitat by 2090 (O'Neal 2002).

**Predicted temperature increases, lower summer flows and altered precipitation patterns are likely to exacerbate temperature-related stress for Chinook salmon.**

## Fish Passage Barriers (Watershed-wide)

### Watershed Status:

Fish passage barriers are a critical obstacle to Chinook salmon recovery in the watershed. The presence of Howard Hanson Dam and the Tacoma Headworks Diversion facility block access to approximately 40 percent of the historical Chinook salmon spawning and rearing habitat (NOAA 2019). This barrier alone blocks access to somewhere between 78-165 miles of suitable fish habitat. The 2005 Plan assumed fish passage would be provided by 2015. Tacoma completed an upstream trap and haul facility at the headworks facility in 2007; however, downstream fish passage at Howard Hanson Dam has not been completed.



In 2019, the NOAA Fisheries released a biological opinion (BiOp) that concluded U.S. Army Corps operations at Howard Hanson Dam would “jeopardize the continued existence of ESA-listed Puget Sound (PS) Chinook salmon, PS steelhead, and Southern Resident killer whales (SRKW), and that the proposed action is likely to result in the adverse modification of these three species’ critical habitat designated under the ESA.” In issuing the jeopardy opinion, NOAA stated that without fish passage the population’s abundance, productivity, and spatial diversity could not achieve established viability criteria, thus increasing the risk of extirpating the population.

In order to avoid jeopardizing ESA-listed Chinook, the BiOp concluded that the U.S. Army Corps must provide operational downstream fish passage no later than February 2031. The resulting facility would be required to satisfy established performance criteria, including achieving 98 percent survival of all fish passing through the facility. The BiOp states that if established performance standards are satisfied, the Upper Green watershed could support self-sustaining populations of Chinook salmon and steelhead, “dramatically improving the likelihood that the Chinook salmon population would achieve a highly viable status.”

In addition to HHD, an unknown number of smaller fish passage barriers impact Chinook salmon movements within the watershed. There is a growing recognition that a number of barriers associated with smaller tributaries adjacent to roads, revetments and flood control structures block juvenile access to critical rearing habitats. One of the larger existing barriers is the Black River Pump Station. The pump station is a flood control facility built in 1970, located near the mouth of the Black River. While the facility was originally constructed with both upstream and downstream fish passage facilities, they are outdated and currently do not meet federal fish passage criteria (Jacobs 2020). In its current state, the facility limits both upstream and downstream fish passage and restricts access to over 50 miles of stream, including Springbrook Creek, Panther Lake Creek, Garrison Creek, and Mill Creek. Although the majority of stream habitat is primarily suitable for coho and steelhead, Chinook salmon have been found in the system, and the area immediately upstream of the facility could provide important rearing and refuge habitat for juvenile Chinook.

## Research/Monitoring

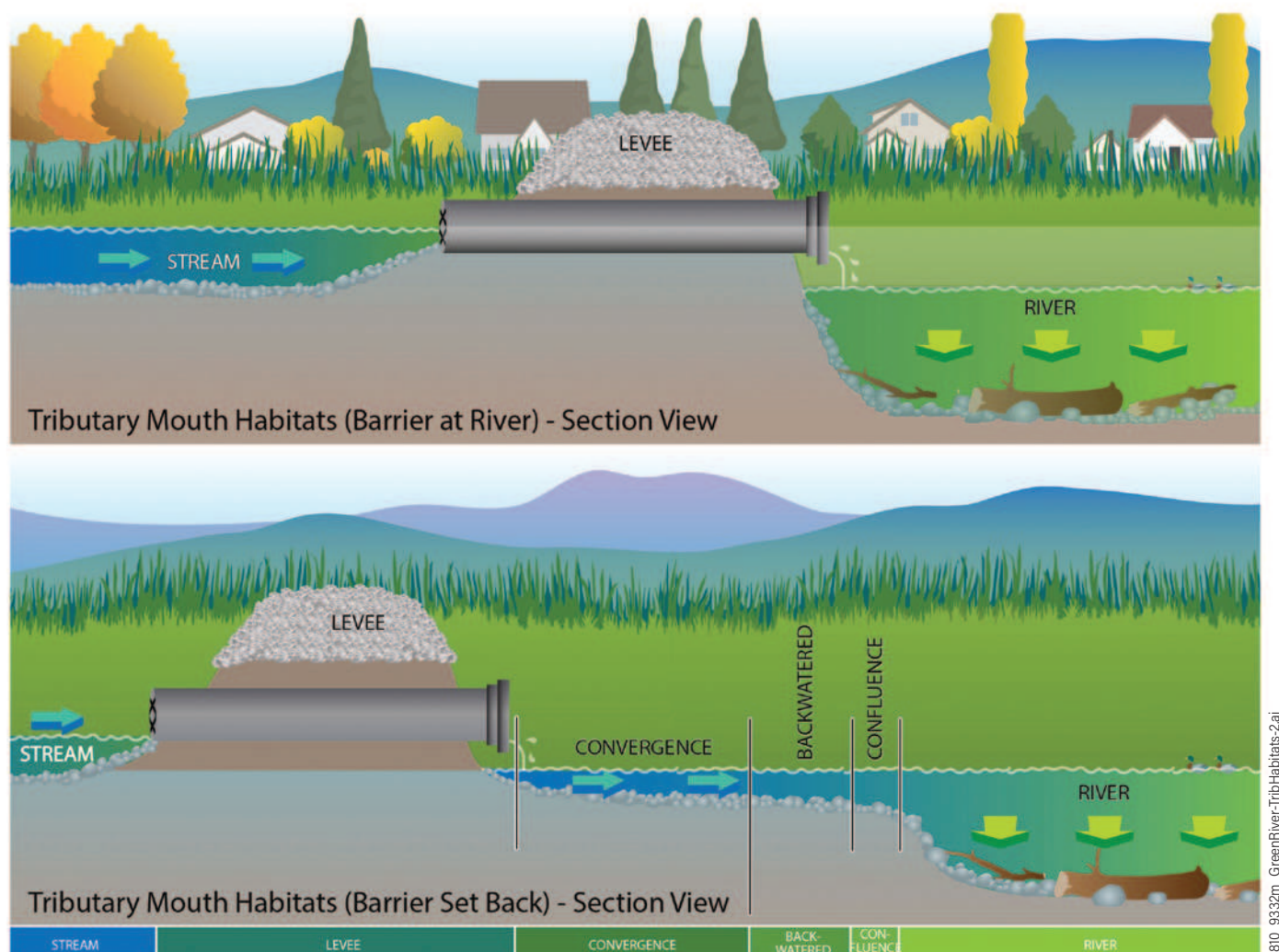
A 2019 study evaluating the use of small non-natal tributaries (streams that do not support Chinook spawning) by juvenile Chinook highlighted the importance of these habitats for both juvenile rearing and flood refuge. Juvenile Chinook were identified in eight of the nine tributaries sampled in the Lower Green River basin and were found up to 480 meters above the confluence with the Green River. The results demonstrated (1) widespread use of non-natal tributaries for extended lengths of time; (2) heavily urbanized streams with a large amount of impervious surfaces appear capable of supporting non-natal juvenile rearing; (3) juvenile upstream passage is an important consideration for fish barriers; and (4) variability in flapgate performance for juvenile fish passage (King County 2019). A follow-up study was funded by WRIA 9 in 2019 to assess flapgate performance and identify potential retrofit and replacement options to improve juvenile passability.

**Non-natal tributaries provide important rearing and refuge habitat in the Lower Green subwatershed.**

Long-term fish-in fish-out monitoring by WDFW indicates that Chinook salmon population productivity is limited by available rearing habitat and that parr outmigrants disproportionately contribute to the abundance of returning adults (Anderson and Topping 2018). Restoration of non-natal tributaries has the potential to complement ongoing restoration efforts in the Lower Green River mainstem to provide additional capacity to support fry growth into parr prior to outmigration to the Duwamish estuary. Larger (basins >100 acres), low-gradient (<2%) tributaries likely provide a large amount of rearing habitat and support higher densities of juvenile Chinook (King County 2019; Tabor et al. 2011; Tabor and Moore 2018; Tabor, Murray and Rosenau 1989; Scrivener et al. 1994; Bradford et al. 2001).



**Figure 11.** Representative tributary mouth habitats associated with flapgate flood control structures.



Source: King County, 2019: Juvenile Chinook Use of Non-natal Tributaries in the Lower Green River

## Land Conversion (Watershed-wide)

### *Watershed Status*

Located within the greater Seattle metropolitan area, population growth and economic development have significantly modified the watershed, its underlying hydrology, and the salmon habitat within it. In addition to legacy impacts (Chapter 3 of 2005 Plan), the watershed experienced tremendous population growth and development in the 15 years since the 2005 Salmon Plan. The population of King County population swelled approximately 25 percent, adding an additional 444,000 residents (U.S. Census Bureau 2019; King County 2006). During the same timeframe, 46,000 new housing units were constructed in the watershed (WA Dept. of Commerce 2017).

The extensive development pressures within the watershed – especially in the Nearshore, Duwamish and Lower Green watershed – have degraded large portions of the watershed from natural conditions. In addition to direct habitat loss, land conversion contributes to increased impervious coverage and stormwater runoff. Refer to the Stormwater section in this chapter for additional information on stormwater impacts on salmon. Approximately 32 percent of the watershed is located within established urban growth areas (UGAs). Competition for scarce available land contributes to high restoration/acquisition costs and the loss of restoration priorities to redevelopment pressures.



## Research/Monitoring

Despite the tremendous growth and development pressure, growth management efforts have concentrated new housing construction within urban growth areas. Only about 3 percent of housing units constructed in the watershed since the 2005 Plan have occurred outside of UGAs (WA Dept. of Commerce 2017). While this is a positive outcome, a comprehensive assessment of changes in forest cover and impervious surfaces has not been completed since 2006. In addition, the basin-wide effectiveness of critical area and shoreline protections has not been assessed. A WRIA 9-funded study of marine shoreline development from 2016-2018 observed a net increase in shoreline armoring and permit compliance rates below 50 percent (King County 2019). Additional information about the status of marine shorelines is presented in the Shoreline Armoring section.

## Levees and Revetments (Middle and Lower Green)

### Watershed Status

An extensive network of flood containment and training levees and revetments protect economic development and agricultural land in the Lower and Middle Green River valleys. In total, there are approximately 36 miles of levees and revetments in the watershed. Over 27 miles of facilities provide flood protection for the Lower Green River valley – the second largest warehouse and distribution center on the west coast. The valley contains \$7.3 billion of structures and associated content, supports over 100,000 jobs, and generates an annual taxable revenue of \$8 billion (Reinelt 2014).

Flood control facilities degrade floodplain function and reduce habitat complexity. They disconnect large portions of the historical floodplain, off-channel habitats, and tributaries – all important juvenile salmon rearing and refuge habitats. Associated vegetation maintenance standards limit riparian revegetation and contribute to elevated instream temperatures. Facilities also disrupt sediment delivery and filtration, water storage and recharge, and large wood input to the river channel. In addition to the direct impacts of the facilities, they also support land use development on historic floodplain habitats.

Due to the diversion of the White and Black rivers, much of the “connected” floodplain is perched above the river channel and only connected during very high flows. Current flows with a 100-year flood event equate to an historic two-year event (King County 2010). At these flows, only 18 percent (3,518 of 19,642 acres) of the historic Lower Green River floodplain is connected (Higgins 2017). The loss of juvenile Chinook salmon-rearing habitat reduces juvenile survival and overall population productivity. Restoration of floodplain habitat in the Lower Green River valley not only requires levee setbacks, but also requires extensive fill removal to reconnect perched floodplains across a larger range of flows.

## Research/Monitoring

Since the 2005 Plan, studies have shown higher growth rates for Chinook salmon accessing floodplains when compared to fish rearing exclusively in the mainstem. Increased growth likely results from increased food availability and foraging efficiency in floodplain habitats (Henning 2004; Sommer et al. 2001; Jeffres, Opperman and Moyle 2008; and Lestelle et al. 2005). This research also suggests that any increased risk of stranding during retreating flows is offset by the potential for increased growth rates. These studies emphasize how important floodplain habitats are to juvenile Chinook growth and provide an important context for understanding how the magnitude of habitat loss in the Lower Green and to a lesser extent in the Middle Green have impacted juvenile Chinook production locally.

Analysis of juvenile life history success in adult Green River Chinook salmon (2015-2017) found parr outmigrants disproportionately contribute to adult returns relative to their abundance. Although parr comprised 3-56 percent of the out-migrating juveniles, more than 97 percent of returning adults were found to have exhibited the parr life history. In comparison, the parr life history is reflected in 64 and 76 percent, respectively, of the adult returns in the Skagit and Nooksack watershed (Campbell and Claiborne 2017; Campbell et al. 2019). These data indicate that Chinook salmon life history success varies between watersheds and that productivity (adult spawner abundance) in the Green is currently driven by parr production, as juveniles exhibiting the fry life history rarely survive to adulthood.

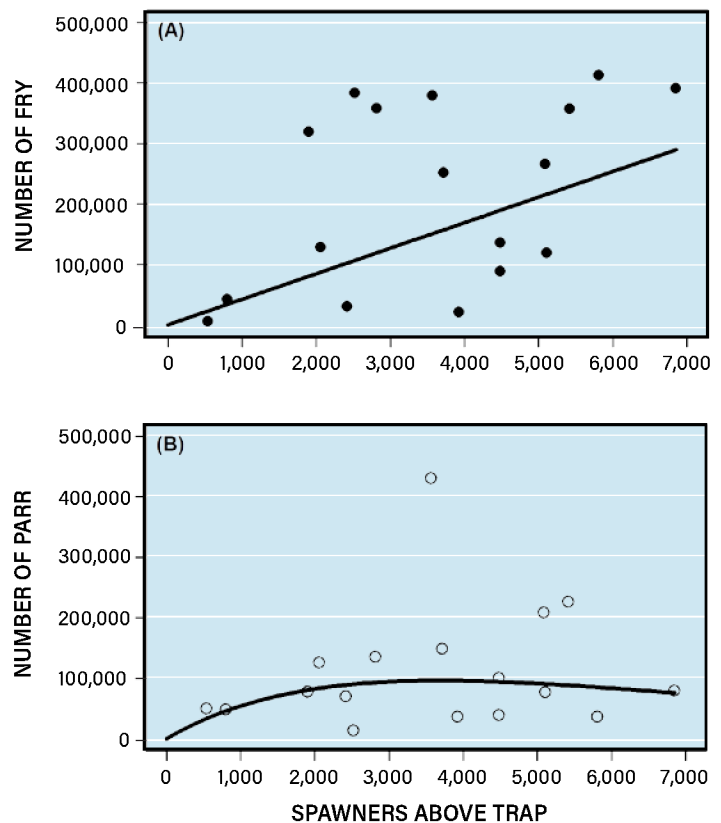


An analysis of long-term juvenile outmigration data collected by WDFW identified a density-dependent relationship between adult spawner abundance and relative parr abundance (Anderson and Topping 2018). Figure 6 shows that adult escapements in excess of 3,000 fish did not generally result in increased parr production. In contrast, fry production was observed to be density independent. Juvenile Chinook require rearing and refuge habitats (e.g., off-channel habitats, side-channels, etc.) to grow into parr prior to outmigration. When considered in concert with the Campbell and Claiborne studies, these results highlight the importance of reconnecting floodplains and restoring rearing habitat to increasing Chinook returns.

## Sediment Contamination (Duwamish)

### Watershed Status

Industrial and commercial development in the Duwamish estuary not only led to dredge and fill of historical estuarine wetlands, but also left a legacy of persistent contaminants within the working water-front. Two Superfund sites require additional clean-up in the Duwamish, the Lower Duwamish Waterway (LDW) and Harbor Island/East Waterway (EW). Both sites contain elevated levels of polychlorinated biphenyls (PCBs), arsenic, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), as well as dioxins and furans. The EPA's Record of Decision for the LDW (2014) outlines the cleanup plan for the 412 acre site, which includes 105 acres of dredging or partial dredging, 24 acres of capping, 48 acres of enhanced natural remediation and 235 acres of monitored natural attenuation. Although early action areas (Slip 4, Terminal 117, Boeing Plant 2/Jorgensen Forge, Diagonal Combined Sewer Overflow [CSO], and Norfolk CSO) resulted in cleanup of approximately 50 percent of PCB contamination, cleanup will not be completed until after 2031. Cleanup options for the EW site are under development.



**Figure 12.** Spawners-recruit plots showing abundance of fry and parr produced based on estimated adult Chinook salmon escapement (Anderson and Topping 2017).

**Productivity in the Green/Duwamish is currently constrained by available rearing habitat in the Lower and Middle Green rivers.**



Transport pathways carry contaminants from sources to surface waters, as well as within surface waters. Contaminants reach the Green/Duwamish receiving waters via point discharges (permitted industrial, stormwater and CSOs discharges), overland flow (stormwater runoff), groundwater, and direct atmospheric deposition, as well as by spills/leaks and bank erosion. Fish are exposed to chemicals through multiple routes including water passing through their gills and/or its ingestion, direct sediment contact and/or its ingestion, and/or through consumption of contaminated prey. Chinook experience greater chemical exposure during the juvenile phase than during the adult phase due to the comparatively different lengths of time they spend in the Duwamish during these life stages (Colton 2018).

Although the 2005 Salmon Plan hypothesized that sediment cleanup would benefit Chinook salmon, limited scientific data were available on the potential impacts of sediment contamination on productivity at the time.

### Research/Monitoring

A growing body of research findings suggests that contaminant exposure for juvenile Chinook salmon in the Duwamish and Elliott Bay is affecting juvenile Chinook salmon growth, disease resistance, and immunosuppression, and ultimately marine survival. Juvenile Chinook salmon rearing in industrial estuary and nearshore habitats (e.g., Duwamish, Puyallup and Snohomish) contain elevated levels of organic contaminants as compared to those rearing in less developed watersheds (Skagit and Nisqually) (O'Neil et al. 2015; Varanasi et al. 1993). Juvenile Chinook salmon whole body PCB tissue concentrations from the Duwamish and associated nearshore areas have exceeded adverse impact thresholds (O'Neil et al.

2015; Johnson 2007). PCB levels in wild fingerlings have also been shown to have significantly higher PCB levels than their hatchery counterparts, suggesting that wild Chinook have a longer residence time within the Duwamish estuary (Nelson, et al. 2013).

An examination of 37 years of hatchery data from 20 hatcheries across 14 watersheds found 45 percent lower smolt-to-adult survival rates for hatchery Chinook that outmigrate through contaminated estuaries as compared to uncontaminated estuaries (Meador 2014). The study evaluated the findings against the total amount of estuary habitat, length of freshwater habitat between each hatchery and estuary, as well as growth rates and did not find these factors could explain observed variation in survival rates. Because wild Chinook – especially the fry outmigrant life history type – are more dependant on and have longer residence times in estuarine habitat, the observed decline in survival may be more pronounced in wild Chinook salmon.

A recent study by scientists at the NOAA Northwest Fisheries Science Center estimated the potential impact remediation of the Lower Willamette River Superfund site would have on Chinook salmon recovery (Lundin et al. 2019). The study used a combination of field and laboratory-collected exposure, growth, and disease resistance data to estimate acute and delayed mortality rates for juvenile Chinook. These estimates were then incorporated into a life cycle model that estimated sediment remediation could improve juvenile survival by 54 percent and increase population abundance by 20 percent. This study provides a population-scale assessment of the potential impacts of legacy pollutants on Chinook salmon and suggests that remediation in the Duwamish could be a significant driver for Chinook recovery.



**Figure 13.** Chinook salmon that enter the estuarine waters as fry (< 60 mm) experience very low marine survival rates. In contrast to less developed watersheds, estuarine-reared fry in the Green/Duwamish are not contributing significantly to adult returns.



The research on potential adverse impacts to juvenile Chinook as a result of contaminant exposure is consistent with a recent analysis of juvenile life histories expressed by adult Chinook salmon in the Green/Duwamish River. Analysis of otoliths from returning adult salmon allow resource managers to back-calculate size upon entry in marine waters, allowing differentiation between parr and fry migrants. Otolith collection from adult Chinook salmon (2015-2017) indicate that less than 3 percent of fish returning to the watershed entered marine waters as a fry migrant, despite representing between 44 and 97 of the total juvenile outmigrants (Campbell and Claiborne 2017; Campbell et al. 2019). Additional research is needed to assess the relative importance of contamination in relation to other stressors (i.e., existing estuarine habitat quality and capacity) in contributing to poor marine survival.

**Research suggests that juvenile Chinook that enter the Duwamish as fry – as opposed to parr – experience very low survival and do not substantively contribute to population abundance as measured by adult escapement.**

Chemicals of emerging concern (CECs) are another area of emerging research. The EPA defines CECs as “chemicals and other substances that have no regulatory standard, have been recently ‘discovered’ in natural streams (often because of improved analytical chemistry detection levels), and potentially cause deleterious effects in aquatic life (e.g., endocrine disruptors) at environmentally relevant concentrations” (EPA 2008). CECs include hormones, pharmaceuticals and personal care products (PPCPs), and industrial process chemicals. An analysis of juvenile Chinook whole body tissue in several Puget Sound estuaries detected 37 of 150 surveyed PPCPs (Meador et al. 2016). Metabolic disruption consistent with starvation was also observed in juvenile Chinook collected adjacent to waste water treatment plants in Sinclair Inlet and the Puyallup River (Meador 2018). The potential impacts to Chinook salmon growth, reproduction, and behavior are not well understood.

## Stormwater (Nearshore, Duwamish, Lower and Middle Green)

### *Watershed Status*

Stormwater runoff and associated hydrological modifications resulting from forest conversion and land use development within the Green/Duwamish watershed adversely impact water quality and salmon habitat. Approximately 59 and 24 percent, respectively, of the 165-foot riparian buffer in the Duwamish and Lower Green is characterized by impervious surfaces (King Co. unpublished data, 2013). Although watershed-wide data are not available, the impacts associated with the loss of forest cover and increase in impervious surfaces are not confined to riparian areas. At the basin-wide scale, these levels of impervious coverage can contribute to a two-three fold increase in stormwater runoff above natural conditions (Paul and Meyer 2001). Increased runoff contributes to rapid changes in flows, with larger peak flows and lower low flows; increased pollutant transport and degradation of water quality; shifts in benthic macroinvertebrates communities; elevated water temperatures; increased bank erosion and sediment transport capacity; and altered channel morphology and hydraulics.

The majority of the development within the watershed – and across Puget Sound – predates existing critical area ordinances and low-impact development standards designed to mitigate impacts to aquatic ecosystems. As a result, stormwater runoff is recognized within the region as one of the more significant challenges facing both salmon and Puget Sound recovery efforts.

### *Research/Monitoring*

Since the 2005 Plan, a significant body of research has focused on stormwater toxicity impacts to salmon in urban creeks. Consistently high levels of mortality (up to 90 percent) in adult coho salmon have been observed in urban watersheds, with the extent of mortality rate related to an urbanization gradient and, more specifically, density of motor vehicle traffic (Scholz 2011; Feist 2017). More recent studies have connected observed mortality events to pollutants associated with highway runoff (Scholz 2016; Peter 2018).



**Although Chinook salmon do not appear vulnerable to acute toxicity as a result of roadway runoff exposure (Scholz 2019), more research is needed to evaluate potential sublethal impacts.**

Although studies have shown treatment of runoff can prevent acute toxicity, the large capital expenditures associated with stormwater retrofits have precluded widespread implementation. A comprehensive needs and cost assessment for stormwater retrofit within the Green/Duwamish and Central Puget Sound watershed was completed in 2014. The study evaluated 278 square miles of the watershed, excluding Seattle and areas upstream of Howard Hanson Dam. An estimated \$210 million per year would need to be spent over the next 30 years to build necessary regional facilities, retrofit roads and highways, and retrofit non-forested lands not redeveloped within the next 30 years (King County 2014).

## Shoreline Armoring (Nearshore)

### *Watershed Status*

The Green/Duwamish and Central Puget Sound watershed encompasses 92 linear miles of marine shoreline. Associated nearshore habitats provide not only important rearing and migratory habitat for juvenile salmon, but also spawning habitat for forage fish (e.g., sand lance and surf smelt), which are important prey items for salmon, birds and marine mammals. Delivery of sediment and trees from natural bluffs helps sustain nearshore habitat complexity (beaches, spits, eelgrass beds, etc.) and shoreline resilience to coastal erosion and sea level rise.

The degradation of marine shorelines and associated ecological functions has implications not only for Chinook salmon recovery, but also for the ESA-listed southern resident orca population. Shoreline armor – especially along feeder bluffs – disrupts sediment supply and transport, altering nearshore habitat quantity and quality. Shoreline land use ranges from commercial and industrial waterfront in Elliott Bay, urban residential between Seattle and Federal Way, to rural residential and undeveloped shorelines along Vashon Island. Approximately 65 percent of the shoreline is currently armored and only 22 of 52 drift cells have greater than 50 percent of historical feeder bluffs intact (King County 2019; WRIA 9 2012).



**Figure 14.** Shoreline modification identified during Marine Shoreline Monitoring and Compliance Project (Ecology).



## Research/Monitoring

Recent research reinforces assumptions in the 2005 Plan about the importance of nearshore habitats to salmon. The range of physical and biological impacts in response to shoreline armoring varies across spatial and temporal scales. Shoreline armoring impacts wrack and log accumulation, juvenile fish utilization, forage fish spawning, beach profiles, sediment grain size, and marine riparian vegetation. In particular, drift cells with a high proportion of armoring tend to be characterized by skinnier beaches, coarser sediments, fewer drift logs, fewer prey species (Dethier et al. 2016).

Natural shorelines convey important benefits to juvenile Chinook salmon. Small juvenile salmon preferentially use low-gradient, unarmored shorelines (Munsch, Cordell and Toft 2016). Riparian vegetation associated with unarmored beaches provide a source of terrestrial prey items for juvenile Chinook and benefit forage fish egg survival by moderating substrate temperatures and maintaining humidity (Rice 2006; Toft, Cordell et al. 2007). Even small-scale beach restoration projects (i.e., Olympic Sculpture Park) have resulted in measurable increases in larval fish abundance, juvenile salmon, and invertebrate diversity as compared to adjacent armored shorelines (Toft, Ogston et al. 2013).

The magnitude of unpermitted shoreline modifications threatens to negate investments in shoreline restoration and undermine the goal of “no net loss” established within the Shoreline Management Act. From 2013-2018, the watershed saw a net increase of 364 feet of shoreline armor despite armor removal and restoration of 382 feet shoreline during the same timeframe. Only 42 percent of observed shoreline modifications were permitted by local governments prior to construction (King County 2019).

Although juvenile Chinook from the Green/Duwamish River have been observed to use the marine shorelines throughout Central Puget Sound, considerable uncertainty surrounds the relative importance of non-natal coastal streams and pocket estuaries. A study in the Whidbey Basin found abundant use of non-natal coastal streams (32 of 63 streams) by juvenile Chinook. The presence of juvenile Chinook was influenced by (1) distance to nearest natal Chinook salmon river; (2) stream channel slope; (3) watershed

area; and (4) presence and condition of a culvert at the mouth of a stream. The importance of non-natal coastal streams to juvenile Chinook salmon dropped significantly beyond 7 km from the mouth of a Chinook bearing river (Beamer, et al. 2013). Additional research is needed to prioritize non-natal coastal streams in WRIA 9 with respect to potential contribution towards Chinook salmon recovery.

**Despite the recognized importance of natural shorelines and significant regional investment in armor removal, WRIA 9 continues to experience a net increase in shoreline armoring.**









## Chapter 6: Recovery Strategies

WRIA 9 developed 11 overarching recovery strategies to organize watershed priorities and guide future investments. These strategies outline priority areas of focus intended to advance salmon recovery over the next 10-20 years. Recovery strategies are not prioritized. Implementation across the portfolio of recovery strategies is necessary to address priority pressures; increase salmon abundance, productivity, and diversity; and build long-term population resiliency. Successful implementation hinges on partner coordination and investment to ensure local land use planning, capital investment programs, and community outreach messaging are consistent with identified watershed priorities.

WRIA 9 hosted a series of subwatershed workshops to review and update policies and programs from the 2005 Salmon Habitat Plan. Revised policies and programs are organized by recovery strategies – as opposed to subwatershed – to reduce redundancy and improve alignment with other Puget Sound salmon plan updates. This structure is intended to provide project sponsors and other recovery partners a streamlined communication tool for a shared understanding of what needs to happen, where, and what policy considerations are necessary at the local and regional level to advance Chinook salmon recovery.

### **Strategy: Restore and Improve Fish Passage**

#### **Location: All Subwatersheds**

Fish passage barriers block access to important spawning and rearing habitat and can exacerbate localized flooding issues. Legacy transportation and flood control infrastructure were not regularly designed for fish passage and/or elevated flood flows associated with climate change. Although addressing fish passage barriers was a priority in the 2005 Plan, a 2018 U.S. Supreme Court ruling affirmed that the State has a treaty-based obligation to address culverts under state-maintained roads in order to preserve tribal harvest rights within their usual and accustomed areas. This ruling has reinforced the need and elevated the urgency for addressing identified barriers in a systematic and strategic manner.





**Figure 15.** Juvenile fish passage barriers block juvenile Chinook salmon access to important rearing habitat in non-natal tributaries. Photos: Mike Perfetti.



**Figure 16.** Healthy juvenile Chinook (right) and coho (left) salmon sampled from a non-natal tributary in 2018. Photo: Chris Gregersen.

## Programs

### » Fish Passage Barrier Removal

WRIA 9 partners should work towards a comprehensive inventory of fish passage barriers in the Green/Duwamish and Central Puget Sound Watershed, and prioritize barrier removal across the watershed to maximize the benefit of fish passage investments. Although the majority of existing barriers in the watershed impact coho salmon and steelhead, special consideration should be given to removing barriers to non-natal tributary rearing habitats. Recent fish monitoring studies have demonstrated the importance of non-natal tributaries to juvenile Chinook and remedying these barriers will expand available rearing habitat and increase Chinook productivity. Recent fish monitoring studies have demonstrated the importance of non-natal tributaries to juvenile Chinook (King County 2019; Tabor and Moore 2018) and remedying these barriers will expand available rearing habitat and increase Chinook productivity.

Many partner jurisdictions do not have the capacity to implement a programmatic approach to barrier identification and removal; instead, barrier removal is driven by infrastructure repair needs and local capital improvement programs. Some, such as the City of Seattle, have an inventory and prioritized list of fish passage barriers but lack sufficient funding for implementation. To support a more comprehensive approach to fish passage, WRIA 9 partners should leverage available technical assistance from Washington Department of Fish and Wildlife (WDFW) Fish Passage and King County Fish Passage Restoration Programs to assess and prioritize barriers for removal outside of their scheduled capital improvement programs to expedite high-priority barrier removals. Jurisdictions should apply for funding for high-priority projects through the Brian Abbott Fish Barrier Removal Board. Regional coordination among WRIA 9 partners on fish barrier removal priorities should help identify synergies and accelerate barrier removal in priority subwatersheds. Programmatic improvements within the County Fish Passage Restoration Program may support increased efficiencies within other jurisdictions. Fish passage accomplishments and lessons learned should be shared regularly to expedite barrier identification and increase coordination across the watershed.



## Policies

- » **Fish Passage (FP) 1:** Provide efficient and safe fish passage where built infrastructure (e.g., road crossings and flood control facilities) intersects instream habitats. Fish passage design considerations should not only facilitate adult upstream migration, but also ensure juvenile salmonid access to rearing habitat provided in non-natal tributaries. Project sponsors should use WDFW Water Crossing Design Guidelines (2013) to assess feasibility and support alternative development.

## Strategy: Protect, Restore and Enhance Floodplain Connectivity

### Location: Lower and Middle Green

The process of channel migration within the floodplain creates side channels, back-water sloughs, and other off-channel habitats that are critical for juvenile salmon on rearing and refuge. Floodplains also facilitate an exchange of nutrients and organic material between land and water, and provide important flood storage capacity that can mitigate flood damages to adjacent

communities. The historic loss of floodplain habitat within the Green/Duwamish watershed resulted in a loss of habitat complexity, increased peaks flows and water velocities, and a loss of groundwater storage and important cold water recharge during summer months. Flow regulation at Howard Hanson Dam and the diversion of the White River into the Puyallup River has reduced the frequency and magnitude of flood events and left much of the floodplain perched well above the current river channel. Reconnecting floodplains and restoring floodplain habitats is essential to increasing both the available rearing habitat and corresponding salmon productivity of the system.



**Figure 17.** The Lower Russell Road Levee Setback Project is a multi-benefit project that provides flood risk reduction, habitat restoration, and recreational enhancements.



## Programs

None identified. Implementation relies on individual capital projects that will be identified in project list.

## Policies

- » **Floodplain Connectivity (FC) 1:** Support multi-benefit flood risk reduction projects that also enhance salmon habitat by allowing rivers and floodplains to function more naturally. Multi-benefit projects can (1) reduce community flood risk; (2) provide critical salmon habitat; (3) increase floodplain storage; (4) improve water quality; (5) replenish groundwater; (6) expand public recreation opportunities; and (7) strengthen community and ecological resilience to extreme weather events due to climate change.
- » **FC2:** Wherever possible, flood protection facilities should be (re)located away from the river edge to reconnect floodplains and re-establish natural riverine processes. During conceptual design of alternatives, project sponsors should evaluate opportunities to pursue relocation of existing infrastructure and real estate acquisition to support levee setbacks. A process-based approach to restoration is ideal for species recovery; however, where a levee setback is infeasible due to the constraints of past land use activity, alternative facility designs (e.g., levee laybacks) should strive to incorporate planting benches and wood structures that mimic lost ecosystem services and improve critically needed edge habitat.

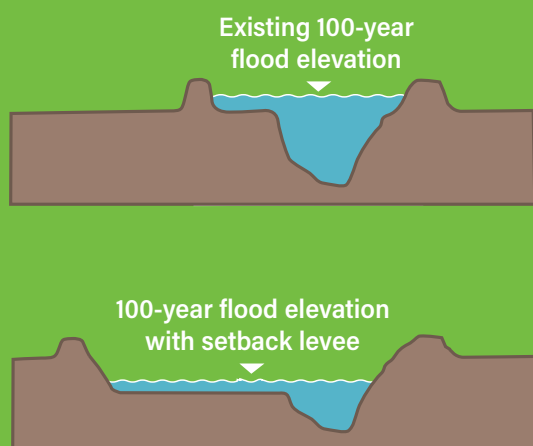
- » **FC3:** Local government should utilize critical areas and shoreline regulations and associated land use policies to protect creek riparian areas and associated floodplains to increase the flood storage capacity of these areas.

- » **FC4:** Vacating and relocating roads should be evaluated as tools to support salmon restoration priorities where impacts are negligible and/or can be mitigated. Coordinating transportation infrastructure improvements with salmon habitat needs (e.g., floodplain reconnection and fish passage) can improve outcomes and reduce project costs. Road vacation policies should be updated to consider level of use and road standards.

## Strategy: Protect, Restore, and Enhance Channel Complexity and Edge Habitat

### Location: Lower, Middle and Upper Green

Flood protection facilities (e.g., Howard Hanson Dam, revetments, and levees) and loss of riparian habitat have disrupted sediment transport, simplified habitat complexity, contributed to a loss of rearing and refuge habitat, and impeded natural recruitment of spawning gravels. Although process based restoration is preferred, ongoing intervention is necessary to replace/mimic natural processes where they cannot be restored.



**Setback:**  
Relocation of the toe of the levee/revetment landward of ordinary high water to provide for increased erosion and channel migration.



## Programs

### » Middle Green River Gravel and Wood Supplementation Program

The U.S. Army Corps of Engineers and Tacoma Public Utilities should continue gravel and wood supplementation in the Middle Green River to account for disruption of natural sediment transport and wood recruitment caused by Howard Hanson Dam. Up to 14,000 tons of spawning gravels are deposited annually at two sites located near river mile 60, just downstream of the Tacoma Headworks Facility. High flows during the winter months engage the deposited gravel and naturally distribute it downstream. Regular monitoring of gravel distribution should inform quantity, size gradation, and timing to maximize benefits for salmonids.

The U.S. Army Corps Corps should continue to transport large wood (> 12 in. diameter; > 20 ft. in length; >4 ft. diameter root ball) that is stranded in the reservoir to below the Tacoma Headworks Facility. Large wood increases channel complexity, provides habitat for juvenile fish, and provides nutrients and substrate for aquatic insects. The upper watershed is heavily forested and large wood is transported to the reservoir during high flow events, but is unable to move downstream of the dam without intervention. Existing quantities of large wood downstream of the dam remain significantly below recommended wood volumes (Fox and Bolton 2007) to support salmon recovery. Periodic surveys should be completed to monitor large wood volumes and ensure project success.

## Policies

**Channel Complexity (CC) 1:** Project designs should incorporate best available science related to climate change predictions and anticipated changes to seasonal instream flow patterns to enhance channel complexity and edge habitat across a range of flows. Lower spring and summer flows could make restored rearing habitat inaccessible during juvenile Chinook outmigration. Special consideration should be given to project designs that ensure juvenile salmon rearing habitat remains accessible in low flow years.

- » **CC2:** For habitat restoration projects calling for the addition of large woody debris, placement of wood should consider risk to river users, such as boaters and swimmers.

## Strategy: Protect, Restore, and Enhance Riparian Corridors

### Location: All Subwatersheds

Healthy riparian corridors provide a critical role in providing cool and clean water for salmon. Riparian vegetation shades instream habitat and moderates water temperatures; reduces erosion by stabilizing streambanks; captures rainwater and filters sediment and stormwater pollutants; provides terrestrial nutrient and food inputs; and is a source of large wood, which is critical to habitat complexity. Restoring riparian corridors is essential to addressing high summertime water temperatures and building long-term resilience to predicted changes associated with climate change. The Washington State Department of Ecology (Ecology) developed total maximum daily loads (TMDLs) for the Green River and Newaukum Creek in 2011 that outlined an implementation plan for improving temperatures. Another TMDL for Soos Creek is under development. Refer to the "Integrate Agricultural Protection and Salmon Recovery Initiatives" strategy for a discussion of riparian corridors within agricultural lands.

## Programs

### » Re-Green the Green Revegetation Program

The 2016 Re-Green the Green Strategy prioritizes riverine, estuarine and marine areas for revegetation, establishes interim goals, and outlines strategies for securing necessary funding. Riparian revegetation priorities are based on the solar aspect shade maps developed by the Muckleshoot Indian Tribe (2014). This effort identified and prioritized shorelines where shade is critically needed to reduce instream water temperatures that frequently exceed water quality standards.

WRIA 9 should continue to run an annual grant program that supports program implementation across priority shoreline areas. As of 2020, approximately \$500,000 of annual Cooperative Watershed Management Funds provided by the King County Flood Control District have been set aside to support Re-Green the Green project implementation by WRIA 9 partners. This funding is intended to provide a baseline level of revegetation funding that can be leveraged to access other sources of funding. Riparian revegetation projects help improve water quality, lower water temperatures, stabilize shorelines, contribute insects (prey) for juvenile salmonids, increase stormwater infiltration, and improve aquatic habitat quality when trees fall into the river.



» **Implement coordinated and comprehensive approach to noxious/invasive weed removal along river and marine shorelines**

WRIA 9 partners should coordinate with the King County Noxious Weed Removal Program to prioritize and sequence weed removal efforts through the watershed. Noxious weed control should be conducted in parallel with priority riparian revegetation efforts. Ongoing invasive removal on restoration sites is critical until native plants become established (~ five years).

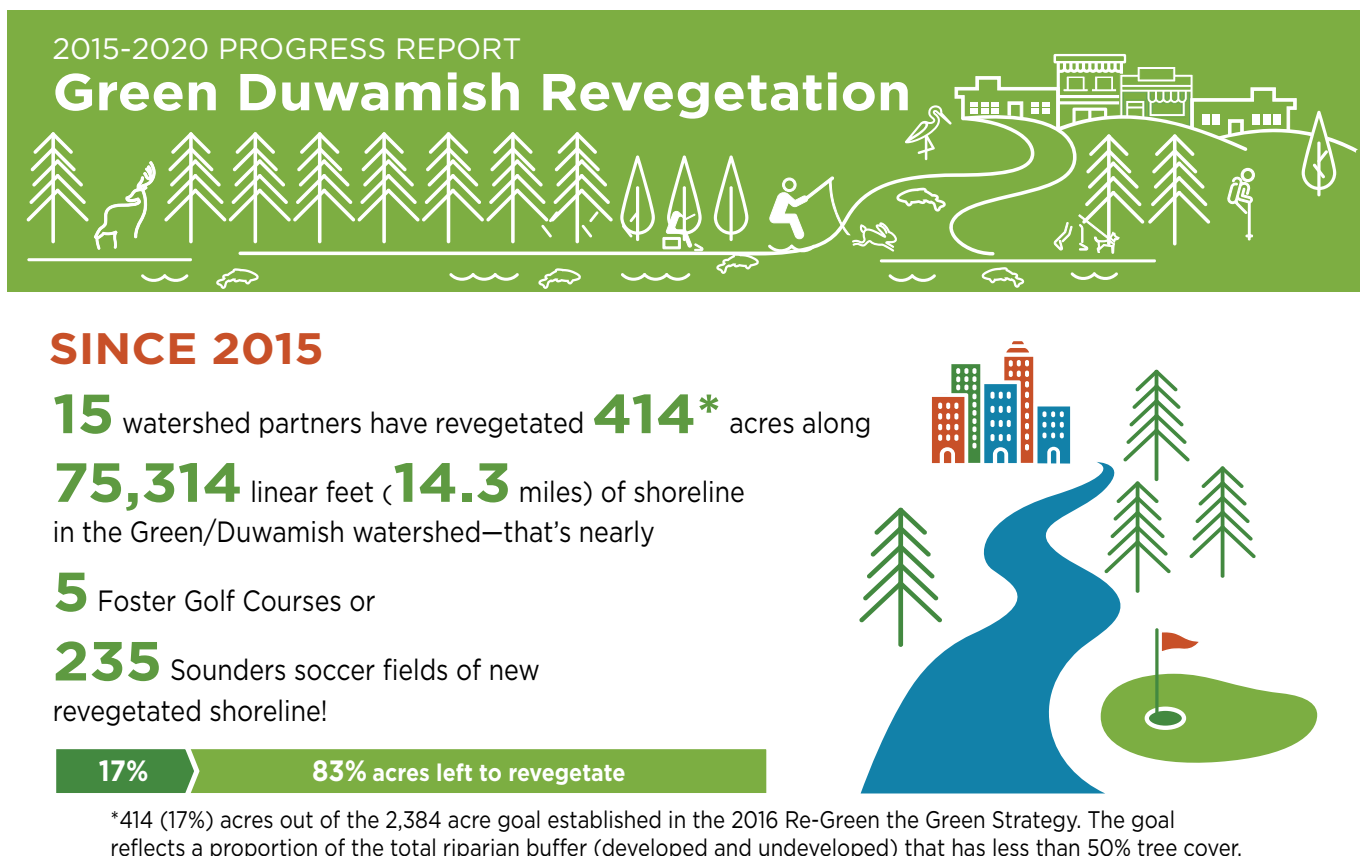
Invasive plants spread quickly, impede growth and establishment of natives, and degrade riparian habitats by destabilizing riverbanks and reducing tree canopy needed to help maintain cool water temperatures. Priority species impacting the riparian community in the Green/Duamish include knotweed species (Class B), purple loosestrife (Class B), policeman's helmet (Class B), English ivy (Class C), Himalayan blackberry (Class C), and reed canary-grass (Class C).

» **Long-term Restoration Site Stewardship and Maintenance**

WRIA 9 partners should explore potential funding sources for a professional stewardship/maintenance crew to provide long-term site maintenance of restoration sites across the watershed. Salmon recovery funding generally does not provide for site maintenance beyond several years, and maintenance typically falls outside the scope of regular park maintenance operations. A shared maintenance crew would provide cost savings to jurisdictions for maintenance of the growing portfolio of restoration sites.

Priority tasks for a crew would include invasive species removal, planting as needed, and litter cleanup. In addition to these basic functions, this crew could play an important role in helping to manage the growing challenge of encampments within the Green River corridor. This program would ensure a regular staff presence at restoration sites to assist with outreach and public safety in addition to enhancing long-term ecological outcomes. In

**Figure 18.** Progress towards the watershed revegetation goals established in the WRIA 9 Re-Green the Green Strategy.





addition, a shared crew would address stewardship and maintenance needs at sites that are not suitable for citizen volunteers.

## Policies

- » **Riparian Corridor (RC) 1:** Protect and enhance riparian corridors to help achieve temperature water quality standards established to protect salmon migration, spawning and rearing. Local governments should support implementation of the Green River and Newaukum Creek TMDLs by protecting and re-establishing mature riparian vegetation within established stream buffers.
- » **RC2:** Revisit levee vegetation guidelines to improve revegetation opportunities along flood facilities. Guidelines must balance the critical need for riparian shade (i.e., Ecology TMDL) with the need to inspect the structural integrity of facilities and maintain public safety. Remote sensing (i.e., ground-penetrating radar, drones, or boat inspections) may provide a viable alternative to traditional visual inspections that require a clear zone.
- » **RC3:** Project sponsors who receive WRIA 9 funding should request funding for up to three years post-construction maintenance funding for plant establishment, and should document the ability to maintain habitat restoration and protection projects to ensure long-term objectives are achieved. Maintenance may include, but is not limited to, noxious weed and invasive plant control, revegetation, and deterrence of undesired uses such as dumping and occupancy that can damage habitat.
- » **RC4:** River corridor trails should be compatible with salmon recovery priorities. Trail design standards should balance the need for riparian tree canopy to maintain cooler water temperatures with needs for important recreational view corridors and sight-lines for user safety. Trail design/placement should also not preclude reconnection of critically needed floodplain habitats. Trails offer residents an opportunity to connect with the river; interpretive signage should highlight the presence of salmon and the ecological importance of riparian and floodplain habitat.

- » **RC5:** Encourage regional efforts to develop a Bonneville Power Authority (BPA) mitigation program for power transmission impacts across Puget Sound. The BPA has a significant footprint within the Upper Watershed and the Soos Creek Basin where vegetation management and tree removal under transmission lines precludes adequate riparian canopy cover. Although the BPA has established mitigation programs for Columbia basin operations, a comparable program does not exist within Puget Sound.

## Strategy: Protect, Restore, and Enhance Sediment and Water Quality

### Location: All Subwatersheds

Clean, cold water is essential for salmon growth and survival. A growing body of evidence suggests clean-up of legacy industrial contamination and stormwater pollution control may improve early marine survival and increase Chinook productivity. Recent scientific literature suggests contaminant exposure pathways (e.g., legacy industrial contamination, stormwater runoff, municipal wastewater discharges, etc.) are having sublethal and lethal impacts on juvenile Chinook salmon. Although the acute toxicity of stormwater runoff to coho salmon in urban watersheds is well documented, potential sublethal impacts to juvenile Chinook salmon as a result of contaminate exposure pathways are not well understood.

## Programs

### Green/Duwamish Watershed Pollution Loading Assessment (PLA)

Ecology should continue to lead development of a pollutant loading assessment (PLA) that will (1) include a watershed-based model to evaluate cumulative effects of pollution; (2) assess relative contribution of toxic pollutants from different sources/pathways in the watershed; and (3) help prioritize source control efforts. The PLA is essential to maximizing effectiveness of Lower Duwamish Waterway cleanup and avoiding subsequent recontamination.

The PLA is an interim strategy for improving water quality – it is not a TMDL or another regulatory



instrument. It represents a foundational effort that will inform future actions to address source control issues. Following its completion, WRIA 9 partners should coordinate with Ecology to address priority pollutant sources within their jurisdictions.

### **Implement Pollution Identification and Control (PIC) Programs**

The Vashon-Maury Pollution Identification and Control (PIC) program provides incentives (technical support and financial) to replace or repair failing septic systems, and address other pollution sources (e.g., animal waste) contributing to water quality degradation in the marine nearshore. Failing or inappropriately sited septic systems have resulted in water quality concerns and closure of beach and shellfish harvest areas – especially within Quarter Master Harbor. While the direct impact on shellfish harvesting is a human health concern, the water quality pollution can negatively affect various parts of the nearshore ecosystem that supports Chinook salmon.

Although the 2005 Salmon Plan focused on Quarter Master Harbor, PIC programs should be expanded to other nearshore areas as warranted to identify pollution sources, provide technical support, and offer financial incentives to remedy failing septic systems and other sources of pollution. Over the last decade, investments made by Public Health—Seattle & King County and other partners have resulted in improved water quality and reopening of 493 acres of shellfish harvest areas.

### **Creosote Removal Program**

WRIA 9 organizations should partner with the Washington Department of Natural Resources Creosote Removal Program to identify and remove creosote-treated debris and derelict structures from marine and estuarine waters. Creosote structures leach chemicals and can create toxic conditions for organisms that live within beach and marine sediments, as well as disrupt the marine foodweb. Studies have found creosote exposure can contribute to mortality of herring eggs and alter growth and immune function of juvenile salmonids. Derelict structures can also interrupt sediment transport and displace aquatic vegetation.

Since adoption of the 2005 Plan, the program has removed over 21,000 tons of creosote debris and

8.0 acres of overwater structures from Puget Sound. However, thousands of derelict creosote pilings remain within Puget Sound. WRIA 9 partners should continue efforts to inventory and prioritize focus areas based on concentration of creosote debris and potential impacts to forage fish and juvenile salmon rearing.

### **Policies**

» **Water Quality (WQ) 1:** Promote Low-Impact Development (LID) and green infrastructure (natural and engineered systems) to address stormwater runoff. Given the magnitude of development constructed prior to existing stormwater controls, extensive stormwater retrofits are needed to address legacy sources of water pollution. LID techniques should mimic, where possible, pre-disturbance hydrological processes of infiltration, filtration, storage, evaporation and transportation. LID techniques include:

- *Vegetation conservation:* native vegetation and small-scale treatment systems;
- *Site design:* clustering of buildings and narrower and shorter roads;
- *Retention systems:* bioretention, bio-swales, rain gardens, wetlands and vegetated roofs;
- *Porous or permeable paving materials:* sidewalks, trails, residential driveways, streets, and parking lots; and
- *Rainwater catchment:* rain barrels and cisterns.

**Green Infrastructure: Green infrastructure is an approach to water management that protects, restores, or mimics the natural water cycle. Green infrastructure is effective, economical, and enhances community safety and quality of life.**

*– American Rivers*



» **WQ2:** Support local and regional watershed-based stormwater management initiatives (e.g., Our Green Duwamish, STORM, etc.) that prioritize programs and projects that can effectively demonstrate large-scale, watershed-wide, water quantity and water quality improvements that benefit salmon recovery. Potential priorities include:

- Collaborative source control strategies such as education and outreach, business inspections, pollution prevention, and programmatic maintenance;
- Regional retrofit programs focused on restoring natural hydrology and the removal of toxics; and
- Green Stormwater Infrastructure (GSI) incentive programs that promote the voluntary use of GSI.

» **WQ3:** Source control efforts across multiple sectors (commercial, industrial, and agricultural) should ensure that water and sediment quality support salmon growth and survival. Source control sufficiency is a critical milestone that must be achieved to initiate contaminated sediment cleanup. Ensuring implementation, maintenance, and enforcement, where necessary, of source control best management practices will help reduce pollutant loading into water bodies and ensure pollutants don't undermine sediment cleanup efforts in the Duwamish. Incentives to promote effective source control include spill prevention and response, technical support, and hazardous waste vouchers to local businesses.

» **WQ4:** Protect and enhance rural and urban forests, which provide diverse social, economic and ecological benefits. In Rural Areas of King County, at least 65 percent of each sub-basin should be preserved as natural forest cover and impervious coverage should not exceed 10 percent of a sub-basin. Where forest cover exceeds this threshold, the goal of no net loss in forest cover should be pursued. In Urban Growth Areas, local governments should adopt goals to achieve 30-40 percent ecologically healthy urban tree canopy coverage and reduce impervious surfaces. Adopting goals specific to riparian canopy could help prioritize riparian restoration. Local education, outreach, and incentive programs should be supported to increase urban forestry programs and associated tree canopy coverage.



**Figure 19.** Stormwater-induced mortality in coho salmon in Miller Creek, Normandy Park. Although stormwater toxicity is not lethal to Chinook salmon, potential sublethal impacts are not well understood. Photo: Matt Goehring.

- » **WQ5:** Ensure cost-share agreements between the U.S. Forest Service, Washington Department of Natural Resources, Tacoma Water, and private landowners are maintained and that road maintenance and abandonment plans achieve sediment reduction goals. Support opportunities to abandon unnecessary forest roads as they are identified to reduce overall road density.
- » **WQ6:** Support regional and state legislative efforts to reduce the risk of oil spills in Puget Sound and ensure the state remains a leader in oil spill prevention and response. Over 20 billion gallons of oil are transported through Washington each year by vessel, pipeline and rail. A catastrophic spill could cost the region over \$10 billion and impact over 150,000 jobs. It would also cause significant harm to aquatic ecosystems and disrupt maritime industry, recreation, and tourism.



- » **WQ7:** Local governments should adopt the Inter-agency Regional Road Maintenance Endangered Species Act Program Guidelines, as amended, for maintenance of existing infrastructure. Governments should participate in the associated Regional Forum to support ongoing adaptive management to improve outcomes.

## Strategy: Protect, Restore and Enhance Marine Shorelines

### Location: Marine Nearshore

Marine nearshore habitats, including beaches, pocket estuaries, eelgrass beds, inlets, and deltas, provide important rearing and migration habitat for juvenile Chinook salmon and many other animals in Puget Sound. They are also critical spawning habitat for forage fish – a key prey species for Chinook salmon. Decades of alteration and armoring of the Puget Sound marine shoreline has reduced shoreline length and habitat complexity, disrupted sediment supply and transport, and eliminated forage fish spawning habitat. Restoring natural shorelines will increase nearshore productivity and salmon growth and survival in the marine environment.

### Programs

- » **Develop/maintain a “Toolbox” of Shore Friendly Alternatives for Privately-Owned Shorelines (aka Do-it-yourself approach for residential shoreline improvement)**

WRIA 9 partners should develop a “shoreline toolbox” to provide shoreline owners guidelines for implementing shore friendly alternatives that clearly outline stewardship concepts and best management practices for private shorelines. It should not only outline the range of alternatives for different shoreline types (e.g., beach and bluffs), but also highlight important design, feasibility, maintenance, and permitting considerations when considering shoreline improvements. Topic areas should include native shoreline vegetation, erosion control, shoreline access, docks, and stormwater management.

The toolbox should be designed to supplement shoreline workshops and technical assistance programs and could be made available online to provide guidance to property owners who may elect to take a “do-it-yourself approach” to shoreline management. It should be tailored to reach private landowners and contractors and connect them with available local and regional resources. The toolbox should draw from regional efforts such as WDFW’s Marine Shoreline Design Guidelines, the Shore Friendly King County collaborative, Green Shores for Homes, and Green Shorelines for Lake



**Figure 20.** Before and after Phase II restoration of Seahurst Park in the City of Burien. Construction was completed in 2014. Photos: Hugh Shipman.



Washington and Lake Sammamish, and highlight local examples of shore-friendly approaches within WRIA 9.

» **Expand Shore-Friendly Technical Assistance and Cost-Share Programs to Accelerate Armor Removal and Soft Shoreline Protection (aka Supported Approach for Residential Shoreline Improvement)**

Access to technical information about shoreline erosion and protection alternatives and the financial costs associated with marine shoreline armor removal have been identified as key barriers to motivating shoreline landowners to consider soft shoreline protection. Soft shoreline protection is less preferred than outright removal, but preferable to traditional hard armor in that it helps maintain and enhance some natural marine shoreline functions (e.g., sediment transport and delivery). Bulkhead removal is expensive and site-specific erosion risk is not conducive to the use of standard models or templates for soft shore protection. In addition, many landowners and consultants are unfamiliar with how to design/implement successful soft shoreline protection projects. Technical assistance to help landowners better understand risk, to provide design and permitting support, and to assist with access to cost-share funding should help to overcome existing barriers to armor removal on private property and promote expansion of soft shoreline protection alternatives.

The King Conservation District (KCD) has historically provided technical assistance on environmentally friendly ways to manage shoreline properties, including shore-friendly alternatives to traditional bulkheads. The KCD also has a cost-share incentive program to encourage revegetation and removal of existing armor and/or soft shore protection designs where site-specific conditions allow. In 2020, KCD established a Shore Friendly King County collaborative between multiple partners. This program is seen as part of a local adaptation of the regional Shore Friendly approach to reducing marine shoreline armoring. Although this is an existing program, additional resources are needed to expand capacity. Landowners are identified through parallel marine shoreline landowner workshops. Priority should be given to currently unarmored shorelines and armored properties where site-specific factors (e.g., structure location, fetch, bank/bluff geology,

etc.) make armor removal and/or soft shoreline protection alternatives feasible.

» **Implement Acquisition Strategy to Protect and Restore Functioning Nearshore Habitats**

Acquisition of priority marine shorelines supports conservation and restoration of critical nearshore processes and rearing habitats used by multiple stocks of juvenile Chinook – including Green/Duwamish Chinook. A number of planning efforts have identified and prioritized conservation of nearshore habitats within WRIA 9, including the Prioritization of Marine Shorelines of WRIA 9 for Juvenile Salmon Habitat Protection and Restoration (2006), Vashon-Maury Island Greenprint (2007), and the Puget Sound Nearshore Ecosystem Restoration Project Strategies for Nearshore Protection and Restoration in Puget Sound (2012). Although many of the highest priority sites have been specifically identified as unique projects within the Habitat Plan, WRIA 9 should support opportunistic acquisition of other functioning nearshore habitats if they become available.

Although the bulk of the acquisition opportunities for functioning habitats are located on Vashon-Maury Islands, additional opportunities exist on the mainland nearshore. Successful implementation of a nearshore acquisition strategy requires consistent outreach to landowners and operational flexibility to capitalize on acquisition opportunities before they are lost. The sale of properties previously unavailable for decades frequently can represent a once in a generational opportunity to protect a priority stretch of marine shoreline. Individual acquisition opportunities should be evaluated based on ecological value/potential of nearshore habitat and risk of development. Available funding sources to support acquisition include King County Conservation Futures, King County Flood Control District Cooperative Watershed Management Program and Coastal Erosion Program, Washington Department of Fish and Wildlife Estuary and Salmon Restoration Program, and various Washington State Recreation and Conservation Office grant programs.



## Policies

» **Nearshore (NS) 1:** Avoid shoreline infrastructure or stabilization except where demonstrated to be necessary to support or protect a legally-established primary structure, critical public infrastructure, or shoreline use in danger of loss or substantial damage. Support armor removal and alternative approaches to shoreline stabilization (e.g., setbacks and relocations) where feasible to reduce impacts to existing natural shoreline processes. Protection and restoration of important sediment sources (e.g., feeder bluffs) is needed to restore nearshore processes and sediment transport. Where the need for bank stabilization is supported by analysis of a geotechnical engineer, "soft" shoreline stabilization techniques (e.g., bioengineering techniques and vegetation enhancement) should be required where feasible. "Soft" stabilization measures should be designed to preserve or restore natural shoreline processes (e.g., sediment transport). "Hard" shoreline stabilization should only be allowed where soft alternatives do not provide adequate protection. Refer to WDFW Marine Shoreline Design Guidelines, Green Shores for Homes, Integrated Stream-bank Guidelines, and Stream Habitat Restoration Guidelines for additional guidance.

**Primary Structure: Structural improvement that is essential to the primary use of the property. Structures that function as secondary or subordinate to the primary use of a property are considered an accessory use.**

- » **NS2:** Encourage multiple family/neighborhood use of docks, boat ramps, and beach access stairs. Local jurisdictions should minimize impacts to the nearshore marine environment by encouraging consolidation/joint-use of structures that could serve multiple landowners. Opportunities to pursue joint-use should be evaluated during development and redevelopment. Boat docks, ramps and beach access stairs can shade aquatic vegetation, disrupt juvenile salmon migration and foraging, alter nearshore sediment transport and degrade nearshore habitats (e.g., eelgrass). Possible incentives include permit streamlining, fee reductions, and dimensional incentives (e.g., increased length, width, etc.).
- » **NS3:** Jurisdictions should promote derelict vessel prevention and coordinate with Washington State Department of Natural Resources (WADNR) on derelict vessel removal. Derelict vessels can contribute to contamination of aquatic lands, degrade water quality, and damage sensitive aquatic habitats (e.g., eelgrass). Although the WADNR Derelict Vessel Removal Program has removed more than 580 vessels from marine waters, local efforts are critical to ensuring effective prevention and rapid response.
- » **NS4:** Support beach nourishment, where appropriate, to offset interruption of natural sediment supply and transport caused from extensive shoreline modifications (e.g., bulkheads, etc.). Beach nourishment has been used successfully to protect shorelines, restore natural beach profiles, and enhance nearshore habitats.
- » **NS5:** Support regional efforts to identify and test actions to increase juvenile survival during outmigration through Puget Sound and increase local efforts to stabilize or improve foodweb function such as forage fish habitat protection and restoration.

## Strategy: Protect, Restore and Enhance Estuarine Habitat

### Location: Duwamish

The Duwamish estuary provides critical rearing habitat for juvenile salmon as they make the physiological transition from fresh to saltwater habitats. Industrial development within the Duwamish valley drove extensive fill of tidal wetlands, armoring of shorelines, and navigational dredging. The modifications



straightened the estuary and eliminated 98 percent of the historic wetlands. Despite the magnitude of loss of habitat, the Duwamish continues to play a critical role in supporting juvenile Chinook salmon. Both cleanup of legacy industrial contamination within the Lower Duwamish Superfund Site and restoration of shallow water rearing habitat are needed to increase juvenile salmon survival and overall productivity within the watershed.

## Program

### » Implement and Adaptively Manage the Duwamish Blueprint

The Duwamish Blueprint outlines strategic guidance for governments, businesses, non-profit organizations and citizen groups working to improve the estuarine ecosystem and increase juvenile salmonid productivity. It identifies approximately 100 acres of shallow water habitat restoration potential within the Duwamish estuary transition zone (RM 1-10). Many of the habitat opportunities are conceptual and have not been prioritized. Periodic evaluation of conceptual opportunities is needed to elevate and refine project ideas as the Duwamish landscape changes (e.g., Superfund cleanup, Natural Resource Damage Assessment [NRDA], and real estate availability).

Restoration in the Duwamish is complex, expensive, and will require flexibility, innovation, and extensive coordination and collaboration to be successful. The former Duwamish Blueprint Working Group, which was convened to develop the Blueprint, would provide a framework to facilitate coordina-

tion across key partners. WRIA 9 partners should leverage the Blueprint Working Group to identify opportunities to enhance partnerships to (1) pursue larger project footprints; and (2) overcome barriers to implementation. Given limited land availability, WRIA 9 should opportunistically evaluate potential acquisitions and consider elevating conceptual projects as part of adaptive management based on habitat benefit, acquisition feasibility, and readiness.

## Policies

- » **Duwamish Estuary (DE) 1:** Engage in the Lower Duwamish Waterway (LDW) Superfund cleanup process to coordinate and sequence potential salmon habitat projects with Superfund activities to maximize benefits to salmon recovery. Strategic acquisition should be prioritized over habitat project construction prior to completion of the LDW cleanup to avoid potential contaminated sediments and minimize potential for re-contamination.
- » **DE2:** Engage with NRDA trustees and potentially liable parties to inform project development and design and maximize potential benefit to salmon recovery. NRDA settlements within the Duwamish will result in large capital investments in habitat restoration that should provide a significant lift to salmon recovery. Coordination with the NRDA process will also support identification of potential synergistic opportunities, and help identify and resolve barriers to maximize restoration outcomes. For example, it may be possible to leverage NRDA settlements to expand existing and/or planned restoration projects.

**Figure 21.** Duwamish Gardens created 1.3 acres of shallow water rearing habitat in a critically important transition zone of the Duwamish Estuary. Subsequent monitoring has documented extensive use of the site by juvenile Chinook salmon. Photo: Mike Perfetti.





Although NRDA has a broader scope than Chinook salmon recovery, priority NRDA habitats significantly overlap with salmon recovery needs in the Duwamish (e.g., estuarine marshes, intertidal mudflats, and riparian habitats). Tracking NRDA project implementation will be important to understanding the status of habitat restoration efforts in the Duwamish. Given the existing uncertainty associated with juvenile Chinook survival in the Duwamish, WRIA 9 should engage with the trustees to share emerging research, exchange lessons learned in restoration, inform adaptive management of restored sites, and identify priority sites for restoration.

- » **DE3:** Encourage the U.S. Army Corps of Engineers and the Port of Seattle to identify strategies for dredging that: (1) minimize impacts to salmon habitat and (2) improve salmon habitat through use of beneficial re-use where suitable. Soil contamination may limit opportunities for re-use.

## Strategy: Protect, Restore and Enhance Instream Flows and Cold Water Refugia

### Location: Lower, Middle and Upper Green

Green River flows are regulated to support both flood control and water supply needs. The Tacoma Water Habitat Conservation Plan requires maintenance of minimum instream flows during summer months. Although water capture and storage behind Howard Hanson Dam (HHD) support maintenance of minimum instream flows and periodic flow augmentations during summer and early fall, it can also reduce the frequency of high flow events that drive lateral channel migration (i.e., habitat forming flows) and availability of juvenile Chinook rearing habitat throughout spring. Low snowpack and drought conditions exacerbate already difficult tradeoffs in timing of water release designated for fish conservation purposes. Water temperatures also regularly exceed established water quality standards for Salmon Core Summer Habitat and Spawning Habitat.

Climate change forecasts predict the watershed will experience reduced snowpack, lower summer time flows, and elevated instream temperatures. These

changes will impact the already difficult reservoir refill strategies at HHD, potentially putting greater stress on refilling earlier and having a bigger impact on juvenile Chinook habitat. Prolonged low flows can cutoff access to critical rearing habitats and exacerbate high instream temperatures. High water temperatures can delay adult migrations, contribute to increased susceptibility to disease, and even be lethal above 23°C. Protecting instream flows and cold water refugia is essential to strengthening watershed resilience to climate change. Cold-water refugia are characterized as being at least 2°C colder than the daily maximum temperature of adjacent waters.

### Programs

#### » Develop Watershed Management Plan to Address Permit-Exempt Well Development

WRIA 9 partners should coordinate on development of the Ecology's Watershed Restoration and Enhancement Plan to assess and offset potential consumptive impacts of new rural, domestic water use on stream flows in the Green/Duwamish watershed. Maintaining legally established minimum instream flows has proven challenging during recent years with below average precipitation. Climate change models indicate that changes in precipitation patterns could exacerbate streamflow issues and further stress salmon.

Implementation of the plan is required to not only offset permit exempt domestic water use, but also provide for a net ecological benefit. The legislature plans to direct \$300 million in funding through 2035 to benefit fish and streamflows. WRIA 9 should position itself to leverage this funding source to support implementation of appropriate projects in this plan that meet the flow or net ecological benefit guidance and/or develop additional project elements that do so. If instream flows remain problematic in the future, additional consideration should be given to integrating other categories of water use into an expanded Watershed Management Plan and implementation program.

#### » Develop a Strategy to Protect and Restore Habitat in the Upper Green River and its Tributaries

Conduct a planning effort to develop a long-term, comprehensive approach to protecting and restoring ecosystem processes in the Upper Green River subwatershed. Current checkerboard ownership



**Figure 22.** Before (2013) and after (2019) restoration photos of the Big Springs Creek. The project protected cool waters from a natural spring.



complicates land management and a strategic approach is needed to leverage the relatively intact upper watershed to maximize benefits for salmon and steelhead recovery. Access to the upper watershed has long been identified as critical to long-term salmon recovery. However, the delay of fish passage and the degraded condition of the lower watersheds have resulted in limited investments in the upper watershed.

Projected shifts in temperature and precipitation patterns associated with climate change further emphasize the critical importance of this landscape to long-term salmon recovery. A number of assessments should be completed to inform a strategic approach to management of the upper watershed, including:

- Visualizing Ecosystem Land Management Assessments (VELMA): Quantify long-term effects of forest management and climate scenarios on salmon habitat (i.e., hydrological flow regimes and instream temperatures);
- Model intrinsic habitat value of stream segments within the upper watershed to inform conservation and restoration priorities;
- Beaver Assessment: Assess current activity, model potential benefits, and explore potential reintroduction if warranted; and

- Assess important wildlife migratory corridors and key landscape level linkages to inform acquisition priorities.

The results of these assessments should be used to prioritize salmon recovery investments in the upper watershed with respect to potential land consolidation, land use management changes, and potential road abandonment.

### Policies

- » **Stream Flows (SF)1:** Support reevaluation of the U.S. Army Corps of Engineers water storage schedule and Fish Conservation Guide Curve at HDD to increase benefits for salmonids while maintaining downstream flood control benefits. The current water capture period overlaps the juvenile Chinook rearing period and impacts accessibility and/or amount of important rearing habitats during outmigration. Utilize the existing Green River Flow Management Coordination Committee to assess fish habitat needs based on best-available science and basin-specific climate change projections.
- » **SF2:** Protect existing cold water refugia and enhance water storage and hyporheic exchange by reconnecting historic floodplain habitats to instream habitats. These habitats facilitate heat dissipation and provide an influx of cooler waters to moderate seasonal fluctuations in stream tem-



peratures and flows, providing physiological and ecological benefits for cold-water salmonids.

- » **SF3:** Support forest management and harvest rotation programs that increase hydrologic function and improve base flows to minimize impacts on salmonid habitat, support climate change resiliency, and maintain viable silviculture. Additional research is necessary to quantify potential benefits.
- » **SF4:** Manage groundwater in conjunction with surface water withdrawals to provide instream flows and water temperatures that support adult salmonid spawning and juvenile rearing. Local governments, water purveyors, and state and federal regulators should:
  - Protect groundwater resources and critical aquifer recharge areas;
  - Manage groundwater and surface water withdrawals seasonally to maximize the benefits to salmonid habitat;
  - Develop drought management plans to supply safe and reliable drinking water while minimizing impacts to salmonids during periods of drought;
  - Ensure rural domestic use does not adversely impact salmonid habitat;
  - Support water rights acquisition programs that can augment chronic low flows; and
  - Limit or preclude mining and other significant excavation activities that could adversely impact groundwater hydrology.
- » **SF5:** Support expansion of reclaimed/recycled wastewater to reduce demands on stream and ground withdrawals. Reclaimed wastewater can be used safely and effectively for non-drinking water purposes such as landscape and agricultural irrigation, heating and cooling, and industrial processing. Reclaimed water is available year-round, even during dry summer months or when drought conditions can strain other water resources.  
See also policies SW4-6 above.

## Strategy: Expand Public Awareness and Education

### Location: All subwatersheds

Education and outreach are fundamental to protecting and restoring salmon. It raises awareness, builds political support, and promotes positive behaviors that benefit salmon. Long-term salmon recovery will not be successful without public support. Broad-based community support provides political leverage to protect and expand local, state and federal investments in habitat restoration. It also helps promote positive behavior change and minimize behaviors that can negatively impact salmon or undermine recovery investments. For example, ecological gains associated with marine shoreline restoration in WRIA 9 have been predominantly offset by new armor installations. General outreach is not sufficient to drive widespread and long-lasting behavior change. Targeted social marketing strategies must identify and overcome both real and perceived barriers to promote positive behaviors that contribute to salmon recovery.

### Programs

#### » Implement a Comprehensive Communications Plan to Promote Behavior Change that Expedites Salmon Recovery in WRIA 9

Integrate lessons learned from the regional Shore Friendly programs into a locally adapted communication plan designed to increase implementation of behaviors that support salmon recovery. Key outcomes include:

- Increased public recognition of the urgency around salmon recovery and connection to southern resident orcas;
- Improved public understanding and stewardship of riverine and nearshore ecosystem processes that support salmon and forage fish;
- Technical assistance provided to interested shoreline residents;
- Target audiences make informed decisions based on knowledge of Shore Friendly practices, climate resilience, and adaptation;
- A suite of tools and incentives developed to address identified barriers to adoption of desired behaviors;



- Messaging and outreach tailored to contractors and realtors;
- The value of riparian vegetation is communicated to the public, including riverside landowners, elected officials, and trail/park users; and
- Partners conducting outreach and education receive positive reinforcement and feedback from the salmon recovery community.

Additional effort is needed to refine target audiences and develop associated social marketing approaches. The intent of the communication plan should be to build awareness, expand stewardship, and promote advocacy. A regional Social Marketing Strategy to Reduce Puget Sound Shoreline Armoring was developed for the Washington Department of Fish and Wildlife in 2015. A Green/Duwamish River Revegetation Outreach and Engagement Plan was developed in 2019. These plans provide an existing framework that can be expanded to integrate other priority salmon recovery issues.

#### » **Expand Volunteer Stewardship**

Increase citizen participation through new stewardship programs and by expanding and supporting existing stewardship programs that engage volunteers in restoring, maintaining, and monitoring habitat protection and restoration projects. These projects not only benefit salmon recovery, but also improve stormwater retention, carbon sequestration and wildlife habitat and include important themes and messages for participants to change behavior at home. Local volunteer programs should:

- Foster environmental stewardship and personal connection to salmon recovery;
- Educate people about threats to salmon and the role of habitat in salmon recovery;
- Leverage additional resources to implement recovery actions; and
- Expand the constituency to advocate for salmon recovery.

The Green/Duwamish Watershed has a number of volunteer stewardship programs that play an instrumental role in invasive vegetation removal and native revegetation. Many of these programs provide long-term stewardship of large capital restoration

sites. Traditional salmon recovery funding is not available to fund long-term (beyond two to three years) stewardship and maintenance of restoration sites. As a result, local funding or creative partnerships are essential to ensure restoration projects achieve desired outcomes into the future.

#### » **Expand Community Science Monitoring**

Develop and implement community science programs to address data gaps and foster watershed stewardship among residents. Community science programs can provide capacity to collect important long-term monitoring data while serving as an outreach tool to educate residents about local natural resource issues. They can also create opportunities to introduce students to scientific research and provide important data for resource managers.

Since 2005, citizen science programs include:

- Beach Nearshore Ecology Team (BeachNet): The Vashon Nature Center coordinates a forage fish monitoring program that collects data on forage fish presence/absence, spawning timing, beach substrate preferences, and intertidal and upland habitat conditions within the marine reserve. Data are shared with WDFW and is used to inform protection of spawning beaches. BeachNet also contributes to shoreline restoration monitoring in partnership with University of Washington, King County, and the Washington State Department of Natural Resources.
- Miller-Walker Basin Community Salmon Investigation (CSI): The CSI program has conducted 10 years of salmonid spawning surveys to assess long-term trends in salmon abundance and the urban runoff mortality syndrome in coho salmon. Data are shared with local jurisdictions and resource managers. A partnership with the UW Tacoma Center for Urban Waters has helped identify both the suite of toxic chemicals contributing to coho mortality and priority areas within this watershed to focus future stormwater improvements.



### » **Shoreline Workshops and Technical Assistance**

Implement workshops to educate target audiences (landowners, landscapers, contractors) about shoreline stewardship and common misconceptions about shoreline erosion. Promote alternative approaches to shoreline management that provide for the use and enjoyment of property in a manner that benefits fish and wildlife. Priority focus areas include:

- Shoreline processes and salmon habitat;
- Erosion control;
- Noxious/invasive weed control;
- Revegetation guidance;
- Natural yard care; and
- Stormwater management.

Workshops should connect target audiences with local and regional resources (e.g., technical assistance) designed to overcome barriers to improving shoreline stewardship. Materials and messaging

should be tailored to specific subwatersheds and groups of landowners to increase effectiveness. The Green Shores for Homes program developed in 2015 is an available tool to guide the design of improved shoreline conditions for Puget Sound properties.

### **Policies**

- » **Education and Stewardship (ES)1:** Support educational programs that integrate watershed science and salmon into problem-based learning exercises for school children. These programs instill a sense of place, encourage appreciation of natural resources, and promote environmental literacy among the next generation of future decision makers.
- » **ES2:** Support diverse outreach and education programs that promote awareness of salmon recovery and positive behavior change. Programs should employ community-based social marketing to identify and overcome barriers to targeted behaviors. Priority focus areas include shoreline stewardship, riparian revegetation, and stormwater management.

## **Strategy: Integrate Agricultural Protection and Salmon Recovery Initiatives**

### **Location: Lower and Middle Green**

Salmon recovery and the preservation of viable agriculture are two regional priorities that intersect in the Middle and Lower Green floodplain and along Newaukum Creek. King County designated over 16,295 acres of land within the Green River watershed for agriculture within three Agricultural Production Districts (APD). Some additional, but relatively small amounts of agricultural activities occur within the cities of Kent and Auburn. Over 5,763 acres of land within the APD have been enrolled within the Farm-



**Figure 23.** A community volunteer examines a salmon carcass as part of the Miller/Walker Basin Community Salmon Investigation. The program has leveraged community support and a partnership with the University of Washington to advance our understanding of stormwater runoff impacts on local salmon. Photo: Miller/Walker Stewardship Program.



land Preservation Program (FPP). Restrictive covenants on FPP properties are designed to permanently protect agricultural use and open space.

The 2005 Plan acknowledged that salmon recovery and agricultural production operate within a shared landscape along the Green River valley. It prioritized sequencing of restoration projects over the first 10 years of plan implementation to focus first on existing public lands, then on lands within the rural and urban growth areas, and finally on lands within the APD, but not enrolled in the FPP. The plan acknowledged that projects that negatively impact tillable surface may need to be reconsidered at a later date.

This Plan Update acknowledges that the implementation of high-priority salmon projects critically needed to advance salmon recovery will result in localized loss of existing farmland. Research indicates that rearing habitat availability in the Lower and Middle Green River is the primary limiting factor for Chinook productivity within the watershed. Collaboration between agricultural and salmon recovery interests will be necessary to identify and advance shared priorities and ensure salmon and agriculture can coexist productively within a shared landscape. Lessons learned from other watersheds should be reviewed for applicability within the Green River watershed.

## Programs

### » Farm Conservation Planning

Farm conservation plans can help landowners protect natural resources while achieving their land use goals. They can also help access and leverage agricultural incentives to improve conservation practices on agricultural lands. Priorities include stream and wetland buffer revegetation and livestock management. Agriculture is widespread throughout the Middle and Lower Green and farmland preservation is a regional priority. Expanding riparian buffer revegetation on Green River valley farms has the potential to greatly benefit salmon recovery, especially where agricultural lands overlap with high priority areas identified by the Muckleshoot solar aspect shade maps (2014). Limiting livestock access to stream buffers can also greatly improve water quality and riparian conditions.

Available incentive programs include:

- King Conservation District rural services programs (e.g., Land Owner Incentive Program, Farm Conservation Technical Assistance, and Agricultural Drainage Program)
- King County Small Habitat Restoration Program
- USDA Farm Service Agency Conservation Reserve Enhancement Program
- King County Livestock Program (i.e., BMP cost share)

Landowner recruitment is essential to program success. Additional resources and strategies are needed to expand participation.

## Policies

» **AG1:** Protect, enhance, and restore high quality salmon habitat in the Agricultural Production Districts in a manner that strives to reduce loss of viable agricultural land and ensure the long-term viability of agriculture. Projects that displace tillable farmland should strive to provide benefits to adjacent farm lands in attempt to offset impacts.

Local governments, state and federal agencies, non-profits, and special purpose districts should work with agricultural landowners in the Agricultural Production Districts to:

- Correct water quality problems resulting from agricultural practices;
- Implement best management practices for livestock and horticulture;
- Prevent additional degradation or clearing of forested riparian buffers;
- Encourage landowners to pursue voluntary sustainable actions for fish, farms, and soils;
- Conduct compliance monitoring and regulatory enforcement where necessary to protect critical habitats;
- Identify opportunities where salmon recovery projects can provide parallel benefits (e.g., flood risk reduction and drainage improvements) to adjacent agricultural lands; and
- Limit the extent of actively farmed lands displaced by priority salmon restoration projects.



» **AG2:** Evaluate the effectiveness of the regulatory flexibility given to agricultural landowners that obtain a farm plan from the KCD. If the flexibility leads to better habitat and water quality outcomes, other opportunities should be explored to provide additional flexibility. If the flexibility has not led to better outcomes, the County should evaluate if there are improvements to the regulatory structure (e.g. require some amount of the farm plan be implemented versus implementation being voluntary) that would improve the outcomes of the flexible approach.

## Strategy: Integrate Salmon Recovery into Land Use Planning

### Location: All Subwatersheds

Historical population growth and development within the watershed displaced habitat, altered natural hydrology, and polluted local waters. Local land use plans should provide a blueprint for future growth and development that is consistent with salmon recovery. Land use decisions should reinforce the importance of preservation of intact, functional habitats and provide a pathway for restoration of priority habitats. While the Salmon Habitat Plan is not a regulatory document, integration of identified recovery strategies and habitat priorities within local land use plans, policy and decision-making can accelerate implementation and ultimately dictate success of recovery efforts within the Green/Duwamish.

### Programs

#### » Incentivize Voluntary Restoration Practices

Local governments and state agencies should promote landowner adoption of voluntary conservation and restoration actions through implementing associated incentive programs. Regulatory complexity, fees, access to technical assistance, and project costs have all been identified as barriers to expanding adoptions of voluntary best management practices on private property. Priority areas to address include invasive removal and native revegetation along shorelines, soft shoreline stabilization, and green stormwater infrastructure. Jurisdictions should review existing barriers and evaluate incentive opportunities, including:

- Streamlined permitting process;
- Reduced fees for restoration projects;
- Free technical assistance (e.g., engineering, planting plans, etc.);
- Cost share/financing programs; and
- Regulatory flexibility.

Voluntary adoption of best management practices by private landowners has been sporadic. Additional targeted investments are needed to expand implementation beyond early adopters. Improving coordination and consistency across regulatory jurisdictions (i.e., local, state and federal governments) is also needed to improve consistency and reliability of the permitting process and increase adoption of best management practices. A coordinated effort across the watershed to identify targeted practices and assess best practices related to available incentives could reduce costs and improve efficiency. Using the Green Shores for Homes or similar programs as an incentive-based program to increase the number of properties that voluntarily improve shoreline conditions on their property should be explored.

#### » Regulatory Compliance Monitoring and Associated Enforcement

Jurisdictions should assess regulatory compliance with shoreline master programs, critical area protections, floodplain regulations, and agricultural regulations (e.g., Livestock Management Ordinance) to assess and improve protection of salmon habitats. Regulatory compliance is fundamental to achieving no net loss of ecological function along marine and freshwater shorelines and to ensuring that ongoing impacts to salmon habitat do not undermine salmon recovery investments. Periodic compliance monitoring should be used to assess the status of jurisdictions and the status of local regulatory implementation and to inform a strategic approach to address shortcomings. If a regulatory framework is not achieving intended outcomes, local jurisdictions should assess changes to staffing levels, outreach and education, technical training for staff, interagency coordination, and enforcement to improve compliance rates.

A WRIA 9 Marine Shoreline Monitoring and Compliance Project (2018) found that only 42 percent of shoreline modifications between 2013-2018



obtained local permits. Even fewer shoreline modifications obtained a WDFW Hydraulic Project Approval. Furthermore, more new shoreline armor (mostly unpermitted) was constructed than removed through restoration projects. These results indicate that unpermitted shoreline modifications are undermining salmon recovery investments and overall efforts to achieve “no net loss of ecosystem function” as required through the Shoreline Management Act. Jurisdictions should take a programmatic approach to identify and address barriers (e.g., permit fees, regulatory uncertainty/confusion) to improve shoreline compliance rates and achieve outcomes that protect salmon habitat. Coordination and sharing of lessons learned across jurisdictions and the larger Puget Sound are recommended to improve efficiency.

## Policies

- » **Land Use (LU)1:** Ensure salmon recovery priorities are integrated into long-range planning efforts, including Shoreline Master Programs, Comprehensive Plans, and Open Space and Parks Plans. Planning documents should be consistent with the Salmon Habitat Plan and support implementation of habitat protection and restoration priorities. WRIA 9 should provide technical assistance to promote compatibility.
- » **LU2:** Land use development, annexation, and capital improvement programs within the watershed should be consistent with the salmon recovery plan and promote progress towards achieving the necessary future conditions (and associated implementation targets) for a viable salmon population. Development proposals should be evaluated with respect to impacts on key habitat indicators and identified habitat projects for the respective subwatershed.
- » **LU3:** Local governments should use comprehensive plans and associated land use policies to direct growth and development within existing Urban Growth Areas (UGAs) to protect ecologically important landscapes in rural areas. Specifically, avoid future expansions to existing UGAs that could result in additional land conversion and landscape degradation.
- » **LU4:** Strictly apply and improve compliance with critical area, shoreline, vegetation conservation, floodplain, and agricultural regulations designed to protect important ecological habitats. Avoid use of variances in priority areas identified for protection and restoration in the salmon habitat plan.
- » **LU5:** Local governments should support flexible development tools that encourage protection and/or restoration of ecologically important salmon habitat. Possible tools include, but are not limited to, transferable development rights, mitigation banking/reserve programs, incentive zoning, Green Shores for Homes, and Public Benefit Rating System tax programs.
- » **LU6:** WRIA 9 partners should incorporate sea level rise projections into long-range planning documents, habitat project designs, and development standards to promote long-term ecosystem resiliency. Nearshore habitats adjacent to armored shorelines could be lost as water levels rise (i.e., coastal squeeze) if shorelines remain fixed. Low-lying shoreline areas should be identified to support landward migration of nearshore habitat as sea levels rise where appropriate.
- » **LU7:** Encourage certified development standards (e.g., Built Green, Salmon-Safe Certification, and Green Shores for Homes) that minimize the impacts of urban development on the natural environment. Incentives could include reductions in flexible development standards, expedited permitting, and reduced or waived permit costs.
- » **LU8:** Incorporate Salmon-Safe Certification standards into best management practices for park and grounds maintenance procedures. Certification is available for parks system, golf courses, and urban development. Salmon-Safe Certification is a peer-reviewed certification and accreditation program that promotes practices that protect water quality, improve watershed health and restore habitat.
- » **LU9:** Local governments should evaluate shorelines and critical areas, open space (e.g., parks and golf courses), and public lands with respect to identified salmon habitat priorities and notify WRIA 9 staff prior to approving significant land use conversion, or pursuing sale/exchange of public lands.



» **LU10:** Incorporate Green Shores for Homes Certification standards into best management practices for residential shoreline development. The WRIA should support municipal efforts to establish a Green Shores for Homes certification process during permit review to help expedite permitting. Green Shores for Homes is an EPA-funded certification and accreditation program that was developed by technical Shore Friendly design of shoreline properties.

- Responding to citizen inquiries concerning watershed issues; and
- Expanding public education and outreach opportunities

Basin stewardship covers the Middle and Lower Green River sub-basins, Miller and Walker Creek basins, and Vashon Island. Priorities for expansion include mainland nearshore and Duwamish sub-basins.

## Plan Implementation and Funding

### Location: All Subwatersheds

The WRIA 9 2016-2025 Interlocal Agreement provides a framework for managing and coordinating implementation of the Salmon Habitat Plan. It recognizes that salmon recovery transcends political boundaries and calls for strong collaboration between local, state, and federal partners. Success hinges on strong relationships, strategic coordination, and collective action. Working effectively across such a diverse landscape as the Green/Duwamish and Central Puget Sound requires creative partnerships with non-traditional partners. Leveraging shared resources to implement multi-benefit projects will help overcome land availability constraints and high restoration costs.

### Programs

#### » Basin Stewardship

Support and expand existing basin stewardship programs across the Green/Duwamish subwatersheds. Basin stewards are instrumental to implementation of the salmon habitat plan. They advocate for salmon recovery, coordinate across diverse stakeholders, and build on-the-ground relationships that facilitate large capital restoration projects. Key tasks for basin stewardship include:

- Coordinating and implementing restoration projects;
- Coordination and collaboration across jurisdictions;
- Securing grant funding (including grant writing) for restoration and acquisition projects;
- Promoting voluntary stewardship on private property;

#### » Land Conservation Initiative (LCI)

The LCI represents a coordinated effort to preserve river corridors, urban open space, trails, natural lands, farmland and forestlands. It is a regional collaboration between King County, cities, business people, farmers, environmental partners, and others to strategically preserve our last, most important places. The initiative sets forth the goal of conserving and preserving 65,000 acres of high conservation value lands throughout King County within the next 30 years. The primary funding source is the Conservation Futures Tax (CFT) fund, which is a property tax on all parcels in the county.

The LCI is an important funding source for pursuing open space acquisitions throughout the Green/Duwamish watershed. WRIA 9 partners should leverage the LCI to execute high-priority land acquisitions within the Green River Corridor to improve hydrological integrity, support salmon recovery, and expand recreational opportunity. Much of WRIA 9 is mapped as an "opportunity area" where households lack access to open space. Implementation of the LCI has the potential to align salmon recovery investments with needed investments to address equitable access to open space throughout the watershed.

#### » U.S. Army Corps Green/Duwamish Ecosystem Restoration Program (ERP)

WRIA 9 partners should continue to engage U.S. Army Corps leadership to advocate for appropriation of funding to implement ERP projects. The original collaborative effort resulted in identification of 45 projects, 29 of which were carried forward in the 2005 Salmon Habitat Plan. U.S. Congress authorized \$113 million in 2000 to be cost shared between the federal (65%) and local partners (35%). Since the 2005 Plan, 13 of the original projects have



been completed, with seven completed under the ERP authorization (e.g., North Winds Weir, Codiga Farms, Riverview Side Channel) and six completed by local sponsors (e.g., Porter Levee Setback, Fenster Levee Setback, and Gale Creek).

The Congressionally authorized ERP represents an important federal resource to support critically needed and underfunded salmon restoration work in the watershed. As of 2016, the ERP has only been allocated 8.25 percent of the authorized amount. A 2018 Green/Duwamish ERP Comprehensive Cost Update removed 12 projects based on the ratio of perceived habitat value to cost and the presence of hazardous materials. However, the recommended “de-scoped” plan still includes a number of high-priority projects including NE Auburn Creek and the Hamakami, Turley, and Lones levee setback projects. The cost update for the modified ERP scope is \$260 million and the congressionally authorized cost adjusted for inflation is \$269 million.

## Policies

» **Implementation (I)1:** The WRIA 9 2016-2025 Inter-local Agreement outlines the governance, funding, and decision-making structure for coordination and implementation of the Salmon Habitat Plan.

» **I2:** Process-based habitat restoration – where feasible – is preferable to other approaches that rely on more intensive human intervention. However, the magnitude of alteration within portions of the watershed render true restoration of degraded processes infeasible in some locations. Rehabilitation and substitution projects require additional monitoring and maintenance to ensure desired functions are achieved. WRIA 9 should support periodic investments in adaptive management of completed projects to ensure maximize long-term ecological benefits.

» **I3:** Support use of mitigation funds to implement priority salmon habitat enhancement projects. Off-site mitigation programs (e.g., in-lieu fee and mitigation banking) can help improve ecological function in critical locations (e.g., Chinook Wind in the Duwamish Transition Zone) as a means of offsetting unavoidable impacts in less sensitive areas of the watershed. Development of mitigation opportunities should be coordinated with the WRIA to ensure proposals are consistent with and do not preclude identified salmon recovery priorities. The WRIA should explore the potential for innovative partnerships that could combine mitigation and restoration funding to expand the overall ecosystem benefit of habitat projects. However, habitat improvements

**Figure 24.**

*The Riverview Park Project created approximately 800 ft of side channel to increasing juvenile Chinook rearing and refuge habitat in the Lower Green River. The project, sponsored by the City of Kent, was constructed in 2012 in partnership with the U.S. Army Corps of Engineers under the Green/Duwamish Ecosystem Restoration Project.*

*Photo: City of Kent.*





associated with mitigation funds must be tracked as separate and discrete from those achieved with restoration-based grant funding.

- » **I4:** Salmon recovery planning and habitat project development should integrate social justice and equity considerations. Public access and recreational improvements should be considered where demonstrated need exists and when compatible with salmon recovery goals. WRIA 9 should seek multiple benefit solutions that consider displacement and social justice issues.
- » **I5:** Coordinate Salmon Habitat Plan implementation with other watershed-wide and regional initiatives to identify synergies, leverage available funding, avoid conflicts, and improve salmon recovery outcomes. Existing watershed-wide and regional initiatives include the King County Flood Hazard Management Plan, King County Flood Control District Lower Green River Corridor Plan, Lower Duwamish Waterway Superfund Cleanup, Puget Sound Action Agenda, Our Green Duwamish, WRIA 9 Watershed Restoration Enhancement Committee, and the Puget Sound South Central Action Area Local Integrating Organization.
- » **I6:** Support examining new funding sources and financing strategies for implementing priority habitat projects and programs throughout Puget Sound. The WRIA 9 Watershed Forum will seek representation on regional committees tasked with the examination of public and private funding strategies at the local and regional level.
- » **I7: Salmon recovery funding** should support adaptive management of previously constructed projects where monitoring data shows design changes are necessary to improve habitat function.





## Chapter 7: Capital Projects

Salmon recovery capital projects preserve, enhance, create or restore the habitats and physical processes that support salmon. Projects include acquisition, restoration, and/or enhancement approaches.

Although significant progress has been made implementing projects identified in the 2005 Salmon Habitat Plan, many projects remain unfunded and under-resourced. Since 2005, 165 projects have been completed or are in progress, totalling over \$160 million of investments. While many of the remaining projects identified within the 2005 Plan are still viable, other opportunities have been lost to development and/or a change in ownership.

This update provides a current, comprehensive list of potential capital projects that align with established goals for Chinook salmon recovery in WRIA 9. A couple of plan amendments added new projects to the 2005 Plan, including: a 2007 plan amendment; and the 2014 Duwamish Blueprint. As part of the 2020 update, all projects described in the plan (and its amendments) or the appendices of the plan were evaluated for inclusion in updated project list.

WRIA 9 staff developed an updated list of capital projects in partnership with ILA member jurisdictions, non-profit partners, state agencies, and others

engaged in salmon recovery. Partners were asked to submit projects and provide specific project information including a project sponsor, location, scope, goals, alignment with recovery strategies, and projected habitat gains. In some cases, an identified project did not have a clear sponsor, but was included due to the perceived importance of the project. The request for projects primarily targeted Chinook salmon-focused projects, but several coho salmon projects were accepted.

A few additional project guidelines were developed in refining the project list:

- **Policies and Programs** – Project submittals were not required for actions that fell within the scope of larger programmatic actions (e.g., fish barrier removal).
- **Discrete footprint** – Projects were required to articulate a specific project footprint to support evaluation of feasibility and magnitude of ecological benefit.
- **Implementable within 10-15 years** – Project sponsors were directed to submit projects that could be implemented within a 10-15-year timeframe, provided adequate funding and landowner willingness.



## Project Prioritization

A team of subject matter experts was recruited to review, evaluate and tier projects for inclusion in the Plan. This four-person prioritization team brought expertise in restoration ecology, fish biology, and habitat project management, and over 50 years of knowledge from working in the Green/Duwamish River and Central Puget Sound. A balance of interests was represented to eliminate bias for specific projects. The review process evaluated all conceptual projects based on their full potential to provide habitat lift. Future constraints identified during design and feasibility could impact overall project scope and associated benefits.

Project prioritization was based on subject matter expert evaluation of:

- **Habitat Quality (lift):** the relative importance and value of a specific proposed habitat; and
- **Habitat Quantity (size):** the potential amount (acreage and shoreline length) of habitat created or enhanced based on the entire project footprint.

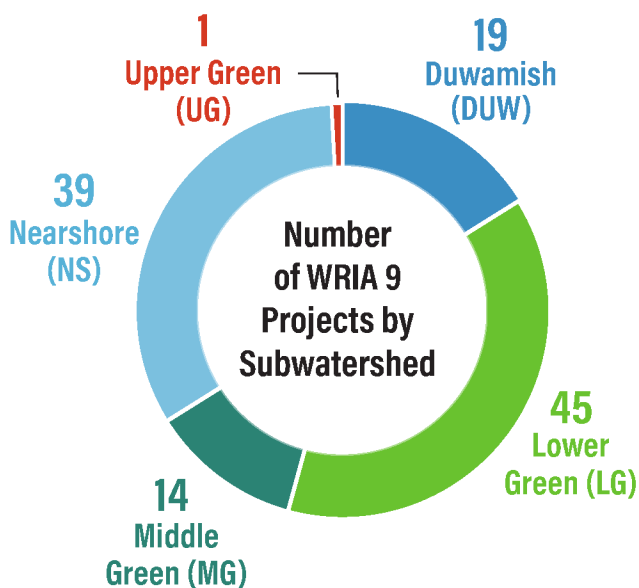
The scoring process was weighted so that habitat quality comprised 75 percent of the score and habitat quantity comprised 25 percent of the score. The tiering process assumes habitat benefits are positively correlated with size. Larger projects not only provide more habitat, they allow increased habitat heterogeneity. Smaller, more homogeneous habitats, are less resilient to perturbations, and site constraints can be problematic for optimizing habitat. A small modifier was added to allow consideration of high-value geographic locations (e.g., proximity to existing restoration sites, feeder bluff, etc.). Potential lift reflects the projected immediate and long-term habitat benefits to addressing limiting factors for Chinook salmon recovery. Process-based restoration was considered to provide more certainty of long-term benefits.

A total of 118 projects were submitted and ranked as part of the project solicitation process. Projects were ranked within a specific subwatershed – not across subwatersheds. Given the large number of projects, projects were tiered based on overall benefit and to provide an indication of priority for financial support from the WRIA. Tiers were defined as follows:

- **Tier 1** - high potential; substantially contribute to recovery goals in each subwatershed.
- **Tier 2** - moderate potential; clear alignment with Chinook salmon recovery goals.
- **Tier 3** - limited potential; associated with Chinook recovery (or not primary species impacted); compliments broader recovery efforts in the subwatershed.

A simplified scoring methodology based on habitat quantity and quality provides a foundation for long-term planning by setting high-level implementation priorities within each subwatershed. Tiers were assigned to projects by identifying natural breakpoints in the full list of projects within a subwatershed. These established breakpoints serve as a scoring baseline for projects received through future biennial calls for projects. Future proposed projects will be scored under the same criteria and assigned a tier. The proposed project will be added to the tiered list for future funding, with near-term funding priority given to those projects previously identified as in need of funding.

The final list of projects was approved unanimously by the Implementation Technical Committee and Watershed Ecosystem Forum in 2019 and will serve as the comprehensive list of recovery actions that help achieve recovery goals, and ultimately toward the delisting of Chinook salmon in Puget Sound.



**Figure 25.** Number of projects by subwatershed.

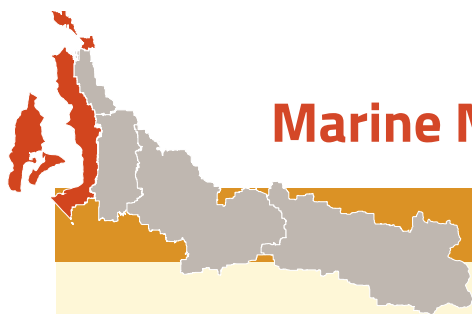


## Capital Project Information by Subwatershed containing:

- Subwatershed project location maps
- Subwatershed project listings with tier rankings
- Project fact sheets with site maps

Marine Nearshore Subwatershed .....	p. 76
Duwamish Estuary Subwatershed.....	p. 102
Lower Green River Subwatershed .....	p. 116
Middle Green River Subwatershed.....	p. 146
Upper Green River Subwatershed .....	p. 160





## Marine Nearshore Subwatershed

**39**  
projects

### Tier 1 (Score 18+) 17 projects

NS-7 .....Cove Creek Pocket Estuary Restoration	NS-29 .....Maury Island Natural Area Revegetation and Reclamation
NS-8 .....Dillworth and Gorsuch Creek Pocket Estuaries	NS-43 .....Dockton Reach Preservation and Restoration
NS-11 .....Beaconsfield on the Sound	NS-45 .....Tahlequah Creek Mouth Restoration
NS-15 .....McSorley Creek Pocket Estuary and Feeder Bluff restoration	NS-49 .....Arroyos Park Bulkhead Removal
NS-21 .....Corbin Beach Acquisition and Restoration	NS-53 .....Perkins Lane Protection and Restoration
NS-23 .....Point Heyer Nearshore Acquisitions	NS-61 .....Manzanita Reach Acquisition and Restoration
NS-24 .....Cross Landing Pocket Estuary Restoration	NS-62 .....Spring Beach Acquisition and Restoration
NS-28 .....Big Beach Reach Acquisition and Restoration	NS-63 .....Green Valley Creek Acquisition and Restoration
	NS-66 .....Camp Kilworth Protection

### Tier 2 (Score 7-18) 8 projects

NS-13 .....Massey Creek Pocket Estuary and Fish Passage Project	NS-31 .....Discovery Park Feeder Bluff Protection and Restoration
NS-14 .....Raab's Lagoon Acquisition and Restoration	NS-44 .....Portage Salt Marsh Restoration
NS-25 .....Judd Creek Pocket Estuary	NS-60 .....Ellisport Creek Mouth Restoration
NS-27 .....Piner Point Acquisition and Restoration	NS-67 .....Des Moines Creek Estuary Restoration

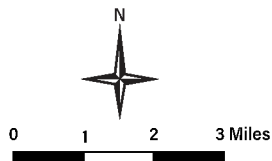
### Tier 3 (Score <7) 14 projects

NS-2 .....Myrtle Edwards Park Pocket Beach Shallow Water Habitat	NS-58 .....Tsugwalla Creek Pocket Estuary Restoration Project
NS-16 .....Dash Point State Park Estuary Restoration and Water Quality Improvements	NS-59 .....Mileta Armor removal and shoreline restoration
NS-22 .....Smith Cove Shallow Water Rehabilitation	NS-68 .....Longfellow Creek Fish Passage and Floodplain Restoration
NS-35 .....Lower Shinglemill Creek habitat restoration	NS-70 .....Fauntleroy Creek Fish Passage
NS-39 .....Walker Creek Headwaters Land Acquisition	NS-72 .....Perkins Lane Protection and Restoration Project/Perkins Lane Utility Access Road
NS-40 .....Salmon Creek Fish Barrier Removal	NS-73 .....Beall Creek Salmon Habitat Project
NS-42 .....Miller Creek Regional Detention Facility	
NS-54 .....West Galer Street/32nd St. Boat Ramp Shoreline Armor Removal and Restoration	



**Figure 26.**  
**Marine Nearshore**  
**Subwatershed Projects**

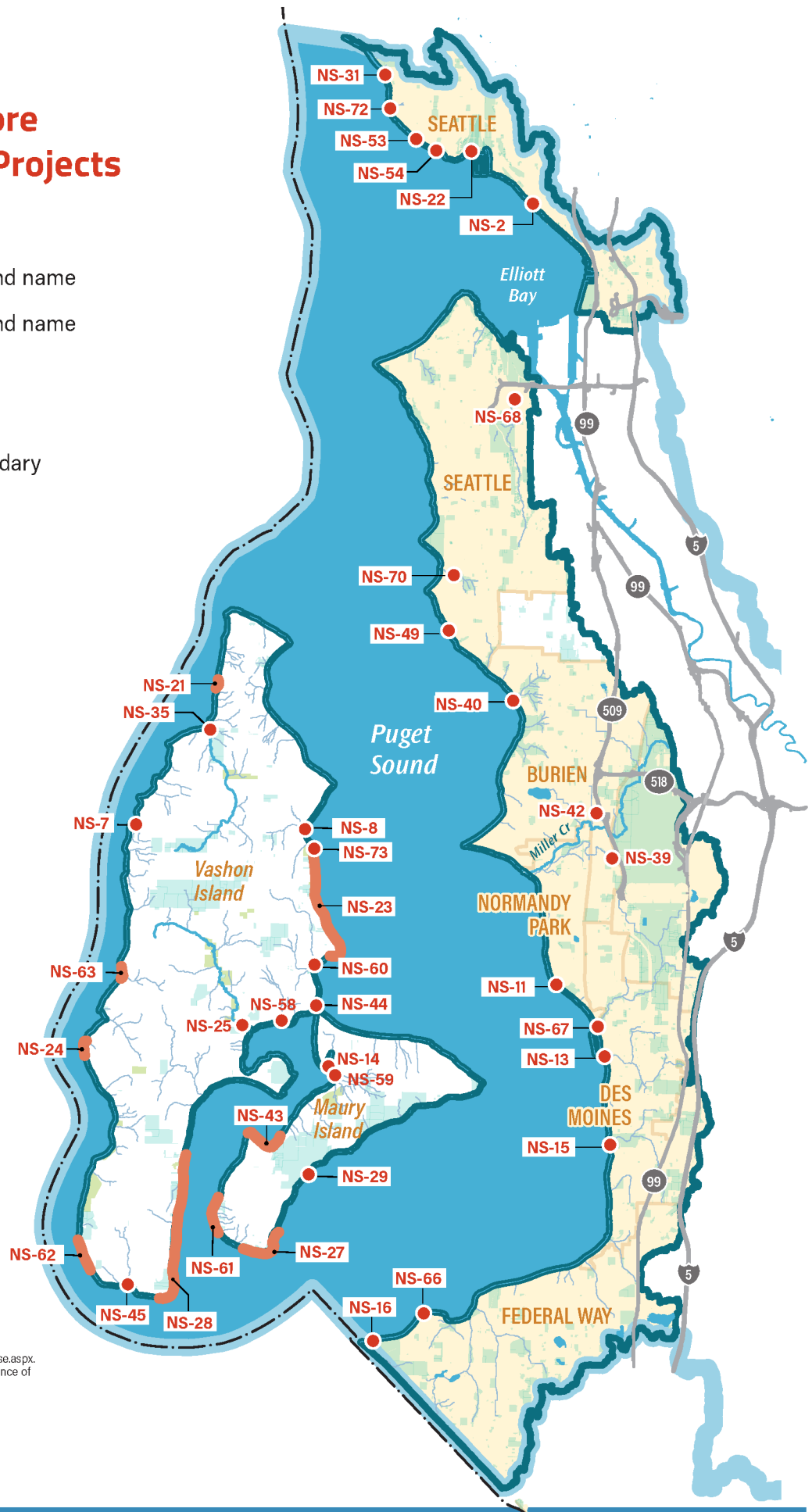
- 1 • River mile
- NS-1 • Project location and name
- NS-1 Project location and name
- River/creek
- Major road
- King County boundary
- Maine Nearshore Subwatershed boundary
- WRIA 9 boundary
- Public lands
- Parks
- Incorporated area
- Open water



**Note:**  
 The use of the information in this map is subject to the terms and conditions found at: [www.kingcounty.gov/services/gis/Maps/terms-of-use.aspx](http://www.kingcounty.gov/services/gis/Maps/terms-of-use.aspx). Your access and use is conditioned on your acceptance of these terms and conditions.

**KCIT-DCE File:**  
 2011\_102021\_W9SHP\_ProjMap\_NS.ai LPRE

**GIS File:**  
 Q:\200009\WRIA9\_Watershed.mxd KLINKAT







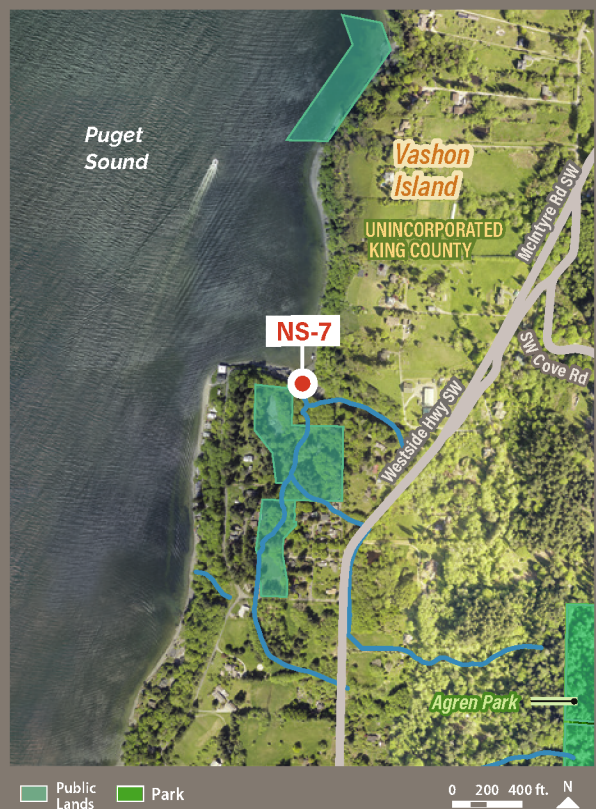
Tier 1 Project: NS-7

# Cove Creek Pocket Estuary Restoration

Green / Duwamish &  
Central Puget Sound



PROJECT AREA MAP



LOCATION MAP



## PROJECT FACTS

### Subwatershed:

Nearshore (NS)

### Drift cell:

Vashon/Maury Island  
(KI - 13-28; KI - 11-7)

### Bankside jurisdiction:

Vashon/Maury

### Project sponsor:

King County

### Budget:

\$600,000

## PROJECT TYPE:



Acquisition



Restoration

## KEY HABITAT:



Nearshore  
Feeder Bluff



Nearshore  
Pocket Estuary

## PROJECT DESCRIPTION:

Protect and improve riparian vegetation, improve tributary access, remove armoring and fill, increase vegetated shallow nearshore and marsh habitats, protect and enhance pocket estuaries and tributary stream mouths.

## Primary strategy

Protect, restore and enhance marine shorelines.

## Benefits:

- Shoreline armor reduction

## Contribution to goals metrics:

- Marine riparian vegetation
- Shoreline armor

Project Area Map: Ortho2019KCNAT aerial photo Site photo: WDOE Shoreline Photo Viewer Images, 2020  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





## Tier 1 Project: NS-8

# Dillworth and Gorsuch Creek Pocket Estuaries

Green / Duwamish &  
Central Puget Sound



### PROJECT AREA MAP



### LOCATION MAP



### PROJECT FACTS

**Subwatershed:**  
Nearshore (NS)

**Drift cell:**  
Vashon/Maury  
(KI - 12 - 4)

**Bankside jurisdiction:**  
Vashon/Maury

**Project sponsor:**  
King County

**Budget:**  
\$3,000,000

### PROJECT TYPE:



Acquisition



Restoration

### KEY HABITAT:



Nearshore  
Pocket Estuary



Riparian

### PROJECT DESCRIPTION:

Acquire properties at the mouth of Dillworth and Gorsuch Creeks to restore stream delta and pocket estuary habitat.

### Primary strategy

Protect, restore and enhance marine shorelines.

### Benefits:

- Increased rearing habitat
- Shoreline armor reduction

### Contribution to goals metrics:

- Marine riparian vegetation
- Shoreline armor
- Shoreline conservation

Project Area Map: Ortho2019KCNAT aerial photo Site photo: WDOE Shoreline Photo Viewer Images, 2020  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





Tier 1 Project: NS-11

# Beaconsfield on the Sound

Green / Duwamish &  
Central Puget Sound



## PROJECT AREA MAP



## LOCATION MAP



## PROJECT FACTS

**Subwatershed:**  
Nearshore (NS)

**Drift cell:**  
Normandy Park  
(KI-7-3)

**Bankside jurisdiction:**  
Normandy Park

**Project sponsor:**  
Normandy Park

**Budget:**  
\$600,000

## PROJECT TYPE:



Acquisition



Restoration

## KEY HABITAT:



Nearshore  
Feeder Bluff

## PROJECT DESCRIPTION:

Protect and restore 1085 ft. of active feeder bluff along mainland marine nearshore.

## Primary strategy

Protect, restore and enhance marine shorelines.

## Benefits:

- Reconnect historic feeder bluffs
- Shoreline armor reduction

## Contribution to goals metrics:

- Shoreline armor

Project Area Map: Ortho2019KCNAT aerial photo Site photo: WDOE Shoreline Photo Viewer Images, 2020  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





# Tier 1 Project: NS-15 McSorley Creek Pocket Estuary and Feeder Bluff Restoration

Green / Duwamish &  
Central Puget Sound



## PROJECT AREA MAP



## LOCATION MAP



## PROJECT FACTS

**Subwatershed:**  
Nearshore (NS)

**Drift cell:**  
Des Moines (KI - 8 - 3)

**Bankside jurisdiction:**  
Des Moines

**Project sponsor:**  
King County/  
State Parks

**Budget:**  
\$20,838,000

## PROJECT TYPE:



Acquisition



Enhancement/  
Planting



Monitoring &  
Assessment



Planning/  
Design



Restoration

## KEY HABITAT:



Nearshore  
Feeder Bluff



Nearshore  
Pocket Estuary

## PROJECT DESCRIPTION:

Restore historic pocket estuary, protect feeder bluffs, remove marine shoreline armoring and enhance low-impact recreational activities.

## Primary strategy

Protect, restore and enhance marine shorelines.

## Benefits:

- Improved forage fish spawning habitat
- Recreation opportunities
- Shoreline armor reduction

## Contribution to goals metrics:

- Marine riparian vegetation
- Shoreline armor

Project Area Map: Ortho2019KC/NAT aerial photo Site photo: WDOE Shoreline Photo Viewer Images, 2020  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT

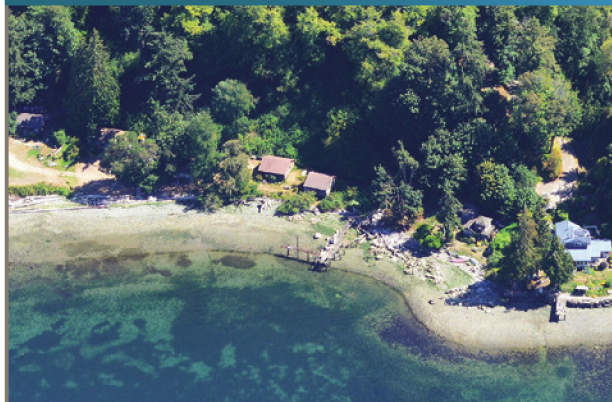




Tier 1 Project: NS-21

# Corbin Beach Acquisition and Restoration

Green / Duwamish &  
Central Puget Sound



PROJECT AREA MAP



Project Area Public Lands  
0 200 400 ft. N

LOCATION MAP



WRIA 9  
Incorporated Area  
0 5 10  
Miles

## PROJECT FACTS

**Subwatershed:**  
Nearshore (NS)

**Drift cell:**  
Vashon/Maury Island  
(KI 11-2)

**Bankside jurisdiction:**  
Vashon/Maury

**Project sponsor:**  
King County

**Budget:**  
\$3,500,000

## PROJECT TYPE:



Acquisition



Restoration

## KEY HABITAT:



Nearshore  
Feeder Bluff

## PROJECT DESCRIPTION:

Acquire to protect and restore nearshore habitat by removing shoreline debris, hard armor, and derelict docks.

## Primary strategy

Protect, restore and enhance marine shorelines.

## Benefits:

- Reconnect historic feeder bluffs
- Shoreline armor reduction

## Contribution to goals metrics:

- Marine riparian vegetation
- Shoreline armor
- Shoreline conservation

Project Area Map: Ortho2019KCNAT aerial photo Site photo: Google Earth  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





Tier 1 Project: NS-23

# Point Heyer Nearshore Acquisitions

Green / Duwamish &  
Central Puget Sound



## PROJECT FACTS

**Subwatershed:**  
Nearshore (NS)

**Drift cell:**  
Vashon/Maury  
(KI - 13 - 2)

**Bankside jurisdiction:**  
Vashon/Maury

**Project sponsor:**  
King County

**Budget:**  
\$10,000,000

## PROJECT TYPE:



Acquisition



Restoration

## KEY HABITAT:



Nearshore  
Feeder Bluff



Riparian

## PROJECT AREA MAP



## PROJECT DESCRIPTION:

Acquire properties to protect and restore beach feeding processes and salt marsh at spit.

## Primary strategy

Protect, restore and enhance marine shorelines.

## Benefits:

- Habitat preservation
- Recreation opportunities
- Shoreline armor reduction

## Contribution to goals metrics:

- Marine riparian vegetation
- Shoreline armor
- Shoreline conservation

## LOCATION MAP



Project Area Map: Ortho2019KC NAT aerial photo Site photo: WDOE Shoreline Photo Viewer Images, 2020  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





Tier 1 Project: NS-24

# Cross Landing Pocket Estuary Restoration

Green / Duwamish &  
Central Puget Sound



PROJECT AREA MAP



LOCATION MAP



## PROJECT FACTS

**Subwatershed:**  
Nearshore (NS)

**Drift cell:**  
Vashon/Maury  
(KI - 13 - 23)

**Bankside jurisdiction:**  
Vashon/Maury

**Project sponsor:**  
King County

**Budget:**  
\$3,500,000

## PROJECT TYPE:



Acquisition



Restoration

## KEY HABITAT:



Nearshore  
Pocket Estuary



Riparian

## PROJECT DESCRIPTION:

Acquire beach feeding parcels, remove fill, restore salt marsh, remove road, and reroute road drainage.

## Primary strategy

Protect, restore and enhance marine shorelines.

## Benefits:

- Shoreline armor reduction

## Contribution to goals metrics:

- Marine riparian vegetation
- Shoreline armor
- Shoreline conservation

Project Area Map: Ortho2019KCNAT aerial photo Site photo: WDOE Shoreline Photo Viewer Images, 2020  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





## Tier 1 Project: NS-28

# Big Beach Reach Acquisition and Restoration

Green / Duwamish &  
Central Puget Sound



### PROJECT AREA MAP



### LOCATION MAP



### PROJECT FACTS

**Subwatershed:**  
Nearshore (NS)

**Drift cell:**  
Vashon/Maury Island  
(KI 13-20)

**Bankside jurisdiction:**  
Vashon/Maury

**Project sponsor:**  
King County

**Budget:**  
\$15,000,000

### PROJECT TYPE:



Acquisition



Restoration

### KEY HABITAT:



Nearshore  
Feeder Bluff

### PROJECT DESCRIPTION:

Acquire to protect and restore about 209 acres of upland and nearshore habitat with approximately 4615 feet of bluff-backed beach shoreline.

### Primary strategy

Protect, restore and enhance marine shorelines.

### Benefits:

- Reconnect historic feeder bluffs
- Shoreline armor reduction

### Contribution to goals metrics:

- Marine riparian vegetation
- Shoreline armor
- Shoreline conservation

Project Area Map: Ortho2019KCNAT aerial photo Site photo: WDOE Shoreline Photo Viewer Images, 2020  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





### PROJECT AREA MAP



### LOCATION MAP



### PROJECT FACTS

**Subwatershed:**  
Nearshore (NS)

**Drift cell:**  
Vashon/Maury  
(KI - 14 - 2)

**Bankside jurisdiction:**  
Vashon/Maury

**Project sponsor:**  
King County

**Budget:**  
\$1,050,000

### PROJECT TYPE:



Restoration

### KEY HABITAT:



Nearshore  
Feeder Bluff

### PROJECT DESCRIPTION:

Remove invasive species, add topsoil, and revegetate about a mile of marine shoreline.

### Primary strategy

Protect, restore and enhance marine shorelines.

### Benefits:

- Improved forage fish spawning habitat
- Recreation opportunities
- Shoreline armor reduction

### Contribution to goals metrics:

- Marine riparian vegetation

Project Area Map: Ortho2019KCNAT aerial photo Site photo: WDOE Shoreline Photo Viewer Images, 2020  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





## Tier 1 Project: NS-43

# Dockton Reach Preservation and Restoration

Green / Duwamish &  
Central Puget Sound



### PROJECT AREA MAP



### LOCATION MAP



### PROJECT FACTS

**Subwatershed:**  
Nearshore (NS)

**Drift cell:**  
Vashon/Maury  
(KI - 13 - 8)

**Bankside jurisdiction:**  
Vashon/Maury

**Project sponsor:**  
King County

**Budget:**  
\$2,600,000

### PROJECT TYPE:



Acquisition



Restoration



Scoping/  
Reconnaissance

### KEY HABITAT:



Nearshore  
Feeder Bluff



Riparian

### PROJECT DESCRIPTION:

Restore 2000 feet of marine shoreline in the Maury Island Aquatic Reserve.

### Primary strategy

Protect, restore and enhance marine shorelines.

### Benefits:

- Shoreline armor reduction

### Contribution to goals metrics:

- Marine riparian vegetation
- Shoreline armor
- Shoreline conservation

Project Area Map: Ortho2019KCNAT aerial photo Site photo: WDOE Shoreline Photo Viewer Images, 2020  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





Tier 1 Project: NS-45

# Tahlequah Creek Mouth Restoration

Green / Duwamish & Central Puget Sound



## PROJECT AREA MAP



Public Lands

0 200 400 ft. N

## LOCATION MAP



WRIA 9

Incorporated Area

0 5 10 Miles

## PROJECT FACTS

### Subwatershed:

Nearshore (NS)

### Drift cell:

Vashon/Maury Island  
(KI - 13 - 21, KI - 13 - 22)

### Jurisdiction:

Vashon/Maury

### Project sponsor:

Vashon/Maury

### Budget:

\$7,000,000

## PROJECT TYPE:



Acquisition



Restoration

## KEY HABITAT:



Nearshore  
Feeder Bluff



Nearshore  
Pocket Estuary



Riparian

## PROJECT DESCRIPTION:

Acquire properties, restore creek meander and fish passage, remove bulkhead, and restore nearshore, estuary and marsh habitat.

## Primary strategy

Protect, restore and enhance marine shorelines.

## Benefits:

- Improved forage fish spawning habitat
- Shoreline armor reduction

## Contribution to goals metrics:

- Marine riparian vegetation
- Shoreline armor

Project Area Map: Ortho2019KCNAT aerial photo Site photo: WDOE Shoreline Photo Viewer Images, 2020  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





Tier 1 Project: NS-49

# Arroyos Park Bulkhead Removal

Green / Duwamish &  
Central Puget Sound



## PROJECT AREA MAP



## LOCATION MAP



## PROJECT FACTS

**Subwatershed:**  
Nearshore (NS)

**Drift cell:**  
City of Seattle (KI -5 - 1)

**Bankside jurisdiction:**  
City of Seattle

**Project sponsor:**  
Seattle Parks and Recreation

**Budget:**  
\$2,500,000

## PROJECT TYPE:



Planning/  
Design



Restoration

## KEY HABITAT:



Nearshore

## PROJECT DESCRIPTION:

Remove approximately 700 feet of rip rap and timber bulkhead along the shoreline.

## Primary strategy

Protect, restore and enhance marine shorelines.

## Benefits:

- Habitat preservation
- Recreation opportunities
- Shoreline armor reduction

## Contribution to goals metrics:

- Shoreline armor
- Shoreline conservation

Project Area Map: Ortho2019KCNAT aerial photo Site photo: WDOE Shoreline Photo Viewer Images, 2020  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





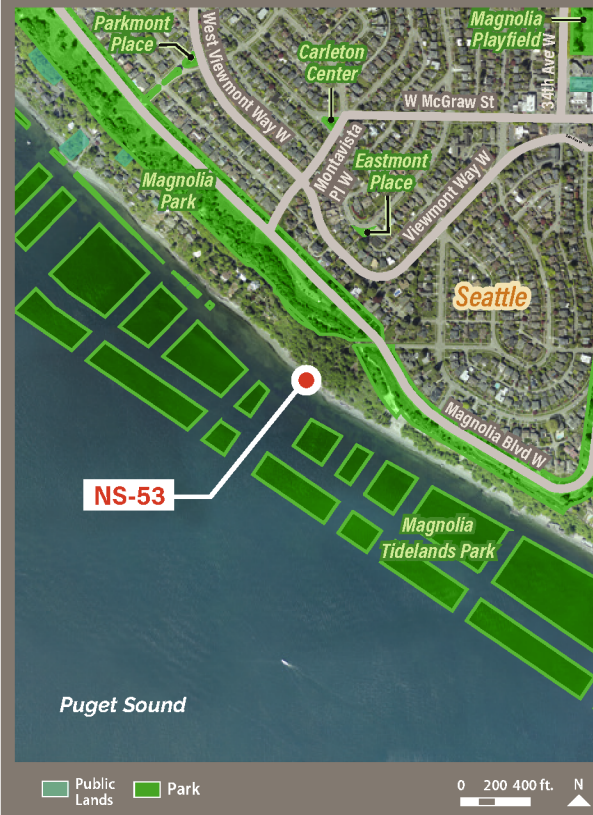
Tier 1 Project: NS-53

# Perkins Lane Protection and Restoration

Green / Duwamish &  
Central Puget Sound



## PROJECT AREA MAP



## LOCATION MAP



## PROJECT FACTS

### Subwatershed:

Nearshore (NS)

### Drift cell:

City of Seattle (KI - 3 - 2)

### Bankside jurisdiction:

City of Seattle

### Project sponsor:

Seattle Parks and Recreation

### Budget:

TBD

## PROJECT TYPE:



Acquisition



Restoration

## KEY HABITAT:



Nearshore  
Feeder Bluff

## PROJECT DESCRIPTION:

Acquire properties to remove old bulkheads and fill.

## Primary strategy

Protect, restore and enhance marine shorelines.

## Benefits:

- Habitat preservation
- Reconnect historic feeder bluffs
- Shoreline armor reduction

## Contribution to goals metrics:

- Shoreline conservation

Project Area Map: Ortho2019KCNAT aerial photo Site photo: WDOE Shoreline Photo Viewer Images, 2020  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





## Tier 1 Project: NS-61

# Manzanita Reach Acquisition and Restoration

Green / Duwamish &  
Central Puget Sound



### PROJECT AREA MAP



### LOCATION MAP



### PROJECT FACTS

**Subwatershed:**  
Nearshore (NS)

**Drift cell:**  
Vashon/Maury (KI - 10 - 3)

**Bankside jurisdiction:**  
Vashon/Maury

**Project sponsor:**  
King County

**Budget:**  
\$15,000,000

### PROJECT TYPE:



Acquisition



Restoration

### KEY HABITAT:



Nearshore  
Pocket Estuary



Riparian

### PROJECT DESCRIPTION:

Acquire properties to remove old bulkheads and fill.

### Primary strategy

Protect, restore and enhance marine shorelines.

### Benefits:

- Improved forage fish spawning habitat
- Reconnect historic feeder bluffs
- Shoreline armor reduction

### Contribution to goals metrics:

- Marine riparian vegetation
- Shoreline armor
- Shoreline conservation

Project Area Map: Ortho2019KCNAT aerial photo Site photo: WDOE Shoreline Photo Viewer Images, 2020  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT

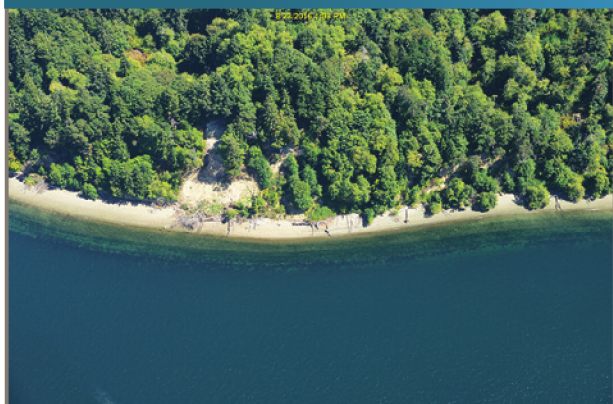




Tier 1 Project: NS-62

# Spring Beach Acquisition and Restoration

Green / Duwamish &  
Central Puget Sound



## PROJECT AREA MAP



## LOCATION MAP



## PROJECT FACTS

**Subwatershed:**

Nearshore (NS)

**Drift cell:**

Vashon/Maury (KI - 10 - 3)

**Bankside jurisdiction:**

Vashon/Maury

**Project sponsor:**

King County

**Budget:**

\$5,000,000

## PROJECT TYPE:



Acquisition



Restoration

## KEY HABITAT:



Nearshore  
Pocket Estuary



Riparian

## PROJECT DESCRIPTION:

Acquire to protect and restore shoreline and forage fish habitat.

## Primary strategy

Protect, restore and enhance marine shorelines.

## Benefits:

- Improved forage fish spawning habitat
- Shoreline armor reduction

## Contribution to goals metrics:

- Marine riparian vegetation
- Shoreline armor
- Shoreline conservation

Project Area Map: Ortho2019KCNAT aerial photo Site photo: WDOE Shoreline Photo Viewer Images, 2020  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT

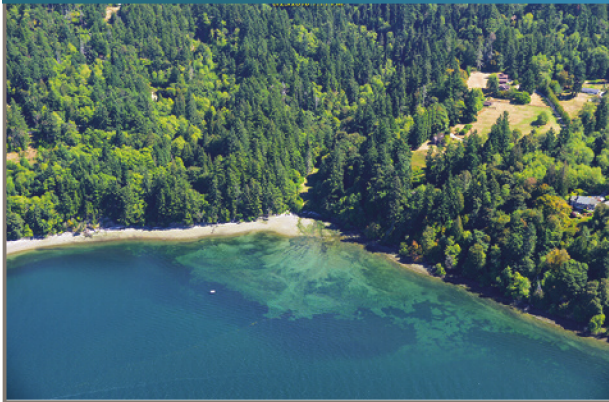




## Tier 1 Project: NS-63

# Green Valley Creek Acquisition and Restoration

Green / Duwamish &  
Central Puget Sound



### PROJECT AREA MAP



### LOCATION MAP



### PROJECT FACTS

**Subwatershed:**  
Nearshore (NS)

**Drift cell:**  
Vashon/Maury (KI - 13 - 26)

**Bankside jurisdiction:**  
Vashon/Maury

**Project sponsor:**  
King County

**Budget:**  
\$4,000,000

### PROJECT TYPE:



Acquisition



Restoration

### KEY HABITAT:



Nearshore  
Pocket Estuary



Riparian

### PROJECT DESCRIPTION:

Acquire undeveloped lots along the Green Valley Creek, restore creek mouth, and remove hard shoreline armor.

### Primary strategy

Protect, restore and enhance marine shorelines.

### Benefits:

- Improved forage fish spawning habitat
- Reconnect historic feeder bluffs
- Shoreline armor reduction

### Contribution to goals metrics:

- Marine riparian vegetation
- Shoreline armor
- Shoreline conservation

Project Area Map: Ortho2019KCNAT aerial photo Site photo: WDOE Shoreline Photo Viewer Images, 2020  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





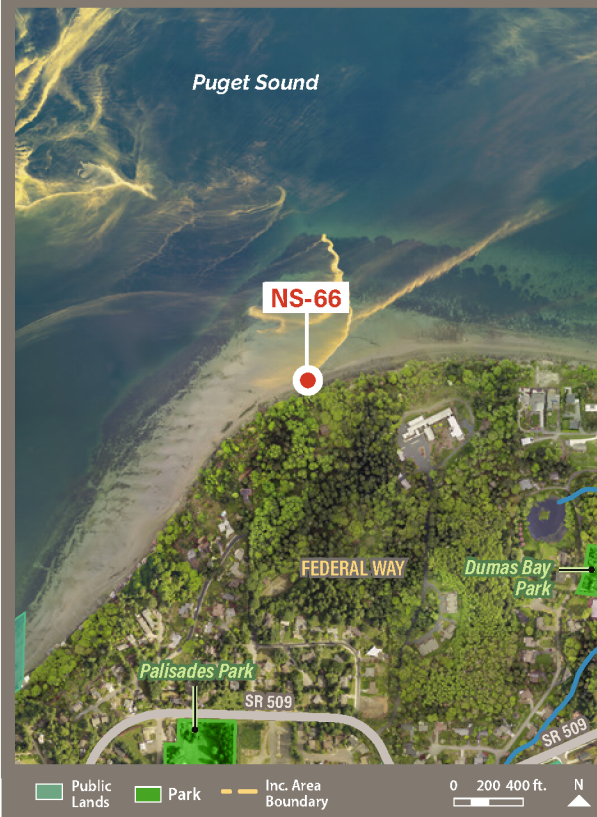
Tier 1 Project: NS-66

# Camp Kilworth Protection

Green / Duwamish &  
Central Puget Sound



## PROJECT AREA MAP



## LOCATION MAP



## PROJECT FACTS

### Subwatershed:

Nearshore (NS)

### Drift cell:

Federal Way (KI - 10 - 3)

### Bankside jurisdiction:

Federal Way

### Project sponsor:

Forterra and Kilworth Environmental Education Preserve (KEEP)

### Budget:

\$3,100,000

## PROJECT TYPE:



Acquisition

## KEY HABITAT:



Nearshore Feeder Bluff

## PROJECT DESCRIPTION:

Protect 900 feet of active feeder bluffs that occurs in the first third of the drift cell.

## Primary strategy

Protect, restore and enhance marine shorelines.

## Benefits:

- Improved forage fish spawning habitat
- Reconnect historic feeder bluffs

## Contribution to goals metrics:

- Shoreline armor

Project Area Map: Ortho2019KCNAT aerial photo Site photo: WDOE Shoreline Photo Viewer Images, 2020  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT



## Tier 2 Project: NS-13

# Massey Creek Pocket Estuary and Fish Passage Project

### PROJECT FACTS

**Subwatershed:**

Nearshore (NS)

**Nearshore**

**jurisdiction:**

Nearshore KI - 8 - 2

**Bankside**

**jurisdiction:**

City of Des Moines

**Project sponsor:**

City of Des Moines

**Budget:**

\$3,000,000

### PROJECT TYPE:



Acquisition



Restoration

### KEY HABITAT:



Nearshore  
Pocket Estuary



Riparian

### PROJECT DESCRIPTION:

Acquire and restore the stream, create fish passage, remove the jetty and rock from the south bank, and create a pocket estuary.



KCIT-DCE VC folder: 2010\_10202w\_NS-13.ai GIS file Q:\2009\WRIA9\_ProjectMaps.mxd

## Tier 2 Project: NS-14

# Raab's Lagoon Acquisition and Restoration

### PROJECT FACTS

**Subwatershed:**

Nearshore

**Nearshore**

**jurisdiction:**

Nearshore KI - 13 - 9

**Bankside**

**jurisdiction:**

King County

**Project sponsor:**

King County

**Budget:**

TBD

### PROJECT TYPE:



Acquisition



Restoration

### KEY HABITAT:



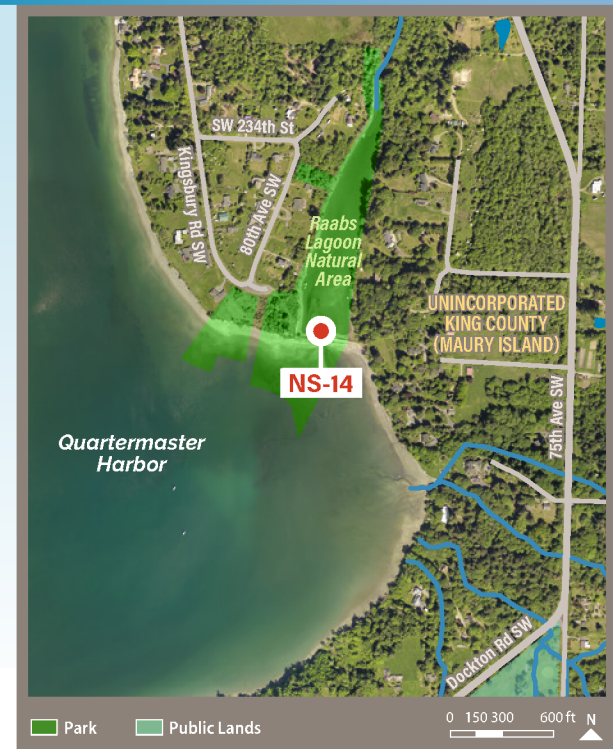
Nearshore  
Pocket Estuary



Riparian

### PROJECT DESCRIPTION:

Acquire vacant lots, restore riparian forest habitat and connectivity by removing the weir and bulkhead.



KCIT-DCE VC folder: 2010\_10202w\_NS-14.ai GIS file Q:\2009\WRIA9\_ProjectMaps.mxd



## Tier 2 Project: NS-25

### Judd Creek Pocket Estuary

#### PROJECT FACTS

**Subwatershed:**  
Nearshore

**Nearshore jurisdiction:**  
Nearshore KI - 0 - 1

**Bankside jurisdiction:**  
King County

**Project sponsor:**  
King County

**Budget:**  
\$6,000,000

#### PROJECT TYPE:



Acquisition



Restoration

#### KEY HABITAT:



Nearshore Feeder Bluff



Nearshore Pocket Estuary



Riparian

#### PROJECT DESCRIPTION:

Restore habitat with wood placement, removal of derelict barge, and additional vegetation near mouth of Judd Creek.



KCIT-DCE VC folder: 2010\_10202w\_NS-25.ai GIS file Q:\2009\WRIA9\_ProjectMaps.mxd

## Tier 2 Project: NS-27

### Piner Point Acquisition and Restoration

#### PROJECT FACTS

**Subwatershed:**  
Nearshore

**Nearshore jurisdiction:**  
Nearshore KI - 13 - 8

**Bankside jurisdiction:**  
King County

**Project sponsor:**  
King County

**Budget:**  
\$1,500,000

#### PROJECT TYPE:



Acquisition



Restoration

#### KEY HABITAT:



Nearshore Feeder Bluff



Riparian

#### PROJECT DESCRIPTION:

Acquire remaining properties, remove bulkheads, and restore feeder bluffs.



KCIT-DCE VC folder: 2010\_10202w\_NS-27.ai GIS file Q:\2009\WRIA9\_ProjectMaps.mxd



## Tier 2 Project: NS-31

# Discovery Park Feeder Bluff Protection and Restoration

### PROJECT FACTS

**Subwatershed:**

Nearshore

**Nearshore**

**jurisdiction:**

Nearshore KI - 3 - 2

**Bankside**

**jurisdiction:**

City of Seattle

**Project sponsor:**

Seattle Parks

and Recreation

**Budget:**

TBD

### PROJECT TYPE:



Acquisition

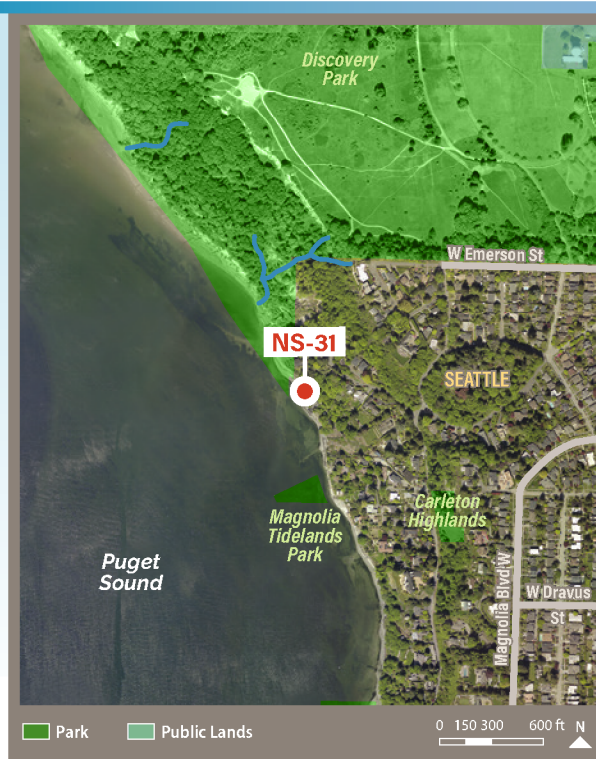


Restoration

### KEY HABITAT:



Nearshore  
Feeder Bluff



KCIT-DCE VC folder: 2010\_10202w\_NS-31.ai GIS file Q:\2009\WRIA9\_ProjectMaps.mxd

### PROJECT DESCRIPTION:

Acquire remaining properties, remove bulkheads, and restore feeder bluffs.

## Tier 2 Project: NS-44

# Portage Salt Marsh Restoration Project

### PROJECT FACTS

**Subwatershed:**

Nearshore

**Nearshore**

**jurisdiction:**

Nearshore KI - 13 - 6

**Bankside**

**jurisdiction:**

King County

**Project sponsor:**

King County

**Budget:**

\$2,000,000

### PROJECT TYPE:



Acquisition



Restoration

### KEY HABITAT:



Nearshore  
Feeder Bluff



Riparian



KCIT-DCE VC folder: 2010\_10202w\_NS-44.ai GIS file Q:\2009\WRIA9\_ProjectMaps.mxd

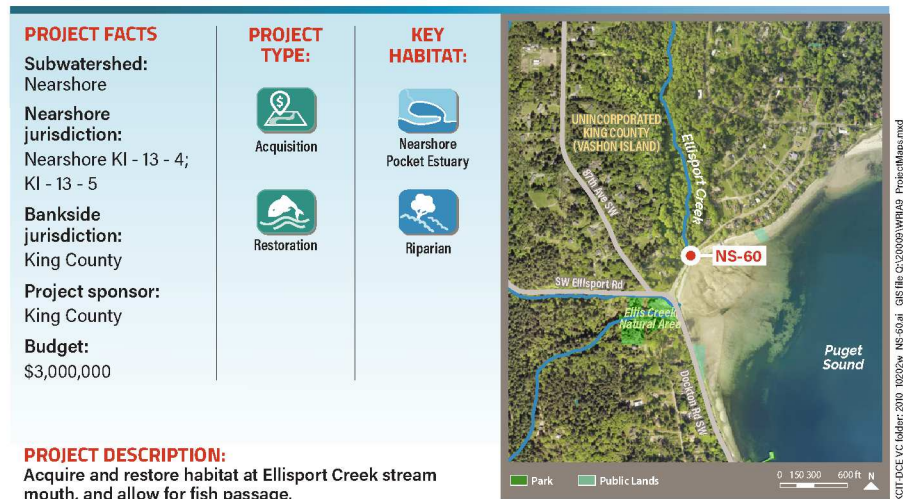
### PROJECT DESCRIPTION:

Install bridge or box culverts, restore fish access, and restore habitat to salt marsh.



## Tier 2 Project: NS-60

### Ellisport Creek Mouth Restoration



## Tier 2 Project: NS-67

### Des Moines Creek Estuary Restoration



Table 3.

### Marine Nearshore Subwatershed Tier 3 Projects

Project No.	Project Name	Project Type	Project Description	Sponsor	River mile and Bank side/Nearshore jurisdiction	Primary Strategy (pick 1)	Jurisdiction	Goal alignment
NS-2	Myrtle Edwards Park Pocket Beach Shallow Water Habitat	<ul style="list-style-type: none"> <li>Planning/Design</li> <li>Restoration</li> <li>Scoping/Reconnaissance</li> </ul>	Remove shoreline armor and restore natural beach adjacent to a previously created pocket beach.	Seattle Parks and Recreation	Nearshore KI - 4 - 1 - NAD	Protect, restore and enhance marine shorelines	City of Seattle	<ul style="list-style-type: none"> <li>Marine riparian vegetation</li> <li>Shoreline armor</li> </ul>
NS-16	Dash Point State Park Estuary Restoration and Water Quality Improvements	<ul style="list-style-type: none"> <li>Restoration</li> <li>Scoping/Reconnaissance</li> </ul>	Project will remove armoring to restore estuary and re-align creek to more sinuous route. Improve water quality in park through parking lot improvements, reduce erosion associated with stormwater runoff, creosote-treated pedestrian bridge replacement, and wetland enhancement.	Washington State Parks & Recreation	Nearshore KI - MA - 014	Protect, restore and enhance marine shorelines	City of Federal Way	<ul style="list-style-type: none"> <li>LG- Off-channel habitat</li> </ul>
NS-22	Smith Cove Shallow Water Rehabilitation	Planning/Design	Remove some level of shoreline armor and plant native vegetation along a stretch of barren riprap. The riprap leads to a protected sandy pocket beach that exists at all tidal elevations. There may be additional opportunity for nearshore restoration on adjacent Port property. The Port also has a marine habitat restoration pilot site adjacent to this project.	Seattle Parks and Recreation	Nearshore KI - 3 -2/3 - 3 - NAD, KI - 3 - 3	Protect, restore and enhance marine shorelines	City of Seattle	<ul style="list-style-type: none"> <li>Marine riparian vegetation</li> <li>Shoreline armor</li> </ul>
NS-35	Lower Shinglemill Creek Habitat Restoration	Restoration	Add LWD into stream reach west of Cedarhurst Road.	King County	Nearshore KI - 11 - 4	Protect, restore and enhance marine shorelines	Vashon/Maury	<ul style="list-style-type: none"> <li>Marine riparian vegetation</li> <li>Shoreline conservation</li> </ul>

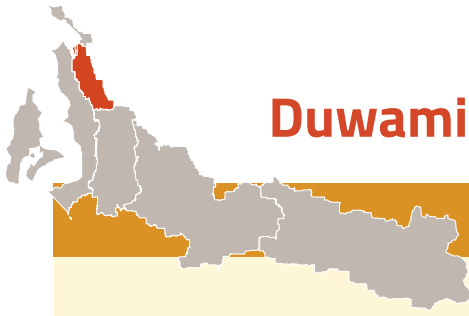
(continued on next page)



**Table 3.**  
**Marine Nearshore Subwatershed Tier 3 Projects, continued**

Project No.	Project Name	Project Type	Project Description		Sponsor	River mile and Bank side/Nearshore jurisdiction	Primary Strategy (pick 1)	Jurisdiction	Goal alignment
NS-39	Walker Creek Headwaters Land Acquisition	<ul style="list-style-type: none"> <li>• Enhancement/Planting</li> <li>• Restoration &amp; Acquisition</li> <li>• Scoping/Reconnaissance</li> </ul>	The project plan is to seek partnership or acquisition opportunities with the property owners within the project area, with the goal of acquiring and restoring additional contiguous areas beyond the current city-owned wetland parcels within the project site.		City of Burien	Nearshore KI - 7 - 3	Protect, restore and enhance marine shorelines	City of Burien	Shoreline conservation
NS-40	Salmon Creek Fish Barrier Removal	<ul style="list-style-type: none"> <li>• Planning/Design</li> <li>• Restoration</li> </ul>	The project plan is to seek a partnership or acquisition opportunities with the property owners within the project area, with the goals of removing the fish-barrier weir at the mouth of the creek, and removing and replacing a culvert with a modern fish passable one.		City of Burien	Nearshore KI - 5 - 1	Protect, restore and enhance marine shorelines	City of Burien	<ul style="list-style-type: none"> <li>• Marine riparian vegetation</li> <li>• Shoreline armor</li> <li>• Shoreline conservation</li> </ul>
NS-42	Miller Creek Regional Detention Facility	Planning/Design	The project plan is to identify one or more large commercial properties in Burien that have no existing stormwater treatment or flow control, and partner with them to construct regional stormwater facilities on their site(s).		City of Burien	Nearshore KI - 7 - 3	Protect, restore and enhance sediment and water quality	City of Burien	Shoreline conservation
NS-54	West Galer Street/32nd St. Boat Ramp Shoreline Armor Removal and Restoration	<ul style="list-style-type: none"> <li>• Planning/Design</li> <li>• Restoration</li> <li>• Scoping/Reconnaissance</li> </ul>	Remove/reduce shoreline armoring, remove fill, relocate an SPU-owned pump station if feasible, and re-vegetate shoreline. Potential acquisition of adjacent properties.		Seattle Public Utilities	Nearshore KI - 3 - 2	Protect, restore and enhance marine shorelines	City of Seattle	Shoreline armor
NS-58	Tsugwalla Creek Pocket Estuary Restoration Project	Restoration & Acquisition	Restore fish passage and salt marsh habitat at mouth of creek.		King County	Nearshore KI - 13 - 15 / KI - 13 - 14	Protect, restore and enhance marine shorelines	Vashon/Maury	<ul style="list-style-type: none"> <li>• Marine riparian vegetation</li> <li>• Shoreline armor</li> <li>• Shoreline conservation</li> </ul>
NS-59	Mileta Armor Removal and shoreline restoration	Restoration	Remove shoreline armoring, evaluate and improve fish passage.		King County	Nearshore KI - 13 - 10	Protect, restore and enhance marine shorelines	Vashon/Maury	<ul style="list-style-type: none"> <li>• Marine riparian vegetation</li> <li>• Shoreline armor</li> <li>• Shoreline conservation</li> </ul>
NS-68	Longfellow Creek Fish Passage and Floodplain Restoration	<ul style="list-style-type: none"> <li>• Acquisition</li> <li>• Planning/Design</li> <li>• Restoration</li> <li>• Restoration &amp; Acquisition</li> <li>• Scoping/Reconnaissance</li> </ul>	This project will evaluate restoration opportunities at five sites along a 1.7-mile section of Longfellow Creek. Future restoration may include: floodplain reconnection, fish passage improvements (culvert replacements or daylighting), stream channel realignment, stream channel and riparian restoration, wetland creation and/or enhancement.		Seattle Public Utilities	RM 0 / left bank	Protect, restore, and enhance riparian corridors	City of Seattle	DUW - Riparian forest
NS-70	Fauntleroy Creek Fish Passage	<ul style="list-style-type: none"> <li>• Acquisition</li> <li>• Planning/Design</li> <li>• Restoration</li> <li>• Restoration &amp; Acquisition</li> </ul>	Replace two aging fish passage barrier culverts with new culverts that meet fish passage standards. Includes partial daylighting and stream channel restoration.		Seattle Public Utilities	Nearshore / KI - 5 - 1	Restore and improve fish passage	City of Seattle	<ul style="list-style-type: none"> <li>• Marine riparian vegetation</li> <li>• Shoreline armor</li> </ul>
NS-72	Perkins Lane Protection and Restoration Project/Perkins Lane Utility Access Road	<ul style="list-style-type: none"> <li>• Planning/Design</li> <li>• Restoration</li> <li>• Scoping/Reconnaissance</li> </ul>	Assess feasibility of modifying the utility service road and sewer access points in order to remove shoreline armor and restore to a natural beach.		Seattle Public Utilities	Nearshore KI - 3 - 2	Protect, restore and enhance marine shorelines	City of Seattle	<ul style="list-style-type: none"> <li>• Marine riparian vegetation</li> <li>• Shoreline armor</li> <li>• Shoreline conservation</li> </ul>
NS-73	Beall Creek Salmon Habitat Project	Restoration	Replace current surface water extraction system with a fish friendly system to allow for the return of salmon and other salmonids		Water District 19	2923039086/Water District 19	Protect, restore and enhance marine shorelines	Water District 19	<ul style="list-style-type: none"> <li>• Marine riparian vegetation</li> <li>• Shoreline armor</li> <li>• Shoreline conservation</li> </ul>





# Duwamish Estuary Subwatershed

19  
projects

## Tier 1 (Score 18+) 8 projects

DUW-2.....Rendering Plant  
 DUW-7 .....Chinook Wind  
 DUW-7a....Chinook Wind - Extension  
 DUW-25...Desimone Oxbow Restoration  
 DUW-29...Seattle City Light North/Hamm Creek  
 DUW-32...Duwamish River People's Park & Shoreline Habitat (Terminal 117)  
 DUW-64...U-Haul River Project  
 DUW-66...Terminal 25 South

## Tier 2 (Score 7-18) 9 projects

DUW-3.....SeattleLA Freight Revetment Setback  
 DUW-18 ....Codiga Off-channel Habitat Expansion  
 DUW-22 ...Cecil Moses  
 DUW-24 ...Carrossino Restoration  
 DUW-26 ...S104th St. Bank Stabilization/Restoration  
 DUW-60...Herring's House Park Fish Access Improvement  
 DUW-61 ....George Long  
 DUW-63...S. 115th St. Road Setback  
 DUW-67.....Codiga to TCC Corridor

## Tier 3 (Score <7) 2 projects

DUW-14 ....Duwamish Waterway Park  
 DUW-19 ....Southgate Creek Restoration









# Tier 1 Project: DUW-2 Rendering Plant

Green / Duwamish &  
Central Puget Sound



## PROJECT AREA MAP



## LOCATION MAP



## PROJECT FACTS

**Subwatershed:**  
Duwamish (DUW)

**River mile:**  
Duwamish RM 10.1 - 9.7/  
right bank

**Bankside jurisdiction:**  
City of Tukwila

**Project sponsor:**  
City of Tukwila

**Budget:** \$9,730,000

## PROJECT DESCRIPTION:

Acquire and restore  
seven + acres with side  
channel and backwater  
habitat enhancements and  
reforestation.

## PROJECT TYPE:



Planning/  
Design



Scoping/  
Reconnaissance



Acquisition



Restoration

## KEY HABITAT:



Backwater



Edge



Duwamish  
Mudflat



Duwamish  
Marsh



Floodplain



Riparian



Side Channel

## Primary strategy

Protect, restore, and enhance channel complexity and  
edge habitat.

## Benefits:

- Increased rearing habitat
- Sediment quality improvement

## Contribution to goals metrics:

- DUW - Riparian forest
- DUW - Shallow water habitat

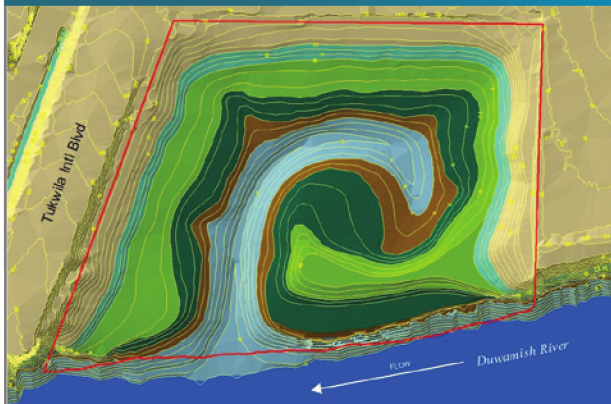
Project Area Map: Ortho2019KCNAT aerial photo Site photo: Google Earth, 2020  
KCIT-DCE file: 2010\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





# Tier 1 Project: DUW-7 Chinook Wind

Green / Duwamish &  
Central Puget Sound



PROJECT AREA MAP



■ Park ■ Public lands ■ Incorp. Area Boundary

0 200 400 600 ft N

LOCATION MAP



■ WRIA 9 ■ Incorporated Area

0 5 10 Miles

## PROJECT FACTS

**Subwatershed:**  
Duwamish (DUW)

**River mile:**  
Duwamish RM 6.7/  
right bank

**Bankside jurisdiction:**  
City of Tukwila

**Project sponsor:**  
King County

**Budget:** \$14,900,000

## PROJECT TYPE:



Acquisition



Restoration

## KEY HABITAT:



Duwamish  
Mudflat



Duwamish  
Marsh



Riparian

## PROJECT DESCRIPTION:

Expand and enhance low velocity, shallow water rearing habitat (shallow subtidal and intertidal) in the Duwamish transition zone.

## Primary strategy

Protect, restore, and enhance channel complexity and edge habitat.

## Benefits:

- Increased habitat connectivity
- Sediment quality improvement

## Contribution to goals metrics:

- DUW - Riparian forest
- DUW - Shallow water habitat

Project Area Map: Ortho2019KCNAT aerial photo  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





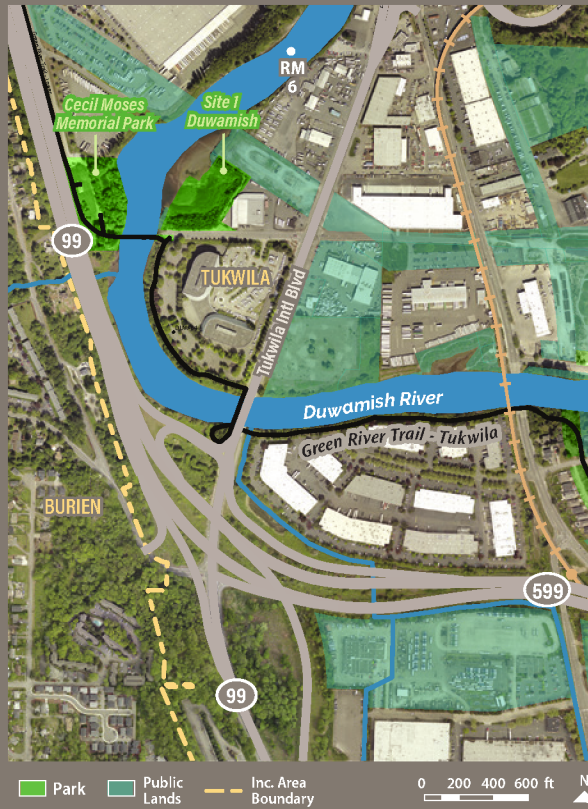
## Tier 1 Project: DUW-7a

# Chinook Wind Extension

Green / Duwamish &  
Central Puget Sound



### PROJECT AREA MAP



### LOCATION MAP



### PROJECT FACTS

**Subwatershed:**  
Duwamish (DUW)

**River mile:**  
Duwamish RM 6.8/  
right bank

**Bankside jurisdiction:**  
City of Tukwila

**Project sponsor:**  
City of Tukwila

**Budget:** \$1,418,000

### PROJECT TYPE:



Acquisition



Restoration



Planning/  
Design

### KEY HABITAT:



Duwamish  
Mudflat



Duwamish  
Marsh



Edge



Riparian

### PROJECT DESCRIPTION:

Expand and enhance the land between Chinook Wind Mitigation and Duwamish Gardens to create a unified park and rest.

### Primary strategy

Protect, restore, and enhance channel complexity and edge habitat.

### Benefits:

- Increased habitat connectivity
- Recreation opportunities
- Sediment quality improvement

### Contribution to goals metrics:

- DUW - Riparian forest
- DUW - Shallow water habitat

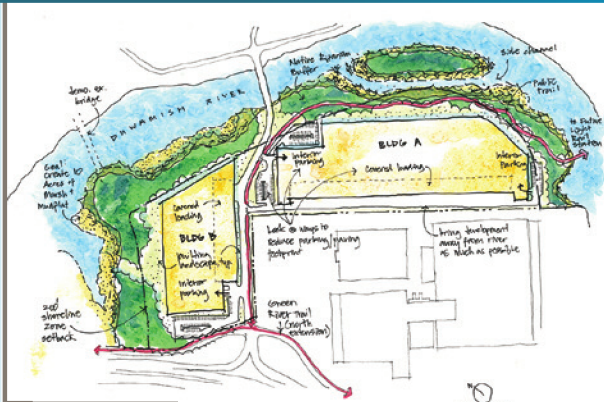
Project Area Map: Ortho2019KCNAT aerial photo  
KCIT-DCE file: 2010\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





# Tier 1 Project: DUW-25 Desimone Oxbow Restoration

Green / Duwamish &  
Central Puget Sound



PROJECT AREA MAP



LOCATION MAP



## PROJECT FACTS

**Subwatershed:**  
Duwamish (DUW)

**River mile:**  
Duwamish RM 6.5 -  
5.3/left bank

**Bankside  
jurisdiction:**  
City of Tukwila

**Project sponsor:**  
Unknown

**Budget:** \$84,193,945

## PROJECT TYPE:



Enhancement/  
Planting



Planning/  
Design



Restoration



Acquisition

## KEY HABITAT:



Backwater



Duwamish  
Marsh



Duwamish  
Mudflat



Edge



Riparian



Side Channel

## PROJECT DESCRIPTION:

Acquire and restore 45.4-acre site located on the western shore of the Duwamish River between river miles 5 and 6 resulting in 23.6 acres of marsh created, 10.8 acres of vegetation, and 34.4 acres refuge habitat created.

## Primary strategy

Protect, restore, and enhance channel complexity and edge habitat.

## Benefits:

- Increased rearing habitat
- Sediment quality improvement

## Contribution to goals metrics:

- DUW - Riparian forest
- DUW - Shallow water habitat
- LG - Off-channel habitat

Project Area Map: Ortho2019KCNAT aerial photo  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





## Tier 1 Project: DUW-29

# Seattle City Light North/Hamm Creek

Green / Duwamish &  
Central Puget Sound



### PROJECT AREA MAP



### LOCATION MAP



### PROJECT FACTS

**Subwatershed:**  
Duwamish (DUW)

**River mile:**  
Duwamish RM 5.0 -  
4.8/ left bank

**Bankside jurisdiction:**  
City of Seattle

**Project sponsor:**  
Seattle City Light

**Budget:**  
TBD

### PROJECT TYPE:



Restoration

### KEY HABITAT:



Backwater



Tributary



Nearshore  
Pocket Estuary

### PROJECT DESCRIPTION:

Create off channel habitat and shallow water estuarine habitat in the area north of the existing Duwamish 230 kV - 26 kV substation.

### Primary strategy

Protect, restore, and enhance channel complexity and edge habitat.

### Benefits:

- Increased rearing habitat
- Sediment quality improvement

### Contribution to goals metrics:

- DUW - Shallow water habitat

Site Photo: Wash. Dept. of Ecology Project Area Map: Ortho2019KCNAT aerial photo  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\200009\WRIA9\_ProjectMaps.mxd KLINKAT





## Tier 1 Project: DUW-32

# Duwamish River People's Park & Shoreline Habitat (Terminal 117)

Green / Duwamish & Central Puget Sound



### PROJECT AREA MAP



### LOCATION MAP



### PROJECT FACTS

**Subwatershed:**  
Duwamish (DUW)

**River mile:**  
Duwamish 4.5 - 4.1 /  
left bank

**Jurisdiction:**  
Port of Seattle

**Project sponsor:**  
Port of Seattle

**Budget:**  
TBD

### PROJECT TYPE:



Enhancement/  
Planting



Planning/  
Design



Restoration

### KEY HABITAT:



Duwamish  
Marsh



Duwamish  
Mudflat



Edge

### PROJECT DESCRIPTION:

Restore approximately 13.5 acres and 2,050 linear feet of upland and aquatic habitats. The project will expand off-channel habitat as well as establish marsh vegetation and riparian forest, restore estuarine shoreline via removal of armoring, and add large wood.

### Primary strategy

Protect, restore, and enhance channel complexity and edge habitat.

### Benefits:

- Increased habitat connectivity
- Recreation opportunities
- Sediment quality improvement

### Contribution to goals metrics:

- DUW - Shallow water habitat

Site Photo: Wash. Dept. of Ecology Project Area Map: Ortho2019KCNAT aerial photo  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT



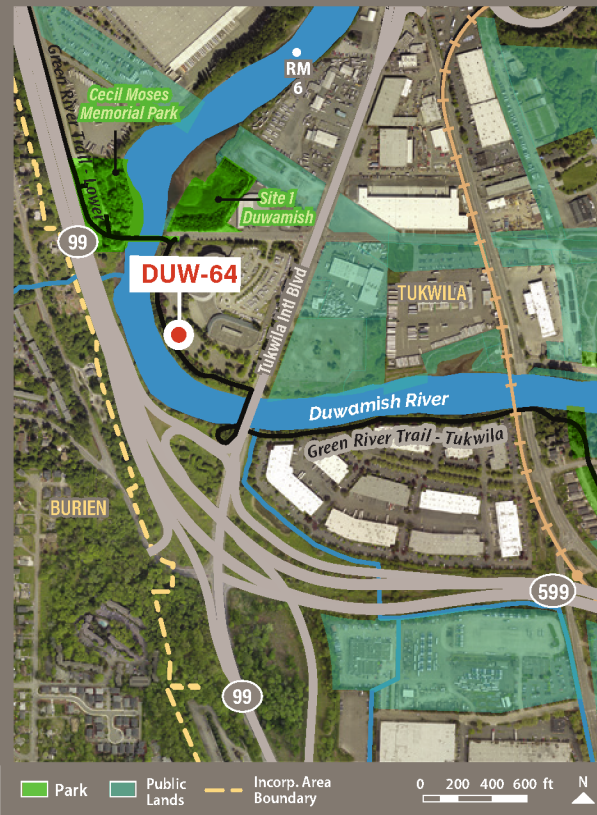


# Tier 1 Project: DUW-64 U-Haul River Project

Green / Duwamish &  
Central Puget Sound



## PROJECT AREA MAP



## LOCATION MAP



## PROJECT FACTS

**Subwatershed:**  
Duwamish (DUW)

**River mile:**  
Duwamish RM 6.5 - 6.3/  
right bank

**Bankside jurisdiction:**  
City of Tukwila

**Project sponsor:**  
City of Tukwila

**Budget:** \$11,770,000

## PROJECT TYPE:



Acquisition



Restoration



Planning/  
Design



Scoping/  
Reconnaissance

## KEY HABITAT:



Backwater



Duwamish  
Mudflat



Duwamish  
Marsh



Edge



Riparian

## PROJECT DESCRIPTION:

Acquire and restore 4.4-acre parcel by creating off-channel mudflat, marsh, and riparian habitat.

## Primary strategy

Protect, restore, and enhance channel complexity and edge habitat.

## Benefits:

- Increased rearing habitat
- Recreation opportunities
- Sediment quality improvement

## Contribution to goals metrics:

- DUW - Riparian forest
- DUW - Shallow water habitat

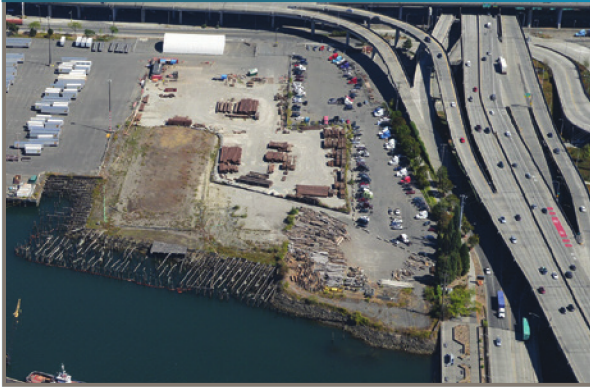
Project Area Map: Ortho2019KCNAT aerial photo Site photo: Google Earth, 2020  
KCIT-DCE file: 2010\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





# Tier 1 Project: DUW-66 Terminal 25 South

Green / Duwamish &  
Central Puget Sound



## PROJECT AREA MAP



## LOCATION MAP



## PROJECT FACTS

**Subwatershed:**  
Duwamish (DUW)

**River mile:**  
Duwamish 0.4 /  
right bank

**Jurisdiction:**  
Port of Seattle

**Project sponsor:**  
Port of Seattle

**Budget:**  
TBD

## PROJECT TYPE:



## KEY HABITAT:



## PROJECT DESCRIPTION:

Restore critically needed estuarine in the East Waterway. Project will expand off-channel habitat as well as establish marsh vegetation and riparian forest, restore estuarine shoreline via removal of armoring & creosote pile, and add large wood.

## Primary strategy

Protect, restore, and enhance channel complexity and edge habitat.

## Benefits:

- Increased rearing habitat
- Sediment quality improvement

## Contribution to goals metrics:

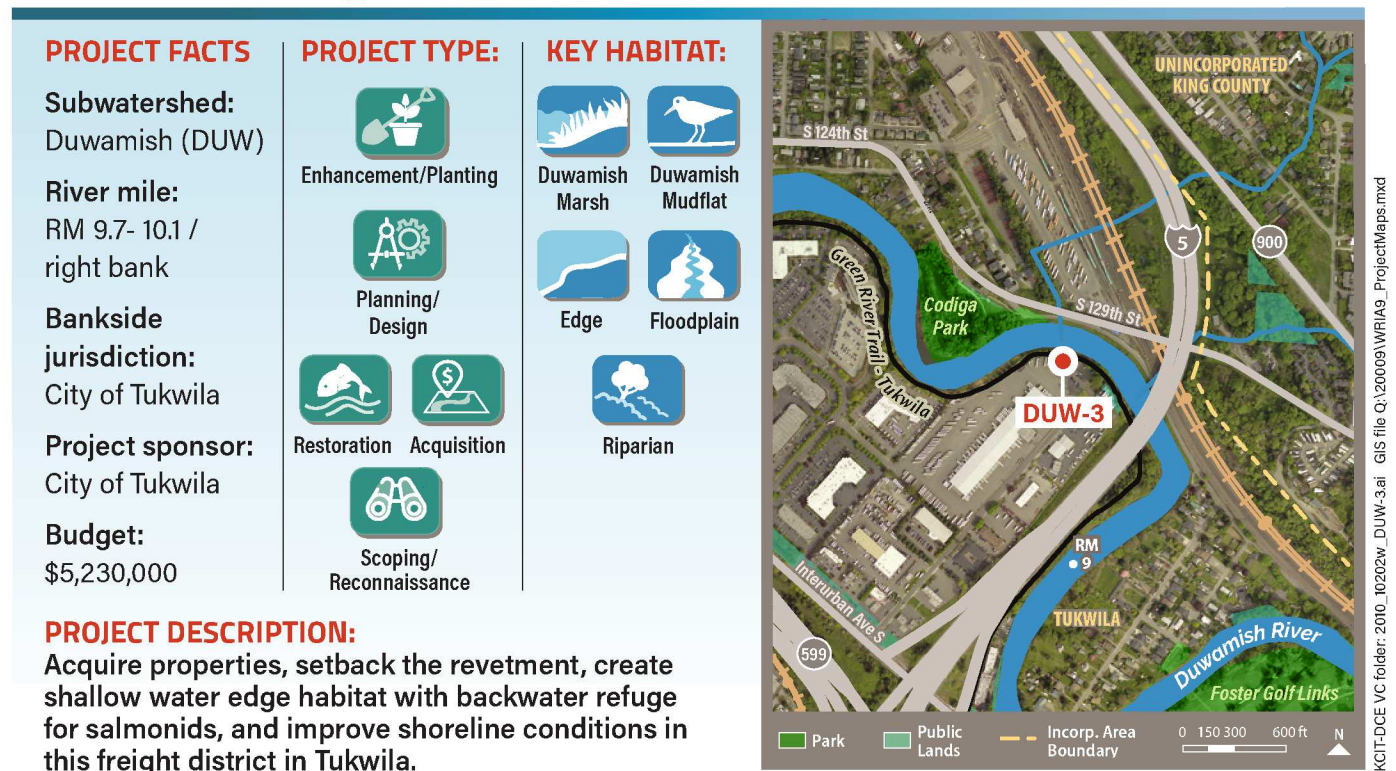
- DUW - Shallow water habitat

Project Area Map: Ortho2019KCNAT aerial photo  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT



## Tier 2 Project: DUW-3

# Seattle LA Freight Revetment Setback



## Tier 2 Project: DUW-18

# Codiga Off-channel Habitat Expansion





## Tier 2 Project: DUW-22

### Cecil Moses

#### PROJECT FACTS

Subwatershed:  
Duwamish (DUW)

River mile:  
RM 6.3 / left bank

Bankside jurisdiction:  
King County

Project sponsor:  
Seattle Parks and Recreation

Budget: \$5,000,000

#### PROJECT TYPE:



Acquisition



Restoration

#### KEY HABITAT:



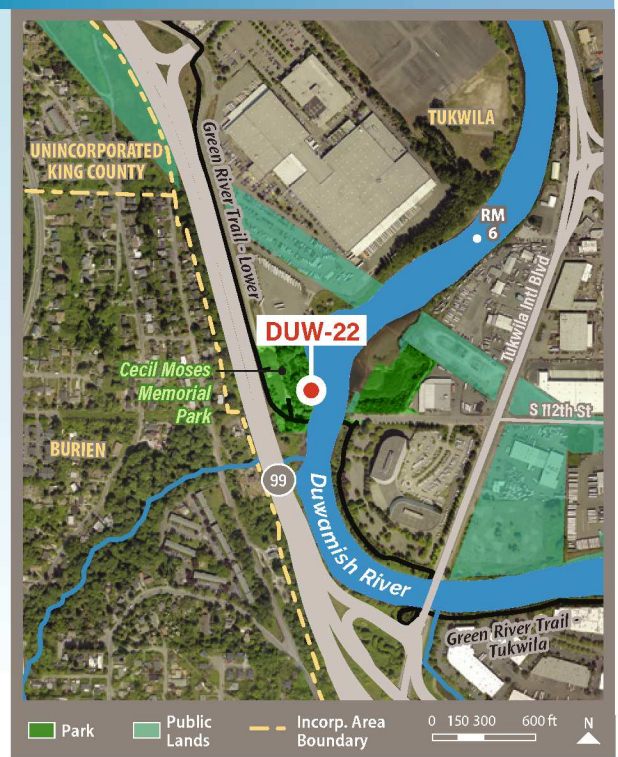
Duwamish Marsh



Duwamish Mudflat

#### PROJECT DESCRIPTION:

Enhance access to and expand existing off-channel habitat to increase quality and quantity of available rearing habitat in the transition zone by expanding existing inlet/outlet, removal of tire revetment, and potential acquisition and restoration of adjacent downstream creek parcel.



KCIT-DCE VC folder: 2010\_10202w\_DUW-22.ai GIS file Q:\20009\WRIA9\_ProjectMaps.mxd

## Tier 2 Project: DUW-24

### Carrossino Restoration

#### PROJECT FACTS

Subwatershed:  
Duwamish (DUW)

River mile:  
6 - 6.1 / right bank

Bankside jurisdiction:  
City of Tukwila

Project sponsor:  
City of Tukwila

Budget: \$16,304,000

#### PROJECT TYPE:



Enhancement/  
Planting



Planning/  
Design



Restoration



Acquisition

#### KEY HABITAT:



Backwater



Duwamish Marsh



Duwamish Mudflat



Edge



Riparian

#### PROJECT DESCRIPTION:

Acquire properties and create shallow mudflat, marsh, and backwater habitats.



KCIT-DCE VC folder: 2010\_10202w\_DUW-24.ai GIS file Q:\20009\WRIA9\_ProjectMaps.mxd



## Tier 2 Project: DUW-26

# S. 104th St. Bank Stabilization/Restoration

### PROJECT FACTS

Subwatershed:  
Duwamish (DUW)

River mile:  
5.6 / right bank

Bankside  
jurisdiction:  
City of Tukwila

Project sponsor:  
City of Tukwila

Budget: \$5,930,000

### PROJECT TYPE:



Planning/  
Design



Restoration



Acquisition



Scoping/  
Reconnaissance

### KEY HABITAT:



Backwater



Duwamish  
Marsh



Duwamish  
Mudflat



Edge



Riparian

### PROJECT DESCRIPTION:

Acquire properties, abandon and remove the road, and create shallow water edge and backwater habitat in the transition zone.



KCIT-DCE VC folder: 2010\_10202w\_DUW-26.ai GIS file Q:\2009\WRIA9\_ProjectMaps.mxd

## Tier 2 Project: DUW-60

# Herring's House Park Fish Access Improvement

### PROJECT FACTS

Subwatershed:  
Duwamish (DUW)

River mile:  
RM 1.1 / left bank

Bankside  
jurisdiction:  
City of Seattle

Project sponsor:  
Seattle Parks and  
Recreation

Budget: \$1,250,000

### PROJECT TYPE:



Planning/  
Design



Restoration

### KEY HABITAT:



Nearshore  
Pocket Estuary



Riparian



Side Channel

### PROJECT DESCRIPTION:

Adaptively manage an older restoration project to increase fish use by expanding channel opening width, removing shoreline armor and considering a bridge over the channel for recreational access.



KCIT-DCE VC folder: 2010\_10202w\_DUW-60.ai GIS file Q:\2009\WRIA9\_ProjectMaps.mxd



## Tier 2 Project: DUW-61

### George Long

#### PROJECT FACTS

**Subwatershed:**  
Duwamish (DUW)

**River mile:**  
10.4 / left bank

**Bankside jurisdiction:**  
City of Tukwila

**Project sponsor:**  
City of Tukwila

**Budget:** \$9,500,000

#### PROJECT TYPE:



Enhancement/  
Planting



Restoration



Acquisition



Scoping/  
Reconnaissance

#### KEY HABITAT:



Backwater



Duwamish  
Marsh



Duwamish  
Mudflat



Edge



Riparian

#### PROJECT DESCRIPTION:

Create backwater refuge and riparian habitat at the uppermost limit of the transition zone.



KCIT-DCE VC folder: 2010\_10202w\_DUW-61.ai GIS file Q:\20009\WRIA9\_ProjectMaps.mxd

## Tier 2 Project: DUW-63

### S. 115th St. Road Setback

#### PROJECT FACTS

**Subwatershed:**  
Duwamish (DUW)

**River mile:**  
RM 7 / right bank

**Bankside jurisdiction:**  
City of Tukwila

**Project sponsor:**  
City of Tukwila

**Budget:**  
\$4,699,000

#### PROJECT TYPE:



Restoration



Scoping/  
Reconnaissance

#### KEY HABITAT:



Duwamish  
Marsh



Edge



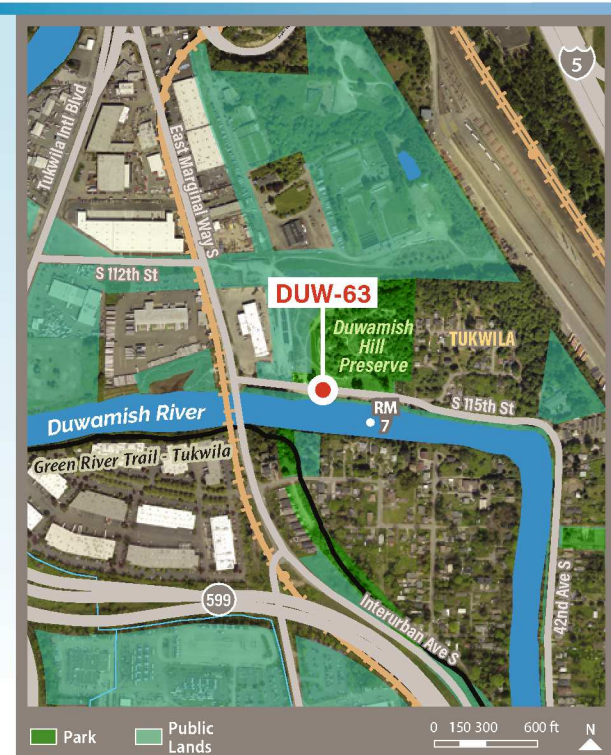
Duwamish  
Mudflat



Side Channel

#### PROJECT DESCRIPTION:

Relocate local road and create shallow water edge, backwater mudflat, marsh, and riparian habitat as part of the Duwamish Hill Preserve Master Plan.



KCIT-DCE VC folder: 2010\_10202w\_DUW-63.ai GIS file Q:\20009\WRIA9\_ProjectMaps.mxd



Tier 2 Project: DUW-67  
Codiga to TCC Corridor

**PROJECT FACTS**

Subwatershed:  
Duwamish (DUW)

River mile:  
RM 8.1-8.3/  
right bank

Bankside  
jurisdiction:  
City of Tukwila

Project sponsor:  
City of Tukwila

Budget:  
\$12,525,000

**PROJECT DESCRIPTION:**  
Acquire properties to create a public greenbelt and shallow water and riparian habitat extending from Codiga Park to the Tukwila Community Center.

**PROJECT TYPE:**

Acquisition

Restoration

Education & Outreach

Enhancement/  
Planting

Planning/  
Design

Scoping/  
Recon.

**KEY HABITAT:**

Backwater

Edge

Duwamish Marsh

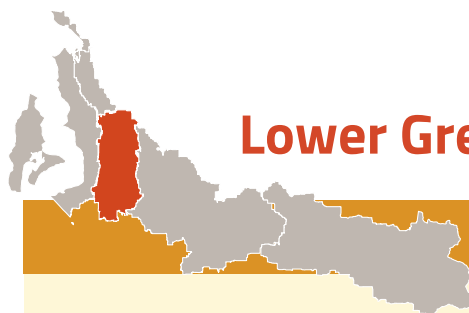
Duwamish Mudflat

Riparian

Table 4  
Duwamish Estuary Subwatershed Tier 3 Projects

Proj#	Project Name	Project Type	Project Description	Sponsor	River mile and Bank side/Nearshore jurisdiction	Primary Strategy (pick 1)	Jurisdiction	Goal Alignment
DUW-14	Duwamish Waterway Park	<ul style="list-style-type: none"><li>• Acquisition</li><li>• Planning/Design</li><li>• Restoration</li><li>• Scoping/Reconnaissance</li></ul>	Acquire adjacent properties, pull back bank armoring, revegetate, incorporate recreational uses.	Seattle Parks and Recreation	RM 3.6/left bank	Protect, restore and enhance marine shorelines;	City of Seattle	Marine riparian vegetation Shoreline armor Shoreline conservation
DUW-19	Southgate Creek Restoration	<ul style="list-style-type: none"><li>• Other</li><li>• Planning/Design</li><li>• Restoration</li><li>• Acquisition</li><li>• Scoping/Reconnaissance</li></ul>	This project would improve fish passage, water quality and floodplain/flood-control in Southgate Creek, which is piped and channelized through most of its lower reach; the confluence of the Green would be improved for off-channel, tributary Chinook use. Studies are required.	City of Tukwila	RM 7.90/left bank	Protect, restore and enhance instream flows and cold water refugia	City of Tukwila	DUW - Riparian forest DUW - Shallow water habitat





## Lower Green River Subwatershed

**45**  
projects

### Tier 1 (Score 18+) 13 projects

LG-3 ..... Horsehead Restoration Project	LG-33 ..... Midway Creek Wetland Complex
LG-6 ..... Wrecking Yards Restoration Project	LG-34 ..... Johnson Creek Floodplain Project
LG-8 ..... Lower Mill Creek Channel Restoration	LG-35 ..... P-17 Stormwater Pond Connection
LG-22 ..... Wetland Floodplain Off-Channel Habitat Reconnection	LG-39 ..... Port of Seattle Mitigation Site Floodplain Connection
LG-28 ..... North Green River Park	LG-40 ..... Downey Side Channel Restoration
LG-29 ..... North of Veteran's Drive Floodplain Reconnection	LG-42 ..... Lower Russell Road: Habitat Area A
	LG-45 ..... Teufel Off Channel Habitat Restoration

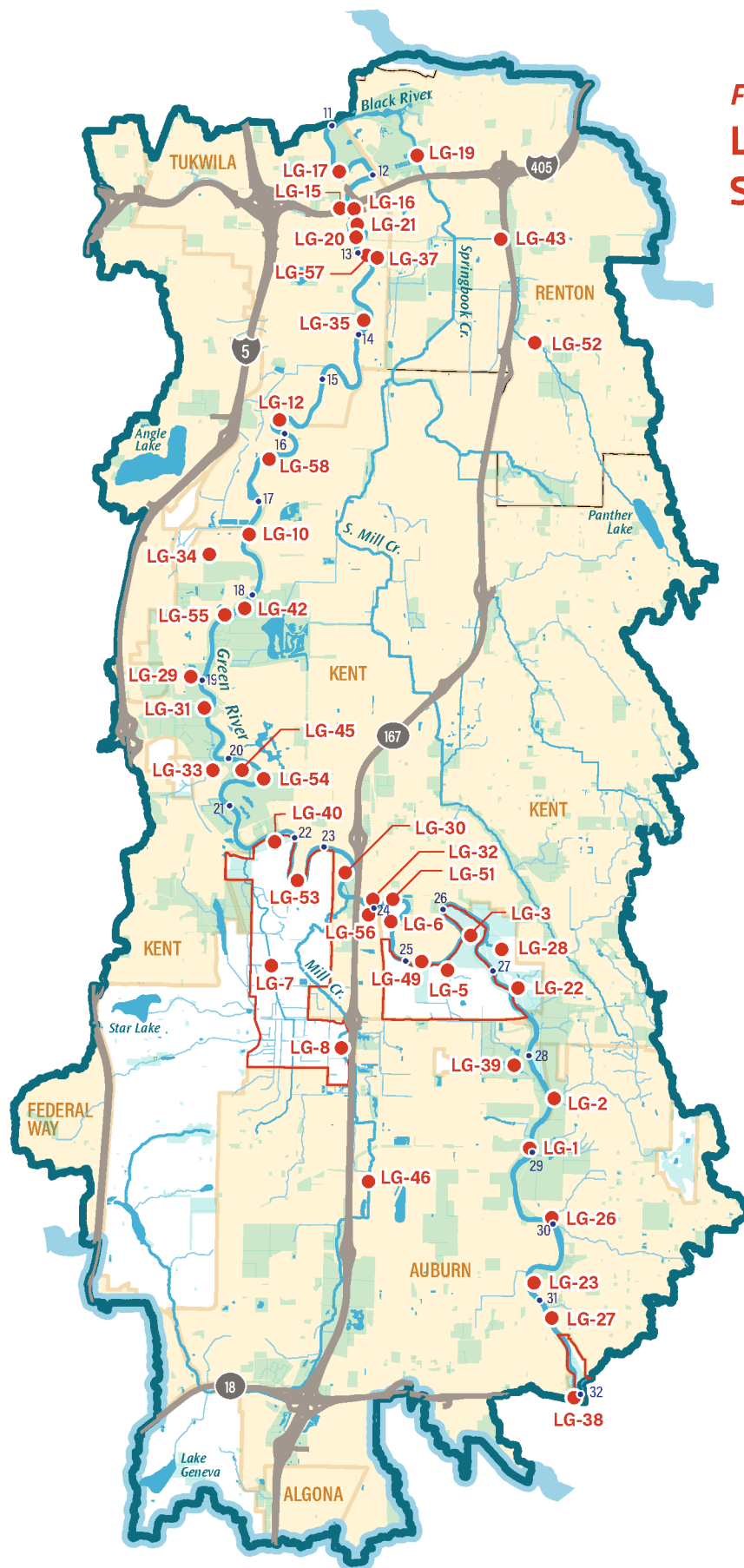
### Tier 2 (Score 7-18) 19 projects

LG-1 ..... Reddington Habitat Creation	LG-27 ..... 8th Street Acquisitions
LG-5 ..... Northeast Auburn Creek Restoration	LG-30 ..... Mill Creek to Washington Ave Bridge Acquisitions and Restoration
LG-7 ..... Mullen Slough	LG-31 ..... South of Veteran's Drive Floodplain Reconnection
LG-10 ..... Boeving Levee Setback Habitat Rehabilitation	LG-32 ..... Foster Park Floodplain Reconnection
LG-12 ..... Briscoe Park Off-channel Habitat	LG-37 ..... Strander Boulevard Off-channel Habitat Creation
LG-17 ..... Fort Dent Revetment Setback	LG-46 ..... Mill Creek Protection and restoration near Emerald Downs
LG-18 ..... Black River Marsh	LG-49 ..... Horseshoe Bend Levee Riparian Habitat Improvements
LG-19 ..... Lower Springbrook Reach Rehabilitation	LG-51 ..... Milwaukee 2 Improvements
LG-23 ..... 8th Street Bridge to 104th Ave Park Off-Channel Habitat	LG-55 ..... Frager Road Levee Setback
LG-26 ..... Valentine Revetment Setback	

### Tier 3 (Score <7) 13 projects

LG-2 ..... Olson Creek Restoration	LG-52 ..... Panther Creek at Talbot Road South Fish Passage Improvement
LG-15 ..... Nelsen Side Channel	LG-53 ..... Signature Pointe Levee Improvements
LG-16 ..... Gilliam Creek Fish Passage and Riparian Rehabilitation	LG-54 ..... SR 516 to S 231st Way Levee
LG-20 ..... Riverview Plaza Off-channel Habitat Creation	LG-56 ..... Kent Airport Levee Setback
LG-21 ..... Best Western Revetment Setback	LG-57 ..... Barnaby Truong Off-Channel Habitat Creation
LG-38 ..... Fenster Slough Wetland Connection	LG-58 ..... Briscoe Levee Riparian Habitat Improvements
LG-43 ..... Panther Creek at East Valley Road Improvement Project	





**Figure 28.**  
**Lower Green River**  
**Subwatershed Projects**

- 1 • River mile
- Project location
- River/creek
- Major road
- Urban Growth Area line
- Lower Green River Subwatershed boundary
- WRIA 9 boundary
- Open water
- Public lands
- Incorporated area



**Note:**  
 The use of the information in this map is subject to the terms and conditions found at:  
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**KCIT-DCE File:**  
 2011\_20202L\_W9SHP\_ProjMap\_LGRai LPRE

**GIS File:**  
 Q:\20009\WRIA9\_Watershed.mxd KLINKAT





Green / Duwamish &  
Central Puget Sound

## Tier 1 Project: LG-3

# Horsehead Restoration Project



### PROJECT AREA MAP



### LOCATION MAP



### PROJECT FACTS

**Subwatershed:**

Lower Green (LG)

**River mile:**

25.7 - 26.5 / left bank

**Bankside jurisdiction:**

King County

**Project sponsor:**

King County

**Budget:** \$11,100,000

### PROJECT TYPE:



Restoration

### KEY HABITAT:



Backwater



Floodplain



Edge



Riparian

### PROJECT DESCRIPTION:

Create approximately 13 acres of backwater habitat and revegetate 3,000 feet of river bank.

### Primary strategy

Protect, restore, and enhance floodplain connectivity.

### Benefits:

- Increased habitat connectivity
- Increased rearing habitat
- Water temperature reduction

### Contribution to goals metrics:

- LG - Large woody debris
- LG - Off-channel habitat
- LG - Riparian forest

Project Area Map: Ortho2019KCNAT aerial photo  
VC file: 2010\_10202L\_W9SHRPfact\_HORSEHEAD.ai GIS file Q:\20009\WRIA9\_ProjectMaps.mxd





An aerial photograph of a large outdoor car wash facility. The facility features several parallel car wash lanes with overhead brushes and water spray systems. A large parking lot adjacent to the car wash is filled with numerous cars. The entire facility is situated along a river, with a grassy bank and some trees in the foreground. In the background, there are various industrial buildings and structures.

This aerial map shows the LG-6 area in Kent, Washington. The map features the Green River Trail, Foster Park, and surrounding streets. A red dashed line indicates the Urban Growth Area Line Bndy. The map includes a legend for Park (green), Public Lands (light green), and Urban Growth Area Line Bndy (red dashed line). A scale bar indicates distances from 0 to 600 feet, and a north arrow is present.

## Wetland

Site Photo: Google Earth Project Area Map: Ortho2019KCNAT aerial photo  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9 ProjectMaps.mxd KLINKAT





## Tier 1 Project: LG-8

# Lower Mill Creek Channel Restoration

Green / Duwamish &  
Central Puget Sound



### PROJECT AREA MAP



### LOCATION MAP



### PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
RM 23.7/left bank  
(Mill Creek 0.3-2.3)

**Bankside jurisdiction:**  
King County

**Project sponsor:**  
King County

**Budget:**  
\$23,900,000

### PROJECT TYPE:



Acquisition



Restoration

### KEY HABITAT:



Tributary



Edge



Floodplain

### PROJECT DESCRIPTION:

Improve aquatic habitat by remeandering the tributary channel, revegetating, and adding large wood to the creek channel.

### Primary strategy

Protect, restore, and enhance channel complexity and edge habitat.

### Benefits:

- Increased habitat connectivity
- Increased rearing habitat
- Water temperature reduction

### Contribution to goals metrics:

- LG - Large woody debris
- LG - Riparian forest

Project Area Map: Ortho2019KCNAT aerial photo  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





## Tier 1 Project: LG-22

# Wetland Floodplain Off-channel Habitat Reconnection

Green / Duwamish &  
Central Puget Sound



### PROJECT AREA MAP



### LOCATION MAP



### PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
27.2 - 27.6 /  
right bank

**Jurisdiction:**  
King County

**Project sponsor:**  
King County

**Budget:**  
\$1,165,000

### PROJECT TYPE:



Acquisition



Restoration

### KEY HABITAT:



Edge



Floodplain



Riparian



Side channel



Tributary



Wetland

### PROJECT DESCRIPTION:

Acquire and restore approximately 30 acres of floodplain wetlands and provide access to 2,000 feet of non-natal tributary rearing habitat. Project would address an existing fish barrier at the mouth of the creek and setback 1,800 feet of Green River Road. Project design will need to consider future location of the Green River Trail.

### Primary strategy

Protect, restore, and enhance floodplain connectivity.

### Benefits:

- Habitat preservation
- Increased habitat connectivity
- Increased rearing habitat

### Contribution to goals metrics:

- LG - Off-channel habitat
- LG - Riparian forest

Site Photo: Google Earth Project Area Map: Ortho2019KCNAT aerial photo  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





## Tier 1 Project: LG-28

# North Green River Park

Green / Duwamish &  
Central Puget Sound



### PROJECT AREA MAP



### LOCATION MAP



### PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
26.5 - 27.3 /  
right bank

**Jurisdiction:**  
King County

**Project sponsor:**  
King County

**Budget:**  
\$17,100,000

### PROJECT TYPE:



Acquisition



Restoration

### KEY HABITAT:



Backwater



Edge



Floodplain



Riparian



Side channel



Tributary



Wetland

### PROJECT DESCRIPTION:

Restore floodplain habitat by removing revetments, restoring reconnecting floodplain wetland, creating side channels and backwater features, and integrating stream channel from the adjacent project (LG-22). Project design will need to preserve or relocate important regional recreational amenities (i.e., soccer fields and Green River access).

### Primary strategy

Protect, restore and enhance floodplain connectivity.

### Benefits:

- Flood risk reduction
- Increased habitat connectivity
- Increased rearing habitat

### Contribution to goals metrics:

- LG - Bank armor
- LG - Off-channel habitat

Site Photo: Google Earth Project Area Map: Ortho2019KCNAT aerial photo  
KOIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





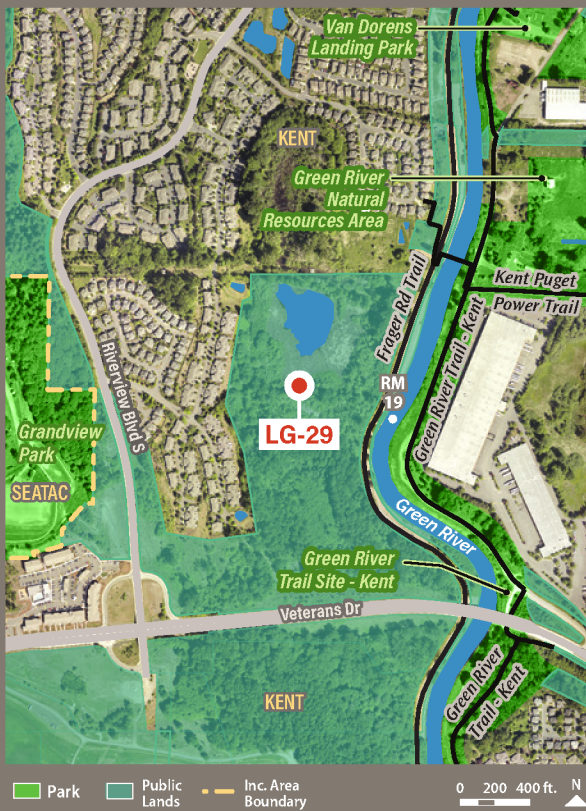
## Tier 1 Project: LG-29

# North of Veterans Drive Floodplain

Green / Duwamish &  
Central Puget Sound



### PROJECT AREA MAP



### LOCATION MAP



### PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
RM 18.9 - 19.2/  
left bank

**Bankside jurisdiction:**  
City of Kent

**Project sponsor:**  
City of Kent

**Budget:**  
TBD

### PROJECT TYPE:



Enhancement/  
Planting



Planning/  
Design



Restoration

### KEY HABITAT:



Floodplain



Riparian



Wetland

### PROJECT DESCRIPTION:

Reconnect floodplain wetland to river, improve wetland area, while preserving Frager Road Trail's connection to the Green River.

### Primary strategy

Protect, restore and enhance floodplain connectivity.

### Benefits:

- Increased habitat connectivity
- Increased rearing habitat
- Recreation opportunities

### Contribution to goals metrics:

- LG - Off-channel habitat

Project Area Map: Ortho2019KCNAT aerial photo  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





## Tier 1 Project: LG-33

# Midway Creek Wetland Complex

Green / Duwamish &  
Central Puget Sound



### PROJECT AREA MAP



### LOCATION MAP



### PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
RM 19.6 - 21.1/  
left bank

**Bankside jurisdiction:**  
City of Kent

**Project sponsor:**  
City of Kent

**Budget:**  
TBD

### PROJECT TYPE:



Acquisition



Enhancement/  
Planting



Planning/  
Design



Monitoring &  
Assessment



Restoration



Scoping/  
Reconnaissance

### KEY HABITAT:



Backwater



Floodplain



Riparian



Side channel



Wetland

### PROJECT DESCRIPTION:

Restore Midway Creek and floodplain wetland complex by removing wetland fill and improving fish passage to enhance connectivity between the Midway Creek and the Green River. Project design should maintain/enhance regional trail connectivity.

### Primary strategy

Protect, restore and enhance floodplain connectivity.

### Benefits:

- Increased habitat connectivity
- Increased rearing habitat
- Water temperature reduction

### Contribution to goals metrics:

- LG - Off-channel habitat
- LG - Riparian forest

Project Area Map: Ortho2019KCNAT aerial photo  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





# Johnson Creek Floodplain

Green / Duwamish &  
Central Puget Sound



## PROJECT AREA MAP



■ Park
 ■ Public Lands
 --- Inc. Area Boundary

0 200 400 ft. N

## LOCATION MAP



■ WRIA 9
 ■ Incorporated Area

0 5 10 Miles N

## PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
RM 17.2 - 17.8/  
left bank

**Bankside jurisdiction:**  
City of Kent

**Project sponsor:**  
City of Kent

**Budget:**  
TBD

## PROJECT TYPE:



Education  
& Outreach



Enhancement/  
Planting



Monitoring &  
Assessment



Planning/  
Design



Restoration

## KEY HABITAT:



Floodplain



Riparian



Tributary

## PROJECT DESCRIPTION:

Acquire properties, setback road and trail, reconnect floodplain, and create off-channel habitat to improve water quality and increase fish access.

## Primary strategy

Protect, restore and enhance floodplain connectivity.

## Benefits:

- Flood risk reduction
- Increased habitat connectivity
- Increased rearing habitat

## Contribution to goals metrics:

- LG - Off-channel habitat
- LG - Riparian forest

Project Area Map: Ortho2019KCNAT aerial photo  
KCIT-DCE file: 2011\_10202L\_LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT

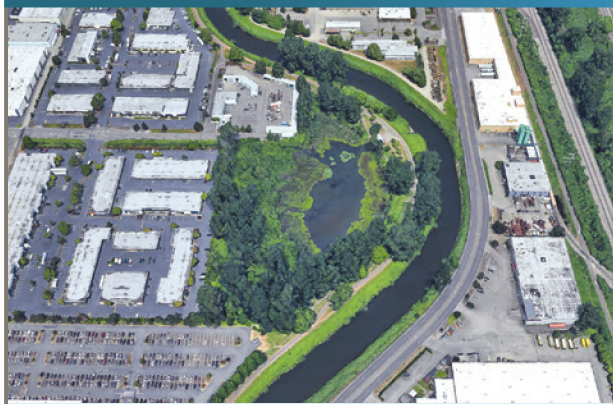




Tier 1 Project: LG-35

# P-17 Pond Connection Reconnection

Green / Duwamish &  
Central Puget Sound



PROJECT AREA MAP



LOCATION MAP



## PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
RM 13.7- 13.9/  
left bank

**Bankside jurisdiction:**  
City of Tukwila

**Project sponsor:**  
City of Tukwila

**Budget:**  
\$37,000,000

## PROJECT TYPE:



Acquisition



Restoration



Planning/  
Design



Scoping/  
Reconnaissance

## KEY HABITAT:



Floodplain



Riparian



Side channel

## PROJECT DESCRIPTION:

Relocate the City of Tukwila's stormwater pond; clean and connect the existing pond to the river, setback the levee to create up to 7 acres of off channel habitat.

## Primary strategy

Protect, restore and enhance floodplain connectivity.

## Benefits:

- Flood risk reduction
- Increased habitat connectivity
- Increased rearing habitat

## Contribution to goals metrics:

- LG - Off-channel habitat

Project Area Map: Ortho2019KCNAT aerial photo Site photo: Google Earth  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





## Tier 1 Project: LG-39

# Port of Seattle Mitigation Site Floodplain Connection

Green / Duwamish &  
Central Puget Sound



### PROJECT AREA MAP



### LOCATION MAP



### PROJECT FACTS

#### Subwatershed:

Lower Green (LG)

#### River mile:

27.9 - 28.2 / left bank

#### Jurisdiction:

City of Auburn

#### Project sponsor:

Port of Seattle

#### Budget:

TBD

### PROJECT TYPE:



Restoration

### KEY HABITAT:



Floodplain



Riparian



Backwater



Wetland

### PROJECT DESCRIPTION:

Connect the Port of Seattle's existing wetland mitigation site with the 100-year floodplain. Within the ~78 acres of reconnected floodplain, approximately 11 acres would be available as regularly inundated off-channel rearing habitat for Chinook salmon. The Port also owns an adjacent 34 acre site to the west which could support restoration of additional wetland habitat and further enhance floodplain connectivity. Project Design will need to address future Green River Trail alignment around this project area.

### Primary strategy

Protect, restore and enhance floodplain connectivity.

### Benefits:

- Flood risk reduction
- Increased habitat connectivity
- Increased rearing habitat

### Contribution to goals metrics:

- LG - Off-channel habitat

Project Area Map: Ortho2019KCNAT aerial photo Site photo: Google Earth  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





Tier 1 Project: LG-40

# Downey Side Channel Restoration

Green / Duwamish &  
Central Puget Sound



## PROJECT AREA MAP



## LOCATION MAP



## PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
RM 21.5 - 22/  
left bank

**Bankside jurisdiction:**  
City of Kent

**Project sponsor:**  
City of Kent

**Budget:**  
\$6,800,000

## PROJECT TYPE:



Monitoring &  
Assessment



Restoration

## KEY HABITAT:



Side channel

## PROJECT DESCRIPTION:

Create network of side channels to provide rearing habitat and increase flood storage capacity, add large wood to create habitat complexity, cover and refuge, and lower peak flood elevations during 100-year flood events.

## Primary strategy

Protect, restore and enhance floodplain connectivity.

## Benefits:

- Flood risk reduction
- Increased habitat connectivity
- Increased rearing habitat

## Contribution to goals metrics:

- LG - Large woody debris
- LG - Off-channel habitat
- LG - Riparian forest

Project Area Map: Ortho2019KCNAT aerial photo Site photo: Google Earth  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





## Tier 1 Project: LG-42

# Lower Russell Road: Habitat Area A

Green / Duwamish &  
Central Puget Sound



### PROJECT AREA MAP



### LOCATION MAP



### PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
RM 17.9 - 18.3/  
right bank

**Bankside jurisdiction:**  
City of Kent

**Project sponsor:**  
City of Kent

**Budget:**  
TBD

### PROJECT TYPE:



Enhancement/  
Planting



Planning/  
Design



Monitoring &  
Assessment



Restoration

### KEY HABITAT:



Edge



Floodplain



Side channel

### PROJECT DESCRIPTION:

Create off-channel habitat by grading and reshaping the bank, widening the channel, restoring channel complexity and meanders, excavating low benches, installing large wood, and planting native vegetation.

### Primary strategy

Protect, restore, and enhance floodplain connectivity.

### Benefits:

- Flood risk reduction
- Increased habitat connectivity
- Increased rearing habitat

### Contribution to goals metrics:

- LG - Large woody debris
- LG - Off-channel habitat
- LG - Riparian forest

Project Area Map: Ortho2019KCNAT aerial photo Site photo: Google Earth  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





Tier 1 Project: LG-45

# Teufel Off Channel Habitat Restoration

Green / Duwamish &  
Central Puget Sound



PROJECT AREA MAP



LOCATION MAP



## PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
20 - 20.8 /  
left bank

**Jurisdiction:**  
Kent

**Project sponsor:**  
King County Flood  
Control District

**Budget:**  
\$12,525,000 -  
\$33,975,000

## PROJECT TYPE:



Enhancement/  
Planting



Planning/  
Design



Restoration

## KEY HABITAT:



Backwater



Edge



Floodplain



Riparian



Side channel



Tributary



Upland



Wetland

## PROJECT DESCRIPTION:

Restore 36 acres by creating side channel and backwater habitat on a largely undeveloped shoreline in City of Kent.

## Primary strategy

Protect, restore, and enhance floodplain connectivity.

## Benefits:

- Flood risk reduction
- Increased habitat connectivity
- Increased rearing habitat

## Contribution to goals metrics:

- LG - Large woody debris
- LG - Off-channel habitat
- LG - Riparian forest

Project Area Map: Ortho2019KCNAT aerial photo  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT



## Tier 2 Project: LG-1

# Reddington Habitat Creation

### PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
28.6 - 28.2 /  
left bank

**Jurisdiction:**  
King County

**Project sponsor:**  
King County

**Budget:**  
TBD

### PROJECT TYPE:



Restoration

### KEY HABITAT:



Backwater



Floodplain



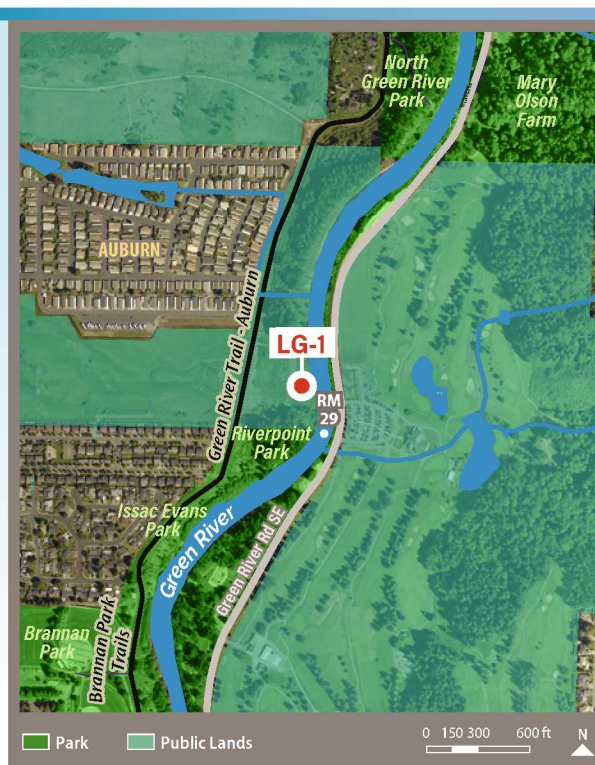
Edge



Side Channel

### PROJECT DESCRIPTION:

The previous Reddington Levee Setback project was done with a focus on flood risk reduction benefits and left two areas waterward of the levee that have room for side channel and/or backwater type habitats. This project would design and create additional habitat integrated with the existing habitat features on site.



KCIT-DCE VC folder: 2010\_10202w\_LG-1a1 GIS file Q:\2009\WRIA9\_ProjectMaps.mxd

## Tier 2 Project: LG-5

# Northeast Auburn Creek Rehabilitation

### PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
25.3 / left bank

**Jurisdiction:**  
King County

**Project sponsor:**  
King County

**Budget:**  
\$5,500,00

### PROJECT TYPE:



Restoration

### KEY HABITAT:



Edge



Floodplain



Riparian



Tributary



Wetland

### PROJECT DESCRIPTION:

Enhance floodplain and stream habitat by creating off channel rearing and high flow refuge habitat for juvenile salmon. Project will improve fish passage, which is currently partially obstructed by a flapgate at the mouth of the creek.



KCIT-DCE VC folder: 2010\_10202w\_LG-5a1 GIS file Q:\2009\WRIA9\_ProjectMaps.mxd



## Tier 2 Project: LG-7 Mullen Slough

### PROJECT FACTS

Subwatershed:  
Lower Green (LG)

River mile:  
21.5 / left bank  
(Mullen Slough  
1 - 2)

Jurisdiction:  
King County

Project sponsor:  
King County

Budget:  
\$9,600,000

### PROJECT TYPE:



Restoration



Acquisition

### KEY HABITAT:



Edge



Floodplain



Riparian



Tributary

### PROJECT DESCRIPTION:

This project would remeander and revegetate the tributary, increasing quantity and quality of aquatic habitat.



KCIT-DCE VC folder: 2010\_10202w\_LG-7.ai GIS file Q:\2009\WRIA9\_ProjectMaps.mxd

## Tier 2 Project: LG-10 Boeing Levee Setback Habitat Rehabilitation

### PROJECT FACTS

Subwatershed:  
Lower Green (LG)

River mile:  
17 - 17.8 / right bank

Jurisdiction:  
City of Kent

Project sponsor:  
City of Kent

Budget:  
TBD

### PROJECT TYPE:



Enhancement/  
Planting



Restoration



Scoping/  
Reconnaissance

### KEY HABITAT:



Edge



Floodplain



Riparian

### PROJECT DESCRIPTION:

Balance future habitat, flood protection and recreation on the site. Explore opportunities to add alcove habitat, excavate low benches and alcoves, install large wood, and plant native riparian vegetation, while maintaining/enhancing the recreational trail user experience.



KCIT-DCE VC folder: 2010\_10202w\_LG-10.ai GIS file Q:\2009\WRIA9\_ProjectMaps.mxd



## Tier 2 Project: LG-12

# Briscoe Park Off-channel Habitat

### PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
RM 15.6 - 16.1 / right bank

**Bankside jurisdiction:**  
City of Kent

**Project sponsor:**  
City of Kent

**Budget:**  
TBD

### PROJECT TYPE:

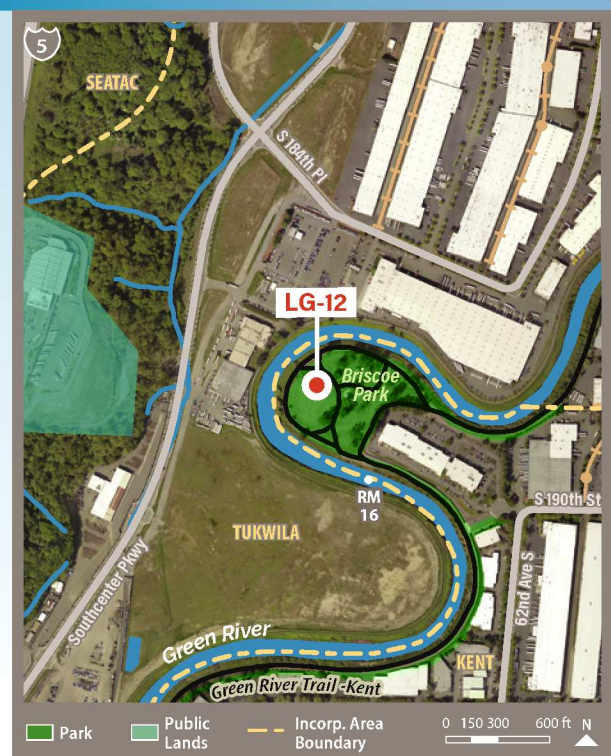


### KEY HABITAT:



### PROJECT DESCRIPTION:

Create off-channel habitat at Briscoe Park by removing bank armor, excavating perched floodplain, installing large wood, and planting riparian vegetation. Project design needs to address potential impacts to recreational amenities at Briscoe Park.



KCIT-DCE VC folder: 2010\_10202w\_LG-12.ai GIS file Q:\2009\WRIA9\_ProjectMaps.mxd

## Tier 2 Project: LG-17

# Fort Dent Revetment Setback

### PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
RM 11 - 11.8 / right bank

**Bankside jurisdiction:**  
City of Tukwila

**Project sponsor:**  
City of Tukwila

**Budget:**  
\$4,699,000

### PROJECT TYPE:

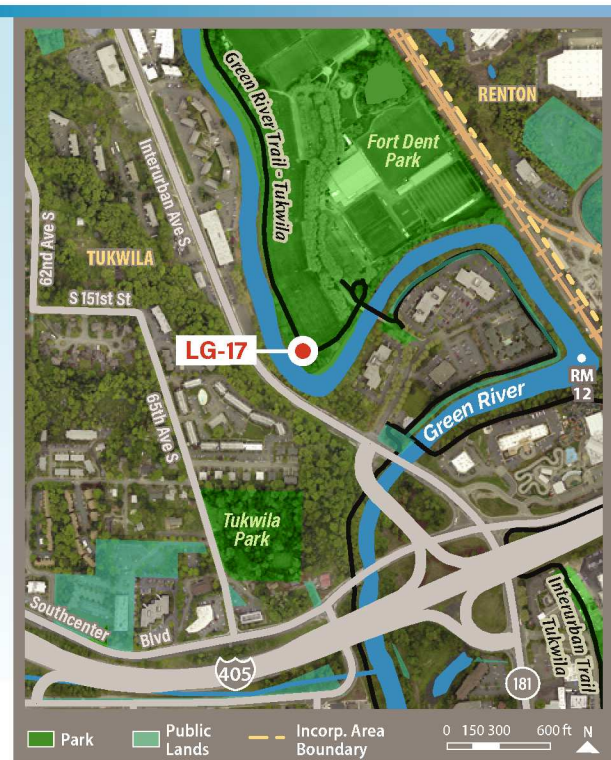


### KEY HABITAT:



### PROJECT DESCRIPTION:

Setback portions of the Fort Dent revetment to create shallow water habitat, riparian forest, and off-channel habitat.



KCIT-DCE VC folder: 2010\_10202w\_LG-17.ai GIS file Q:\2009\WRIA9\_ProjectMaps.mxd



## Tier 2 Project: LG-18

# Black River Marsh

### PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
RM 11 - 11.8 /  
right bank

**Bankside jurisdiction:**  
City of Tukwila

**Project sponsor:**  
City of Tukwila

**Budget:**  
\$4,699,000

### PROJECT TYPE:

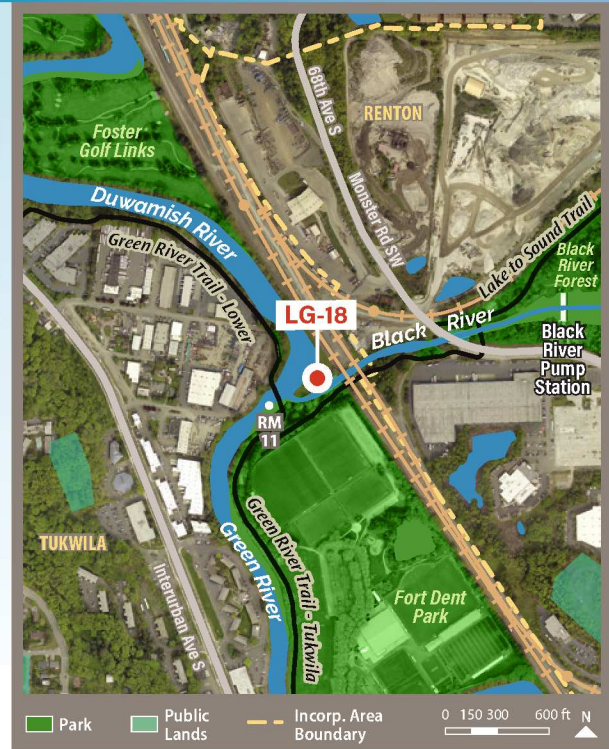


### KEY HABITAT:



### PROJECT DESCRIPTION:

Create an island at the confluence of the Black, Green, and Duwamish Rivers, and increase edge habitat, flood storage, and off-channel refuge. Revegetate the shoreline along the Black River up to the Black River Pump Station.



KCIT-DCE VC folder: 2010\_10202w\_LG-18.ai GIS file Q:\2009\WRIA9\_ProjectMaps.mxd

## Tier 2 Project: LG-19

# Lower Springbrook Reach Rehabilitation

### PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
RM 11 /  
right bank

**Bankside jurisdiction:**  
City of Renton

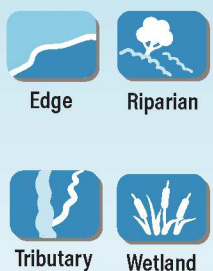
**Project sponsor:**  
City of Renton

**Budget:**  
\$20,000,000

### PROJECT TYPE:

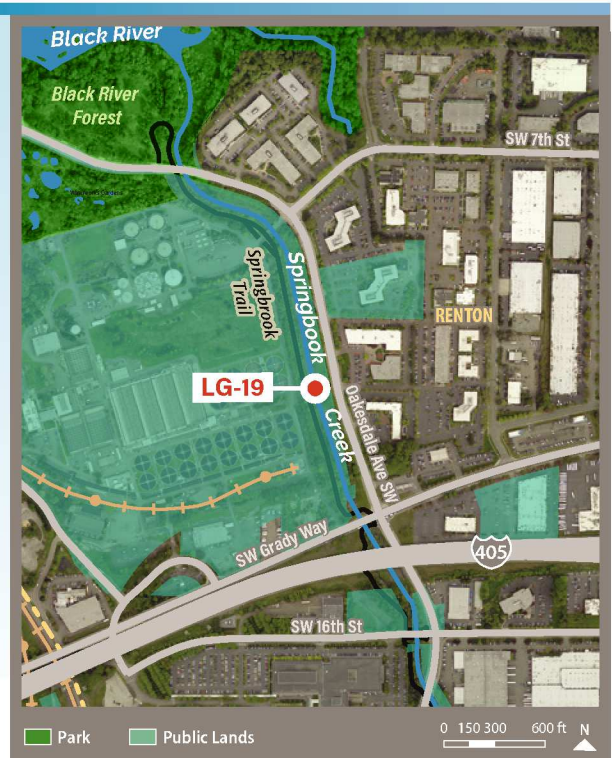


### KEY HABITAT:



### PROJECT DESCRIPTION:

Improve the aquatic and riparian habitat for Lower Springbrook Creek with riparian plantings, large woody debris, pool construction, channel branch excavation, and potential two-stage channel.



KCIT-DCE VC folder: 2010\_10202w\_LG-19.ai GIS file Q:\2009\WRIA9\_ProjectMaps.mxd



## Tier 2 Project: LG-23

# 8th Street Bridge to 104th Ave Park Off-Channel Habitat

### PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
RM 30.4 - 31.1 /  
right bank

**Bankside  
jurisdiction:**  
City of Auburn

**Project sponsor:**  
City of Auburn

**Budget:**  
TBD

### PROJECT TYPE:



Acquisition



Enhancement/  
Planting



Planning/  
Design



Restoration

### KEY HABITAT:



Floodplain



Riparian



Side Channel

### PROJECT DESCRIPTION:

Acquire private properties and restore off-channel and riparian habitat, including up to 0.25 miles of potential side channel.



KCIT-DCE VC folder: 2010\_10202w\_LG-23.ai GIS file Q:\2009\WRIA9\_ProjectMaps.mxd

## Tier 2 Project: LG-26

# Valentine Revetment Setback

### PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
RM 30.1 - 29.8 /  
right bank

**Bankside  
jurisdiction:**  
City of Auburn

**Project sponsor:**  
City of Auburn

**Budget:**  
TBD

### PROJECT TYPE:



Enhancement/  
Planting



Planning/  
Design



Restoration



Acquisition

### KEY HABITAT:



Floodplain



Riparian



Tributary

### PROJECT DESCRIPTION:

Setback the existing revetment and relocate Green River Road to the north, away from the river. Realign the unnamed fish stream into the historic channel and install a fish friendly culvert.



KCIT-DCE VC folder: 2010\_10202w\_LG-26.ai GIS file Q:\2009\WRIA9\_ProjectMaps.mxd



## Tier 2 Project: LG-27

### 8th Street Acquisitions

#### PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
RM 31.1 - 31.4 /  
right bank

**Bankside jurisdiction:**  
City of Auburn

**Project sponsor:**  
City of Auburn

**Budget:**  
TBD

#### PROJECT TYPE:



Acquisition



Planning/  
Design



Restoration

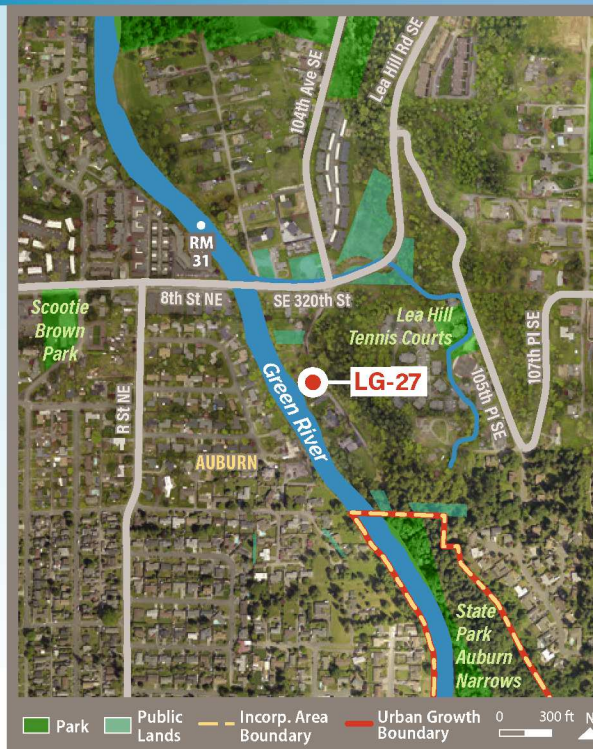
#### KEY HABITAT:



Floodplain



Riparian



#### PROJECT DESCRIPTION:

Acquire properties and restore off-channel and riparian habitat.

## Tier 2 Project: LG-30

### Mill Creek to Washington Ave Bridge Acquisitions and Restoration

#### PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
RM 23.2- 23.7 /  
left bank

**Bankside jurisdiction:**  
City of Kent

**Project sponsor:**  
City of Kent

**Budget:**  
TBD

#### PROJECT TYPE:



Acquisition



Restoration

#### KEY HABITAT:



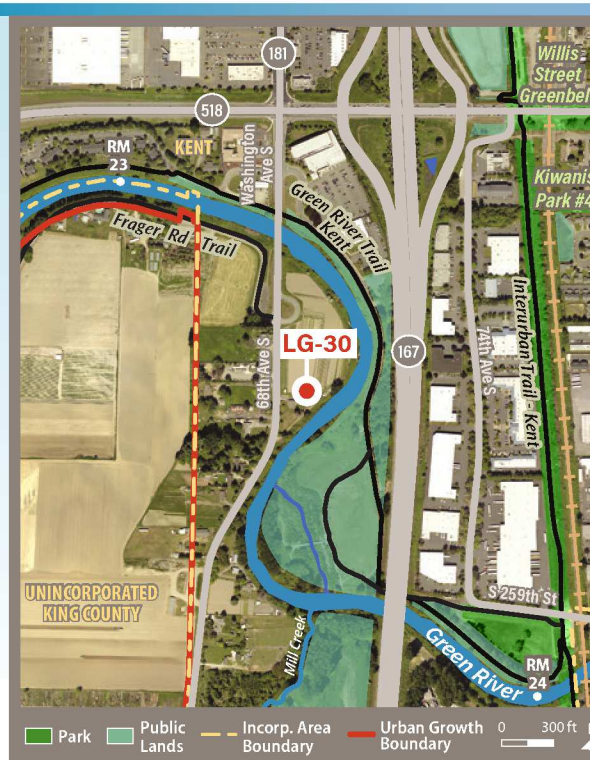
Edge



Floodplain



Riparian



#### PROJECT DESCRIPTION:

Acquire left bank properties from Mill Creek (Auburn) to Washington Ave. S. bridge and install native plantings.



## Tier 2 Project: LG-31

# South of Veterans Drive Floodplain Reconnection

### PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
RM 19.4 - 19.3 /  
left bank

**Bankside jurisdiction:**  
City of Kent

**Project sponsor:**  
City of Kent

**Budget:**  
TBD

### PROJECT TYPE:



Enhancement/  
Planting



Planning/  
Design



Restoration

### KEY HABITAT:



Floodplain



KCIT-DCE VC folder: 2010\_10202w\_LG-31.ai GIS file Q:\20009\WRIA9\_ProjectMaps.mxd

### PROJECT DESCRIPTION:

Create off-channel habitat in small triangle of flat land behind Frager Road.

## Tier 2 Project: LG-32

# Foster Park Floodplain Reconnection

### PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
RM 23.9 - 24 /  
right bank

**Bankside jurisdiction:**  
City of Kent

**Project sponsor:**  
City of Kent

**Budget:**  
TBD

### PROJECT TYPE:



Scoping/  
Reconnaissance



Planning/  
Design

### KEY HABITAT:



Edge



Floodplain



Riparian



KCIT-DCE VC folder: 2010\_10202w\_LG-32.ai GIS file Q:\20009\WRIA9\_ProjectMaps.mxd

### PROJECT DESCRIPTION:

Restore off-channel habitat within the park, while balancing flood protection and recreation.



## Tier 2 Project: LG-37

# Strander Boulevard Off-Channel Habitat Creation

### PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
RM 13.1 / right bank

**Bankside jurisdiction:**  
City of Tukwila

**Project sponsor:**  
City of Tukwila

**Budget:**  
\$10,000,000

### PROJECT TYPE:



Planning/  
Design



Scoping/  
Reconnaissance

### KEY HABITAT:



Backwater



Floodplain



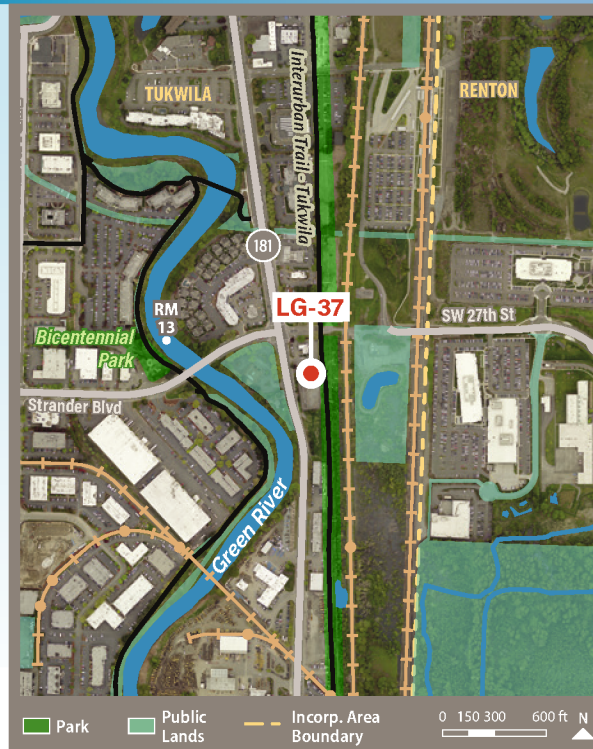
Riparian



Wetland

### PROJECT DESCRIPTION:

This project would connect an isolated wetland area in between two railroad tracks with the river creating floodplain connection and use for salmonid rearing and refugia.



KCIT-DCE VC folder: 2010\_10202w\_LG-37.ai GIS file Q:\20009\WRIA9\_ProjectMaps.mxd

## Tier 2 Project: LG-46

# Mill Creek Protection and Restoration Near Emerald Downs

### PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
RM 23.7 / left bank  
(Mill Creek  
RM 3.0 - 4.4)

**Bankside jurisdiction:**  
King County

**Project sponsor:**  
King County

**Budget:**  
TBD

### PROJECT TYPE:



Restoration



Acquisition

### KEY HABITAT:



Floodplain



Riparian



Tributary



Wetland

### PROJECT DESCRIPTION:

Acquire property and restore creek meander of the existing channel, revegetate the riparian zone and associated wetland habitat, and increase channel capacity to reduce existing flood risks.



KCIT-DCE VC folder: 2010\_10202w\_LG-46.ai GIS file Q:\20009\WRIA9\_ProjectMaps.mxd







## Tier 2 Project: LG-55

# Frager Road Levee Setback

### PROJECT FACTS

**Subwatershed:**  
Lower Green (LG)

**River mile:**  
RM 17.25 - 18.75 /  
left bank

**Bankside jurisdiction:**  
City of Kent

**Project sponsor:**  
City of Kent

**Budget:**  
TBD

### PROJECT TYPE:



Restoration

### KEY HABITAT:



Edge



Riparian

### PROJECT DESCRIPTION:

Reconstruct the toe, slope and levee crest to a stable configuration with a fully bioengineered solution, including a vegetated bench.



KCIT-DCE VC folder: 2010\_10202w\_LG-55.ai GIS file Q:\2009\WRIA9\_ProjectMaps.mxd







Table 5

## Lower Green River Subwatershed Tier 3 Projects

Proj#	Project Name	Project Type	Description	Sponsor	River mile and Bank side/ Nearshore jurisdiction	Primary Strategy (pick 1)	Jurisdiction	Goal Alignment
LG-2	Olson Creek Restoration	Restoration	Improve quality of aquatic habitat through setting back the banks, adding large wood to channel, and expanding riparian vegetation along the creek. Increase amount and quality of flood refuge habitat by reconnecting southern grassy area at lower flows and restoring as a wetland. This project will build off of a KCDOT project to fix the fish passage barrier at the mouth in 2020.	King County	RM 28.4 / right bank	Protect, restore and enhance instream flows and cold water refugia	City of Auburn	LG - Large woody debris LG - Off-channel habitat LG - Riparian Forest
LG-15	Nelsen Side Channel	<ul style="list-style-type: none"> <li>Acquisition</li> <li>Enhancement/Planting</li> <li>Planning/Design</li> <li>Restoration</li> </ul>	This project reconnects a segment of the former river channel that was disconnected with construction of I-405 and rerouting of the river.	City of Tukwila	RM 12.5 / right bank	Protect, restore, and enhance channel complexity and edge habitat	City of Tukwila	LG - Large woody debris LG - Off-channel habitat LG - Riparian Forest
LG-16	Gilliam Creek Fish Passage and Riparian Rehabilitation	<ul style="list-style-type: none"> <li>Enhancement/Planting</li> <li>Planning/Design</li> <li>Restoration</li> </ul>	This project will replace a large flapgate that inhibits salmonid usage of the Gilliam Creek tributary, and restore nearly 300 lineal feet of the lowest stretch of Gilliam Creek.	City of Tukwila	RM 12.5 / left bank	Restore and improve fish passage	City of Tukwila	LG - Off-channel habitat
LG-20	Riverview Plaza Off-channel Habitat Creation	<ul style="list-style-type: none"> <li>Enhancement/Planting</li> <li>Planning/Design</li> <li>Restoration</li> </ul>	This City-owned parcel once had a modest picnic area for viewing, but those have since been removed. There are several, large cottonwood trees in this low bank area with opportunities to create shallow water habitat while preserving most or all of the trees. It is waterward of the levee and Green River Trail.	City of Tukwila	RM 12.7 / left bank	Protect, restore, and enhance channel complexity and edge habitat	City of Tukwila	LG - Large woody debris LG - Off-channel habitat LG - Riparian Forest
LG-21	Best Western Revetment Setback	<ul style="list-style-type: none"> <li>Acquisition</li> <li>Restoration</li> </ul>	This project would setback this revetment to the extent possible. There is a hotel 80' landward; setting it back somewhat could create some edge habitat. Should look for opportunities in the event of property redevelopment.	City of Tukwila	RM 12.7 / right bank	Protect, restore and enhance floodplain connectivity	City of Tukwila	1. Off-channel habitat 2. Riparian 3. Large Woody Debris Forest
LG-38	Fenster Slough Wetland Connection	<ul style="list-style-type: none"> <li>Enhancement/Planting</li> <li>Planning/Design</li> <li>Restoration</li> </ul>	Reconnect approximately 1/2 acre of wetland area to the Green River that is currently cut off by the Fenster II Levee. The area has the potential to provide backwater/off-channel and riparian habitat functions.	City of Auburn	RM 40 / left bank	Protect, restore and enhance floodplain connectivity	City of Auburn	LG - Off-channel habitat
LG-43	Panther Creek at East Valley Road Improvement Project	<ul style="list-style-type: none"> <li>Acquisition</li> <li>Enhancement/Planting</li> <li>Planning/Design</li> <li>Restoration</li> </ul>	The project is intended to provide daylighting and habitat improvements of Panther Creek from river mile 0.5 to 0.0 and the adjacent East Valley wetlands. This includes improving hydrologic and hydraulic function through repairing and/or replacing the existing culverts at East Valley Road and Lind Ave SW.	City of Renton	RM 11 / right bank	Restore and improve fish passage	City of Renton	LG - Off-channel habitat
LG-52	Panther Creek at Talbot Road South Fish Passage Improvement	<ul style="list-style-type: none"> <li>Acquisition</li> <li>Other</li> <li>Planning/Design</li> </ul>	The project intends to provide fish passage and improved conveyance through a culvert replacement along Panther Creek at the Talbot Road South culvert.	City of Renton Surface Water Utility	RM 11 / right bank	Restore and improve fish passage	City of Renton	LG - Off-channel habitat
LG-53	Signature Pointe Levee Improvements	<ul style="list-style-type: none"> <li>Enhancement/Planting</li> <li>Planning/Design</li> <li>Restoration</li> <li>Acquisition</li> </ul>	Setback levee segments and slope. Install large wood and native riparian plants. Address potential for recreational impacts of moving the trail further from the river and closer to residential units.	City of Kent	RM 23.15 - 21.75 / left bank	Protect, restore, and enhance channel complexity and edge habitat	City of Kent	LG - Bank Armor LG - Large woody debris LG - Off-channel habitat
LG-54	SR 516 to S 231st Way Levee	<ul style="list-style-type: none"> <li>Planning</li> <li>Scoping/</li> <li>Reconnaissance</li> </ul>	Balance habitat, flood protection, and recreation. Set back existing levee to allow for more flood storage and habitat improvements. These potential improvements include flatter riverbank side slopes, log jams along the river, and increased riparian plantings.	City of Kent	RM 21.75 - 19.2 5/ left bank	Protect, restore and enhance floodplain connectivity	City of Kent	LG - Bank Armor LG - Off-channel habitat LG - Riparian Forest
LG-56	Kent Airport Levee Setback	<ul style="list-style-type: none"> <li>Planning/Design</li> <li>Restoration</li> <li>Acquisition</li> </ul>	Setback the levee, incorporate current stormwater pond into riparian buffer, and install native plants.	City of Kent	RM 24.1 - 23. 8/ left bank	Protect, restore, and enhance channel complexity and edge habitat	City of Kent	LG - Riparian Forest
LG-58	Briscoe Levee Riparian Habitat Improvements	<ul style="list-style-type: none"> <li>Enhancement/Planting</li> <li>Planning/Design</li> <li>Restoration</li> </ul>	Re-grade side slopes that are overly steep, remove non-native invasive plant species, and plant new native vegetation in areas that have not already been improved. The project also includes installation of large wood structures along the river's edge throughout the length of the levee reach where feasible.	City of Kent	RM 17.0 - 16.1 / right bank	Protect, restore, and enhance channel complexity and edge habitat	City of Kent	LG - Off-Channel Habitat





## Middle Green River Subwatershed

**14**  
projects

### **Tier 1 (Score 18+) 8 projects**

MG-3..... Flaming Geyser Floodplain Reconnection  
MG-9 ..... Lones Levee Restoration  
MG-11..... Turley Levee Setback  
MG-13..... Hamakami Levee Setback  
MG-19..... Lower Soos Creek Channel Restoration  
MG-21..... Whitney Bridge Reach Acquisition and Restoration  
MG-24 .... Meyer/Imhof Levee Setback  
MG-26.... Newuakum Creek Tributary Acquisition and Restoration

### **Tier 2 (Score 7-18) 5 projects**

MG-6 ..... Middle Newaukum Creek Riparian Planting and Large Woody Debris Placement  
MG-10..... Burns Creek Restoration  
MG-16..... Ray Creek Restoration  
MG-20.... Auburn Narrows Floodplain Restoration  
MG-22.... Kanaskat Reach Restoration

### **Tier 3 (Score <7) 1 project**

MG-25 .... Little Soos Restoration - Wingfield Neighborhood



**Figure 29**  
**Middle Green River**  
**Subwatershed Projects**







## Tier 1 Project: MG-3

# Flaming Geyser Floodplain Reconnection

Green / Duwamish &  
Central Puget Sound



### PROJECT AREA MAP



### LOCATION MAP



### PROJECT FACTS

**Subwatershed:**  
Middle Green (MG)

**River mile:**  
RM 42-44/both banks

**Bankside jurisdiction:**  
King County

**Project sponsor:**  
King County

**Budget:**  
\$6,000,000

### PROJECT TYPE:



Planning/  
Design



Restoration

### KEY HABITAT:



Side channel



Tributary

### PROJECT DESCRIPTION:

Remove levee, relocate gravel in the levee under-structure into the river channel, place large wood in river channel and associated wetland, and extensively revegetate riparian zone throughout state park.

### Primary strategy

Protect, restore and enhance floodplain connectivity.

### Benefits:

- Increased habitat connectivity
- Water temperature reduction

### Contribution to goals metrics:

- MG - Bank armor
- MG - Floodplain connectivity/lateral channel migration
- MG - Large woody debris
- MG - Riparian forest

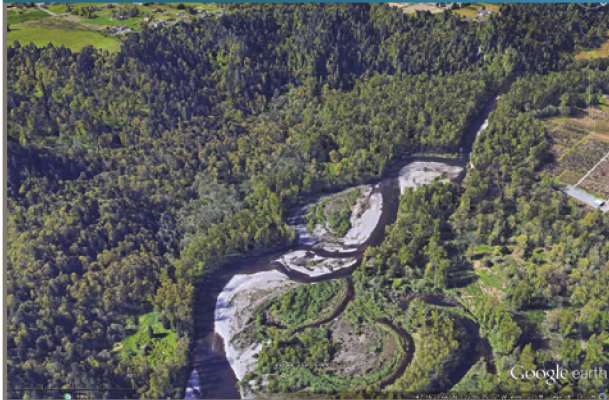
Project Area Map: Ortho2019KCNAT aerial photo Site photo: Google Earth  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





# Lones Levee Restoration

Green / Duwamish &  
Central Puget Sound



## PROJECT AREA MAP



## LOCATION MAP



## PROJECT FACTS

**Subwatershed:**  
Middle Green (MG)

**River mile:**  
RM 38/right bank

**Bankside jurisdiction:**  
King County

**Project sponsor:**  
King County

**Budget:**  
\$5,500,000

## PROJECT TYPE:



Restoration

## KEY HABITAT:



Backwater



Riparian



Side channel



Tributary



Wetland

## PROJECT DESCRIPTION:

Remove existing levee, install setback feature to protect agricultural land, place large wood in river channel and remnant river channel, and reintroduce gravel from remnant levee into river channel.

## Primary strategy

Protect, restore and enhance floodplain connectivity.

## Benefits:

- Increased habitat connectivity
- Increased rearing habitat
- Water temperature reduction

## Contribution to goals metrics:

- MG - Bank armor
- MG - Floodplain connectivity/lateral channel migration
- MG - Large woody debris
- MG - Riparian forest

Project Area Map: Ortho2019KCNAT aerial photo Site photo: Google Earth  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT



# Turley Levee Setback

Green / Duwamish &  
Central Puget Sound



PROJECT AREA MAP



LOCATION MAP



## PROJECT FACTS

**Subwatershed:**  
Middle Green (MG)

**River mile:**  
RM 37 / left and right bank

**Bankside jurisdiction:**  
King County

**Project sponsor:**  
King County

**Budget:**  
\$6,000,000

## PROJECT TYPE:



Acquisition



Restoration

## KEY HABITAT:



Backwater



Floodplain



Riparian



Side channel



Tributary



Wetland

## PROJECT DESCRIPTION:

Acquire land, remove existing levee, setback new revetment away from river channel, and increase complexity with large wood in river channel and associated wetland.

## Primary strategy

Protect, restore, and enhance floodplain connectivity.

## Benefits:

- Increased habitat connectivity
- Increased rearing habitat
- Water temperature reduction

## Contribution to goals metrics:

- MG - Bank armor
- MG - Floodplain connectivity/lateral channel migration
- MG - Large woody debris
- MG - Riparian forest

Project Area Map: Ortho2019KCNAT aerial photo Site photo: Google Earth  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





## Tier 1 Project: MG-13

# Hamakami Levee Setback

Green / Duwamish &  
Central Puget Sound



### PROJECT AREA MAP



### LOCATION MAP



### PROJECT FACTS

**Subwatershed:**  
Middle Green (MG)

**River mile:**  
RM 35/right bank

**Bankside Jurisdiction:**  
King County

**Project sponsor:**  
King County

**Budget:**  
\$6,000,000

### PROJECT TYPE:



Acquisition



Restoration

### KEY HABITAT:



Backwater



Riparian



Side channel



Tributary



Wetland

### PROJECT DESCRIPTION:

Acquire land, remove levee, relocate gravel in the levee under-structure into the river channel, construct revetment away from river, and place large wood in river channel and associated wetland.

### Primary strategy

Protect, restore, and enhance floodplain connectivity.

### Benefits:

- Increased habitat connectivity
- Increased rearing habitat
- Water temperature reduction

### Contribution to goals metrics:

- MG - Bank armor
- MG - Floodplain connectivity/lateral channel migration
- MG - Large woody debris
- MG - Riparian forest

Project Area Map: Ortho2019KCNAT aerial photo Site photo: Google Earth  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\2009\WRIA9\_ProjectMaps.mxd KLINKAT





# Lower Soos Creek Channel Restoration

Green / Duwamish &  
Central Puget Sound



## PROJECT AREA MAP



Legend: Park (green), Public Lands (light green), Urban Growth Area Line Bndy. (red dashed), Inc. Area Boundary (orange dashed), Scale: 0 200 400 ft., North arrow.

## LOCATION MAP



## PROJECT FACTS

**Subwatershed:**  
Middle Green (MG)

**River mile:**  
RM 33.3/right bank

**Bankside jurisdiction:**  
King County

**Project sponsor:**  
King County

**Budget:**  
\$1,500,000

## PROJECT TYPE:



Acquisition



Restoration

## KEY HABITAT:



Riparian



Side channel



Tributary



Wetland

## PROJECT DESCRIPTION:

Restore habitat and increased water quality with placement of large trees in streams and associated wetlands, and plant native trees and shrubs along riparian edge.

## Primary strategy

Protect, restore, and enhance floodplain connectivity.

## Benefits:

- Water temperature reduction

## Contribution to goals metrics:

- MG - Large woody debris
- MG - Riparian forest

Project Area Map: Ortho2019KCNAT aerial photo Site photo: Google Earth  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





## Tier 1 Project: MG-21

# Whitney Bridge Reach Acquisition and Restoration

Green / Duwamish &  
Central Puget Sound



### PROJECT AREA MAP



■ Park

0 200 400 ft. N

### LOCATION MAP



■ WRIA 9

■ Incorporated Area

0 5 10  
Miles

### PROJECT FACTS

**Subwatershed:**  
Middle Green (MG)

**River mile:**  
41 / left and right bank

**Jurisdiction:**  
King County

**Project sponsor:**  
King County

**Budget:**  
TBD

### PROJECT TYPE:



Acquisition



Restoration

### KEY HABITAT:



Floodplain



Riparian

### PROJECT DESCRIPTION:

Acquire approximately 40 acres, and install several hundred pieces of large wood on ~3,500 lineal feet of river.

### Primary strategy

Protect, restore, and enhance floodplain connectivity.

### Benefits:

- Habitat preservation
- Increased habitat connectivity
- Increased rearing habitat

### Contribution to goals metrics:

- MG - Floodplain connectivity/lateral channel migration
- MG - Large woody debris
- MG - Riparian forest

Project Area Map: Ortho2019KCNAT aerial photo Site photo: Google Earth  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT





Tier 1 Project: MG-24

# Meyer/Imhof Levee Setback

Green / Duwamish &  
Central Puget Sound



## PROJECT AREA MAP



## LOCATION MAP



## PROJECT FACTS

**Subwatershed:**  
Middle Green (MG)

**River mile:**  
40.5 - 41.5 /  
right bank

**Jurisdiction:**  
King County

**Project sponsor:**  
King County

**Budget:**  
\$1,500,000

## PROJECT TYPE:



Acquisition



Restoration

## KEY HABITAT:



Floodplain



Riparian



Wetland

## PROJECT DESCRIPTION:

Acquire land, remove levee, construct set-back structure away from the River, add wood to floodway, and revegetate with native plants.

## Primary strategy

Protect, restore, and enhance floodplain connectivity.

## Benefits:

- Habitat preservation
- Increased habitat connectivity
- Increased rearing habitat

## Contribution to goals metrics:

- MG - Bank armor
- MG - Floodplain connectivity/lateral channel migration
- MG - Large woody debris
- MG - Riparian forest

Project Area Map: Ortho2019KCNAT aerial photo Site photo: Google Earth  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT

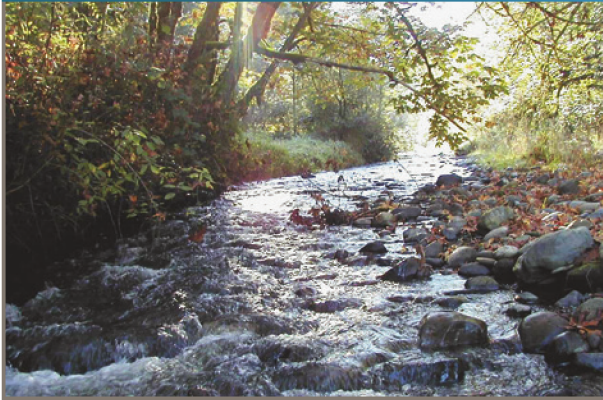




## Tier 1 Project: MG-26

# Newuakum Creek Tributary Acquisition

Green / Duwamish &  
Central Puget Sound



### PROJECT AREA MAP



### LOCATION MAP



### PROJECT FACTS

**Subwatershed:**  
Middle Green (MG)

**River mile:**  
RM 40.4/left bank

**Bankside jurisdiction:**  
King County

**Project sponsor:**  
King County

**Budget:**  
\$3,500,000

### PROJECT TYPE:



Acquisition



Restoration

### KEY HABITAT:



Riparian



Side channel



Tributary



Wetland

### PROJECT DESCRIPTION:

Restore habitat and improve water quality with placement of large wood in the stream channel and associated wetlands, revegetating the riparian area.

### Primary strategy

Protect, restore, and enhance channel complexity and edge habitat.

### Benefits:

- Habitat preservation
- Increased rearing habitat
- Water temperature reduction

### Contribution to goals metrics:

- MG - Large woody debris
- MG - Riparian forest

Project Area Map: Ortho2019KCNAT aerial photo  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT



## Tier 2 Project: MG-6

### Middle Newaukum Creek Riparian Planting and Large Woody Debris Placement

#### PROJECT FACTS

**Subwatershed:**  
Middle Green (MG)

**River mile:**  
RM 40 / left bank

**Bankside jurisdiction:**  
King County

**Project sponsor:**  
King County

**Budget:**  
\$2,500,000

#### PROJECT TYPE:



Acquisition



Restoration

#### KEY HABITAT:



Riparian



Side Channel



Tributary



Wetland

#### PROJECT DESCRIPTION:

Place large wood in the stream channel between RM 6 - 10 and remove hardened streambanks.



KCIT-DCE VC folder: 2010\_10202w\_MG-6.ai GIS file Q:\2009\WRIA9\_ProjectMaps.mxd

## Tier 2 Project: MG-10

### Burns Creek Restoration

#### PROJECT FACTS

**Subwatershed:**  
Middle Green (MG)

**River mile:**  
RM 33 / right bank

**Bankside jurisdiction:**  
King County

**Project sponsor:**  
King County

**Budget:**  
\$1,500,000

#### PROJECT TYPE:



Acquisition



Restoration

#### KEY HABITAT:



Floodplain



Tributary



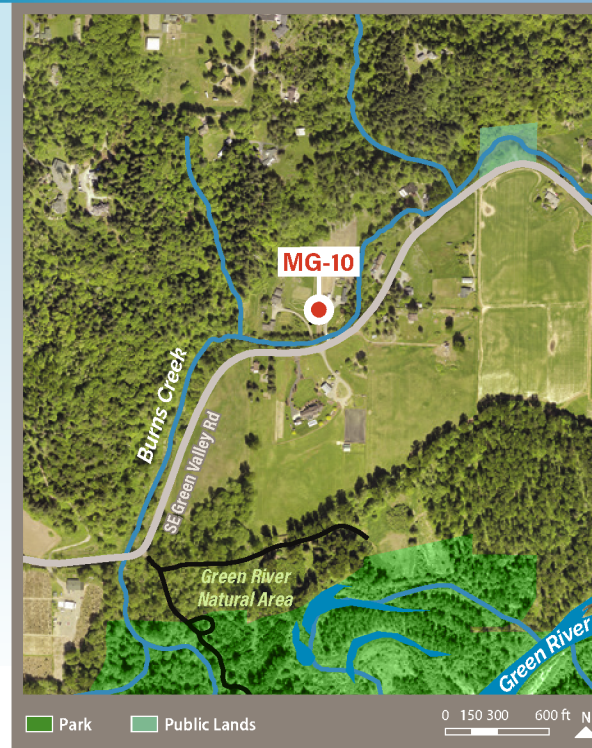
Riparian



Wetland

#### PROJECT DESCRIPTION:

Restore lower two miles of Burns Creek by acquiring several parcels or portions of parcels, place large trees with rootwads attached in streams and associated wetlands, plant native trees and shrubs to significantly improve fish and wildlife habitat, wetlands, and water quality in an area which is very important for over-wintering salmon.



KCIT-DCE VC folder: 2010\_10202w\_MG-10.ai GIS file Q:\2009\WRIA9\_ProjectMaps.mxd



## Tier 2 Project: MG-16

# Ray Creek Restoration

### PROJECT FACTS

Subwatershed:  
Middle Green (MG)

Bankside  
jurisdiction:  
King County

Project sponsor:  
King County

Budget:  
\$1,500,000

### PROJECT TYPE:



Acquisition



Restoration

### KEY HABITAT:



Floodplain



Riparian



Tributary



Wetland

### PROJECT DESCRIPTION:

Acquire several conservation easements of at least 100' buffers, place large wood in stream, and plant native trees and shrubs in riparian buffer. Build fencing for livestock exclusion to immediately improve of fish and wildlife habitat, wetlands, water quality in a degraded area.



KCIT-DCE VC folder: 2010\_10202w\_MG-16.ai GIS file Q:\2009\WRIA9\_ProjectMaps.mxd

## Tier 2 Project: MG-20

# Auburn Narrows Floodplain Restoration

### PROJECT FACTS

Subwatershed:  
Middle Green (MG)

River mile:  
RM 33 / left bank

Bankside  
jurisdiction:  
King County

Project sponsor:  
King County

Budget:  
\$350,000

### PROJECT TYPE:



Acquisition



Restoration

### KEY HABITAT:



Floodplain



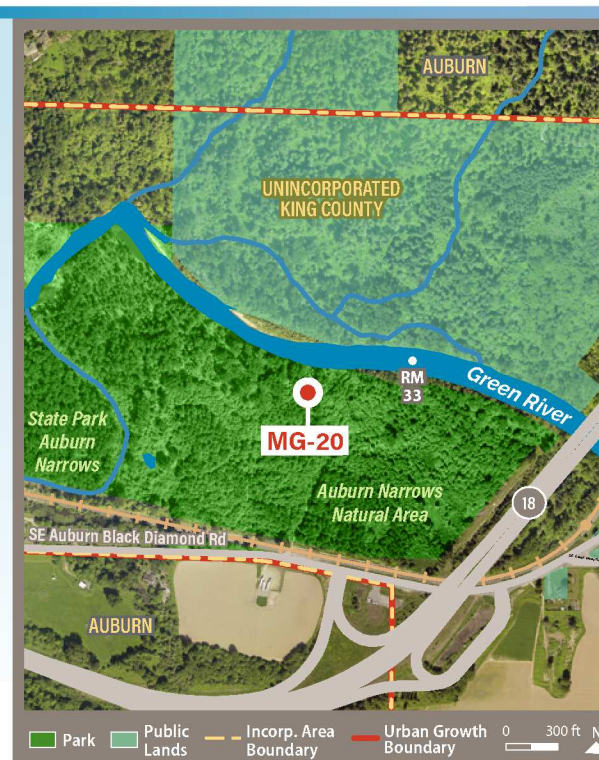
Riparian



Wetland

### PROJECT DESCRIPTION:

Remove gravel road in floodway, expand notch of previously-constructed side channel, add large wood, and plant native vegetation.



KCIT-DCE VC folder: 2010\_10202w\_MG-20.ai GIS file Q:\2009\WRIA9\_ProjectMaps.mxd



## Tier 2 Project: MG-22

### Kanaskat Reach Restoration

#### PROJECT FACTS

Subwatershed:  
Middle Green (MG)

River mile:  
RM 59 / left bank

Bankside  
jurisdiction:  
King County

Project sponsor:  
King County

Budget:  
\$600,000

#### PROJECT TYPE:



Acquisition



Restoration

#### KEY HABITAT:



Riparian



#### PROJECT DESCRIPTION:

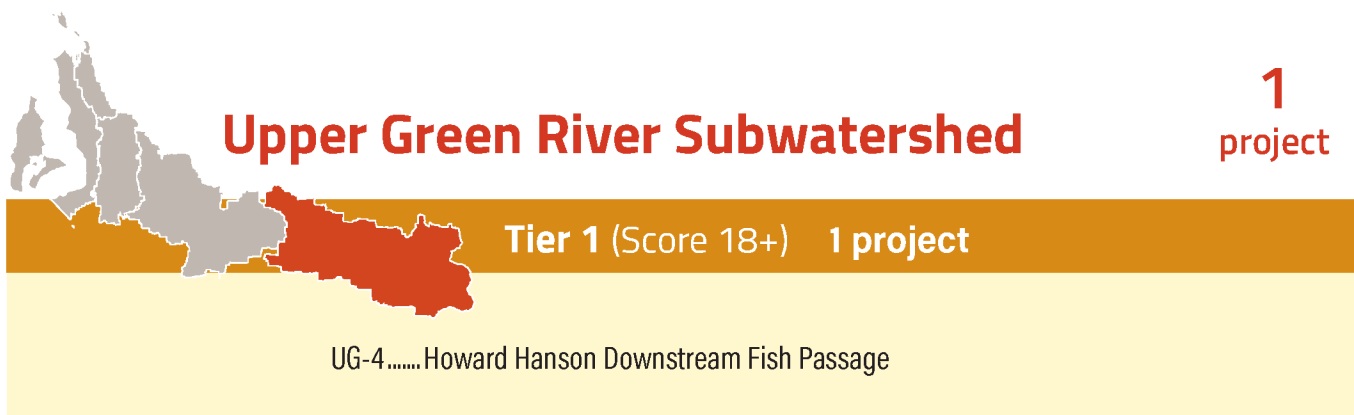
Acquire about 3.5 acres, remove large house/garage/septic, convert 3,300 lineal foot gravel road to backcountry trail, and extensively revegetate site.

Table 6

### Middle Green River Subwatershed Tier 3 Projects

Proj. No.	Project Name	Project Type	Project Description		Sponsor	River mile and Bank side/Nearshore jurisdiction	Primary Strategy (pick 1)	Jurisdiction	Goal alignment
MG-25	Little Soos Restoration - Wingfield Neighborhood	<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Planning/design</li> <li>• Restoration</li> <li>• Scoping/reconnaissance</li> </ul>	Little Soos Creek at stream mile 1 runs through City of Covington owned open space through the Coho Creek development. The stream historically has been armored, disconnected from its floodplain and a paved trail adjacent to the creek is often flooded in the winter. There is an opportunity to restore in stream and floodplain habitat in the stream through reconnecting the creek to its floodplain, restoring side channels, removing artificial armoring, adding large wood, and revegetating the riparian zone.		Mid Sound Fisheries Enhancement Group	RM 33.3/right bank	Protect, restore, and enhance riparian corridors;	City of Covington	<ul style="list-style-type: none"> <li>• MG - Floodplain connectivity/lateral channel migration</li> <li>• MG - Riparian forest</li> </ul>

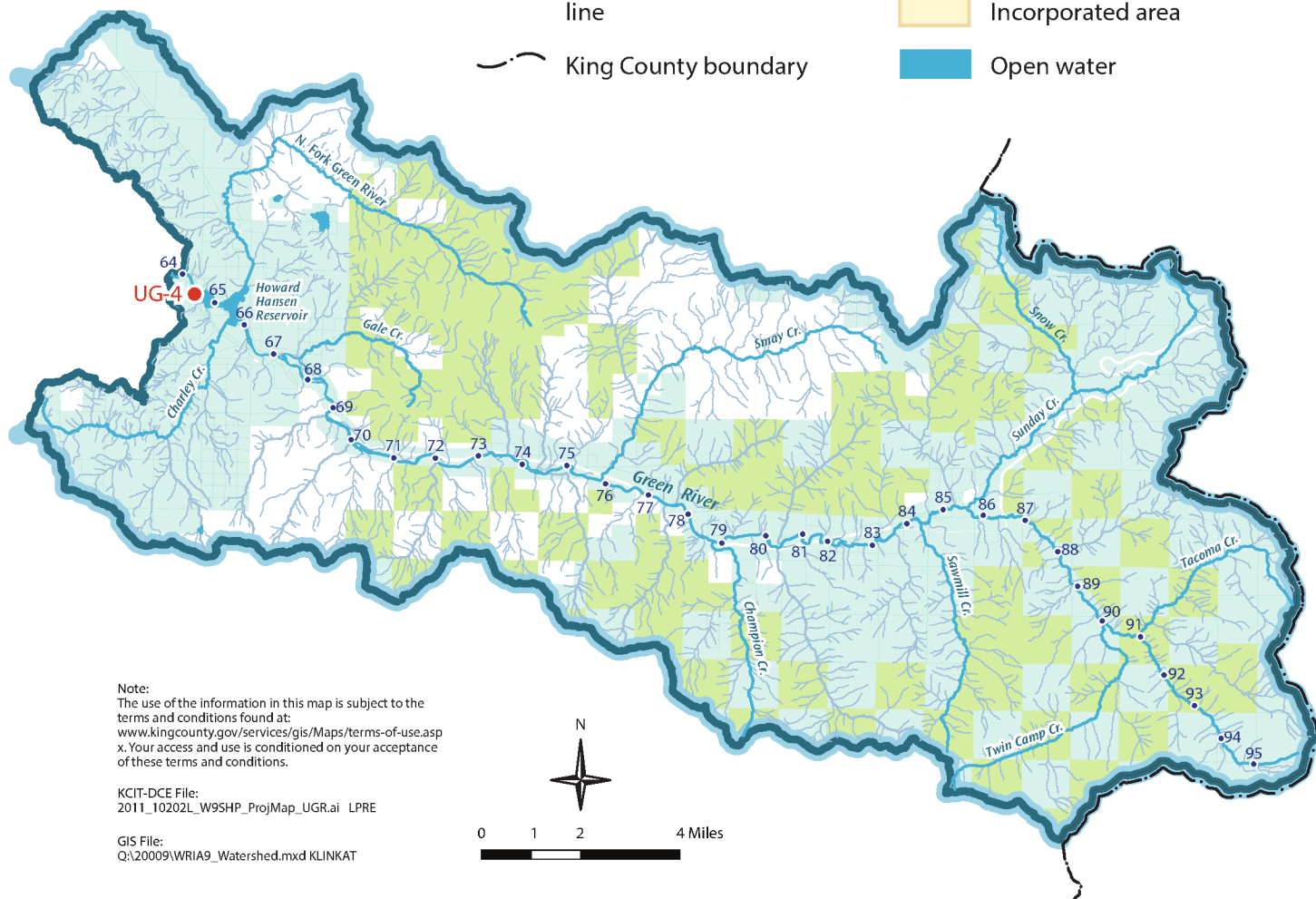




**Figure 30**

## Upper Green River Subwatershed Projects

- 1 • River mile
- UG-1 • Project location and name
- River/creek
- Major road
- Urban Growth Area line
- King County boundary
- Upper Green River Subwatershed boundary
- WRIA 9 boundary
- Public lands
- Parks
- Incorporated area
- Open water







## Tier 1 Project: UG-4

# Howard Hanson Downstream Fish Passage

Green / Duwamish &  
Central Puget Sound



### PROJECT AREA MAP



Public  
Lands

0 200 400 ft.



### LOCATION MAP



WRIA 9

Incorporated Area

0 5 10  
Miles

## PROJECT FACTS

**Subwatershed:**  
Upper Green (UG)

**River mile:**  
King County (RM 64)

**Bankside jurisdiction:**  
King County

**Project sponsor:**  
King County/Army Corps of Engineers

**Budget:**  
Unknown

## PROJECT TYPE:



Planning/  
Design



Scoping/  
Reconnaissance

## KEY HABITAT:



Edge



Riparian



Side channel



Tributary



Upland

## PROJECT DESCRIPTION:

Creation of downstream fish passage at the Howard Hanson dam is the highest priority project within the Green/Duwamish watershed as it would have an immediate and dramatic impact on all Viable Salmonid Population (VSP) parameters of Chinook and steelhead.

## Primary strategy

Restore and improve fish passage.

## Benefits:

- Increased habitat connectivity
- Increased rearing habitat
- Water temperature reduction

## Contribution to goals metrics:

- UG - Bank armor

Project Area Map: Ortho2019KCNAT aerial photo Site photo: Google Earth  
KCIT-DCE file: 2011\_10202L LPRE GIS file Q:\20009\WRIA9\_ProjectMaps.mxd KLINKAT









## Chapter 8: Implementation Strategy

There are three major funding sources that support implementation of the projects and programs prioritized within the Salmon Habitat Plan – Salmon Recovery Funding Board (SRFB), Puget Sound Acquisition and Restoration Fund (PSAR), and King County Flood Control District Cooperative Watershed Management (CWM) grants. The WRIA also supports project sponsors in seeking funding from various other local, state and federal sources.

### Annual Funding Package

WRIA 9 develops an annual funding package of projects based on anticipated allocations. The proposed funding package is reviewed and approved by the WRIA 9 Implementation and Technical Committee (ITC) and Watershed Ecosystem Forum (WEF). This funding package serves as the WRIA 9 Lead Entity's habitat project list, as defined in RCW 77.85.050.

Several factors are considered when building the annual project list for funding. Primarily, the WRIA supports projects from the list that demonstrate readiness to proceed and have a high likelihood of success, and where WRIA funding is critical to moving the project forward. Project tiering (Chapter VII) will assist the ITC and WEF in making tough funding choices when there are more projects in need

than funding available. Project planning efforts with partners have allowed the WRIA to project out-year project funding needs which provides time to anticipate funding shortfalls and seek outside support. This long-term planning effort also allows sponsors to align salmon projects with other jurisdictional priorities, like those within their jurisdiction's Capital Improvement Plans and Transportation Improvement Plans, as well as realistically phase large projects that span multiple years.

Yearly, project sponsors assess the status of their projects and funding needs and notify the WRIA 9 Habitat Project Coordinator of their intent to apply for WRIA funding, and for how much. Projects undergo a technical review by WRIA staff and the ITC. For those projects competing for SRFB funding, projects undergo an additional rigorous technical review by the SRFB review panel.



## Salmon Recovery Funding

**Salmon Recovery Funding Board (SRFB)** funding is administered through the Recreation and Conservation Office (RCO). It is a fund source of combined state salmon funds and federal Pacific Coast Salmon Recovery Funding (PCSRF). This annual fund is allocated by a SRFB approved interim allocation formula based in NOAA's Chinook delisting criteria. For several years, the Green/Duwamish watershed has received \$295,895 annually to support implementation of the Plan.

**Puget Sound Acquisition and Restoration Fund (PSAR)** is co-managed by the Puget Sound Partnership and the RCO. This is a Puget Sound specific fund source appropriated through the State budget process, within RCO's budget request. In 2007, Governor Christine Gregoire formed PSAR in direct response to the growing need to restore habitat for salmon and other wildlife within Puget Sound. The Green/Duwamish has received just over \$1.1 million biennially to support implementation of the Plan. RCO serves as the fiduciary for both PSAR and SRFB funding, so all projects funded through SRFB and PSAR are reviewed and approved through the SRFB process.

**King County Flood Control District Cooperative Watershed Management Funds (CWM)** are provided by the King County Flood Control district (KCFCD). The KCFCD is a special purpose government created to provide funding and policy oversight for flood protection projects and programs in King County. Funding for CWM is a small portion of the tax assessment to support salmon recovery projects within the four WRIAs in King County. In 2020, CWM funding was doubled, and WRIA 9 now receives \$3.63 million annually to support high priority projects and programs. The FCD approves project lists annually.

**Other Local, State and Federal Funding Sources** – In addition to these funding programs, sponsors are encouraged to compete for other local, state and federal funds. It typically takes multiple funding sources to implement projects due to project complexity and cost. Many projects are initiated with and sustained by local funding provided by the sponsoring jurisdiction. Other state and regional grant programs that support salmon recovery include, but are not limited to, the Estuary and Salmon Restoration Program (ESRP), Floodplains by Design (FbD), Brian Abbott

Fish Barrier Removal Board (FBRB), Aquatic Lands Enhancement Account (ALEA), and Washington Wildlife and Recreation Program (WWRP). Additionally, many of the projects within King County are supported through the County's Conservation Futures Tax (CFT), a program passed by the Washington State Legislature in the 1970s to ensure citizens have are afforded the right to a healthy and pleasant environment. This fund specifically protects urban parks and greenways, watersheds, working forests, and salmon habitat as well as critical links connecting regional trails and urban greenbelts.

## WRIA 9 CWM Funding Allocation

**High-Priority Capital Projects** – CWM funding (> 65%) and all SRFB/PSAR capital funding. The WRIA invests the majority of annual funding on high priority capital projects that protect and restore critical habitats. These projects are identified through planning efforts like the Duwamish Blueprint, Middle Green Blueprint, and the Lower Green River Corridor planning process. More recently, projects incorporated in this Plan Update were solicited from partner organizations.

**Regreen the Green small grant program** - Up to \$500,000 of CWM funding. This grant program originated in 2016 after the completion of the "Re-Green the Green Revegetation Strategy" to support implementation of the priority sites identified in the plan. It has served as a primary source of funding to those focusing on revegetation efforts along critical areas in the Green/Duwamish. Additionally, this program has supported successful coalition building, landowner outreach campaigns, and network development that helps achieve broader Plan engagement goals.

**Monitoring, Research and Adaptive Management** – Up to 10% of CWM funding. This funding is essential to informing adaptive management and maximizing return on investment with respect to salmon recovery. This funding allocation also supports the Green River smolt trap managed by Washington Department of Fish and Wildlife.

**Stewardship, Engagement and Learning** – Up to 5% of CWM funding. This funding supports Stewardship, Engagement and Outreach efforts designed to increase awareness around salmon recovery and promote positive behavior change.



## Outyear Project Planning (6-year HCPIP)

WRIA 9 maintains a Habitat Capital Project Implementation Plan (HCPIP) that identifies all projects with expected funding needs for three biennium (6 years). While these numbers are estimates they provide a sense of the magnitude of funding needed per year. This implementation plan supports staff in working with partners to properly sequence and support projects throughout the project life cycle, and to seek out additional funding to compliment WRIA directed funds. In many cases, WRIA directed funding sources are inadequate to support the full scope of a project but enable project sponsors to leverage other local, state and federal funds. The HCPIP will be updated annually based on evolving project needs, and will be published biennially along with a call for projects.

To ensure projects acquire, restore, rehabilitate, or create the type and amount of habitat that they was described in the original project description for the 2020 Salmon Habitat Plan capital project solicitation (or subsequent calls for projects), project sponsors will be required present to the ITC or project workgroup (below) for at least one of the significant milestones of the project design process.

This team will support ranking and tiering of any new proposed large capital restoration projects and provide input on design for WRIA funded projects.

## Performance Management

Projects receiving funding through grants directed by WRIA 9 are often subject to various pressures from other local, state, and regional funders, stakeholders, and interested parties during project development. In order to make sure projects acquire, restore, rehabilitate, or create the type and amount of habitat that they described in the projects original description for the Salmon Habitat Plan, project sponsors will be required to present to the ITC or project workgroup (below) for at least one of the significant milestones of the project design process. For very large projects that will likely seek PSAR Large Capital funding, or large-scale complex projects with multiple objectives, the WRIA may request sponsor design teams include a WRIA technical representative to support WRIA 9 salmon recovery project priorities.

An ad hoc project workgroup will be established to support elements of project development, made up of three to five members of the ITC. This team will rank and tier newly proposed large capital restoration projects and provide input on design for WRIA-funded projects. The goal of this workgroup would be to provide feedback that will maximize salmon benefits, incorporate lessons learned from previous projects, ensure projects meet the highest possible outcomes for salmon, and help reduce project costs by addressing issues early in design.

It is anticipated that project sponsors will work with the Habitat Project Coordinator to present to the project workgroup or the ITC as follows, or if major changes/updates were made to the design:

1. Alternatives analysis - Project Workgroup
2. 30% design - Full ITC
3. 90% design - Full ITC

Project sponsors are expected to maintain fidelity to the original habitat deliverables. Naturally projects will evolve as more is learned about project design and feasibility. The project sponsor is responsible for alerting the WRIA if substantive modifications to the original scope are required. Modifications to the scope of the project may invoke a full project team review to affirm the project tier and may require subsequent approval from the ITC or WEF. Failure to notify the WRIA of these changes, or use of funding outside of the approved scope, could result in the withholding of future funding or constitute a breach of contract.









## Chapter 9: Monitoring and Adaptive Management

### Adaptive Management Framework

The 2005 Salmon Habitat Plan outlined a science-based blueprint for prioritizing Chinook salmon recovery efforts in the Green/Duwamish and Central Puget Sound Watershed. This Plan Update reflects an ongoing commitment to adaptive management to ensure prioritization and sequencing of investments reflect best available science and maximize benefits to Chinook salmon, in terms of established viable salmon population criteria. WRIA 9 convenes a regular Implementation and Technical Committee (ITC) to oversee monitoring and adaptive management of the Salmon Habitat Plan. The ITC informs monitoring priorities, evaluates plan implementation and recovery progress, and makes formal policy and funding recommendations to the Watershed Ecosystem Forum.

In 2020, WRIA 9 developed a Monitoring and Adaptive Management Plan (Appendix F) that outlines a framework to:

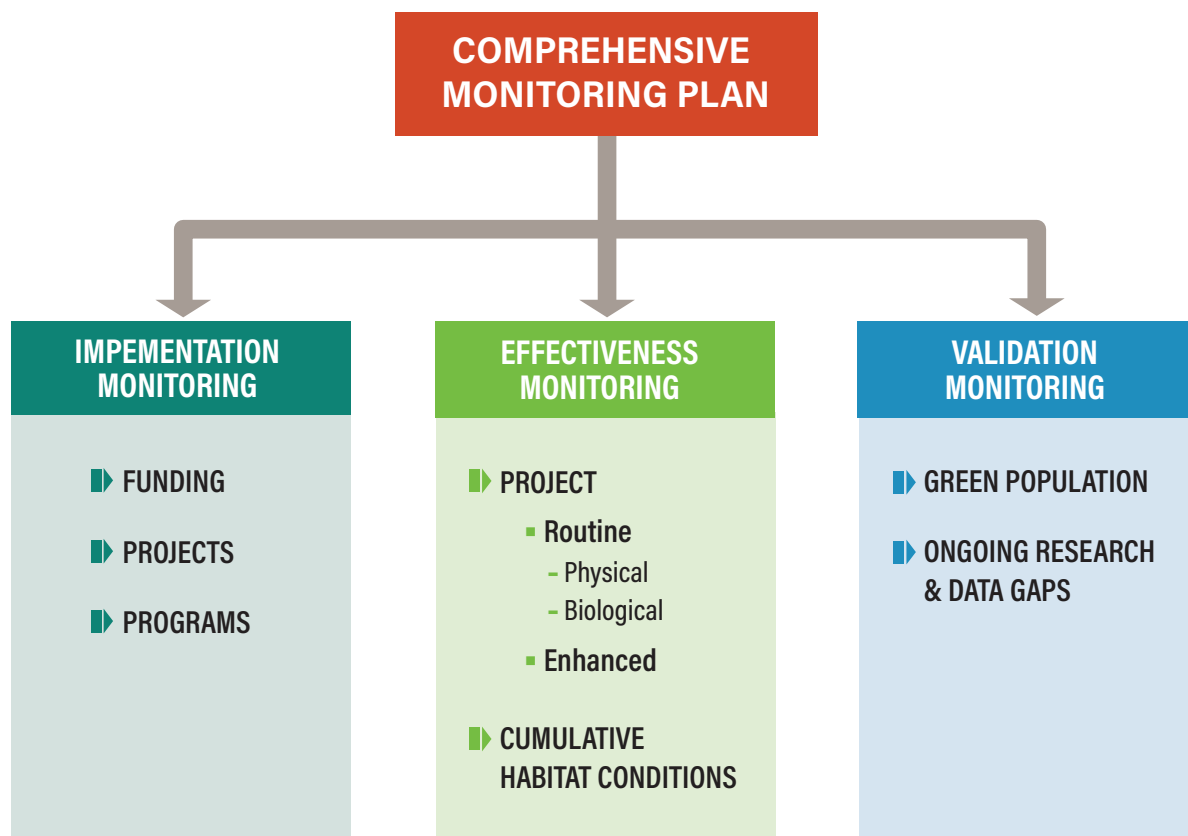
- Prioritize research and monitoring investments to address important data and knowledge gaps;
- Support status and trends monitoring to assess established habitat-related recovery goals and viable salmon population metrics;
- Promote collaboration among partners engaged in research and monitoring within the watershed; and
- Guide adaptive management of the Salmon Habitat Plan.

The WRIA 9 Monitoring and Adaptive Management Plan (MAMP) outlines three categories of monitoring intended to help evaluate and inform strategic adaptation of recovery efforts (Figure 31). Each category of monitoring is intended to answer underlying questions related to implementation progress, effectiveness of actions, and overall impact on Chinook recovery.

- **Implementation Monitoring:** Is the plan being implemented as intended? Are we on track to meet established habitat targets?
- **Effectiveness Monitoring:** Are habitat projects functioning as expected? Are habitat status and trends improving throughout the watershed?
- **Validation Monitoring:** Are salmon recovery efforts benefiting the Green River Chinook salmon population (i.e., VSP criteria)? Are the underlying scientific assumptions of the plan accurate?



**Figure 31.** Types of monitoring used to evaluate management strategies and adapt them as necessary.



Periodic assessment of these questions allows watershed partners to reassess plan implementation, underlying recovery strategies, and/or reallocate resources to maximize outcomes.

## Implementation Monitoring

The Plan Update outlines numeric targets for key habitats (Table 2, Chapter IV) linked to Chinook salmon productivity and recovery. The targets are intended to inform tracking and assessment of plan implementation (i.e., projects constructed, specific habitat gains, funding secured) in relation to established long-term goals. Regular evaluation of implementation progress feeds into an adaptive management decision framework (Figure 32). This framework connects decision makers (i.e., Watershed Ecosystem

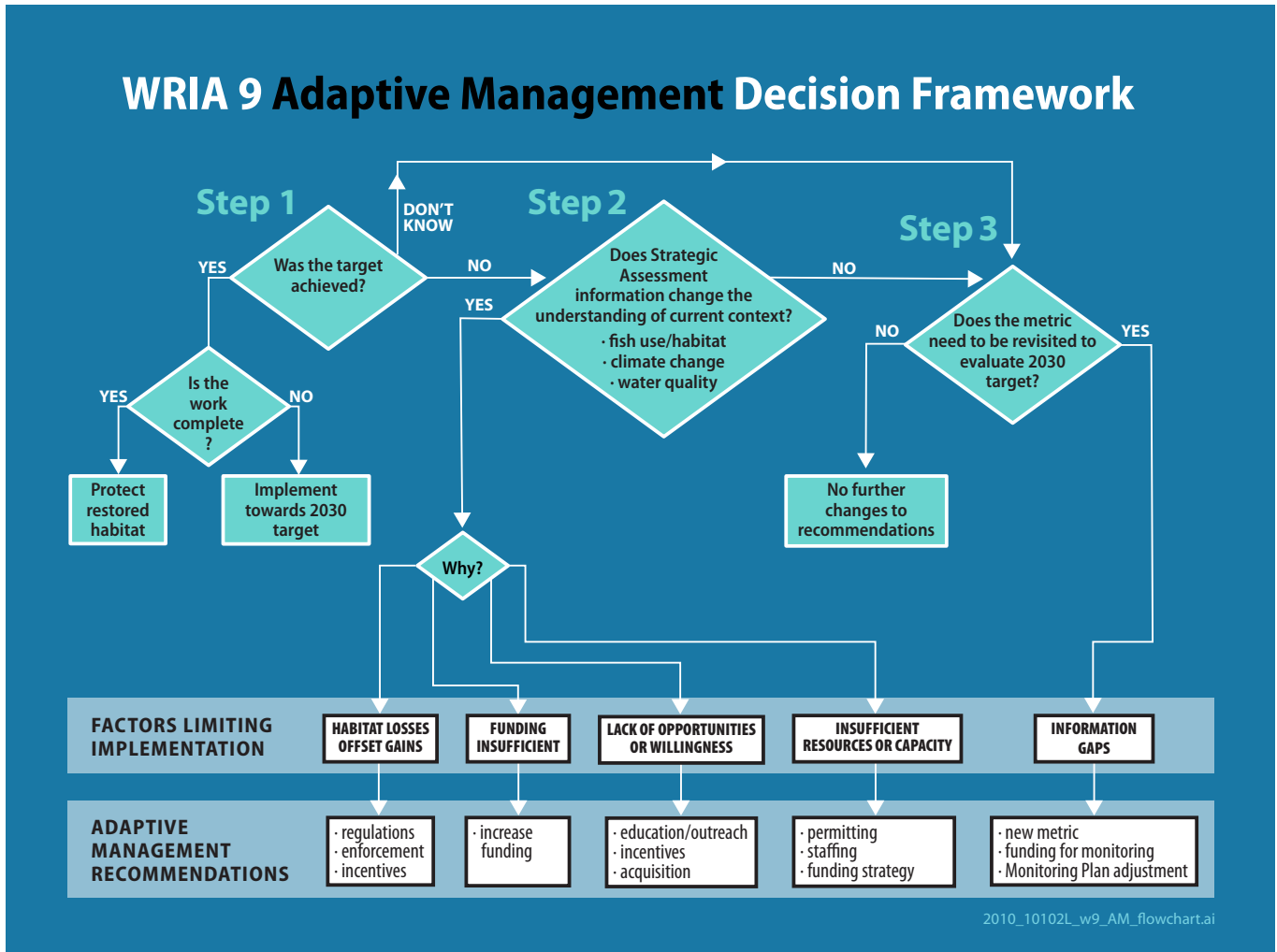
Forum) with important monitoring and research findings, informing corrective actions to recovery strategies when necessary.

## Effectiveness Monitoring

Effectiveness monitoring is designed to assess if habitat restoration projects are functioning as intended and achieving physical and biological performance standards. It includes both project-level and cumulative habitat conditions. Capital habitat project implementation can take over a decade from conceptual design to construction and costs millions of dollars. Effectiveness monitoring is essential to ensure large capital investments maximize benefits to salmon and help identify potential design improvements and cost efficiencies that can be adapted into future projects.



**Figure 32.** Adaptive management decision framework.



## Routine Monitoring

Routine project effectiveness monitoring evaluates whether restored habitat is functioning the way it was intended 3-10 years after the project is built. Project specific monitoring plans should be designed to assess project-specific goals and objectives. Project sponsors are encouraged to begin development of a monitoring plan at the project's 30 percent design milestone to allow for pre-project monitoring that can be essential for verifying if future changes are due to the project's actions or natural variability. The MAMP (Appendix F, Table 2) outlines routine physical and biological monitoring recommendations based on project type and subtype. The highlighted indicators and metrics are designed to be relatively affordable and consistent with regulatory permit monitoring requirements. Project sponsors are generally expected to undertake routine monitoring for WRIA-funded projects and report monitoring results to the ITC.

## Enhanced Fish Monitoring

Enhanced monitoring is focused on understanding how fish use a restoration project type. Unlike routine project monitoring, which asks whether a certain type of habitat was created and sustained, enhanced monitoring is meant to evaluate how fish utilize the habitat, and which restoration techniques convey the most benefit. Projects should be evaluated with a combination of Before-After Control-Impact or reference/control sites research designs. Enhanced fish monitoring is outside the scope of monitoring for many project sponsors, nor is it frequently required by regulatory agencies. Due to the costs associated with enhanced monitoring, WRIA 9 intends to continue to financially support enhanced fish monitoring of select projects. The MAMP (Appendix F, Table 3) also outlines a prioritization framework (certainty of benefit, process-based vs. engineered design, project type frequency, and project cost) for WRIA-directed invest-



ments to support enhanced monitoring. Monitoring results should be reported to the ITC and inform necessary maintenance and/or design modifications.

## Cumulative Habitat Conditions

The Salmon Habitat Plan outlines a suite of projects, programs, and policies intended to improve cumulative habitat conditions across the watershed. Monitoring status and trends in cumulative habitat conditions allows us to assess the overall effectiveness of plan implementation. It provides data on the net change (improving, no change, degrading) in specific habitat conditions over time that supports evaluation of habitat restoration in relation to ongoing impacts to, and loss of, habitat. This information will help identify any gaps in the watershed's approach to salmon recovery and help (re)direct partner resources to potential areas of concern. The MAMP (Appendix F, Table 4) outlines priority habitat metrics recommended for inclusion as part of a periodic cumulative habitat assessment that are consistent with the WRIA 9 Status and Trends Report 2005-2011 (ITC 2012). The WRIA 9 ITC should complete a cumulative habitat conditions every five years.

## Validation Monitoring

### Viable Salmon Population Criteria

The National Oceanic and Atmospheric Administration (NOAA) developed the viable salmon population (VSP) concept as a tool to assess the conservation status of a population. NOAA defines a viable salmonid population as "an independent population of any Pacific salmonid (genus *Oncorhynchus*) that has a negligible risk of extinction due to threats from demographic variation, local environmental variation, and genetic diversity changes over a 100- year time frame" (McElhany, et al. 2000). Four parameters are used to assess population status: abundance, productivity; spatial structure, and diversity. These measures of population status indicate whether the cumulative recovery actions in our watershed are improving the population's overall viability and long-term resilience.

The MAMP (Appendix F, Table 5) outlines recommended metrics to evaluate VSP criteria that should be monitored to assess the population status of the Green River Chinook salmon population. Additional

NOAA-approved VSP targets are presented in Chapter IV, Table 1. Although VSP parameters are not a direct measurement of habitat conditions, habitat availability, distribution and quality are inherently reflected in VSP criteria. Tracking trends in the recommended VSP parameters allows resource managers to evaluate how the population is responding overtime to the net impact of conservation actions and ongoing land use development activity in the watershed. Over a long enough timeframe, results can also inform recalibration of recovery strategies if the conservation status of the population does not improve or continues to decline.

The VSP concept – and conservation status of Green River Chinook salmon – is influenced by a variety of factors outside the scope of this plan (i.e., habitat). The Puget Sound Salmon Recovery Plan emphasizes that the conservation status of the Puget Sound Chinook salmon Evolutionary Significant Unit is ultimately linked to the "Four H's" – habitat, hydro-power, hatcheries and harvest. "Each of these factors independently affects the (Shared Strategy Development Committee 2007) status of salmon populations, but they also have cumulative and synergistic effects throughout the salmon life cycle. The achievement of viability at the population and ESU level depends on the concerted effort of all three factors working together, not canceling each other out, and adjusting over time as population conditions change" (Shared Strategy Development Committee 2007).

## Research and Data Gaps

The Salmon Habitat Plan Update reflects an update to the scientific framework (i.e., Strategic Assessment) of the original 2005 Plan. New scientific data improved our understanding of the functional linkages between environmental stressors, habitat, and population productivity, abundance, diversity and spatial distribution. This information is reflected in updates to the WRIA 9 recovery strategies and embedded projects, policies, and programs. Best available science is used to recalibrate the magnitude and sequencing of our strategic investments, maximizing the effectiveness of our investments.

Numerous data gaps and uncertainties remain. Ongoing investments in research and monitoring will be essential to informing adaptive management of recovery strategies and ensuring that plan imple-



mentation and associated funding decisions remain science driven. Additional information on research priorities and data gaps can be found in the Habitat Use and Productivity, Temperature, Climate Change, and Contaminant white papers in Appendices A-D. These papers build on the existing 2004 WRIA 9 Chinook Salmon Research Framework which utilized a conceptual life-cycle model to organize and prioritize research efforts to inform recovery planning.









## Chapter 10: References

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Published by the

## Green/Duwamish and Central Puget Sound Watershed Water Resource Inventory Area 9 (WRIA 9)



City of Algona  
City of Auburn  
City of Black Diamond  
City of Burien  
City of Covington

City of Des Moines  
City of Enumclaw  
City of Federal Way  
City of Kent  
King County

City of Maple Valley  
City of Normandy Park  
City of Renton  
City of SeaTac  
City of Seattle

City of Tacoma  
City of Tukwila



ROGER TABOR



## **SUMMARY and FISCAL NOTE\***

<b>Department:</b>	<b>Dept. Contact/Phone:</b>	<b>CBO Contact/Phone:</b>
Seattle Public Utilities	Martha Neuman – 206-496-4917	Akshay Iyengar/4-0716

*\* Note that the Summary and Fiscal Note describes the version of the bill or resolution as introduced; final legislation including amendments may not be fully described.*

### **1. BILL SUMMARY**

**Legislation Title:** A RESOLUTION ratifying the 2021 Update to the Green/Duwamish and Central Puget Sound Watershed or Water Resource Inventory Area (WRIA) 9 Salmon Habitat Plan, Making our Watershed Fit for a King.

**Summary and background of the Legislation:** This resolution would ratify the update of the 2005 Green/Duwamish and Central Puget Sound Watershed (WRIA 9), Salmon Habitat Plan, *Making Our Watershed Fit for a King*. The update is an addendum to the 2005 plan ratified by Council through Resolution 30824. The 2005 Plan served as the blueprint for salmon habitat recovery in WRIA 9 for 15 years.

WRIA 9 is the lead entity for salmon recovery in the Green/Duwamish and Central Puget Sound under the State of Washington’s watershed-based framework for salmon recovery. It is a watershed-based organization comprised of local, state, and federal partners, non-profit organizations, business interests, and citizens. The 17 local governments within WRIA 9 formalized a partnership under an interlocal agreement (ILA).

The Puget Sound wild Chinook population was listed as threatened species in 1999. The population has continued to decline since 2005 and is consistently below the planning targets set by the National Marine Fisheries Service.

The Plan Update reflects over a decade of new science regarding salmon conservation and recovery with the core recovery strategies and underlying scientific framework largely the same. The 2005 plan and 2021 Update, along with the 2014 Duwamish Blueprint and the 2016 Regreen the Green, provide a science-based framework for identifying, prioritizing, and implementing salmon recovery actions.

The Plan Update outlines 12 recovery strategies to address priority pressures; increase salmon abundance, productivity, and diversity; and build long-term population resiliency. Successful implementation hinges on partner coordination and investment to ensure local land use planning, capital investments, and community outreach are consistent with watershed priorities.

The Update includes a revised list of 127 capital projects developed in partnership with member jurisdictions including Seattle, non-profit partners, state agencies, and others engaged in salmon recovery. Some of these projects are sponsored by the City of Seattle.

The Update also includes a Monitoring and Adaptive Management Plan intended to help evaluate progress and inform strategic adaptation of the recovery strategies.



## 2. CAPITAL IMPROVEMENT PROGRAM

Does this legislation create, fund, or amend a CIP Project? \_\_\_ Yes x No

## 3. SUMMARY OF FINANCIAL IMPLICATIONS

Does this legislation amend the Adopted Budget? \_\_\_ Yes x No

**Does the legislation have other financial impacts to the City of Seattle that are not reflected in the above, including direct or indirect, short-term or long-term costs?**

Yes. Seattle will likely implement projects in the plan. The projects could be funded through grants and ratepayer dollars. Project costs would come through the budget process.

**Is there financial cost or other impacts of *not* implementing the legislation?**

Implementation of the WIRA 9 plan is critical for recovery of the Puget Sound Chinook population. Without implementation and the investments outlined in the plan, the salmon population will likely further decline.

## 4. OTHER IMPLICATIONS

a. Does this legislation affect any departments besides the originating department?

No.

b. Is a public hearing required for this legislation?

No.

c. Is publication of notice with *The Daily Journal of Commerce* and/or *The Seattle Times* required for this legislation?

No.

d. Does this legislation affect a piece of property?

No.

e. Please describe any perceived implication for the principles of the Race and Social Justice Initiative. Does this legislation impact vulnerable or historically disadvantaged communities? What is the Language Access plan for any communications to the public?

There are no perceived race and social justice implications for ratification of the habitat plan.

f. Climate Change Implications

1. Emissions: Is this legislation likely to increase or decrease carbon emissions in a material way?

No.



2. **Resiliency: Will the action(s) proposed by this legislation increase or decrease Seattle's resiliency (or ability to adapt) to climate change in a material way? If so, explain. If it is likely to decrease resiliency in a material way, describe what will or could be done to mitigate the effects.**

Ratification of the plan will not increase or decrease Seattle's resiliency or ability to adapt to climate change. Implementation of the plan could increase climate change resiliency.

- g. **If this legislation includes a new initiative or a major programmatic expansion: What are the specific long-term and measurable goal(s) of the program? How will this legislation help achieve the program's desired goal(s).**

Not applicable

**List attachments/exhibits below:**



**Amendment 1**

**to**

**RES 32031 – WRIA 9**

**Sponsor:** CM Herbold

Duwamish Basin Steward

Beginning on p. 3 of Resolution 32031, make the following changes:

WHEREAS, the WRIA 9 Plan recognizes that salmon recovery is a long-term effort, and focuses  
on a ten-year implementation time horizon to allow for evaluation of progress and  
adaptation of goals and implementation strategies; and

WHEREAS, it is important to provide jurisdictions, the private sector, and the public with  
certainty and predictability regarding salmon recovery actions in WRIA 9; and

WHEREAS, the WRIA 9 Watershed Ecosystem Forum supports the concept of basin stewards to  
help implement the plan, and the City of Seattle, City Tukwila, King County, and the Port  
of Seattle have recently agreed to jointly fund a new Duwamish Basin Steward, in  
addition to a Green River Steward already working in the watershed; and

WHEREAS, if insufficient action is taken at the local and regional level, Chinook salmon  
populations in WRIA 9 are unlikely to improve and the federal government could list  
Puget Sound Chinook salmon as an endangered species, thereby decreasing local  
flexibility; and

<p><b>Effect:</b> This amendment would add a new recital regarding a recent decision by multiple jurisdictions to fund a new Duwamish Basin Steward.</p>
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## Legislation Text

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**File #:** Res 32030, **Version:** 1

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### CITY OF SEATTLE

### RESOLUTION \_\_\_\_\_

A RESOLUTION relating to the City Light Department; acknowledging and approving the City Light Department's adoption of a biennial energy conservation target for 2022-2023 and ten-year conservation potential.

WHEREAS, Ballot Initiative 937 (I-937), also known as the Energy Independence Act, was passed by

Washington state voters on November 7, 2006, which requires qualifying electric utilities to obtain new renewable resources and undertake cost-effective energy conservation; and

WHEREAS, I-937 was codified in chapter 19.285 RCW; and

WHEREAS, RCW 19.285.040 calls for each qualifying utility to pursue all available conservation that is cost-effective, reliable, and feasible, including requiring of the development of conservation potential and biennial conservation targets; and

WHEREAS, WAC 194-37-070 requires that each qualifying utility must document the methodologies and inputs used in the development of its ten-year potential and biennial target are consistent with the requirements of RCW 19.285.040; and

WHEREAS, City Light undertook a Conservation Potential Assessment study to develop its ten-year potential and biennial target, which was consistent with the methodologies set forth in RCW 19.285.040 and WAC 194-37-070; and

WHEREAS, the Conservation Potential Assessment identifies a ten-year conservation potential of 76.9 annual megawatts (aMW) starting in 2022, and a biennial energy conservation target of 18.7 aMW for City



Light in 2022-2023; and

WHEREAS, City Light anticipates meeting or exceeding the energy conservation target for 2022 and 2023, and updating its Conservation Potential Assessment by the year 2023; and

WHEREAS, WAC 194-37-070 requires that each utility must establish its ten-year potential and biennial target by action of the utility's governing board, after public notice and opportunity for comment; NOW, THEREFORE,

**BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF SEATTLE, THE MAYOR  
CONCURRING, THAT:**

Section 1. Pursuant to RCW 19.285 et. seq. and corresponding WAC 194-37-070 regulations, and after public hearing, the City Council acknowledges and approves the City Light Department's (City Light) adoption of a biennial energy conservation target of 18.7 aMW for 2022-2023 and a ten-year conservation potential of 76.9 aMW starting in 2022. City Light's biennial energy conservation target and ten-year conservation potential are based upon a Conservation Potential Assessment conducted using methodologies consistent with those used by the Pacific Northwest Electric Power and Conservation Planning Council in order for City Light to pursue all available conservation that is cost-effective, reliable, and feasible.

Section 2. The City Council further acknowledges that City Light anticipates meeting or exceeding the biennial energy conservation target with its adopted 2022 budget.

Adopted by the City Council the \_\_\_\_\_ day of \_\_\_\_\_, 2021, and signed by  
me in open session in authentication of its adoption this \_\_\_\_\_ day of \_\_\_\_\_, 2021.

\_\_\_\_\_



President \_\_\_\_\_ of the City Council

The Mayor concurred the \_\_\_\_\_ day of \_\_\_\_\_, 2021.

\_\_\_\_\_  
Jenny A. Durkan, Mayor

Filed by me this \_\_\_\_\_ day of \_\_\_\_\_, 2021.

\_\_\_\_\_  
Monica Martinez Simmons, City Clerk

(Seal)



## **SUMMARY and FISCAL NOTE\***

<b>Department:</b>	<b>Dept. Contact/Phone:</b>	<b>CBO Contact/Phone:</b>
Seattle City Light	Kali Hollenhorst/4-3645 Jennifer Finnigan/6-9153	Greg Shiring/6-4085

*\* Note that the Summary and Fiscal Note describes the version of the bill or resolution as introduced; final legislation including amendments may not be fully described.*

### **1. BILL SUMMARY**

**Legislation Title:** A RESOLUTION relating to the City Light Department; acknowledging and approving the City Light Department’s adoption of a biennial energy conservation target for 2022-2023 and a ten-year conservation potential.

**Summary and background of the Legislation:**

To comply with RCW 19.285 (also known as I-937 or the Energy Independence Act), City Light must establish and make publicly available a biennial acquisition target for cost-effective conservation and a ten-year conservation potential. This Resolution establishes an 18.7 average megawatt (aMW) conservation target for 2022-2023 and a ten-year conservation potential of 76.9 aMW.

Initiative 937 was passed by Washington state voters in November 2006 to establish renewable and energy efficiency targets for electric utilities serving more than 25,000 retail customers. In complying with RCW 19.285.040, each qualifying utility shall pursue all available conservation that is cost-effective, reliable, and feasible. RCW 19.285.040.

WAC 194-37-070 Section (5) provides further guidance that the development of the biennial target and the ten-year potential should follow the methodologies used by the Northwest Power and Conservation Council (NWPPC) and this section offers a series of methodical details to ensure consistency with this regional effort. Section (4) also calls for electric utilities to “establish its ten-year potential and biennial target by action of the utility’s governing board, after public notice and opportunity for public comment.” The adoption of this resolution by the City Council in an open public meeting will maintain our compliance with state law.

Every two years City Light initiates a Conservation Potential Assessment (CPA) to identify the biennial acquisition target and the ten-year potential for the service territory. City Light hired the consulting firm (Cadmus) to support the CPA consistent with the methodologies outlined in RCW 19.285.040 and WAC 194-37-070 and to be consistent with the Northwest Power and Conservation Council’s methodology used for their Seventh Power Plan. This CPA has identified a total of 18.7 aMW being achievable within the City Light service territory for 2022-2023 and a total conservation potential of 76.9 aMW for the ten-year period starting in 2022. City Light anticipates meeting or exceeding the 18.7 aMW biennial target for 2022-2023 and believes the spending plan adopted in the Strategic Plan’s rate path is sufficient to meet the biennial acquisition targets.



As a point of reference, this is the seventh Resolution to establish the biennial target and ten-year potential for the utility. The most recent legislation, Resolution #31932 established the 2020-2021 conservation target of 21.27 aMW and ten-year potential of 82.67 aMW. The 2022-2023 target of 18.7 aMW is a decrease from the 2020-2021 conservation target of approximately 12%. Other than the energy savings target and ten-year potential, this Resolution is quite similar to Resolution 31932 in its language and intent.

## 2. CAPITAL IMPROVEMENT PROGRAM

Does this legislation create, fund, or amend a CIP Project? \_\_\_ Yes X No

## 3. SUMMARY OF FINANCIAL IMPLICATIONS

Does this legislation amend the Adopted Budget? \_\_\_ Yes X No

**Does the legislation have other financial impacts to the City of Seattle that are not reflected in the above, including direct or indirect, short-term or long-term costs?**

There is no direct financial impact of implementing this legislation; the adoption of this Resolution is an administrative requirement of state law. However, failing to meet the biennial conservation targets may result in an administrative penalty outlined in RCW 19.285.060: “(1) Except as provided in subsection (2) of this section, a qualifying utility that fails to comply with the energy conservation or renewable energy targets established in RCW 19.285.040 shall pay an administrative penalty to the state of Washington in the amount of fifty dollars for each megawatt-hour of shortfall. Beginning in 2007, this penalty shall be adjusted annually according to the rate of change of the inflation indicator, gross domestic product-implicit price deflator, as published by the bureau of economic analysis of the United States department of commerce or its successor.”

City Light’s proposed 2022 budget and the spending plan adopted in the Strategic Plan’s rate path provide the resources necessary to meet the target and it is anticipated that adequate resources will be available to meet the biennial acquisition targets for 2022-2023. City Light does not expect to propose any significant increase in budget levels to implement this legislation.

**Is there financial cost or other impacts of *not* implementing the legislation?**

There is no direct financial cost of not implementing this legislation. However, City Light is required by state law to set the conservation targets as outlined in RCW 19.285.040. City Light anticipates meeting the conservation targets with the funding levels proposed in the 2022-2026 Strategic Plan.

## 4. OTHER IMPLICATIONS

- a. Does this legislation affect any departments besides the originating department?  
No



**b. Is a public hearing required for this legislation?**

Yes. Consistent with WAC 194-37-070 section (4), the utility must establish its ten-year potential and biennial target by action of the utility's governing board, after public notice and opportunity for comment.

**c. Is publication of notice with *The Daily Journal of Commerce* and/or *The Seattle Times* required for this legislation?**

No

**d. Does this legislation affect a piece of property?**

No

**e. Please describe any perceived implication for the principles of the Race and Social Justice Initiative. Does this legislation impact vulnerable or historically disadvantaged communities? What is the Language Access plan for any communications to the public?**

No, this resolution sets an overall savings target for City Light, but does not alter the way the organization offers services to vulnerable or historically disadvantaged communities.

**f. Climate Change Implications**

**1. Emissions: Is this legislation likely to increase or decrease carbon emissions in a material way?**

This resolution supports a decrease in carbon emissions by establishing a two- and ten-year energy conservation target. Energy efficiency helps to reduce City Light's carbon emissions by saving energy and helping to reduce overall load, ultimately helping City Light's hydroelectric resources meet most of our demand.

**2. Resiliency: Will the action(s) proposed by this legislation increase or decrease Seattle's resiliency (or ability to adapt) to climate change in a material way? If so, explain. If it is likely to decrease resiliency in a material way, describe what will or could be done to mitigate the effects.**

This resolution supports Seattle's resiliency to climate change by establishing two- and ten-year energy conservation targets. Energy efficiency helps to reduce carbon emissions, as stated in f2.

**g. If this legislation includes a new initiative or a major programmatic expansion: What are the specific long-term and measurable goal(s) of the program? How will this legislation help achieve the program's desired goal(s).**

This is not a new initiative or major programmatic expansion; this effort is consistent with City Light's longstanding commitment to energy efficiency.

**List attachments/exhibits below:**

Summary Att A - 2022 Conservation Potential Assessment—Volume I





# 2022 Conservation Potential Assessment—Volume I

August 3, 2021

Project Lead: Kali Hollenhorst, Seattle City Light  
Prepared by: Aquila Velonis, Sophia Spencer, Cadmus



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## Definition of Terms

aMW	Average Megawatt
AC	Air Conditioning
ACS	American Community Survey
BPA	Bonneville Power Administration
CBECS	Commercial Buildings Energy Consumption Survey
CBSA	Commercial Building Stock Assessment
CETA	Clean Energy Transformation Act
CEE	Consortium for Energy Efficiency
CFL	Compact Fluorescent Lamp
CEAP	Clean Energy Action Plan
CEIP	Clean Energy Implementation Plan
Council	Northwest Power and Conservation Council
CPA	Conservation Potential Assessment
CRI	Color Rendering Index
DHW	Domestic hot water
DHP	Ductless heat pump
DSR	Demand-side response
ECM	Energy Conservation Measure
ECM	Electronically Commutated Motor
EISA	Energy Independence and Security Act of 2007
EUI	Energy Use Intensity
EUL	Effective Useful Life
GPM	Gallons Per Minute
HVAC	Heating Ventilation and Air Conditioning
I-937	Initiative 937
IRP	Integrated Resource Plan
kW	Kilowatt
kWh	Kilowatt-hour



LED	Light-emitting diode
MW	Megawatt
MWh	Megawatt-hour
NEEA	Northwest Energy Efficiency Alliance
O&M	Operations and Maintenance
PACT	Program administrator cost test
RBSA	Residential Building Stock Assessment
RCW	Revised Code of Washington
REC	Renewable Energy Credit
RTF	Regional Technical Forum
RUL	Remaining Useful Life
SEER	Seasonal Energy Efficiency Ratio
T&D	Transmission and Distribution
TRC	Total Resource Cost
TSPR	Total System Performance Ratio
UCT	Utility Cost Test
UEC	Unit Energy Consumption
UES	Unit Energy Savings
WAC	Washington Administrative Code



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# 1. Executive Summary

## 1.1. Overview

Seattle City Light (City Light) engaged Cadmus to complete a Conservation Potential Assessment (CPA) to produce rigorous estimates of the magnitude, timing, and costs of conservation resources in its service territory over the next 20 years, beginning in 2022. This study, as part of City Light's Integrated Resource Planning (IRP) process, is intended to identify cost-effective potential from the perspectives of energy efficiency and demand response within City Light's major customer sectors: residential, commercial, and industrial.<sup>1</sup> The results of this assessment will also help inform City Light's future programs. The study period aligns with the timeline for City Light's 2022 IRP and provides direct inputs into its IRP.

This study accomplishes the following objectives:

- Fulfills statutory requirements of Chapter 194-37 of the Washington Administrative Code (WAC), Energy Independence Act. The WAC requires that City Light identify all achievable, cost-effective, conservation potential for the upcoming ten years.<sup>2</sup> City Light's public biennial conservation target should be no less than the *pro rata* share of conservation potential over the first ten years. The study estimates will inform City Light's targets for the 2022-2023 biennium.
- Supports City Light's compliance of Washington State's Clean Energy Transformation Act (CETA), passed as Senate Bill 5116 in April 2019, to inform City Light's energy efficiency and demand response short- and long-term targets.<sup>3</sup> In addition, this study will inform City Light's near-term interim targets for its Clean Energy Implementation Plan (CEIP) as required by CETA. CETA sets additional requirements for City Light, such as including the social cost of carbon in avoided energy costs. This study, more broadly, supports City Light's Clean Energy Action Plan (CEAP), a ten-year action plan described in the 2020 IRP Progress Report to meet CETA requirements.
- Develops up-to-date estimates of energy conservation measure (ECM) datasets for the residential, commercial, and industrial market sectors using measures consistent with the Northwest Power and Conservation Council's (Council) draft 2021 Power Plan, the Regional Technical Forum (RTF), and other data sources.
- Provides inputs into City Light's IRP. Completed every two years, City Light's IRP determines the mixture of supply-side and demand-side resources required over the next 20 years to meet customer demand and looks ahead to how City Light plans to meet the 2045 100 percent

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<sup>1</sup> This study did not estimate street lighting potential as all streetlights have been converted to LED.

<sup>2</sup> Washington State Legislature. *Energy Independence Act*. Washington Administrative Code Chapter 194-37.

<sup>3</sup> CETA requires proposing interim targets for meeting the standard under RCW 19.405.040(1) during the years prior to 2030 and between 2030 and 2045. This study estimates potential over 20 years (2022-2041) and does not directly estimate potential through 2045. Through the IRP process, City Light's projects their long-term targets out to 2045.



non-emitting standard of CETA. The IRP requires a thorough analysis of conservation potential to properly assess the reliability, cost, risk, and environmental impact of different resource portfolios for power generation as well as other demand-side resources that are not part of the CPA.

This study relies on City Light-specific data, compiled from City Light’s oversample of the 2017 Northwest Energy Efficiency Alliance (NEEA) Residential Building Stock Assessment (RBSA),<sup>4</sup> the 2019 Commercial Building Stock Assessment (CBSA),<sup>5</sup> and other regional data sources. This study uses a methodology consistent with the Council’s draft 2021 Power Plan supply curve workbooks, as of December 2020.<sup>6</sup> It incorporates savings and costs for all ECMs in the Council’s draft 2021 Power Plan workbooks and the active unit energy savings (UES) workbooks from the RTF.<sup>7</sup> The *Detailed Methodology* section of this report describes the sources and data used in greater detail.

This study also estimates demand response potential to align with the Council’s demand response methodology and to provide City Light the data it needs to meet Washington State’s CETA requirements. The demand response potential can be found in Appendix E.

## 1.2. Scope of Analysis

This study analyzed three sectors—residential, commercial, and industrial—and, where applicable, Cadmus considered multiple market segments, construction vintages (new and existing), and end-uses:

- Residential: Eight segments including standard-income single-family and multifamily homes (including low-rise, mid-rise, and high-rise) and low-income single-family and multifamily homes (including low-rise, mid-rise, and high-rise)<sup>8</sup>
- Commercial: 20 major commercial segments (including offices, retail, and other segments)
- Industrial: Energy-intensive manufacturing and primarily process-driven customers

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<sup>4</sup> Northwest Energy Efficiency Alliance. *2017 Residential Building Stock Assessment*.

<sup>5</sup> Northwest Energy Efficiency Alliance. *2019 Commercial Building Stock Assessment*.

<sup>6</sup> In early 2022, the Council is expected to finalize the region’s eighth Power Plan (the 2021 Power Plan). This is a regional plan that provides guidance on which resources can help ensure a reliable and economical regional power system from 2022 to 2041. The Council develops supply curves covering a variety of supply- and demand-side resources, considers how to best meet the region’s power needs across a range of future scenarios, balancing cost and risk, and develops a draft plan and gathers public input before releasing the final version.

<sup>7</sup> RCW 19.285.040 requires CPAs to use methodologies consistent with those used by the Council’s most recent regional power plan.

<sup>8</sup> Cadmus disaggregated residential households into low-income and standard-income segments based on income qualification in the City Light Utility Discount Program. Thus, only customers with a household income of less than 70 percent of the state median income, by household size, were considered low-income.



For each sector, Cadmus developed a baseline end-use load forecast that assumed no new future programmatic conservation. The baseline forecast largely captured savings from building energy codes, equipment standards, and other naturally occurring market forces. Cadmus calculated energy efficiency potential estimates by assessing the impact of each ECM on this baseline forecast. Therefore, conservation potential estimates presented in this report represent savings beyond codes and standards and naturally occurring savings.

Consistent with the WAC requirements, this study considers two types of energy efficiency potential, as shown in Figure 1.1. City Light determined a third potential—achievable economic—through the IRP’s optimization modeling.

**Figure 1.1. Types of Energy Efficiency Potential**



The three types of potential are described as follows:

- **Technical potential** assumes that all technically feasible resource opportunities may be captured, regardless of their costs or other market barriers. It represents the total energy efficiency potential in City Light’s service territory, after accounting for purely technical constraints.
- **Achievable technical potential** is the portion of technical potential assumed to be achievable during the study’s forecast, regardless of the acquisition mechanism. For example, savings may be acquired through utility programs, improved codes and standards, and market transformation.
- **Achievable economic potential** is the portion of achievable technical portion determined to be cost-effective by the IRP’s optimization modeling, in which either bundles or individual energy efficiency measures are selected based on cost and savings. The cumulative potential for these selected bundles constitutes achievable economic potential.

This is a divergence from prior CPAs where Cadmus provided the estimates for achievable economic potential based on screening individual measures for cost-effectiveness under a total resource cost (TRC)



test.<sup>9</sup> For the 2022 CPA, City Light used their IRP optimization model to select measures based on the levelized cost.

To be consistent with WAC requirements of relying on cost-effective energy efficiency for this 2022 CPA, Cadmus bundled the resulting forecasts of achievable technical potential by levelized costs bin for City Light's IRP modeling team. The IRP modeling team then determined the amount of cost-effective energy efficiency that could be considered as a resource within the IRP. Details of the IRP process and the final selection of measures considered as part of the IRP optimization model can be found in the *Development of Conservation IRP Inputs* section of this report and in Appendix D (Measure Details).

### 1.3. Summary of Results

The study found 125 average megawatts (aMW) of achievable technical potential in the first ten years (cumulative in 2031) in City Light's service territory.<sup>10</sup> To inform CEIP energy efficiency targets, Cadmus calculated two-year and four-year cumulative achievable technical potential. In the first two years, cumulative achievable technical potential equals 28 aMW, and in the first four year cumulative achievable technical potential is 53 aMW.

Furthermore, City Light used its IRP optimization model to select measures based on the levelized TRC. Overall, the cumulative 20-year achievable economic potential is 106 aMW, with 77 aMW acquired in the first ten years. The *pro rata* share (20 percent of 10-year achievable economic potential), which represents City Light's minimum biennial target, equals 15 aMW. All estimates of potential in this report are presented at the generator, meaning they include line losses.<sup>11</sup>

#### 1.3.1. Technical Potential

Table 1.1 shows the cumulative technical potential for each sector in 2041. Overall, the study identified 233 aMW of technically feasible conservation potential by 2041—the equivalent of 19 percent of forecasted baseline sales. Study results are presented as a percentage of forecasted baseline sales, which provides a useful benchmark for comparison against City Light's previous CPAs and the Council's draft 2021 Power Plan. The commercial, residential, and industrial sectors account for 56 percent, 39 percent, and 5 percent of the 20-year technical potential, respectively.

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<sup>9</sup> Cadmus conducted both the 2020 CPA and the 2022 CPA.

<sup>10</sup> An average megawatt (aMW) refers to a unit of measure that represent one million watts (MW) delivered continuously 24 hours a day for each day of the year (e.g., 8,760 hours). A detailed description of MW and aMW can be found on the Council's website:  
<https://www.nwcouncil.org/reports/columbia-river-history/megawatt>

<sup>11</sup> For illustrative purposes, City Light estimates line losses to be 5.5 percent, so the minimum biennial target at the customer site is 14 aMW.



**Table 1.1. Cumulative Technical Potential by Sector (2022-2041)**

<b>Sector</b>	<b>Baseline Sales– 20-Year (aMW)</b>	<b>Technical Potential– 20-Year (aMW)</b>	<b>Technical Potential as % of Baseline Sales</b>
Residential	461	90	20%
Commercial	667	131	20%
Industrial	91	12	13%
<b>Total</b>	<b>1,219</b>	<b>233</b>	<b>19%</b>

**1.3.2. Achievable Technical Potential**

Table 1.2 shows the cumulative achievable technical potential for each sector in 2041. Overall, the study identified 196 aMW of technically feasible achievable potential by 2041—the equivalent of 16 percent of forecasted baseline sales. The commercial, residential, and industrial sectors account for 59 percent, 36 percent, and 5 percent of the cumulative achievable technical potential, respectively.

**Table 1.2. Cumulative Achievable Technical Potential by Sector (2022-2041)**

<b>Sector</b>	<b>Baseline Sales– 20-Year (aMW)</b>	<b>Achievable Technical Potential– 20-Year (aMW)</b>	<b>Achievable Technical Potential as % of Baseline Sales</b>
Residential	461	70	15%
Commercial	667	116	17%
Industrial	91	10	11%
<b>Total</b>	<b>1,219</b>	<b>196</b>	<b>16%</b>

Table 1.3 provides two-year, four-year, and ten-year cumulative achievable technical potential by sector. The commercial sector provides the majority of the cumulative achievable technical potential. This is due in part to the commercial sector's higher baseline sales compared to the residential and industrial sectors as well as the reduction in potential for residential screw-base lighting compared to prior assessments, thereby shifting the potential to the commercial sector.

**Table 1.3. Cumulative Achievable Technical Potential by Sector and Time Period**

<b>Sector</b>	<b>Achievable Technical Potential – aMW</b>				
	<b>2-Year (2022-2023)</b>	<b>4-Year (2022-2025)</b>	<b>10-Year (2022-2031)</b>	<b>20-Year (2022-2041)</b>	<b>20% of 10-Year Potential</b>
Residential	6	12	32	70	6
Commercial	20	37	85	116	17
Industrial	2	4	9	10	2
<b>Total</b>	<b>28</b>	<b>53</b>	<b>125</b>	<b>196</b>	<b>25</b>



Table 1.4 provides the winter and summer technical and achievable technical capacity savings from energy efficiency by sector in 2041 in megawatts (MW). Capacity savings represent the maximum demand for each season. The commercial sector accounts for the majority of the total cumulative winter and summer capacity achievable technical potential. The residential sector accounts for nearly 46 percent of the winter capacity achievable technical potential but only 25 percent of the summer capacity achievable technical potential, which reflects the relatively higher saturation of residential electric space heating loads compared with residential cooling loads.

**Table 1.4. Cumulative Winter and Summer Capacity (MW) Savings by Sector (2022-2041)**

Sector	Technical Potential		Achievable Technical Potential	
	Winter MW	Summer MW	Winter MW	Summer MW
Residential	158	81	124	63
Commercial	154	199	135	175
Industrial	13	13	11	11
<b>Total</b>	<b>325</b>	<b>294</b>	<b>270</b>	<b>249</b>

Table 1.5 provides the two-, four-, and ten-year summer and winter capacity savings by sector. In the first ten years of the study period, the cumulative winter achievable technical capacity savings are 167 MW, 62 percent of the 20-year cumulative winter achievable technical capacity savings. The cumulative summer achievable technical capacity savings are 165 MW, 66 percent of the 20-year cumulative summer achievable technical capacity savings.

**Table 1.5. Cumulative Winter and Summer Capacity (MW) Savings by Sector and Time Period**

Sector	Cumulative Winter Achievable Technical Potential (MW)			Cumulative Summer Achievable Technical Potential (MW)		
	2-Year (2022-2023)	4-Year (2022-2025)	10-Year (2022-2031)	2-Year (2022-2023)	4-Year (2022-2025)	10-Year (2022-2031)
Residential	10	22	59	5	10	26
Commercial	23	43	98	31	57	129
Industrial	2	4	9	2	4	10
<b>Total</b>	<b>35</b>	<b>69</b>	<b>167</b>	<b>38</b>	<b>71</b>	<b>165</b>

### 1.3.3. Technical and Achievable Technical Comparison to the 2020 CPA

The 2022 CPA identified 233 aMW of cumulative, 20-year technical potential, compared to 282 aMW in the 2020 CPA, as shown in Table 1.6. The 17 percent decrease in cumulative, final year technical potential is due to the following major drivers:

- Cadmus made updates to the residential baseline forecast that assume a shift in heating and cooling equipment to more efficient heat pumps over time based on City Light's assumptions about market adoption. For example, Cadmus increased new construction, single-family heat



pump saturations from 15 percent in the base year to 30 percent in the final year to align with City Light's load forecasting assumptions.

- The study accounted for an increase in LED lighting saturation and state standards in Washington (HB 1444). The state standards require general service lamps to meet or exceed a lamp efficacy of 45 lumens per watt, similar to the federal Energy Independence and Security Act of 2007 (EISA) backstop provision. Additional details can be found in *Additional Codes and Standards Considerations* section of this report.
- Cadmus assumed a higher saturation of more efficient lighting for standard-income residential customers compared to the 2020 CPA. As a result, less lighting savings can be achieved (e.g., more homes already have efficient LED lighting).
- Commercial lighting measure potential decreased by 50 percent compared to the Seventh Power Plan, in part, due to the higher saturation of existing LED lamp and fixture applications in the commercial sector.
- Cadmus included additional industrial measures from the draft 2021 Power Plan, requested by City Light.

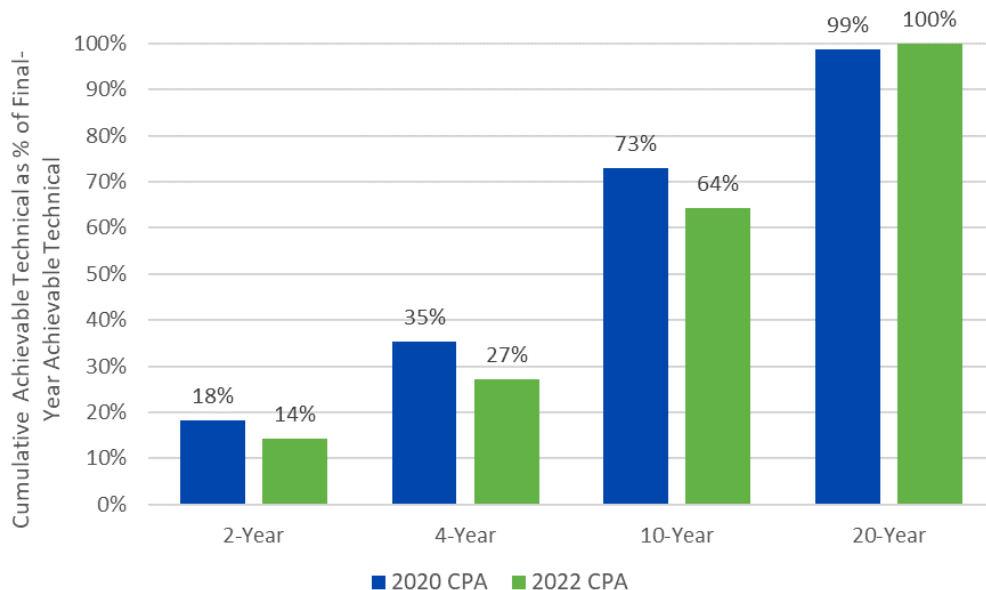
**Table 1.6. Cumulative Technical Potential Comparison by Sector**

Sector	2022 CPA			2020 CPA		
	Baseline Sales— 20 Year (aMW)	Technical Potential— 20 Year (aMW)	Technical Potential as % of Baseline Sales	Baseline Sales— 21 Year (aMW)	Technical Potential— 21 Year (aMW)	Technical Potential as % of Baseline Sales
Residential	461	90	20%	440	100	23%
Commercial	667	131	20%	693	173	25%
Industrial	91	12	13%	88	9	10%
<b>Total</b>	<b>1,219</b>	<b>233</b>	<b>19%</b>	<b>1,221</b>	<b>282</b>	<b>23%</b>

This report's *Comparison to 2020 CPA* section discusses each factor in detail. Figure 1.2 illustrates that the 2020 CPA realized a higher proportion of total achievable technical potential in the initial years of the study.



**Figure 1.2. Cumulative Achievable Technical Potential as a Percentage of Total Achievable Technical Potential**



Cadmus used the draft 2021 Power Plan ramp rates in the 2022 CPA rather than the Seventh Power Plan ramp rates (released in February 2016) that were used in the 2020 CPA. The change in sources for ramp rate data leads to a decrease in potential in the initial years of the study relative to the final year. Because the Seventh Power Plan ramp rates ranged from 2016 to 2035, for the 2020 CPA, Cadmus took the ramp rate beginning in 2020 and extrapolated maximum saturation to extend from 2035 to the final year of the study (2040). This methodology is described in more detail in the *Achievable Technical Potential and Ramping* section of this report.

The 2022 CPA used the ramp rates from the draft 2021 Power Plan supply curve workbooks (as of December 2020), which have ramp rates for the 2022 to 2041 period. Therefore, the first year of the study aligns with the first year of the CPA—no extrapolation was needed. This leads to less realized potential in the initial years of the study. It is worth noting, as part of this study, Cadmus worked with City Light to determine the appropriate Council ramp rates so that City Light’s program measures align better with historical program acquisition as well as with local and state policies promoting energy efficiency.

Even with these adjustments, the annual rate of adoption is lower in the early years of this study compared to the prior CPA. However, this study still “frontloads” the savings with the earlier part of the study with the ten-year estimate representing over 60 percent of the total 20-year achievable technical potential. Ramp rates are explained in more detail in the *About Measure Ramp Rates* section of this report.

The industrial sector in the 2022 CPA included new measures based on the draft 2021 Power Plan, such as HVAC measures, forklift battery chargers, and new savings methodology for compressors, fans, pumps, and other motor-driven systems. City Light also requested the inclusion of measures such as industrial generator block heaters, retro-commissioning, and welder system upgrades. These additions and changes



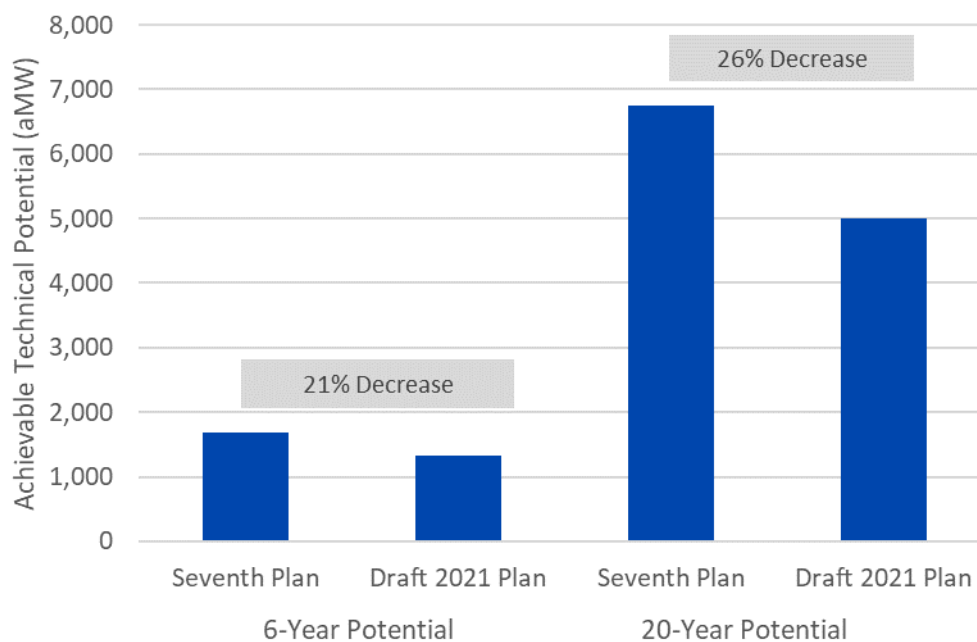
in methodology increased the potential in the industrial sector compared to the prior CPA. Additional detail of this comparison can be found in the *Industrial Sector Changes*

The industrial sector in the 2022 CPA included new measures based on the draft 2021 Power Plan, such as HVAC measures, forklift battery chargers, and new methodology for compressors, fans, pumps, and other motor-driven systems. City Light also requested the addition of measures such as industrial generator block heaters, retro-commissioning, and welder system upgrades. These additions and changes in methodology increased the potential in the industrial sector compared to the prior CPA.

#### Achievable Technical Potential and Ramping

Further differences in the achievable technical and technical potential between the 2020 CPA and the 2022 CPA are tied to the change in source of the underlying data, from using the Seventh Power Plan to using the draft 2021 Power Plan. Both studies are consistent with Council as the primary resource for residential, commercial, and industrial measures impacts. The 2022 CPA transitioned from the Council's Seventh Power Plan (February 2016) to the draft 2021 Power Plan. These updates impacted measure consumption or savings values for individual measures. As demonstrated in Figure 1.3, the potential in the first six years and the 20-year achievable technical potential from the draft 2021 Power Plan are 21 percent and 26 percent less than the corresponding Seventh Power Plan values, respectively.

**Figure 1.3. Draft 2021 Power Plan and Seventh Power Plan Regional Cumulative Achievable Technical Potential**



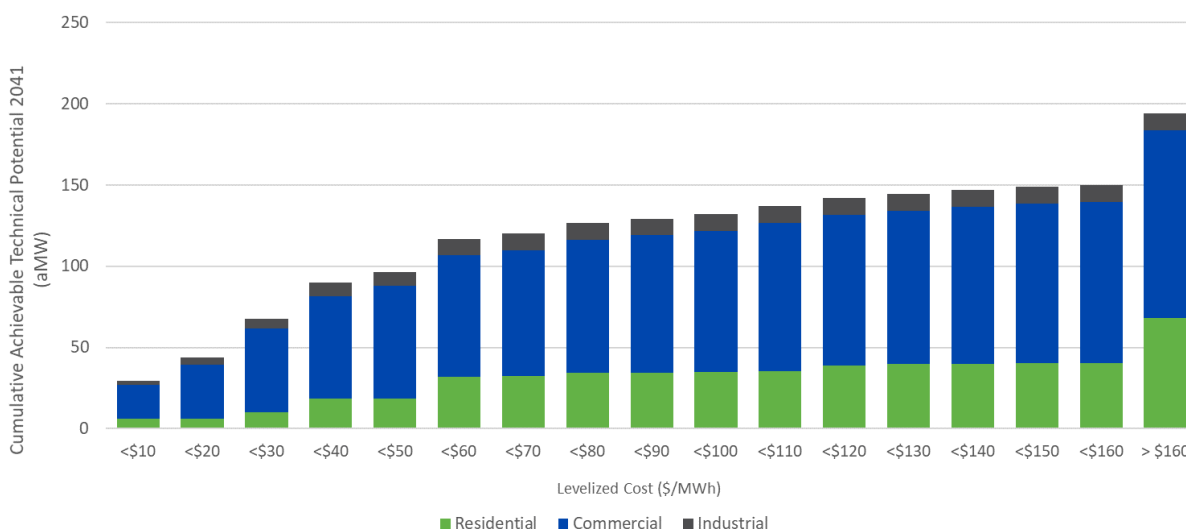
*Note: Draft 2021 Power Plan data was last updated on June 16, 2020, and may not represent final planning values.*



### 1.3.4. Incorporating Conservation into City Light's IRP

Cadmus summarized the achievable technical potential for energy efficiency, described above, by the leveled cost groups (bins) of conserved energy by customer class for inclusion in City Light's IRP framework. These costs have been calculated over a 20-year program life—the *Development of Conservation IRP Inputs* section provides additional detail on the leveled cost methodology. Figure 1.4 shows that 67 aMW, or 34 percent, of the cumulative, 2041 achievable technical potential has a leveled cost of less than or equal to \$30 per MWh. Additionally, the figure shows that 24 percent of the total achievable technical potential has a leveled cost of greater than \$160 per MWh.

**Figure 1.4. Electric Supply Curve – Cumulative 20-Year Achievable Technical Potential (Levelized Cost Bins)**



There is less energy efficiency potential available in the lower leveled cost bins compared to the prior CPA. This directly corresponds with the Council's draft 2021 Power Plan data, where the measure acquisition costs are higher compared to the Seventh Power Plan.

### 1.3.5. Achievable Economic Potential

After incorporating the achievable technical leveled cost of conserved energy bins, City Light's IRP model identified an optimal amount of annual conservation. Bundling resources into a number of distinct cost groups allowed the portfolio optimization model to select the combination of conservation cost bundles by sector that provided City Light with the least-cost portfolio alongside renewable resources while also achieving resource adequacy targets, I-937 requirements, City Light's greenhouse gas neutrality goals, and the requirements of the Clean Energy Transformation Act of Washington. By integrating conservation choices alongside renewable supply options into the portfolio optimization model, City Light can capture the different value streams from all resources within the same analytical framework.

The resulting IRP analysis selected 106 aMW of achievable economic potential at an optimal leveled cost for each sector, as shown in Table 1.7. Cumulative, 20-year achievable economic potential accounted for



9 percent of the total baseline sales in 2041. The commercial sector had the greatest achievable economic potential relative to baseline sales, accounting for 12 percent of the baseline sales for the commercial sector in 2041. This was followed by the industrial sector cumulative achievable economic potential, which accounted for 11 percent of the industrial 2041 baseline sales. Finally, the residential sector cumulative achievable economic potential made up 4 percent of the 2041 residential baseline sales.

The IRP portfolio optimization model differentiated the levelized TRC by sector so the model can select the specific energy efficiency cost bins for each sector that best fit City Light's portfolio and minimize the overall costs. This also recognizes that the conservation supply curves for each sector have different shapes, limits, and elasticities. As shown in Table 1.7, the achievable economic potential represents the levelized TRC of \$40 or less per MWh for residential, \$70 or less per MWh for commercial, and all levelized cost bins for industrial.

**Table 1.7. Cumulative Achievable Economic Potential by Sector (2022-2041)**

<b>Sector</b>	<b>Levelized TRC (\$/MWh)</b>	<b>Baseline Sales—20 Year (aMW)</b>	<b>20-Year Achievable Economic Potential (aMW)</b>	<b>Achievable Economic Potential as % of Baseline Sales</b>
Residential	≤\$40	461	18	4%
Commercial	≤\$70	667	77	12%
Industrial	All Bins	91	10	11%
<b>Total</b>		<b>1,219</b>	<b>106</b>	<b>9%</b>

Table 1.8 provides the two-, four-, ten-, and 20-year cumulative achievable economic potential estimates by sector. Eighteen percent of the total 20-year achievable economic is achieved in the first two years, and 73 percent is achieved in the first ten years.

**Table 1.8. Cumulative Achievable Economic Potential by Sector and Time Period**

<b>Sector</b>	<b>Achievable Economic Potential – aMW</b>				
	<b>2-Year (2022-2023)</b>	<b>4-Year (2022-2025)</b>	<b>10-Year (2022-2031)</b>	<b>20-Year (2022-2041)</b>	<b>20% of 10-Year Potential</b>
Residential	2.90	5.22	11.16	17.91	2.23
Commercial	13.85	25.98	57.08	77.48	11.42
Industrial	1.99	4.03	8.65	10.44	1.73
<b>Total</b>	<b>18.74</b>	<b>35.23</b>	<b>76.89</b>	<b>105.83</b>	<b>15.38</b>

Table 1.9 provides achievable economic potential estimates of the two-, four-, and ten-year summer and winter capacity savings by sector.



**Table 1.9. Cumulative Achievable Economic Winter and Summer Capacity (MW) Savings by Sector and Time Period**

Sector	Cumulative Winter Achievable Technical Potential (MW)			Cumulative Summer Achievable Technical Potential (MW)		
	2-Year (2022-2023)	4-Year (2022-2025)	10-Year (2022-2031)	2-Year (2022-2023)	4-Year (2022-2025)	10-Year (2022-2031)
Residential	4	8	16	3	5	12
Commercial	16	31	68	20	37	80
Industrial	2	4	9	2	4	10
<b>Total</b>	<b>23</b>	<b>43</b>	<b>93</b>	<b>25</b>	<b>47</b>	<b>102</b>

## 1.4. Organization of this Report

This report presents the study's findings in two volumes. Volume I—this document—presents the methodologies and findings. Volume II contains the appendices and provides detailed study results, supplemental materials, and summaries of demand response potential.

**Volume I** includes the following sections:

- *Methodology Overview* provides an overview of the methodology Cadmus and City Light used to estimate technical, achievable technical, and achievable economic potential.
- *Baseline Forecast* provides detailed sector-level results for Cadmus' baseline end-use forecasts.
- *Energy Efficiency Potential* provides detailed sector, segment and end-use specific estimates of conservation potential as well as discussion of top-saving measures in each sector.
- *Comparison to 2020 CPA* shows how this study's results (the 2022 CPA) compare to City Light's prior CPA.
- *Detailed Methodology* describes Cadmus' combined top-down/bottom-up modeling approach.
- *Developing Baseline Forecasts* provides an overview of Cadmus' approach to produce baseline end-use forecasts for each sector.
- *Measure Characterization* describes Cadmus' approach for developing a database of ECMs, deriving from this estimates of conservation potential. This section discusses how Cadmus adapted measure data from the draft 2021 Power Plan, the RTF, RBSA, CBSA, and other sources for this study.
- *Estimating Conservation Potential* discusses assumptions and underlying equations used to calculate technical and achievable technical potential.
- *Development of Conservation IRP Inputs* details the 2022 CPA methodology of determining cost-effective conservation supply curves as an input for City Light's IRP optimization model to identify the achievable economic potential.



- *City Light's IRP Portfolio Framework* provides an overview of the methodology from the City Light economic screening process to determine the cost-effective conservation potential for the Energy Independence Act and the CEIP.

**Volume II** includes the following sections:

- Appendix A. Washington Initiative 937 (I-937) Compliance Documentation
- Appendix B. Baseline Data
- Appendix C. Detailed Assumptions and Energy Efficiency Potential
- Appendix D. Measure Details<sup>12</sup>
- Appendix E. Demand Response

**Volume III** includes detailed inputs, assumptions, and scenarios of City Light's IRP optimization modeling.

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<sup>12</sup> Appendix D includes sector, end-use group, and measure level results by technical, achievable technical, and IRP selected potential (achievable economic potential).



## 2. Methodology Overview

Estimating conservation potential draws upon a sequential analysis of various energy conservation measures (ECMs) in terms of technical feasibility (technical potential), expected market acceptance, and the normal barriers that could impede measure implementation (achievable technical potential).

Cadmus' assessment took the following primary steps:

- Development of the baseline forecast involved determining the 20-year future energy consumption by sector, market segment, and end-use. This study calibrated the base year (2022) to City Light's sector level, corporate load forecast produced in 2020. Baseline forecasts in this report include estimated impacts of market-driven efficiency, codes and standards, and City Light's estimates of the impacts of COVID-19 on commercial and residential energy usage. Cadmus worked with the City Light load forecast team to determine the impacts of market-driven efficiency and codes and standards.
- Estimates of technical potential are based on incremental difference between the baseline load forecast and an alternative forecast reflecting the technical impacts of specific energy efficiency measures.
- Estimates of achievable technical potential are calculated by applying ramp rates and achievability percentages to technical potential, described in greater detail in this section.

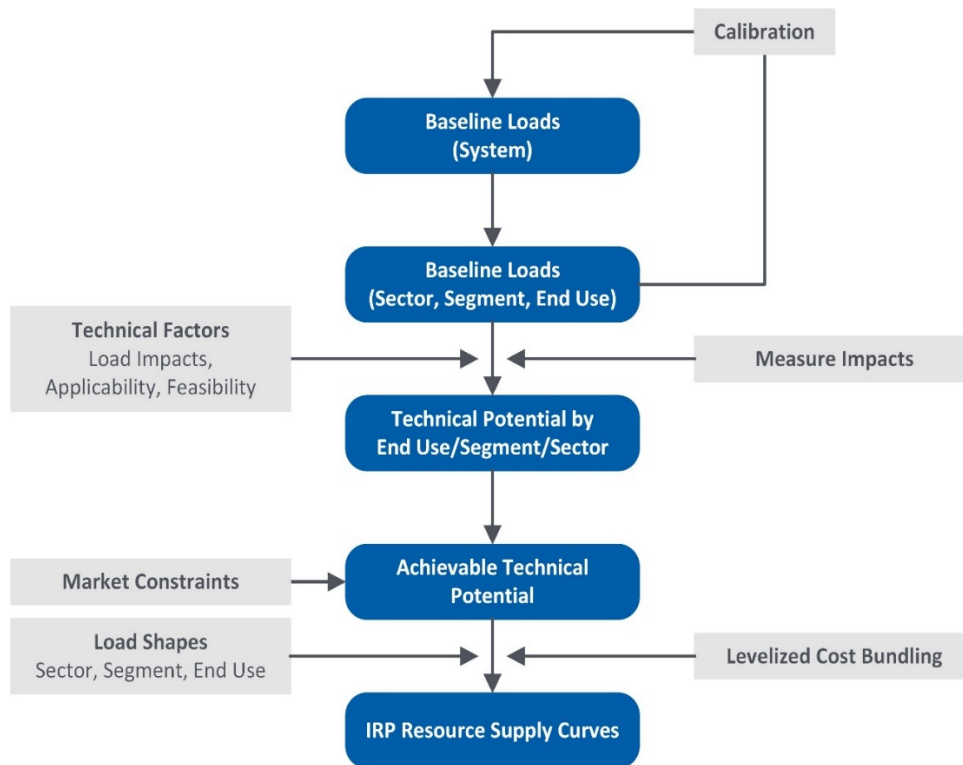
This approach offered two advantages:

- Savings estimates were driven by a baseline forecast that is consistent with the assumptions used in City Light's adopted 2020 corporate load forecast.
- The approach maintained consistency among all assumptions underlying the baseline and alternative forecasts—technical and achievable technical potential. The alternative forecasts changed relevant inputs at the end-use level to reflect ECM impacts. Because estimated savings represented the difference between baseline and alternative forecasts, they could be directly attributed to specific changes made to analysis inputs.

Cadmus' general methodology can be best described as a combined top-down/bottom-up approach. As shown in Figure 2.1, the top-down component began with the most current load forecast, adjusting for building codes, equipment efficiency standards, and market trends. Cadmus then disaggregated this load forecast into its constituent customer sectors, customer segments, and end-use components.

The bottom-up component estimates electric consumptions for each major building end-use and applies potential technical impacts of various ECMs to each end-use. This bottom-up analysis includes assumption on end-use equipment saturations, fuel shares, ECM technical feasibility, ECM cost, and engineering estimates of ECM unit energy consumption and savings. A detailed description of the methodology can be found in the [Detailed Methodology](#) section.



**Figure 2.1. General Methodology for Assessment of Conservation Potential**

In the final step, Cadmus developed energy efficiency supply curves so City Light’s IRP portfolio optimization model could identify the amount of cost-effectiveness for energy efficiency. The portfolio optimization model required hourly forecasts of electric energy efficiency potential. To produce these hourly forecasts, Cadmus applied hourly end-use load profiles to annual estimates of achievable technical potential for each measure. These profiles are similar to the shapes the Council used in its draft 2021 Power Plan supply curves and as the RTF used in its UES measure workbooks.

## 2.1. Considerations and Limitations

This study provides insights into which measures City Light could offer in future programs and is intended to inform program targets. The following are other considerations about the design of this potential study that may cause future program plans to differ from study results:

- The baseline demand forecasts is based on the 2020 adopted City Light’s Corporate Forecast. It includes assumptions about the impacts of COVID-19 on commercial and residential energy usage that, by default, impact the related energy efficiency potential. Due to the lack of data and knowledge about the future impacts of the pandemic, it is possible that the near-term demand and potential available has more uncertainty than in normal times.
- This potential study uses broad assumptions about the adoption of energy efficiency measures. Program design, however, requires a more detailed examination of historic participation and incentive levels on a measure-by-measure basis. The study can inform planning for measures City



Light has not historically offered, or can focus program design on areas with remaining amounts of potential identified in this study.

- This potential study does not consider program implementation barriers. Though it includes a robust, comprehensive set of efficiency measures, it does not examine if these measures can be delivered through incentive programs or what incentive rate is appropriate. Many programs require strong trade ally networks or must overcome market barriers to succeed.
- This potential study cannot predict market changes over time. Though it accounts for changes in codes and standards as they are enacted today, the study cannot predict future changes in policies, pending codes and standards, and which new technologies may become commercially available. For example, past potential studies may not have accurately predicted the speed and magnitude of recent adoption of LED technology. City Light programs are not static and have the flexibility to address changes in the marketplace, whereas the potential study estimates potential using information collected at a single point in time.
- Due to timing constraints, City Light did not fully evaluate climate change impacts in its baseline load forecast that was used for the 2022 CPA. City Light's current forecast does not include the same level of climate change-induced impacts as does the Council. As a result, this study does not directly reflect possible changes in consumption patterns resulting from climate change. However, City Light's 2022 IRP portfolio optimization model did assess alternative scenarios that incorporate climate change impacts.
- This potential study does not attempt to forecast or otherwise predict future changes in energy efficiency measure costs. The study includes Council and RTF incremental energy efficiency measure costs, including equipment, labor, and operations and maintenance, but it does not attempt to forecast changes to these costs during the course of the study (except where Council makes adjustments). For example, changes in incremental costs may impact some emerging technologies, which may then impact both the speed of adoption and the levelized cost of that measure (impacting the IRP levelized cost bundles).
- Commercial end-use consumption relies on NEEA's CBSA data supplemented by U.S. Energy Information Administration's Commercial Buildings Energy Consumption Survey (CBECS). However, these data may not reflect the type of commercial facilities in City Light's territory and may have an inherent level of uncertainty. On May 28, 2021, the Council's Conservation Resources Advisory Committee reiterated that additional research for the region is needed to develop more reliable energy use intensity data for commercial buildings. In addition, Seattle contains a number of large multifamily buildings with insufficient primary data (such as baseline stock characteristics). For example, this potential study assessed the impacts of the 2018 Seattle Energy Code and incorporated the code as best as possible. Data were limited on the natural gas fuel shares of equipment in multifamily construction and, therefore, it was difficult to correctly estimate the impact of this 2018 code. As a result, this potential study has limited insight to inform the remaining potential in this segment and requires further research.



- This study uses City Light’s nonresidential database to identify sales and the number of customers for each commercial market segment. City Light last updated this database in 2016. Though still relatively recent, this database does not incorporate changes in customer building use or any new construction activity within the past five years. An update to these data will be the basis for segmentation of the commercial sector and will improve future CPA potential characterization analysis.

Though these considerations and limitations impact the CPA, it is worth noting that Chapter 194-37 of the WAC requires City Light to complete and update a CPA every two years. City Light can then address some of these considerations over time and mitigate short- and mid-term uncertainties by continually revising CPA assumptions to reflect changes in the market.



## 3. Baseline Forecast

### 3.1. Scope of Analysis

Assessing conservation potential starts with development of baseline end-use load forecasts over a 20-year (2022 to 2041) planning horizon. These forecasts are calibrated to City Light's corporate load forecast in the base year (2022). They are not adjusted for future programmatic conservation, but they do account for enacted equipment standards and building energy codes. This potential study separately considers residential, commercial, and industrial sectors in the baseline forecast.

In each sector-level assessment, the study further distinguishes building segments, facility types, and their respective, applicable end-uses. The analysis addressed the following:

- Sixteen residential segments of existing and new construction:
  - Single-family, single-family low-income
  - Multifamily low-rise, multifamily low-rise low-income, multifamily mid-rise, multifamily mid-rise low-income, multifamily high-rise, multifamily high-rise low-income<sup>13</sup>
- Forty commercial segments, which include new and existing construction for 20 standard commercial segments
- Eight industrial segments (existing construction only)

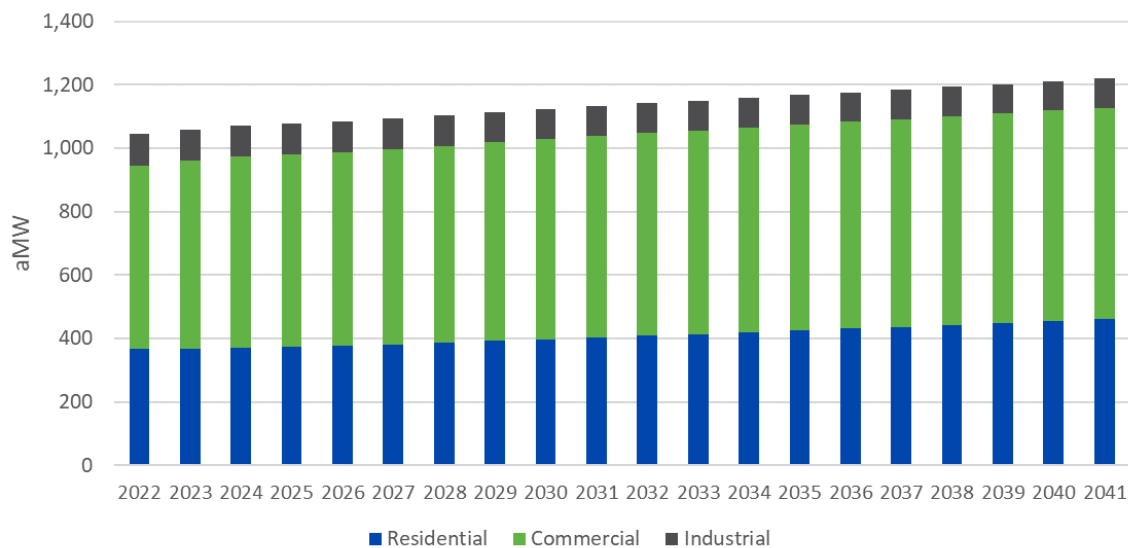
Cadmus and City Light's load forecast team worked together to develop a baseline forecast that aligned with City Light's 2020 adopted corporate load forecast. To achieve this, Cadmus modified the residential baseline forecast to include assumptions about electrification and market-driven equipment adoption (e.g., changing heat pump and cooling equipment saturations over time). These changes are detailed in the following section as well as in the *Detailed Methodology* section.

Figure 3.1 shows the distribution of projected sales by sector in 2041. The commercial sector will account for roughly 55 percent of projected sales, while the residential and industrial sectors will account for 38 percent and 7 percent, respectively.

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<sup>13</sup> Multifamily low-rise is defined as multifamily buildings with one to three floors; mid-rise is defined as buildings with four to six floors; and high-rise is defined as buildings with more than six floors. Multifamily common area is treated within the commercial sector.



**Figure 3.1. Annual Baseline Sales by Sector (2022-2041)**

### 3.2. Residential

Cadmus considered eight residential segments with 34 end-uses. Table 3.1 lists the residential segment and end-uses considered as well as the broad end-use groups used in this study. Overall, the residential sector accounted for approximately 38 percent of total baseline sales.

City Light produces separate forecasts of single-family, multifamily low-rise, multifamily mid-rise, and multifamily high-rise households. Cadmus used City Light’s residential household forecast in the baseline forecast. Cadmus disaggregated these households into low-income and standard-income segments based on income qualification in the City Light Utility Discount Program.<sup>14</sup> Thus, only customers with a household income of less than 70 percent of the state median income, by household size, were considered low-income.

Cadmus relied on five-year American Community Survey (ACS) household income reports to determine the proportion of customers considered low-income for each residential building type. Cadmus combined residential household forecasts, estimates of end-use saturations, fuel shares, efficiency shares, and end-use consumption to produce a sales forecast through 2041. This approach is described in the *Developing Baseline Forecasts* section below.

<sup>14</sup> City of Seattle, Seattle Public Utilities. “Utility Discount Program.” Accessed June 2021.  
<https://www.seattle.gov/utilities/your-services/discounts-and-incentives/utility-discount-program>

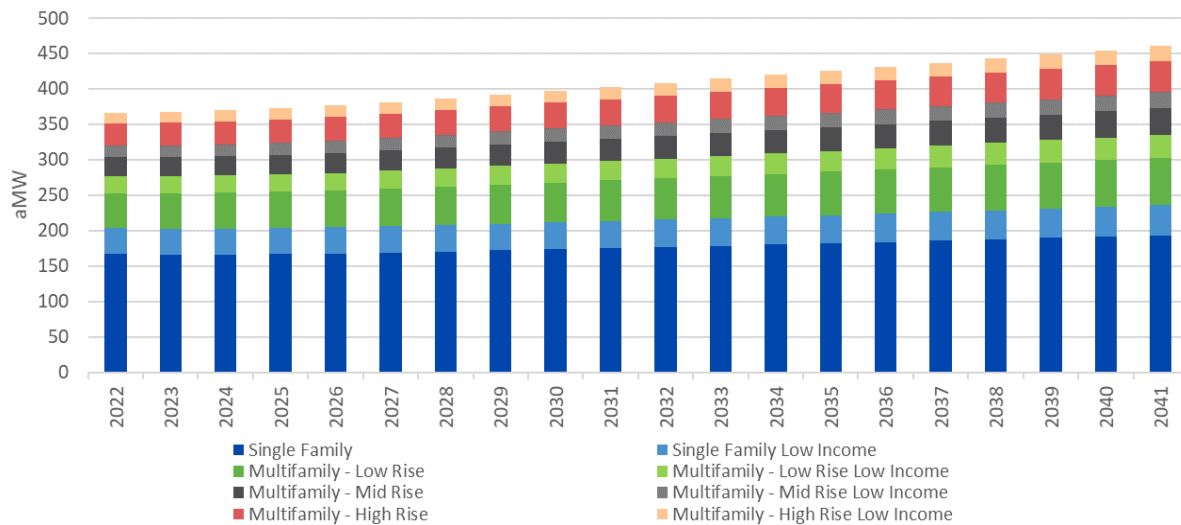


**Table 3.1. Residential Segment and End-Uses**

Segments	End-Use Group	End-Use	
Single-Family Multifamily – High-Rise Multifamily – Mid-Rise Multifamily – Low-Rise Single-Family Low-Income Multifamily – High-Rise Low-Income Multifamily – Mid-Rise Low-Income Multifamily – Low-Rise Low-Income	Appliances	Cooking Oven Dryer	Freezer Refrigerator
	Electric Vehicles	Electric Vehicles	
	Cooling	Cool Central	Microwave
	Electronics	Cool Room	Monitor
		Computer – Desktop	Multifunction Device
		Computer – Laptop	Plug Load Other
		DVD Player	Printer
		Home Audio System	Set Top Box
			Television
	Exterior Lighting	Lighting Exterior Standard	
	Heating	Circulation – Domestic Hot Water (DHW)	Heat Pump
		Circulation – Hydronic Heating	Heat Room
		Heat Central	Ventilation - Air
	Interior Lighting	Lighting Interior Linear Fluorescent Lighting Interior Specialty Lighting Interior Standard	
	Miscellaneous	Air Purifier Other	Waste Water Pool Pump
	Water Heating	Water Heat GT 55 Gal Water Heat LE 55 Gal	

Figure 3.2 shows residential sales by segment for each year of the study. City Light projects more than 80,000 new housing units will be built by 2041. New multifamily units account for about 80 percent of new residential construction, so multifamily sector baseline sales are expected to increase at a faster rate than single-family, as shown in Table 3.2.



**Figure 3.2. Annual Residential Baseline Sales by Segment (2022-2041)****Table 3.2. Residential Baseline Sales and Housing Units by Segment**

Sector	Sales (aMW)		Housing Units	
	2022	2041	2022	2041
Single-Family	167	194	164,352	177,532
Single-Family Low-Income	37	42	35,836	38,710
Multifamily – Low-Rise	49	67	60,983	79,711
Multifamily – Low-Rise Low-Income	24	32	29,155	38,109
Multifamily – Mid-Rise	27	37	37,320	48,782
Multifamily – Mid-Rise Low-Income	16	23	22,772	29,765
Multifamily – High-Rise	32	44	43,783	57,229
Multifamily – High-Rise Low-Income	15	21	20,601	26,928
<b>Total</b>	<b>366</b>	<b>461</b>	<b>414,803</b>	<b>496,765</b>

In the base year (2022), Cadmus calibrated baseline forecasts to City Light’s load forecast, ensuring that the study’s starting point aligned with the starting point of City Light’s forecasts. Cadmus then produced a residential forecast.

Figure 3.3 shows the residential baseline forecast by end-use. Overall, City Light’s residential forecast increases by approximately 26 percent over the 20-year horizon. This is primarily due to an increased customer forecast, the addition of new load from electric vehicles, and assumptions for the greater saturation of electric heat pumps as a result of electrification. The figure also shows that heating and appliances are the top two consuming end-use groups, accounting for a combined 57 percent of



residential consumption. The next three highest forecasted end-use groups were electronics (13.8 percent), water heating (13.6 percent), and electric vehicles (8 percent).

**Figure 3.3. Annual Residential Baseline Forecast by End-Use Group (2022-2041)**

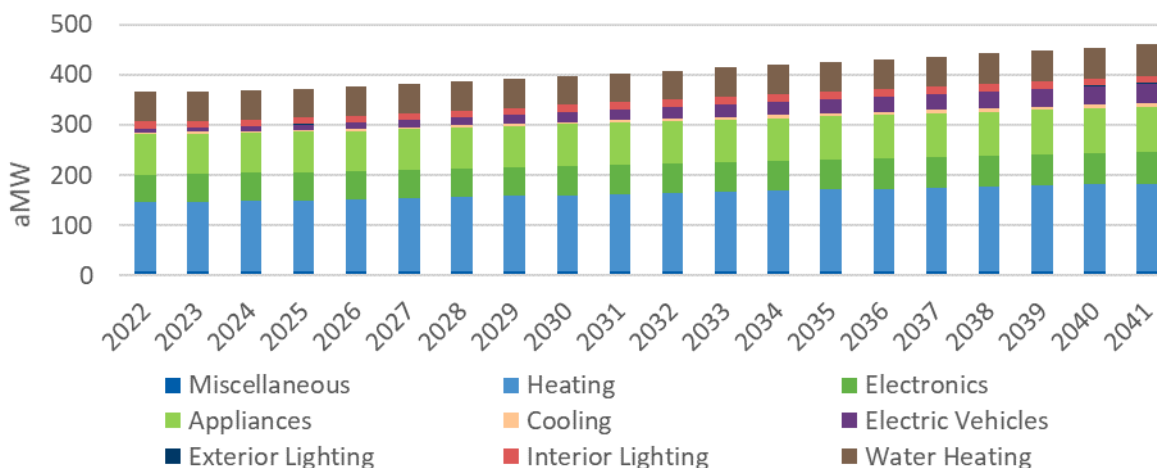


Table 3.3 shows the assumed average electric consumption per household for each residential segment in 2041. Differences in average consumption for each segment drive either differences in end-use consumption, saturations, fuel shares,<sup>15</sup> or any combination of differences. Appendix B includes detailed baseline data for the residential sector.

<sup>15</sup> Fuel shares refers to the percentage of end-use equipment that is electric for end-uses where customers have at least the option of electricity or another fuel. Residential end-uses where multiple fuels are an option include central furnace space heat, water heating, cooking, and dryers. For example, single-family has a higher share of natural gas space heating compared to multifamily. Therefore, multifamily electric space heating end-use baseline sales show a higher per-home value.



**Table 3.3. Per Household Baseline Sales (kWh/Home) by Sector and End-Use Group – 2041**

End Use	Single-Family	Multifamily – Low-Rise	Multifamily – Mid-Rise	Multifamily – High-Rise
Miscellaneous	200	119	98	98
Heating	2,862	3,347	3,157	3,222
Electronics	1,550	824	773	773
Appliances	2,080	1,050	1,285	1,285
Cooling	89	173	147	147
Electric Vehicles	757	618	618	618
Exterior Lighting	59	1	1	1
Interior Lighting	403	145	138	137
Water Heating	1,561	1,117	487	487
<b>Total</b>	<b>9,562</b>	<b>7,394</b>	<b>6,704</b>	<b>6,769</b>

Note: Low-income kwh/home values are equivalent to the standard-income.

Table 3.4 shows the electric end-use group distributions of the baseline consumption in 2041 by building type. For each of the building types, heating makes up greater than 25 percent of the building type consumption in 2041 and is the end-use group with the largest consumption.

**Table 3.4. Residential Consumption End-Use Group Distributions by Segment – 2041**

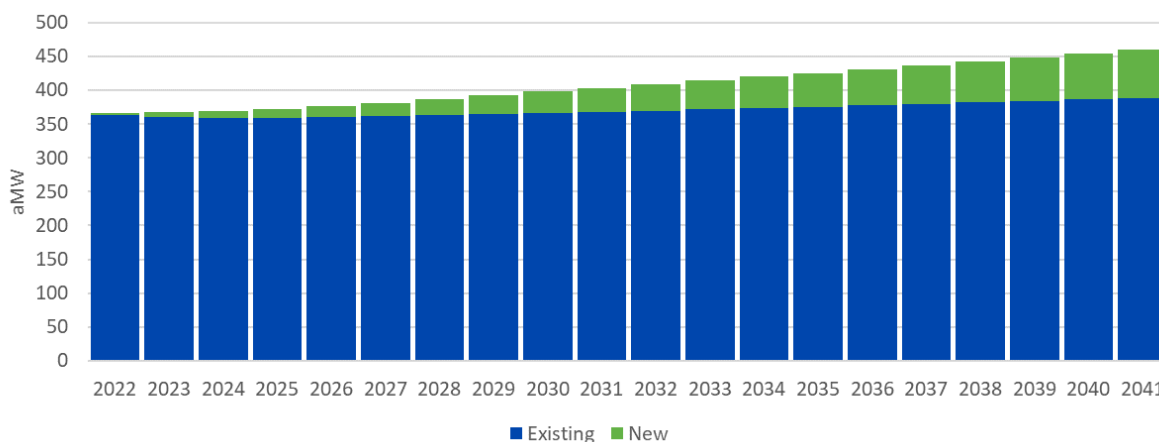
End-Use Group	Single-Family	Multifamily – Low-Rise	Multifamily – Mid-Rise	Multifamily – High-Rise
Miscellaneous	2%	2%	1%	1%
Heating	30%	45%	47%	48%
Electronics	16%	11%	12%	11%
Appliances	22%	14%	19%	19%
Cooling	1%	2%	2%	2%
Electric Vehicles	8%	8%	9%	9%
Exterior Lighting	1%	0.01%	0.01%	0.01%
Interior Lighting	4%	2%	2%	2%
Water Heating	16%	15%	7%	7%

Note: Low-income percentage distribution values are equivalent to the standard-income.

Figure 3.4 shows forecasted residential sales by construction vintage over the study horizon. Study results indicate approximately 16 percent of sales will derive from homes constructed after 2021 (new construction). Use per customer for existing homes will decrease over the 20-year study timeframe, partly due to more efficient equipment standards and other naturally occurring efficiency.



**Figure 3.4. Annual Residential Baseline Sales by Construction Vintage (2022-2041)**



### 3.3. Commercial

Cadmus considered 20 commercial building segments and 18 end-uses. Table 3.5 shows the commercial segments and end-uses considered in this study as well as the corresponding segment and end-use groups presented in this report. Cadmus chose commercial segments for consistency with the draft 2021 Power Plan with one exception. The multifamily common area was not a stand-alone segment in the draft 2021 Power Plan. Overall, the commercial sector accounts for 667 aMW, or 55 percent of total baseline sales in 2041.



**Table 3.5. Commercial Segments and End-Uses**

Segment Group	Segment	End-Use Group	End-Use
Assembly	Assembly	Cooking	Cooking
Data Center	Data Center	Cooling	Cool Chillers Cooling DX
Hospital	Hospital	Data Center	Data Center Servers
Large Grocery	Supermarket	Heat Pump	Heat Pump (Air Source)
Large Office	Large Office Medium Office	Heating	Space Heat
Lodging	Lodging	Lighting	Exterior Lighting Interior Lighting
Multifamily Common Area	Multifamily Common Area	Miscellaneous	Computer – Desktop Computer – Laptop Other <sup>1</sup> Plug Load Other Waste Water
Miscellaneous	Other	Refrigeration	Refrigeration
Other Health	Residential Care	Ventilation and Circulation	Ventilation and Circulation
Restaurant	Restaurant	Water Heat	Water Heat GT 55 Gal Water Heat LE 55 Gal
Retail	Large Retail Medium Retail Small Retail Extra Large Retail		
School	School K-12		
Small Grocery	Mini Mart		
Small Office	Small Office		
University	University		
Warehouse	Warehouse		

<sup>1</sup> Other end uses includes all undefined loads such as elevators, automatic doors, and process loads.

Cadmus used City Light's nonresidential database to identify sales and the number of customers for each commercial market segment. The database combined City Light's billing data with King County Assessor data, as well as other secondary data sources, to identify the customer segment and consumption for each nonresidential customer. These data served as the basis for Cadmus' segmentation of the commercial sector.

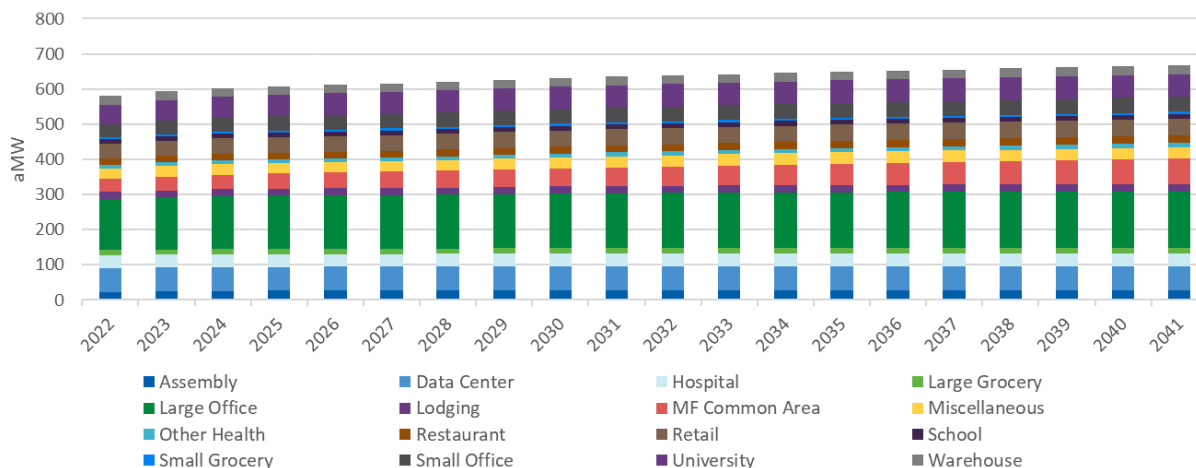
Cadmus also classified customers as commercial or industrial based on City Light's premise-level nonresidential customer database. Commercial customers are mapped to segments listed in Table 3.5. (Industrial customers are mapped to segments listed in Table 3.6, shown in the *Industrial* section below.)

To align with the City Light load forecast team's commercial building square footage, Cadmus adjusted the commercial building counts per segment, based on average square footage per building type from the 2020 CPA.



Figure 3.5 shows the distribution of baseline commercial energy consumption by segment for each year of the study. Large offices accounted for 24 percent of commercial baseline sales. Data center, multifamily common area, and university accounted for ten percent, 11 percent, and ten percent, respectively, of baseline sales. Together, these segments represent 55 percent of all commercial sector sales.

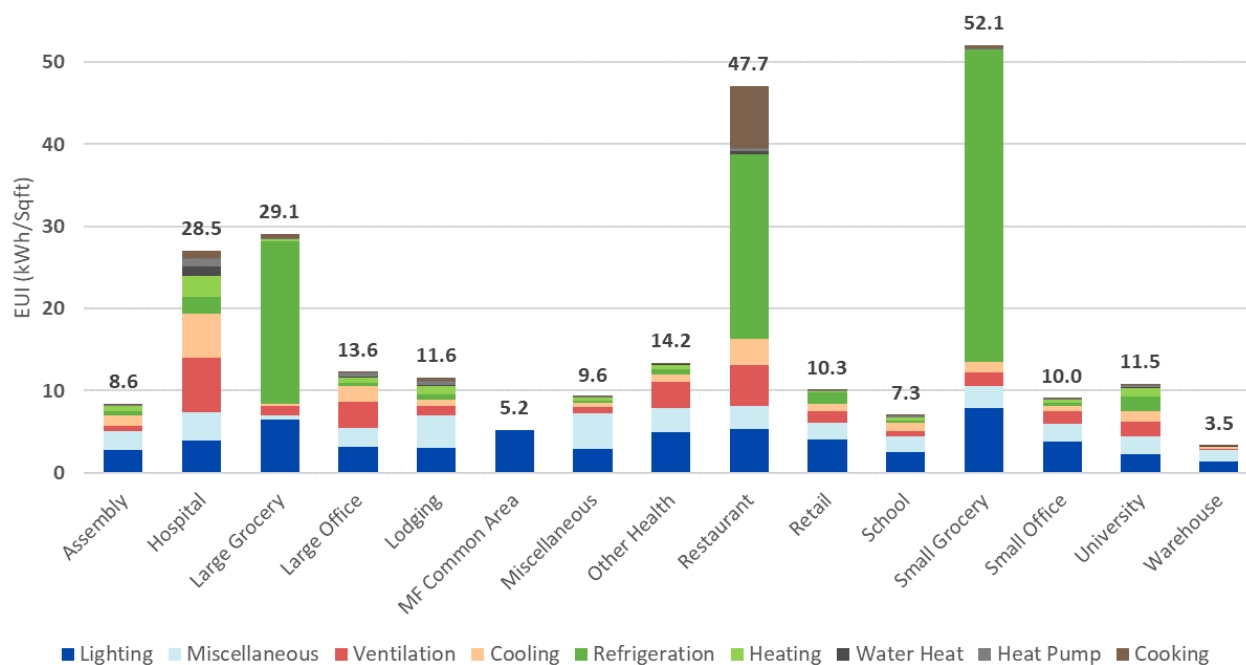
**Figure 3.5. Annual Commercial Baseline Sales by Segment (2022-2041)**



Cadmus developed the whole-building energy intensities (total kWh per building square feet) based on NEEA's CBSA IV. To develop the end-use intensities, Cadmus used CBSA, Energy Information Administration's Commercial Buildings Energy Consumption Survey (CBECS), and other Cadmus research. Further details is described in the *Derivation of End-Use Consumption* section below. Figure 3.6 shows energy intensities for each building type and end-use group.



**Figure 3.6. Commercial End-Use Group Intensities by Building Type – 2041**

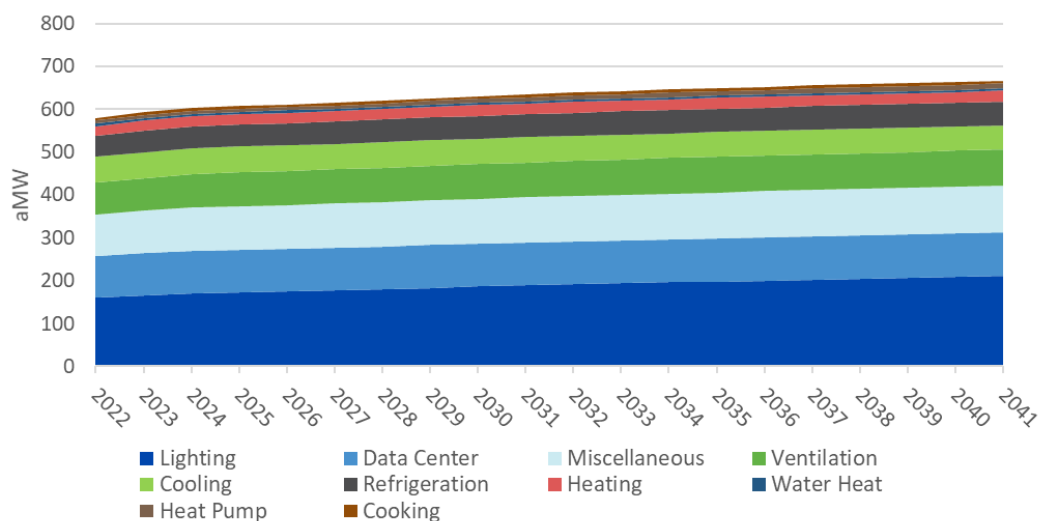


*Note: The data center segment EUI of 181.5 kWh/sq ft is not included due to scaling. Additionally, all of the consumption for the data center segment appears in the data centers end-use group.*

Figure 3.7 shows the commercial baseline forecast by end-use group. The forecast shows moderate load growth of commercial sales by roughly 0.7 percent on average per year over the study's horizon. The highest consuming end-use group was lighting, accounting for 32 percent of projected commercial consumption in 2041 (approximately the same percentage of overall end use as in 2022). Miscellaneous, data center, and ventilation end-use groups also account for a large share of consumption, at 16 percent, 15 percent, and 13 percent of projected commercial sales, respectively. Appendix B includes detailed baseline data for the commercial sector.



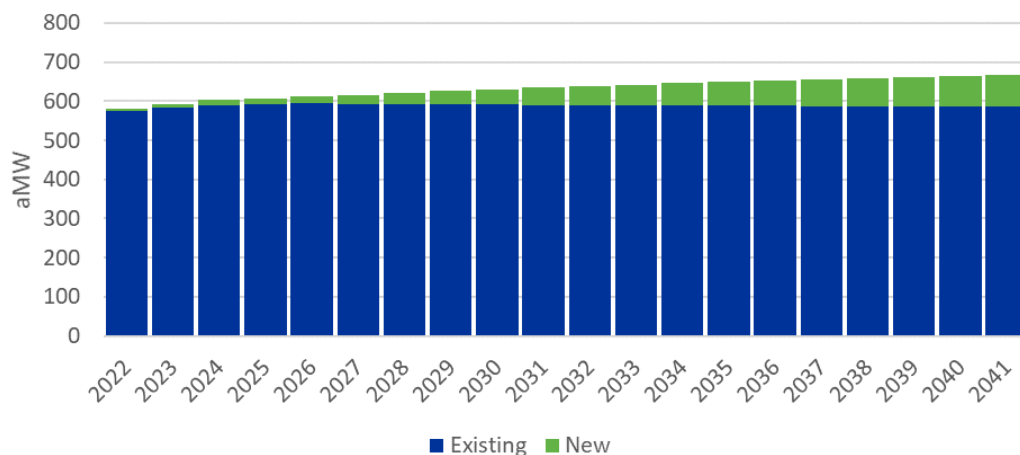
**Figure 3.7. Annual Commercial Forecast by End-Use Group (2022-2041)**



*Note: The “miscellaneous” end-use group includes laptops (1.88 aMW of 2041 sales), desktops (28 aMW of 2041 sales), all other plug load (69.59 aMW of 2041 sales), and waste water (9.79 aMW of 2041 sales).*

New commercial floorspace is a significant contributor to load growth in the commercial sector. By 2041, 12 percent of the forecasted load will come from buildings constructed after 2019. Figure 3.8 shows the commercial baseline forecast by construction vintage based on floor space.

**Figure 3.8. Annual Commercial Forecast by Construction Vintage (2022-2041)**



### 3.4. Industrial

Cadmus disaggregated City Light’s forecasted industrial sales into eight facility types/segments and 11 end-uses, as shown in Table 3.6. Overall, the industrial sector accounted for 91 aMW, or seven percent of City Light’s overall forecasted baseline sales in 2041. The sector included about ten of City Light’s



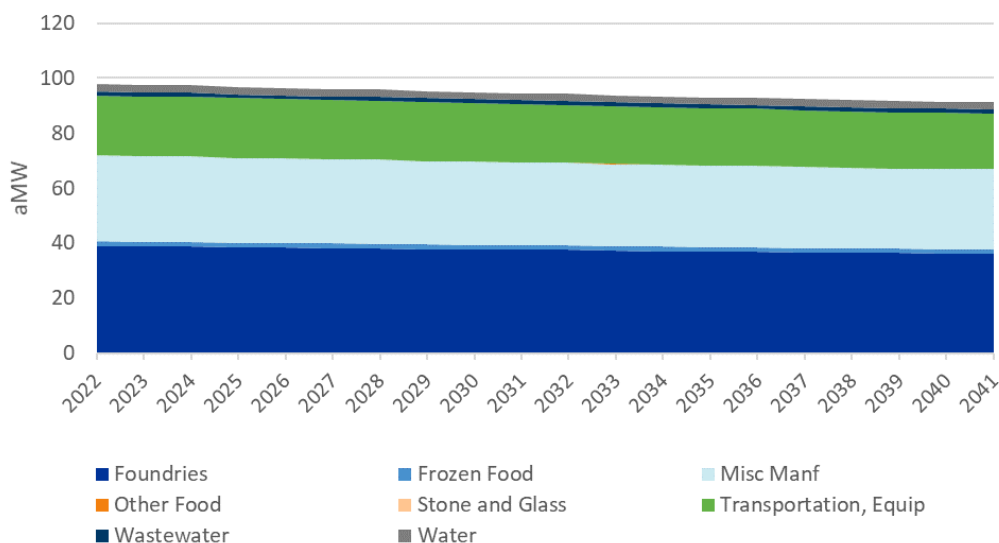
largest customers with known industrial processes in addition to customers that contribute wastewater and water treatment loads.

**Table 3.6. Industrial Segments and End-Uses**

Segments	End-Uses
Foundries	Process Air Compressor
Frozen Food	Lighting
Miscellaneous Manufacturing	Fans
Other Food	Pumps
Stone and Glass	Motors Other
Transportation, Equipment	Process Other
Wastewater	Process Heat
Water	HVAC
	Other
	Process Electro Chemical
	Process Refrigeration

Like the commercial sector, Cadmus relied on City Light's nonresidential customer database to determine the distribution of baseline sales by segment. Figure 3.9 shows the distribution of industrial sales by segment in 2041. Foundries accounts for 40 percent of industrial baseline sales; the next largest segments are miscellaneous manufacturing (32 percent) and transportation equipment (22 percent).

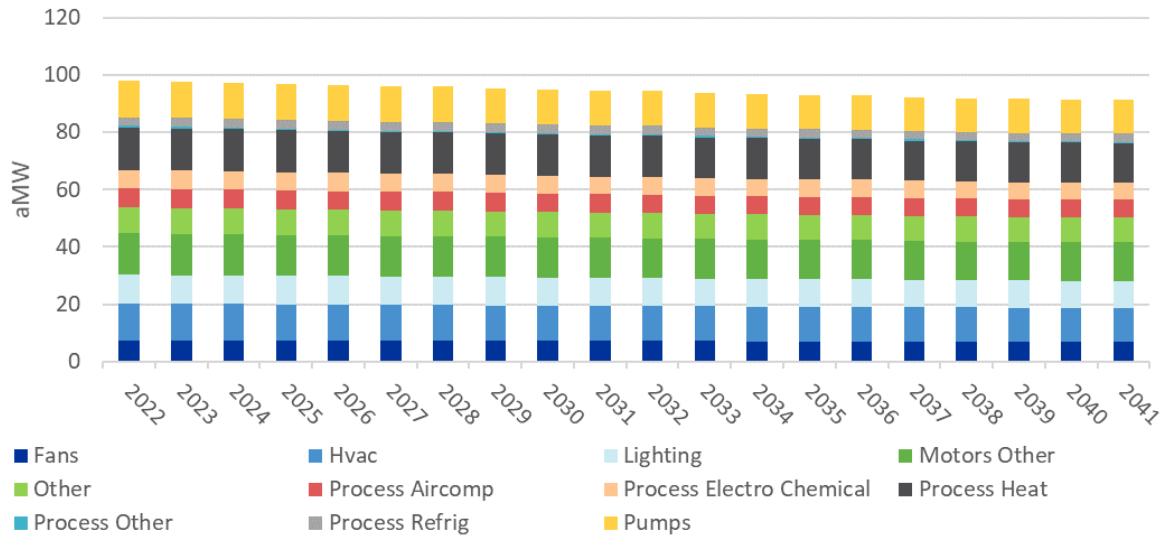
**Figure 3.9. Annual Industrial Baseline Sales by Segment (2022-2041)**



Cadmus relied on end-use distributions provided in the draft 2021 Power Plan's industrial tool to disaggregate segment-specific consumption into end-uses. Figure 3.10 shows industrial baseline sales forecast by end-use.



**Figure 3.10. Annual Industrial Baseline Sales by End-Use (2022-2041)**





## 4. Energy Efficiency Potential

### 4.1. Overview

#### 4.1.1. Scope of the Analysis

This potential study included a comprehensive set of conservation measures, including those assessed by the Council in the draft 2021 Power Plan and by the RTF. Cadmus began its analysis by assessing the technical potential of hundreds of unique conservation measures applicable to each sector, segment, and construction vintage (discussed in the *Baseline Forecast* section).

Cadmus considered over 7,111 permutations of conservation measures representing a wide range of technologies and applications. Permutations are defined as unique measure, sector, segment, end-use, construction vintage, and baseline combinations that have technical potential (i.e., no below-standard measures are included). For example, an ENERGY STAR air purifier for residential single-family new construction with a federal standard baseline is a different permutation than an ENERGY STAR purifier for residential single-family *existing* construction with a federal standard baseline. Table 4.1 lists the number conservation measures and permutations by sector considered in this study.

**Table 4.1. Measures and Permutations**

Sector	Measures	Permutations
Residential	228	1,454
Commercial	1,137	5,471
Industrial	34	186
<b>Total</b>	<b>1,399</b>	<b>7,111</b>

#### 4.1.2. Summary of Results

Table 4.2 shows baseline sales and cumulative technical and achievable technical potential by sector. Study results indicate 233 aMW of technically feasible conservation potential—19 percent of baseline sales—will be available by 2041, and 84 percent (196 aMW) is considered achievable in 2041. The achievable technical potential corresponds to 16 percent of baseline sales. Technical and achievable technical potential are inclusive of future City Light-funded conservation. That is, the baseline consumption forecasts account for historical achieved and planned City Light-funded conservation prior to 2022. However, the estimated potential identified is inclusive of—not in addition to—forecasted program savings. In other words, the baseline forecast excludes future, planned energy efficiency program efforts but the savings estimates include energy efficiency program savings.

These results in this report account for line losses and represent cumulative energy savings at generator (unless specified).



**Table 4.2. Cumulative Technical and Achievable Technical Potential by Sector (2022-2041)**

Sector	Baseline Sales	Technical Potential		Achievable Technical Potential	
		aMW	Percent of Baseline	aMW	Percent of Baseline
Residential	461	90	20%	70	15%
Commercial	667	131	20%	116	17%
Industrial	91	12	13%	10	11%
<b>Total</b>	<b>1,219</b>	<b>233</b>	<b>19%</b>	<b>196</b>	<b>16%</b>

The commercial sector, representing 55 percent of baseline energy use, accounts for approximately 59 percent of cumulative achievable technical potential in 2041, as shown in Figure 4.1. The residential and industrial sectors account for 36 percent and 5 percent, respectively.

**Figure 4.1. Cumulative Achievable Technical Potential by Sector (2022-2041)**

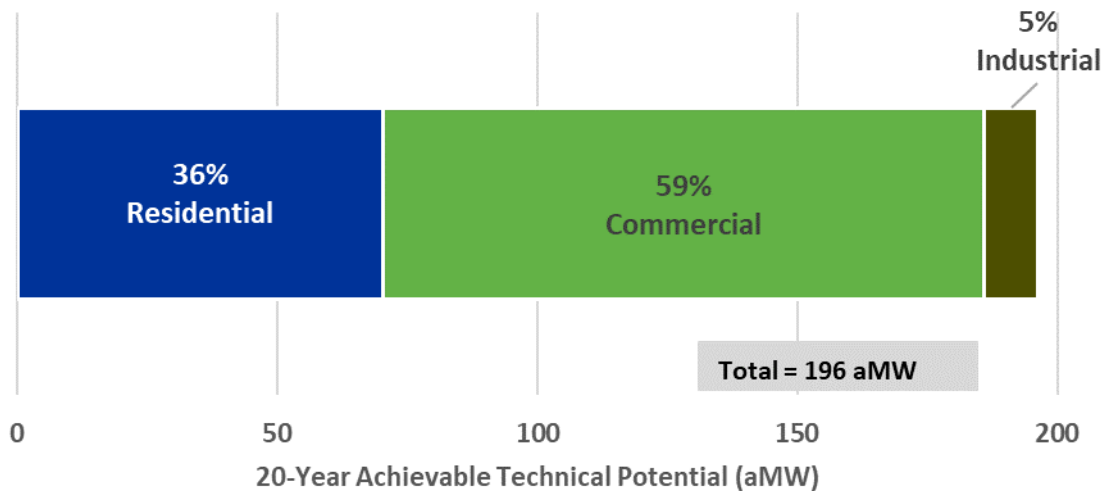


Table 4.3 shows cumulative two-year, four-year, ten-year, and 20-year achievable technical potential by sector, as well as 20 percent of the ten-year achievable technical potential.

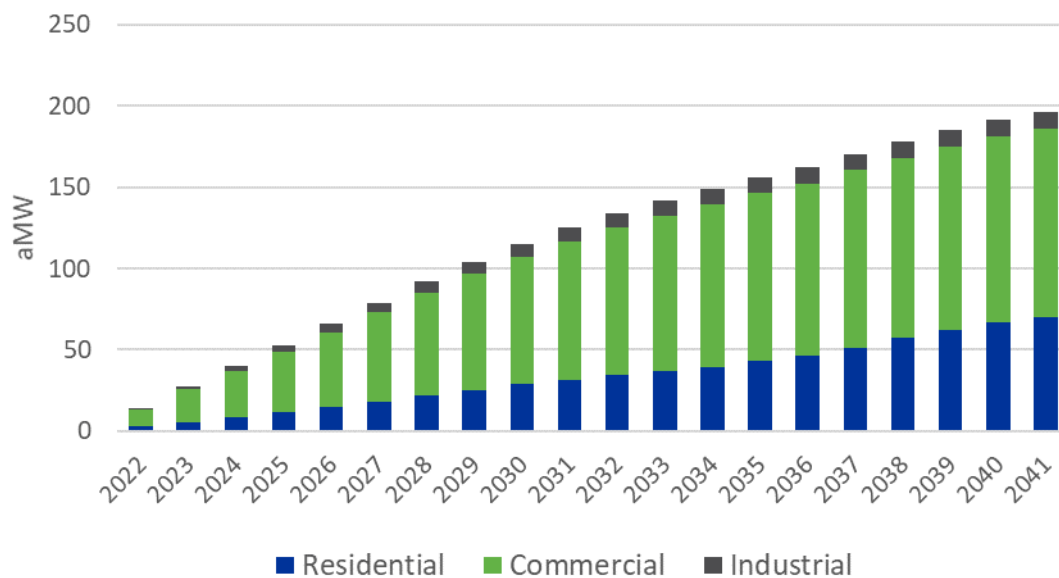
**Table 4.3. Cumulative Achievable Technical Potential by Sector and Time Period**

Sector	Achievable Technical Potential – aMW				
	2-Year (2022-2023)	4-Year (2022-2025)	10-Year (2022-2031)	20-Year (2022-2041)	20% of 10-Year Potential
Residential	6	12	32	70	6
Commercial	20	37	85	116	17
Industrial	2	4	9	10	2
<b>Total</b>	<b>28</b>	<b>53</b>	<b>125</b>	<b>196</b>	<b>25</b>



Figure 4.2 presents the cumulative achievable technical potential across the study horizon.

**Figure 4.2. Cumulative Achievable Technical Potential by Sector (2022-2041)**

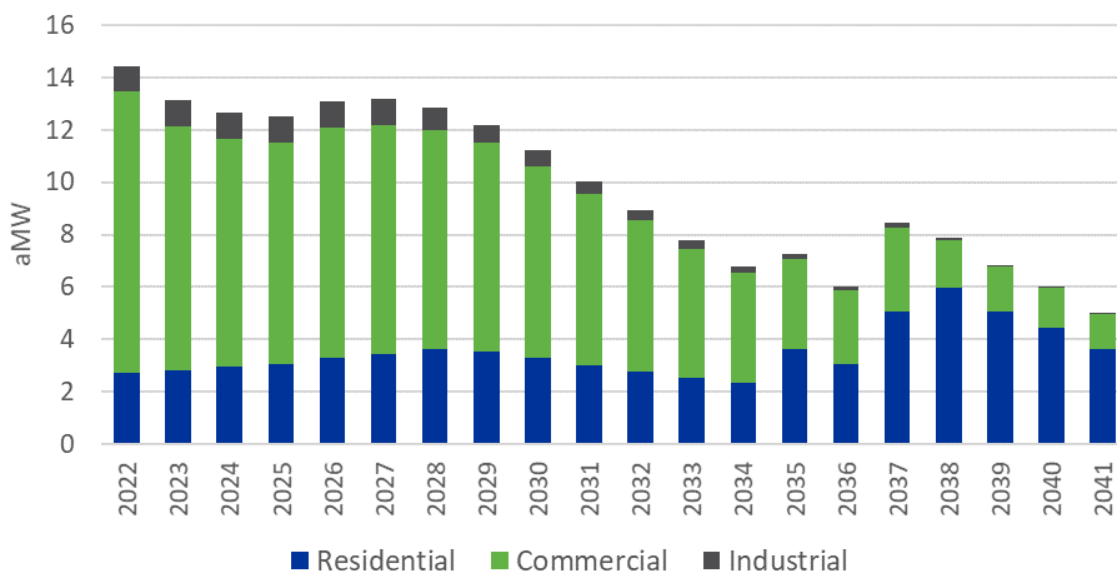


Approximately 27 percent of cumulative 20-year achievable potential is acquired in the first four years, and 64 percent of cumulative 20-year achievable potential is acquired in the first ten years. This acquisition rate is based on the acquisition rate from the draft 2021 Power Plan along with acceleration adoption for measures that City Light has historically offered through programs to better align with local and state policies promoting energy efficiency. The *About Measure Ramp Rates* section of this report provides more information on how Cadmus performed this calculation.

Cadmus determined incremental achievable technical potential in each year of the study horizon, using the rate at which equipment naturally turns over and measure-specific ramp rates. Figure 4.3 shows incremental achievable potential. The increase in savings in 2037 is the result of the ramp rates applied and the 15-year measure life for many heating measures. For example, in 2037, residential zonal heating systems, initially installed in 2022, need to be replaced since the technology has a 15-year measure life. A proportion, based on the ramp rate in the year of replacement (2037), is replaced by ductless heat pumps. Since ductless heat pumps are such a high-saving measure, there is a large increase in residential incremental achievable potential in 2037.



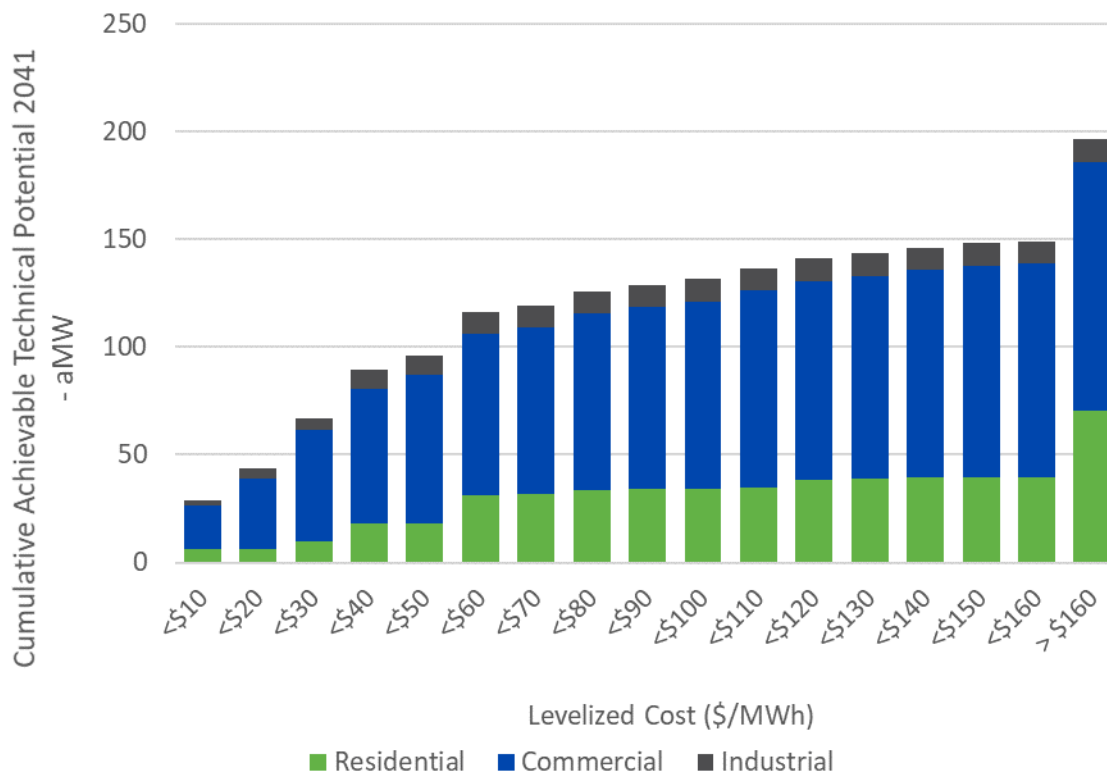
**Figure 4.3. Annual Incremental Achievable Technical Potential (2022-2041)**



The conservation supply curve in Figure 4.4 shows cumulative achievable potential in \$10/MWh levelized cost increments. The study found that 60 percent (117 aMW) of the cumulative 2041 achievable technical potential can be acquired at less than or equal to \$60/MWh.<sup>16</sup> The amount of available achievable technical potential levels off at less than or equal to \$60/MWh, excluding high-cost measures (costing more than \$160/MWh). The 2041 achievable technical potential with a levelized cost of greater than \$160/MWh makes up 24 percent of cumulative achievable technical potential. Many of the costlier measures are for emerging equipment, heat pump conversion (e.g., electric resistance heating to heat pump), and weatherization in the residential and commercial sectors.

<sup>16</sup> The levelized cost bundle of less than or equal to \$60/MWh represents an example value, and it has been identified as in between City Light's IRP optimization model selection for the residential (\$40/MWh) and commercial (\$70/MWh) sectors.



**Figure 4.4. All Sectors Supply Curve — Cumulative Achievable Technical Potential in 2041 by Levelized Cost**

Appendix D shows detailed measure-level results, including levelized costs and technical and achievable technical conservation potential for each measure. The remainder of this section provides detailed results by sector.

City Light's IRP selected an achievable economic potential of 106 aMW. Table 4.4 shows cumulative, 20-year achievable economic potential by sector and the maximum levelized cost for measure permutations in each sector. For example, all residential achievable economic potential can be obtained at a levelized cost of less than or equal to \$40/MWh. Details of achievable economic potential methodology can be found in the *Achievable Economic Potential* section.

**Table 4.4. Cumulative Achievable Economic Potential by Sector (2022-2041)**

Sector	Levelized TRC (\$/MWh)	20-Year Achievable Economic Potential (aMW)
Residential	≤\$40	18
Commercial	≤\$70	77
Industrial	All Bins	10
<b>Total</b>		<b>106</b>



## 4.2. Residential

Residential customers in City Light’s service territory account for 38 percent of 2041 total baseline sales. This sector, made up of low- and standard-income single-family and multifamily customers, has a variety of sources for potential savings, including equipment efficiency upgrades (e.g., water heaters and appliances) and improvements to building shells (e.g., windows, insulation, and air sealing).

Based on resources in this assessment, Cadmus estimated residential, cumulative, achievable technical potential of 70 aMW over 20 years, which corresponds to 15 percent of the forecast residential load in 2041. Table 4.5 shows cumulative 20-year residential conservation potential by segment.

**Table 4.5. Cumulative Residential Potential by Segment (2022-2041)**

Segment	Baseline Sales	Cumulative 2041 – aMW			
		Technical Potential (TP)	TP % of Baseline	Achievable Technical Potential (AP)	AP % of TP
Single-Family	194	41	21%	31	77%
Single-Family Low-Income	42	9	21%	7	77%
Multifamily – Low-Rise	67	12	18%	10	80%
Multifamily – Low-Rise Low-Income	32	6	18%	5	80%
Multifamily – Mid-Rise	37	7	18%	5	78%
Multifamily – Mid-Rise Low-Income	23	4	18%	3	78%
Multifamily – High-Rise	44	8	18%	6	78%
Multifamily – High-Rise Low-Income	21	4	18%	3	78%
<b>Total</b>	<b>461</b>	<b>90</b>	<b>20%</b>	<b>70</b>	<b>78%</b>

As shown in Table 4.5 and Figure 4.5, single-family homes account for 55 percent (38 aMW) of total achievable technical potential, followed by multifamily low-rise (15 aMW), multifamily high-rise (9 aMW), and multifamily mid-rise (8 aMW). Total achievable technical potential for income-qualified customers is 18 aMW, or 25 percent. Each home type’s proportion of baseline sales drives this distribution, but segment-specific end-use saturations and fuel shares have a role as well. Appendix B includes detailed data on saturations and fuel shares for each segment.<sup>17</sup> Appendix C includes detailed summary of achievable technical potential by segment and end use for each segment.

<sup>17</sup> The scope of this study does not distinguish differences in end-use saturations and fuel shares among income classifications. Potential by income classification is defined by customer segmentation. (Potential results by segment, including income classification and end-use, can be found in Appendix C).



**Figure 4.5. Residential Cumulative Achievable Technical Potential by Segment (2022-2041)**

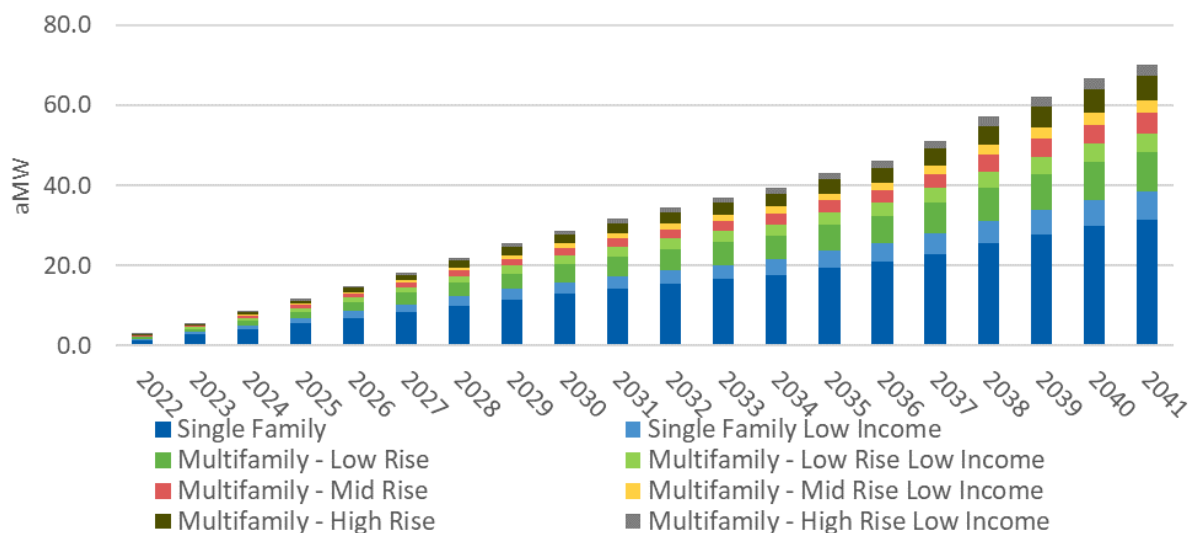


Figure 4.6 presents the cumulative achievable technical potential by construction type for the residential sector. Existing construction represents the majority of achievable technical potential, particularly in the early years of the study, accounting for 96 percent of the potential in the first two years (2022-2023). However, by the final year of the study period (2041), new construction accounts for 18 percent of the total cumulative residential achievable technical potential. This is because of the increase in new construction, from roughly 4,000 buildings in 2022 to over 86,000 buildings constructed between 2022 and 2041.



**Figure 4.6. Residential Cumulative Achievable Technical Potential by Construction Type (2022-2041)**

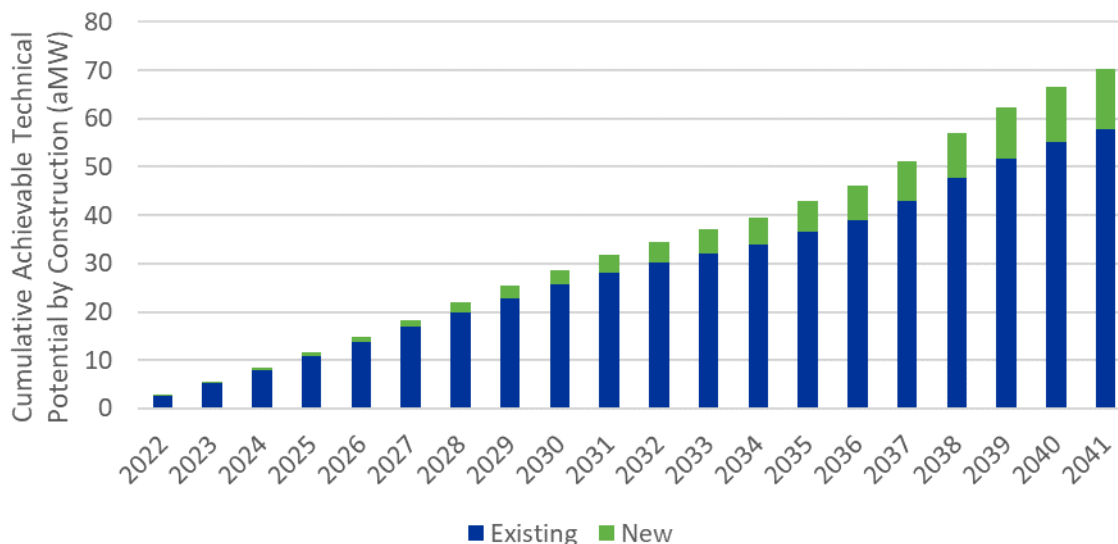


Table 4.6 shows the residential baseline sales, technical, and achievable technical potential by end-use group. Heating savings make up the greatest proportion of cumulative achievable technical potential at 37 percent. Water heating measures contribute 29 percent of the total achievable technical potential, followed by appliance measures at 25 percent. Overall, 78 percent of the technical potential is considered achievable based on adoption patterns from the draft 2021 Power Plan and adjusted for City Light’s historical program success.



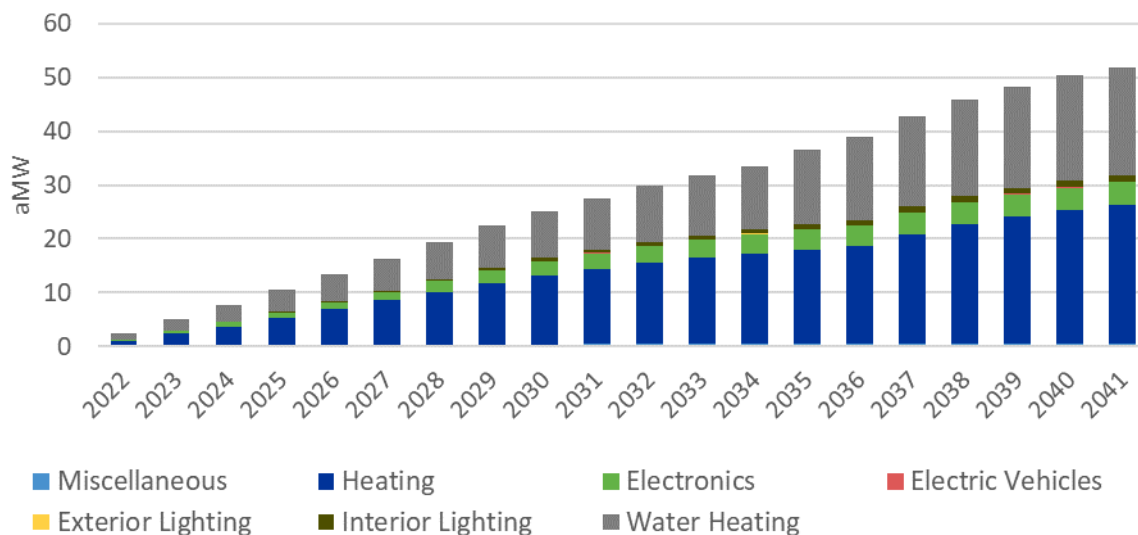
**Table 4.6. Cumulative Residential Potential by End-Use Group (2022-2041)**

End Use	Baseline Sales	Cumulative 2041 - aMW			
		Technical Potential (TP)	TP % of Baseline	Achievable Technical Potential (AP)	AP % of TP
Miscellaneous	8	1	7%	1	87%
Heating	175	32	18%	26	80%
Electronics	64	4	7%	4	94%
Appliances	89	26	29%	18	69%
Cooling	7	1	11%	1	81%
Electric Vehicles	38	0.2	1%	0.2	94%
Exterior Lighting	1	<0.01	2%	<0.01	85%
Interior Lighting	14	1	9%	1	86%
Water Heating	63	25	39%	20	82%
<b>Total</b>	<b>461</b>	<b>90</b>	<b>20%</b>	<b>70</b>	<b>78%</b>

Incremental and cumulative potential over the 20-year study horizon varies by end-use group due to the application of ramp rates. These ramp rates were assigned to each measure based on factors such as availability, existing program activity, and market trends. Cadmus used the same ramp rates for each measure, as assigned by the Council in the draft 2021 Power Plan, with some adjustments as discussed in the *Achievable Technical Potential and Ramping* section. Figure 4.7 shows cumulative residential achievable potential.



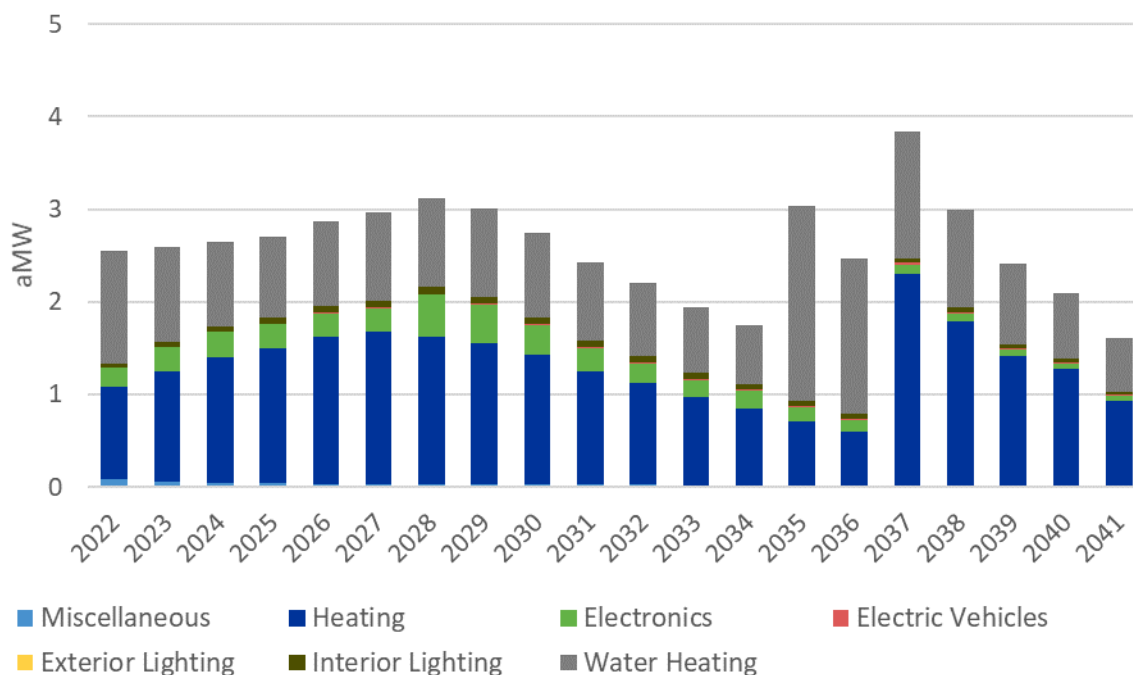
**Figure 4.7. Residential Cumulative Achievable Technical Potential (2022-2041)**



*Note: In 2041, exterior lighting and electric vehicles makes up 0.03 percent and 0.27 percent of residential cumulative achievable technical potential, respectively.*

Figure 4.8 shows incremental residential achievable potential. Measure ramp rates and effective useful lives (only for equipment replacement measures) determine the timing of these savings. The increase in heating savings in 2037 is the result of the replacement of a high proportion of zonal heating measures with ductless heat pumps after their 15-year measure life expires.



**Figure 4.8. Residential Incremental Achievable Technical Potential (2022-2041)**

*Note: On average, exterior lighting and electric vehicles makes up 0.03 percent and 0.27 percent of annual residential incremental achievable technical potential, respectively.*

Table 4.7 lists the 15 highest-saving residential measures, which make up 77 percent of the total residential achievable technical potential. The table also includes the weighted average levelized costs for these measures,<sup>18</sup> which represent the economic equipment and administrative costs while still accounting for energy and non-energy benefits. The measure with the highest cumulative achievable technical potential—multifamily ductless heat pumps—also has a levelized cost of \$297 per MWh. Other measures identified with high savings are heat pump dryers, efficient (hybrid) heat pump water heaters, and refrigerators and freezers CEE (Consortium for Energy Efficiency) Tier 3. Of the highest-savings measures, the least costly are ENERGY STAR printers, wall insulation, and CEE Tier 3 refrigerators and freezers.

<sup>18</sup> The levelized cost value represents a weighted average across all iterations, including segment and end-use. As a result, permutations of a measure may have a low levelized cost while other permutations may have a high levelized cost.

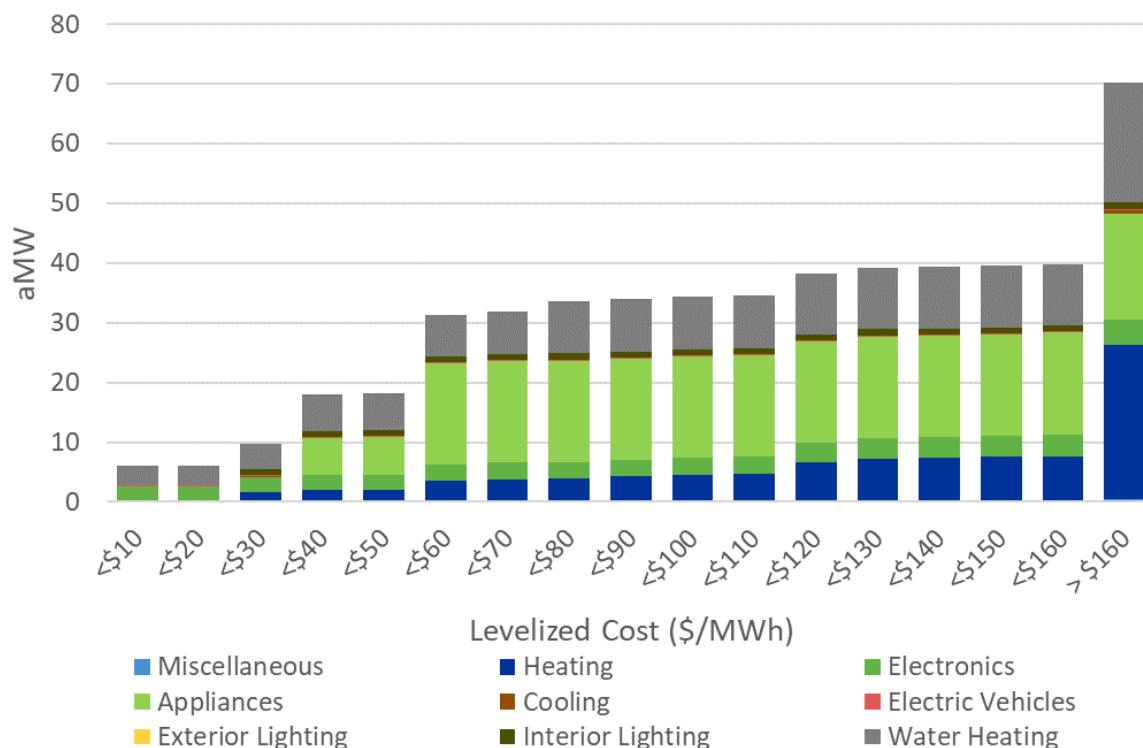


**Table 4.7. Top-Saving Residential Measures**

Measure Name	Cumulative Achievable Technical Potential – aMW				Percent of Total (20-Year)	Weighted Average Levelized TRC (\$/MWh)
	2-Year	4-Year	10-Year	20-Year		
Multifamily Ductless Heat Pump Upgrade	0.50	1.43	4.98	11.40	16%	\$297.08
Heat Pump Dryer	0.02	0.09	1.00	10.61	15%	\$56.43
Heat Pump Water Heater – Tier 4	0.30	0.82	2.79	7.70	11%	\$367.54
Refrigerator and Refrigerator-Freezer – CEE Tier 3	0.28	0.73	2.34	6.04	9%	\$39.64
Heat Pump Water Heater – Tier 3	0.14	0.38	1.18	3.13	4%	\$60.09
Office Printer – ENERGY STAR	0.30	0.62	1.55	1.94	3%	-\$4.90
Single Family Weatherization – Insulate Wall – R0 to R11 – Heating Zone 1	0.41	0.82	1.64	1.87	3%	\$133.46
Front Load Washer CEE Tier 2 and Electric DHW Electric Dryer	0.60	0.92	1.48	1.86	3%	\$119.28
Solar Hot Water - Solar Zone 1	0.00	0.02	0.23	1.78	3%	\$1,034.36
HVAC Upgrade – Heat Pump Upgrade to 12 HSPF/18 Seasonal Energy Efficiency Ratio (SEER) - Heating and Cooling Zone 1	0.01	0.06	0.40	1.54	2%	\$1,810.16
Wall Insulation - R0 to R11 - Heating Zone 1	0.33	0.66	1.33	1.51	2%	\$28.86
Top Load Washer CEE Tier 1 and Electric DHW Electric Dryer	0.42	0.64	1.03	1.29	2%	\$90.31
Zonal to Ductless Heat Pump	0.09	0.23	0.41	1.19	2%	\$215.74
Single Family Showerhead Aerator 1.50 Gallons Per Minute (GPM)	0.40	0.60	0.93	1.09	2%	\$40.64
Residential Thermostatic Shower Restriction Valve	0.01	0.05	0.51	1.00	1%	\$185.71

Overall, 16 percent of residential conservation potential is achievable within the first four years, and 45 percent is achievable in the first ten years. Figure 4.9 shows 20-year cumulative residential potential by levelized cost (in \$10/MWh increments).



**Figure 4.9. Residential Supply Curve — Cumulative Achievable Technical Potential in 2041 by Levelized Cost**

Forty-three percent of the residential achievable technical potential is from measures with a levelized cost of over \$160/MWh. This is partly because the highest savings measure—multifamily ductless heat pump upgrades (MF DHP Upgrades)—has a levelized cost greater than \$160/MWh.

City Light’s IRP selected an economic achievable potential of 18 aMW for the residential sector. Figure 4.9 shows the cumulative, 20-year achievable economic potential for the residential sector by end-use group. The two end-use groups that have the greatest achievable economic potential are appliances and water heating. Collectively, appliance and water heating achievable economic potential is 68 percent of the total residential 20-year, cumulative achievable economic potential.



**Figure 4.10. Residential Cumulative Achievable Economic Potential in 2041 by End-Use Group**

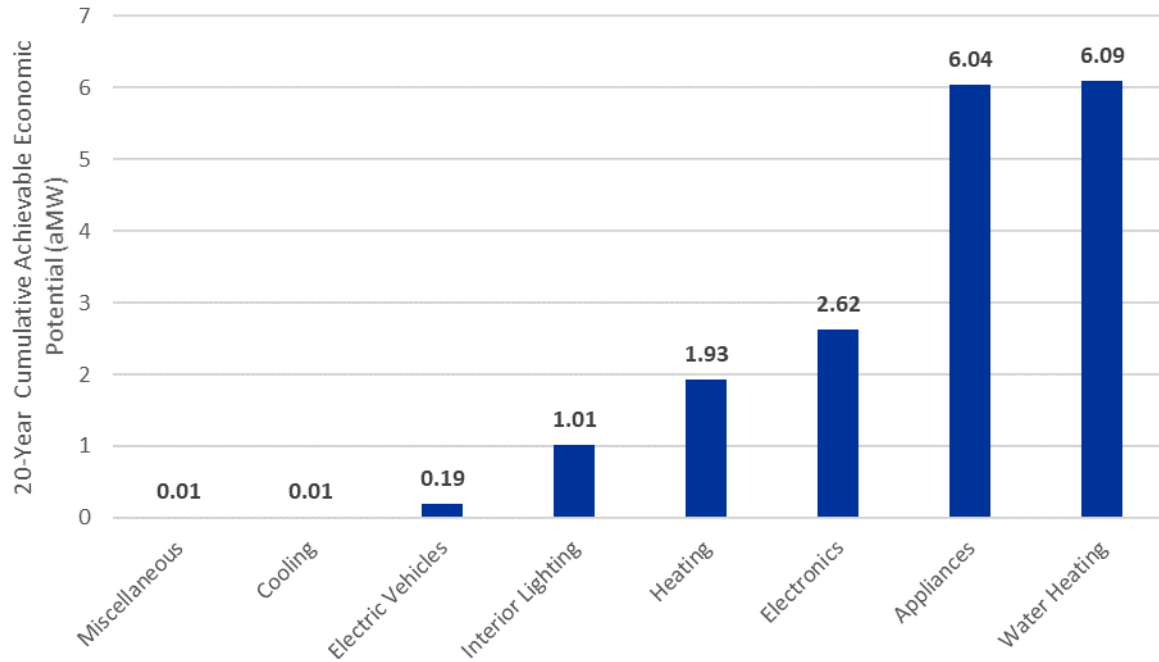


Table 4.8 lists the 15 highest saving IRP selected residential measures. The measure permutations included in the table all have a levelized cost of less than or equal to \$40/MWh and make up 21 percent of the cumulative, 20-year achievable technical potential for the residential sector.



**Table 4.8. Top-Saving Residential Measures Selected by IRP**

Measure Name	Cumulative Achievable Economic Potential (aMW) – Less than or Equal to \$40/MWh				Percent of Cumulative 20-Year Achievable Technical Potential
	2-Year	4-Year	10-Year	20-Year	
Refrigerator and Refrigerator-Freezer – CEE Tier 3	0.28	0.73	2.34	6.04	9%
Office Printer – ENERGY STAR	0.30	0.62	1.55	1.94	2%
Front Load CEE Tier 2 Washer with Electric DHW Electric Dryer	0.56	0.86	1.38	1.73	2%
Wall Insulation - R0 to R11 - Heating Zone 1	0.32	0.64	1.29	1.46	2%
Top Load Washer CEE Tier 1 with Electric DHW Electric Dryer	0.39	0.59	0.96	1.20	1%
Single Family Showerhead Aerator 1.50 GPM	0.37	0.55	0.87	1.01	1%
Linear Fluorescent Lamp – TLED	0.09	0.20	0.56	1.00	1%
Heat Pump Water Heater – Tier 3	0.04	0.10	0.30	0.81	1%
Multifamily Showerhead Aerator 1.50 GPM	0.18	0.28	0.45	0.57	1%
Home Audio System – ENERGY STAR	0.01	0.02	0.19	0.38	0.4%
Single Family Bathroom Aerator	0.09	0.13	0.21	0.24	0.3%
Ultra-High Definition TV – ENERGY STAR	0.00	0.01	0.11	0.22	0.2%
Electric Vehicle Supply Equipment Level 2 Networked Charger	0.00	0.00	0.04	0.19	0.2%
Single Family Kitchen Aerator	0.06	0.09	0.13	0.16	0.2%
Floor Insulation - R0 to R19 - Heating Zone 1	0.03	0.07	0.13	0.15	0.2%

### 4.3. Commercial

City Light's commercial sector accounts for 55 percent of its baseline sales in 2041 and 59 percent of total achievable technical potential. Cadmus estimated potential for the 20 commercial segments listed above in Table 3.5 (grouped into 16 segments for this report). Table 4.9 summarizes 20-year cumulative technical and achievable technical potential by commercial segment.



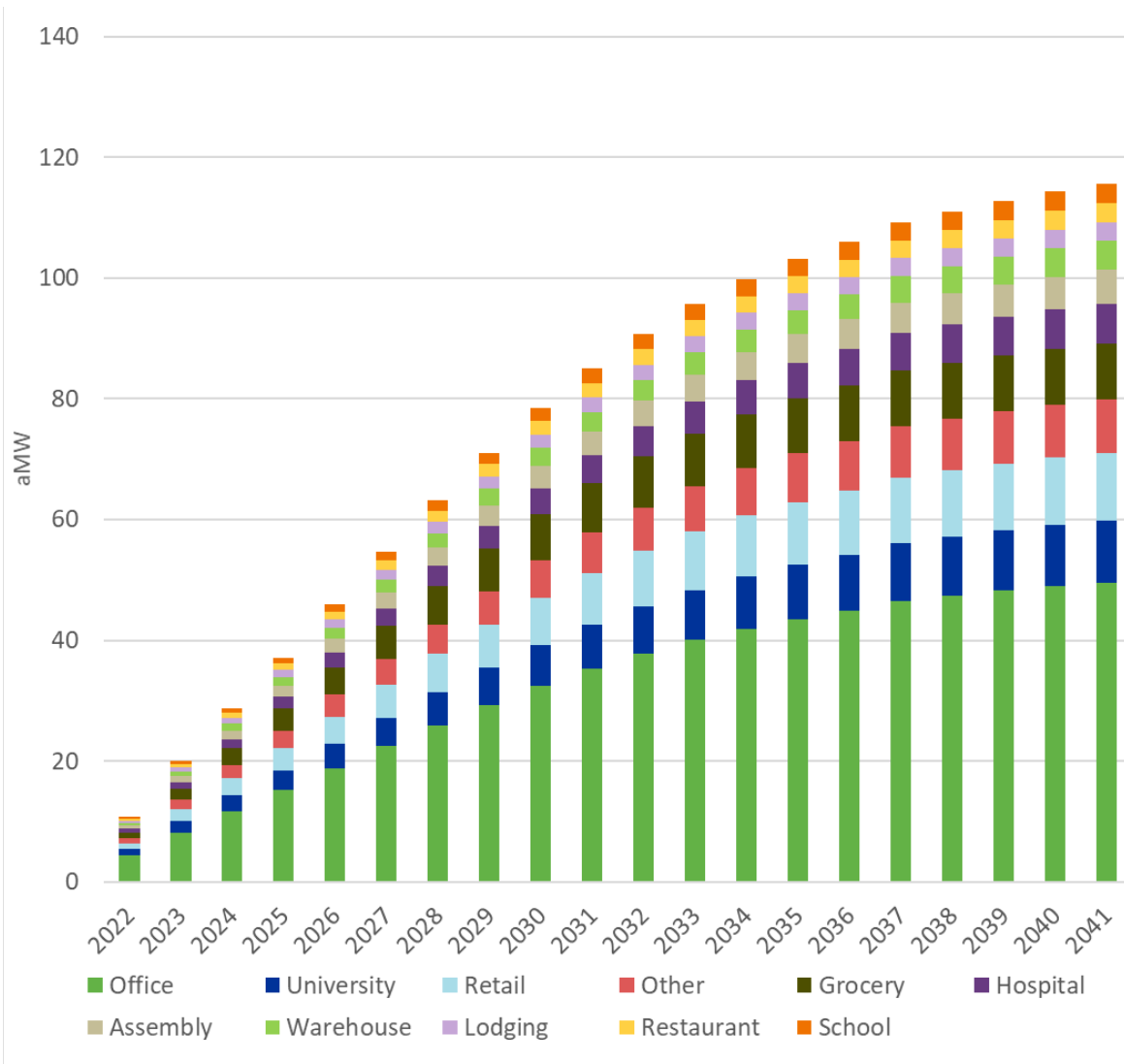
**Table 4.9. Cumulative Commercial Potential by Segment (2022-2041)**

Segment	Baseline Sales	Cumulative 2041 – aMW			
		Technical Potential (TP)	TP % of Baseline	Achievable Technical Potential (AP)	AP % of TP
Assembly	28	6	23%	6	88%
Data Center	67	0.3	0.5%	0.3	85%
Hospital	38	8	20%	7	85%
Large Grocery	16	9	56%	8	89%
Large Office	160	41	25%	36	89%
Lodging	21	4	17%	3	89%
Multifamily Common Area	71	0	0%	0	0%
Miscellaneous	33	7	22%	7	91%
Other Health	11	2	18%	2	90%
Restaurant	21	4	16%	3	87%
Retail	47	13	26%	11	90%
School	14	4	28%	3	85%
Small Grocery	7	2	23%	1	89%
Small Office	42	15	35%	13	89%
University	65	12	19%	10	83%
Warehouse	25	5	22%	5	88%
<b>Total</b>	<b>667</b>	<b>131</b>	<b>20%</b>	<b>116</b>	<b>88%</b>

Approximately 31 percent of 20-year commercial achievable technical potential is from the large office segment, as shown in Figure 4.10. Together, large and small offices account for 43 percent of commercial achievable technical potential. The large grocery segment has the highest technical potential savings relative to baseline sales due to the high potential associated with refrigeration equipment.



**Figure 4.11. Cumulative Commercial Achievable Technical Potential by Segment (2022-2041)**

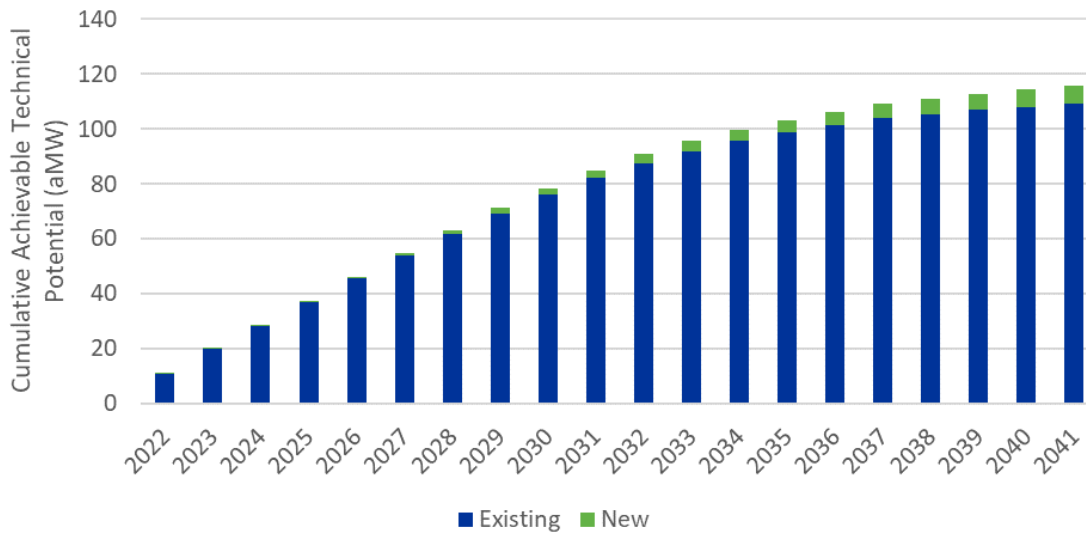


*Note: Other segment includes data centers, multifamily common area, miscellaneous, and other health.*

Figure 4.11 presents the cumulative achievable technical potential by construction vintage for the commercial sector. Existing construction represents the majority of achievable technical potential, particularly in the early years of the study, accounting for 98.9 percent of the potential in the first two years (2022-2023).



**Figure 4.12. Cumulative Commercial Achievable Technical Potential by Construction Type (2022-2041)**



Across each of these segments, lighting accounts for 33 percent of total achievable technical potential. Table 4.10 shows 20-year cumulative commercial potential by end use.

**Table 4.10. Cumulative Commercial Potential by End-Use Group (2022-2041)**

End Use	Baseline Sales	Cumulative 2041 – aMW			
		Technical Potential (TP)	TP % of Baseline	Achievable Potential (AP)	AP % of TP
Cooking	7	1	9%	1	85%
Cooling	57	23	40%	19	82%
Data Center	101	5	5%	4	89%
Heat Pump	12	4	36%	4	84%
Heating	25	8	30%	6	85%
Lighting	211	42	20%	38	91%
Miscellaneous	109	5	4%	4	88%
Refrigeration	56	18	32%	16	89%
Ventilation	85	25	30%	23	91%
Water Heating	5	2	32%	1	74%
<b>Total</b>	<b>667</b>	<b>131</b>	<b>20%</b>	<b>116</b>	<b>88%</b>

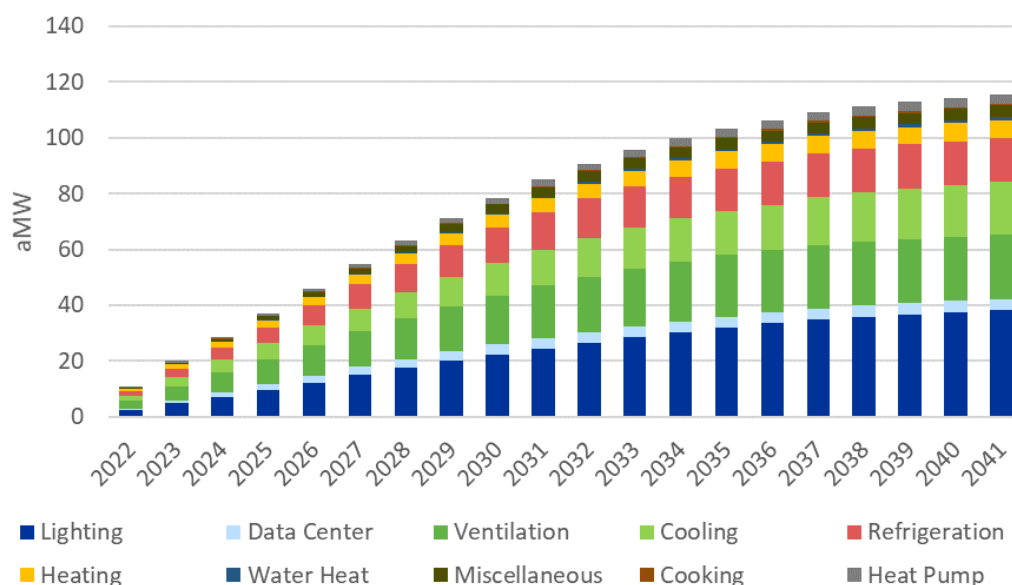
*Note: The heat pump end-use group includes air source heat pumps and related retrofit measures. This differs from heat pump water heaters, which are included in the water heating end-use group. Heating end-use group refers to non-heat pump electric space heating equipment (e.g., electric resistance heating). Cooling end-use group refers to cooling direct expansion, chiller equipment, and related retrofit measures.*



One-third of commercial achievable potential comes from interior lighting equipment upgrades, exterior lighting equipment upgrades, and controls. Lighting's 20-year technical potential is equivalent to an 18 percent reduction in baseline lighting consumption. Overall, 91 percent of lighting technical potential is considered achievable based on the maximum achievable potential assumed in the draft 2021 Power Plan.

Compared to the residential sector, a larger proportion of the achievable technical potential is realized in the first ten years of the study, with 73 percent of the 20-year cumulative achievable technical potential in the first ten years and 32 percent in the first four years. Figure 4.12 and Figure 4.13 show cumulative and incremental achievable potential for the commercial sector, respectively. There is a slight bump in incremental achievable technical potential in 2037, due to the replacement of high-savings measures that have a measure life of 15 years.

**Figure 4.13. Commercial Cumulative Achievable Technical Potential (2022-2041)**





**Figure 4.14. Commercial Incremental Achievable Technical Potential (2022-2041)**

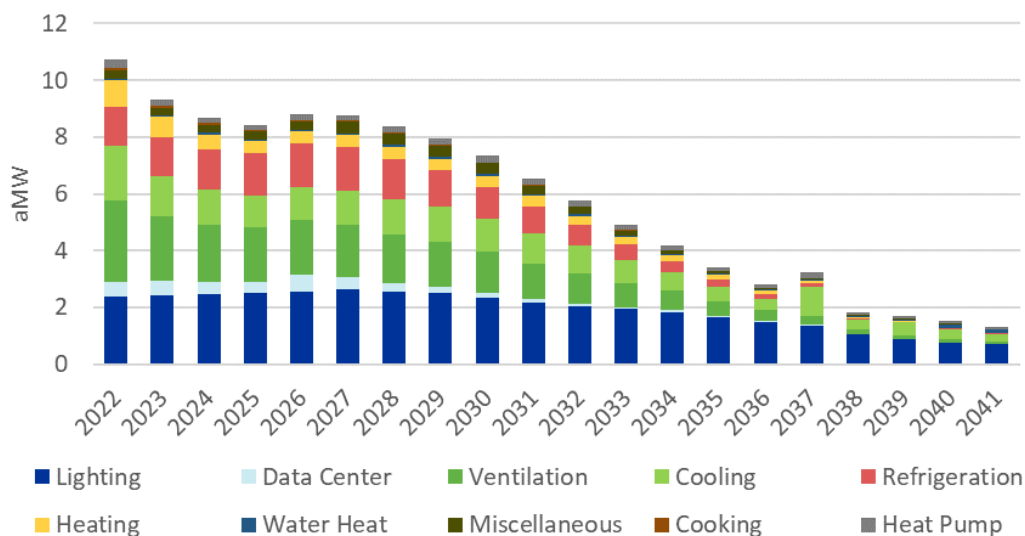


Table 4.11 shows the top 15 commercial measures and their average levelized costs,<sup>19</sup> sorted by 20-year achievable technical potential. Together, these measures represent 34 percent of the commercial cumulative 2041 achievable technical potential. The highest-saving measure is HVAC retro-commissioning with over 5 aMW, or four percent, of achievable technical potential. Depending on the application, this measure can also be costly and may not be considered economic with a weighted average levelized TRC of \$160 per MWh.

<sup>19</sup> The levelized cost value represents a weighted average across all iterations, including segment and end-use. As a result, permutations of a measure may have a low levelized cost while other permutations may have a high levelized cost.



**Table 4.11. Top-Saving Commercial Measurers**

Measure Name	Cumulative Achievable Technical Potential - aMW				Percent of Total (20-Year)	Weighted Average Levelized TRC (\$/MWh)
	2-Year	4-Year	10-Year	20-Year		
HVAC Retro-commissioning	1.95	2.94	4.54	5.16	4%	\$159.97
Building Automation System Upgrades	1.81	2.74	4.29	4.96	4%	\$11.87
Strategic Energy Management (SEM)	0.06	0.26	2.50	4.59	4%	\$189.09
Large Office Linear Fixture from Linear Fluorescent Tube to LED Panel Control	0.23	0.58	1.81	3.31	3%	\$23.70
New Refrigerated Case	0.71	1.41	2.84	3.22	3%	\$25.94
Fans (Retrofit) Commercial System Upgrade	0.51	1.01	2.03	2.31	2%	\$44.47
Thin Triple Windows Large Office	0.03	0.12	1.13	2.03	2%	\$116.81
Server – Virtualization	0.44	0.87	1.75	1.99	2%	\$15.36
Medium Office Linear Fixture from Linear Fluorescent Tube to LED Panel Control	0.13	0.32	0.99	1.81	2%	\$23.51
Circulation Pumps Space Heating Commercial Electronically Commutated Motor (ECM) + Advanced Speed Controls	0.68	1.02	1.58	1.80	2%	\$93.84
Server - ENERGY STAR	0.42	0.79	1.69	1.78	2%	\$1.39
Packaged AC (Air-Cooled) >= 240,000 Btu/h and < 760,000 Btu/h - Above Code	0.05	0.18	0.69	1.74	2%	\$12.56
Packaged AC (Air-Cooled) >= 135,000 Btu/h and < 240,000 Btu/h - Above Code	0.05	0.18	0.68	1.73	1%	\$214.33
Circulation Pumps Water Heating Commercial ECM + Advanced Run Hour Controls	0.65	0.97	1.50	1.71	1%	\$74.74
Large Commercial Refrigerators	0.16	0.39	1.38	1.65	1%	\$355.41

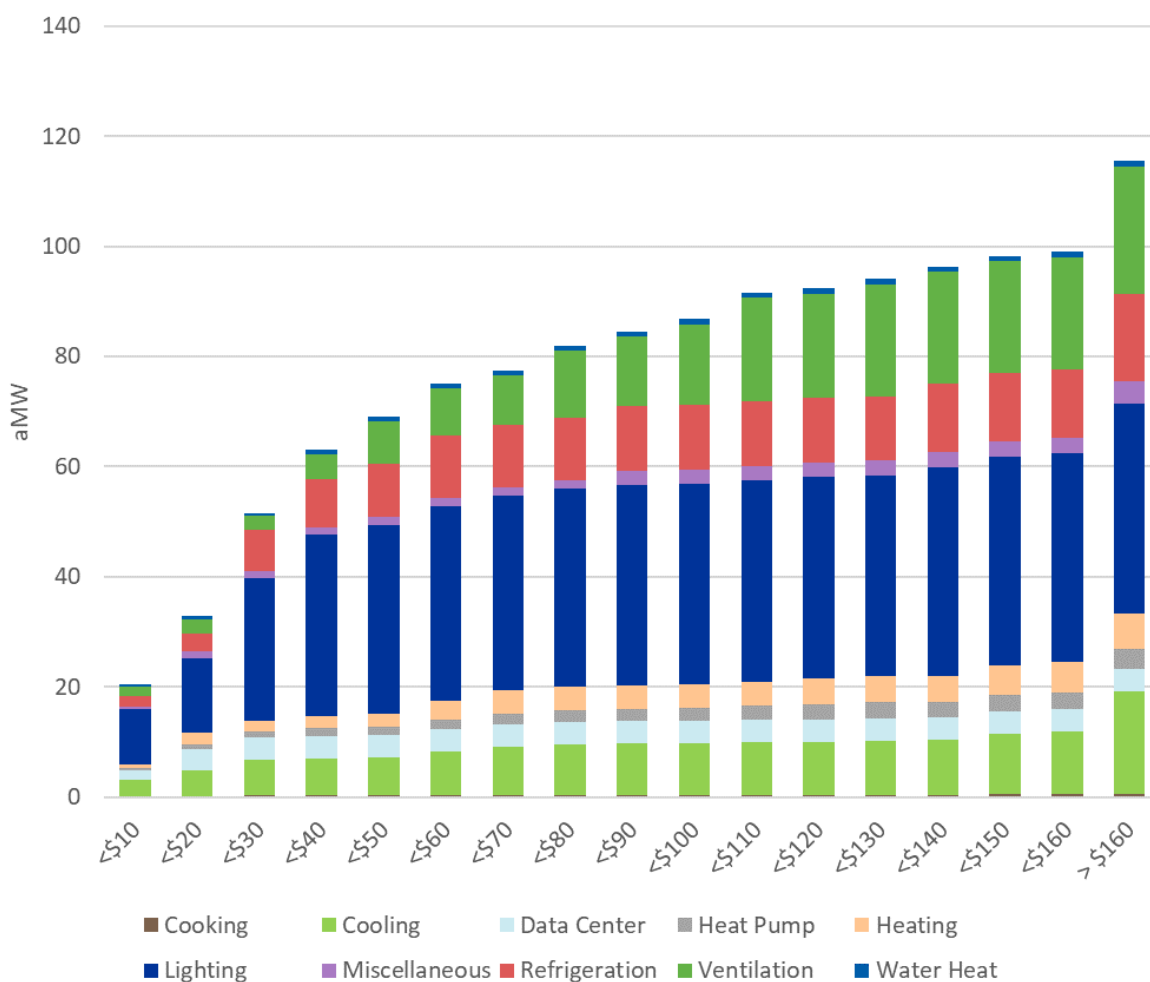
*Note: The average levelized TRC value represents a weighted average across all iterations, including segment and end-use. As a result, permutations of a measure may have a low levelized cost while other permutations may have high levelized cost.*



Approximately 73 percent of 20-year commercial achievable technical potential falls within the first ten years of the study horizon. Much of the commercial retrofit potential for existing buildings becomes exhausted within the first ten years.

Figure 4.14 shows that the commercial levelized cost distributions for the achievable technical potential are similar to the residential sector. However, 14 percent of the realized achievable technical savings has costs greater than \$160/MWh. This is primarily because HVAC retro-commissioning and weatherization measures such as thin triple window replacements are costly but offer large savings opportunities.

**Figure 4.15. Commercial Supply Curve — Cumulative Achievable Technical Potential in 2041 by Levelized Cost**



*Note: The cooking end use has 0.12 aMW at ≤\$10/MWh, 0.21 aMW at ≤\$20/MWh, 0.38 aMW at ≤\$30/MWh, 0.40 aMW at ≤\$90/MWh, 0.43 aMW at ≤\$100/MWh, 0.53 aMW at ≤\$150/MWh.*

City Light's IRP selected an achievable economic potential for the commercial sector of 77 aMW. Figure 4.15 shows the cumulative, 20-year achievable economic potential for the commercial sector by end-use



group. Lighting achievable economic potential makes up 46 percent of the commercial achievable economic potential, followed by refrigeration (15 percent) and ventilation (12 percent).

**Figure 4.16. Commercial Cumulative Achievable Economic Potential in 2041 by End-Use Group**

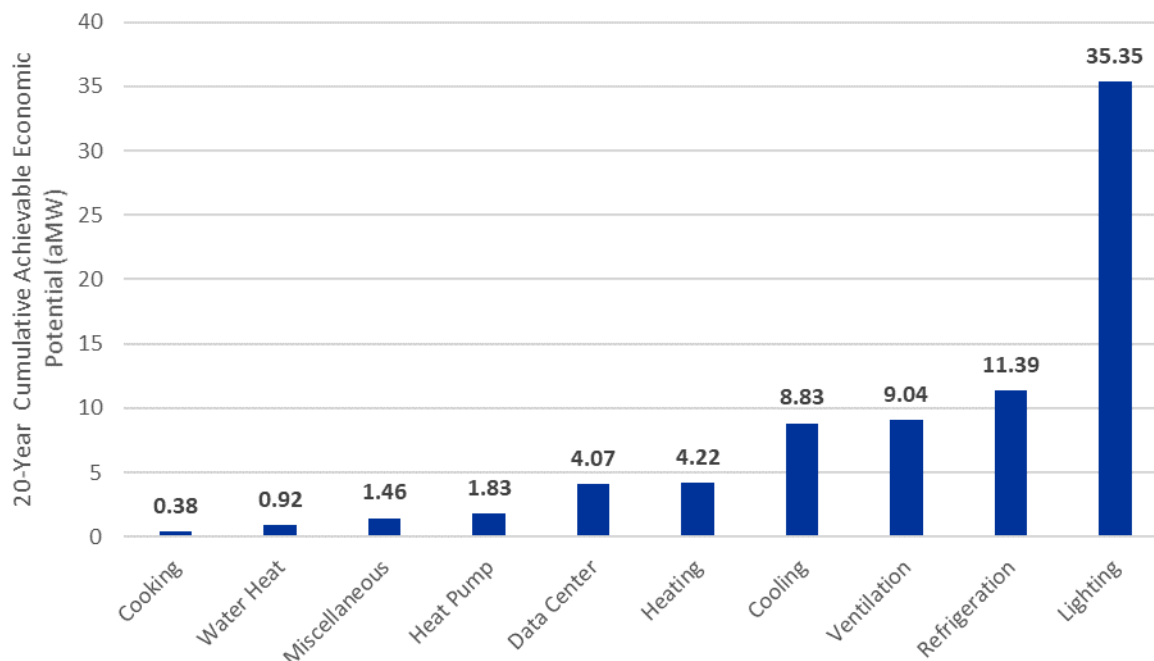


Table 4.12 lists the 15 highest saving IRP selected commercial measures. The commercial achievable economic measure permutations selected all have a levelized cost of less than or equal to \$70/MWh, and their associated cumulative achievable economic potential makes up 26 percent of the commercial, cumulative 2041 achievable technical potential.



**Table 4.12. Top-Saving Commercial Measures Selected by IRP**

Measure Name	Cumulative Achievable Economic Potential (aMW) – Less than or Equal to \$70/MWh				Percent of Cumulative 20-Year Achievable Technical Potential
	2-Year	4-Year	10-Year	20-Year	
Building Automation System Upgrades	1.65	2.49	3.91	4.53	4%
Large Office Linear Fixture from Linear Fluorescent Tube to LED Panel Control	0.23	0.58	1.81	3.31	3%
New Refrigerated Case	0.71	1.41	2.84	3.22	3%
HVAC Retro-commissioning	1.02	1.54	2.38	2.70	2%
Fans (Retrofit) Commercial System Upgrade	0.51	1.01	2.03	2.31	2%
Server – Virtualization	0.44	0.87	1.75	1.99	2%
Medium Office Linear Fixture from Linear Fluorescent Tube to LED Panel Control	0.13	0.32	0.99	1.81	2%
Server - ENERGY STAR	0.42	0.79	1.69	1.78	2%
Packaged AC (Air-Cooled) >= 240,000 Btu/h and < 760,000 Btu/h - Above Code	0.05	0.18	0.69	1.74	2%
Strategic Energy Management	0.02	0.10	0.93	1.66	1%
Small Office Linear Fixture from Linear Fluorescent Tube to LED Panel Control	0.07	0.18	0.57	1.22	1%
Retrofit Add Refrigerated Case Door	0.23	0.47	0.94	1.07	1%
Exterior Lighting - Parking Lot to LED from High Pressure Sodium 250W	0.13	0.28	0.76	1.06	1%
Economizer - Outside Air	0.39	0.59	0.91	1.03	1%
Other Building Type Linear Fixture from Linear Fluorescent Tube to LED Panel Control	0.08	0.21	0.64	1.03	1%

#### 4.4. Industrial

Cadmus estimated conservation potential for the industrial sector using the Council’s draft 2021 Power Plan analysis tool. The conservation potential addressed eight industrial segments in City Light’s service territory, based on allocations developed from City Light’s nonresidential database. The assessment identified approximately 10 aMW of achievable technical potential by 2041.

Table 4.13 shows cumulative industrial potential by segment in 2041.



**Table 4.13. Cumulative Industrial Potential by Segment (2022-2041)**

Segment	Baseline Sales	Cumulative 2041 – aMW			
		Technical Potential (TP)	TP % of Baseline	Achievable Potential (AP)	AP % of TP
Foundries	36	5	15%	5	86%
Frozen Food	2	0.3	17%	0.2	85%
Miscellaneous Manufacturing	29	1	5%	1	86%
Other Food	0	<0.1	17%	<0.1	86%
Transportation Equipment	20	4	21%	4	85%
Wastewater	2	0.2	10%	0.1	85%
Water	3	1	27%	1	85%
<b>Total</b>	<b>91</b>	<b>12</b>	<b>13%</b>	<b>10</b>	<b>86%</b>

*Note: Miscellaneous Manufacturing represents all undefined industrial segments with City Light's customer database. Other Food represents all non-frozen food manufacturing that may include specialty food manufacturing, fruit and vegetable preserving, bakeries and tortilla manufacturing, animal food manufacturing, etc.*

Figure 4.15 shows industrial cumulative achievable technical potential by segment and year. The distribution of industrial achievable technical potential by segment follows a similar distribution to the baseline sales. Foundries account for 5 aMW, the largest percentage of 20-year industrial achievable technical potential, followed by transportation equipment, which makes up 4 aMW of total achievable technical potential.



**Figure 4.17. Cumulative Industrial Achievable Technical Potential by Segment (2022-2041)**

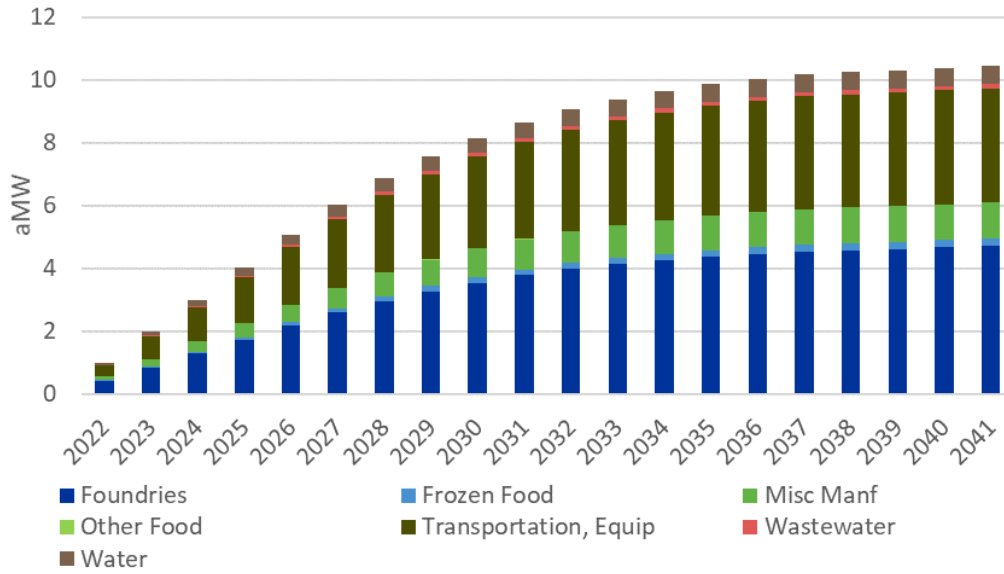


Table 4.14 shows 20-year potential by industrial end use. The four highest end-uses of industrial achievable technical potential are for lighting (32 percent), fans (15 percent), pumps (15 percent), and process air compressor (12 percent).



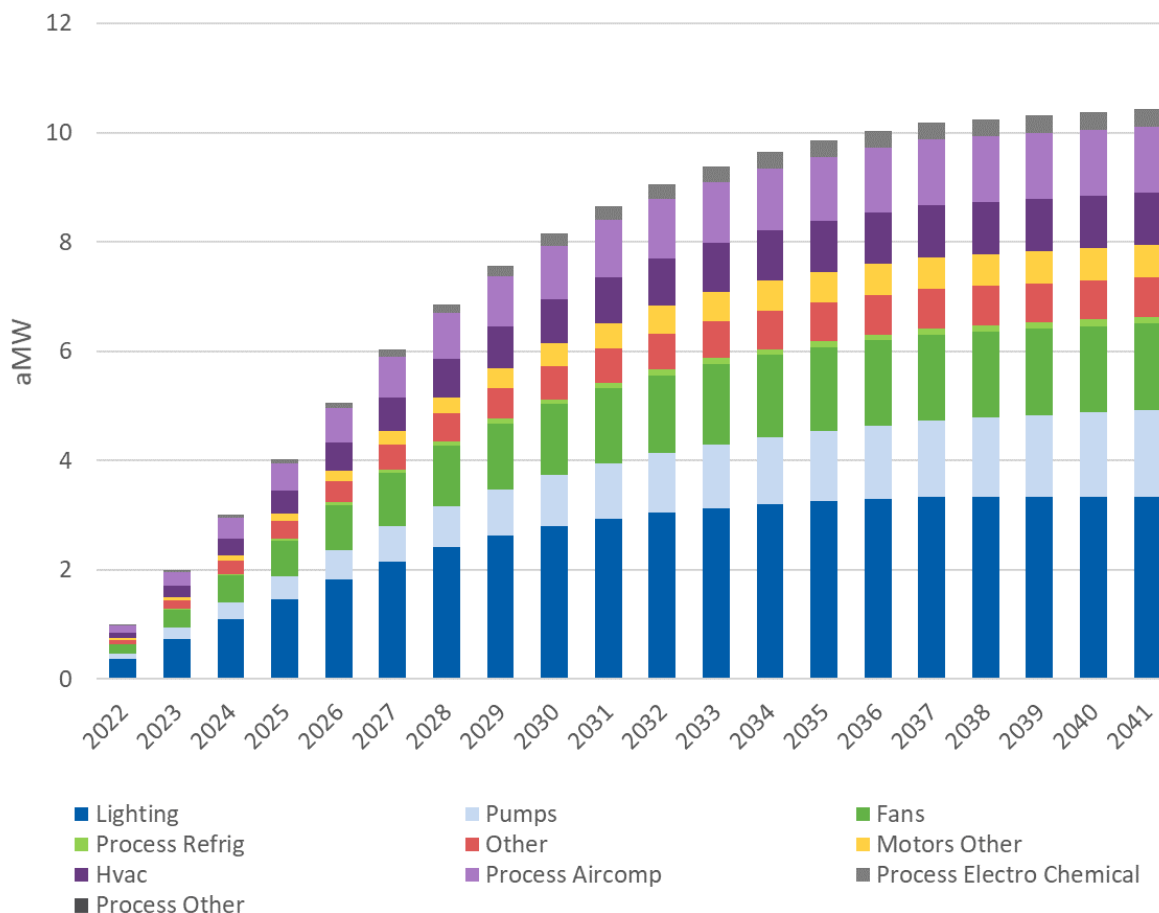
**Table 4.14. Cumulative Industrial Potential by End-Use (2022-2041)**

End Use	Baseline Sales	Cumulative 2041 – aMW			
		Technical Potential (TP)	TP % of Baseline	Achievable Potential (AP)	AP % of TP
Fans	7	2	27%	2	85%
HVAC	12	1	10%	1	85%
Lighting	9	4	42%	3	85%
Motors Other	13	1	5%	1	85%
Other	9	1	10%	1	85%
Process Air Compressor	6	1	21%	1	92%
Process Electro Chemical	6	0.4	6%	0.3	85%
Process Heat	14	0	0%	0	0%
Process Other	0.5	0	0%	0	0%
Process Refrigeration	3	0.1	5%	0.1	85%
Pumps	12	2	16%	2	85%
<b>Total</b>	<b>91</b>	<b>12</b>	<b>13%</b>	<b>10</b>	<b>86%</b>

Figure 4.16 and Figure 4.17 show cumulative and incremental, achievable technical potential over the 20-year study horizon, respectively.



**Figure 4.18. Industrial Cumulative Achievable Technical Potential (2022-2041)**



**Figure 4.19. Industrial Incremental Achievable Technical Potential (2022-2041)**

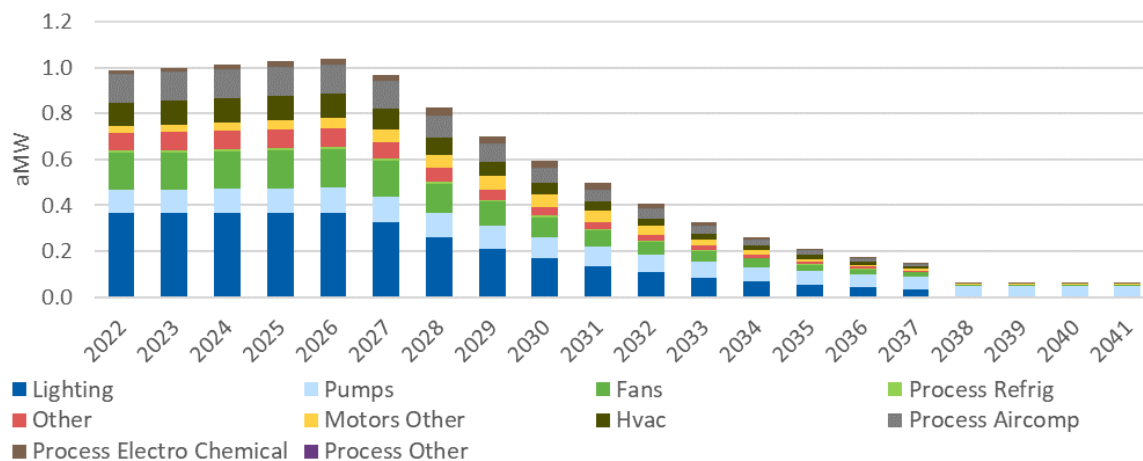




Table 4.15 shows the top-saving industrial measures and their weighted average levelized costs; collectively, these represent 79 percent of industrial 20-year cumulative, achievable technical potential.

**Table 4.15. Top-Saving Industrial Measures**

Measure Name	Cumulative Achievable Technical Potential – aMW				Percent of Total (20-Year)	Weighted Average Levelized TRC (\$/MWh)
	2-Year	4-Year	10-Year	20-Year		
Lighting Controls	0.19	0.37	0.74	0.84	8%	\$39.81
HVAC	0.18	0.36	0.73	0.83	8%	\$15.35
Pump Optimization	0.07	0.14	0.35	0.70	7%	\$2.14
Energy Management (SEM)	0.07	0.16	0.58	0.69	7%	\$21.68
Fan Equipment Upgrade	0.15	0.30	0.59	0.67	6%	\$0.00
High Bay Lighting 2 Shift	0.14	0.27	0.55	0.62	6%	\$34.01
Wastewater	0.13	0.25	0.51	0.58	6%	\$55.85
Air Compressor Equipment	0.13	0.25	0.51	0.58	6%	\$62.71
High Bay Lighting 1 Shift	0.12	0.24	0.48	0.55	5%	\$39.43
Efficient Lighting 2 Shift	0.11	0.21	0.43	0.49	5%	\$10.34
Efficient Lighting 1 Shift	0.09	0.18	0.36	0.41	4%	\$12.61
Fan Optimization	0.08	0.17	0.34	0.38	4%	\$36.90
Energy Management 2 (SEM)	0.03	0.07	0.17	0.33	3%	\$44.67
Air Compressor Variable Speed	0.06	0.13	0.25	0.29	3%	\$56.67
Advanced Motors - Material Processing	0.03	0.06	0.23	0.28	3%	\$9.02

*Note: The average levelized TRC value represents a weighted average across all iterations, including segment and end-use. As a result, permutations of a measure may have a low levelized cost while other permutations may have high levelized cost.*

*Note: The Council separated the Energy Management (SEM) measures into two tiers level 1 and level 2. Energy Management (SEM) 2 represents 50 percent more savings but assumes double the cost.*

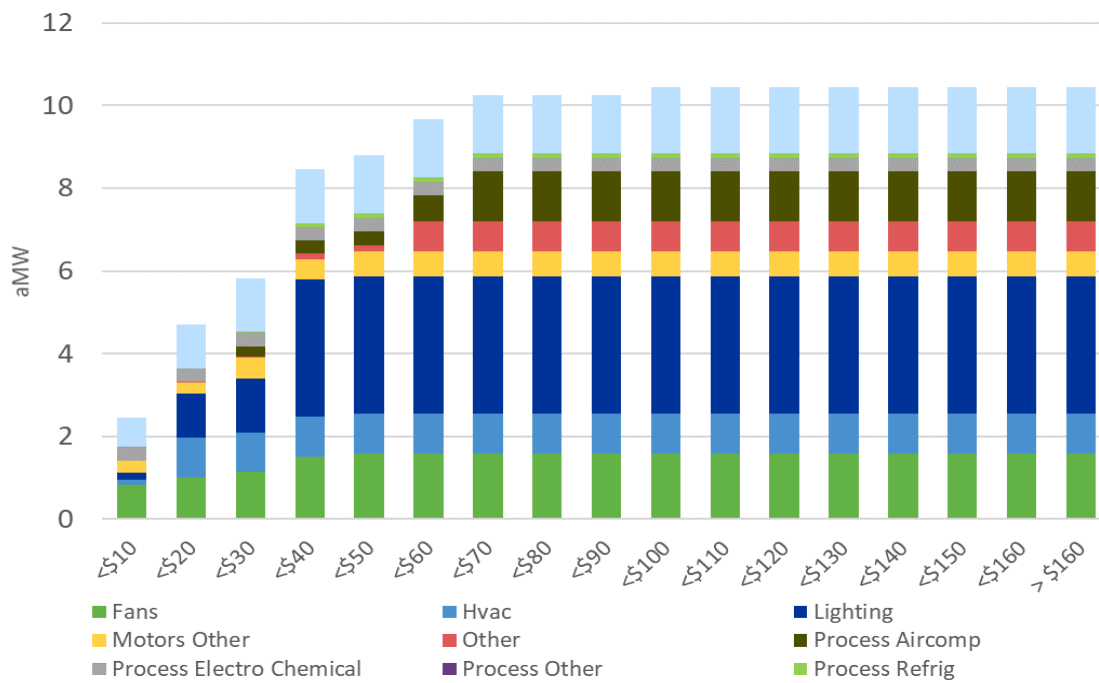
*Note: The Fan Equipment Upgrade net expenses (costs and benefits) were less than zero. The resulting levelized TRC was shown as \$0.00 (\$/MWh) and can be considered cost effective,*



Consistent with the Council's approach to the industrial sector, Cadmus modeled all industrial measures as retrofits and did not distinguish between new and existing construction. After applying ramp rates, approximately 83 percent of 20-year achievable technical potential is realized within the first ten years.

Industrial measures are generally low cost, so the industrial achievable technical potential by levelized cost distribution does not suffer from the same peak at greater than \$160/MWh as the residential and commercial sectors do. In fact, all 10 aMW of industrial potential can be achieved at a levelized cost of less than or equal to \$100/MWh. Figure 4.18 shows cumulative achievable economic potential in 2041 for different levelized cost thresholds.

**Figure 4.20. Industrial Supply Curve — Cumulative Achievable Technical Potential in 2041 by Levelized Cost**



City Light's IRP selected all industrial measures for inclusion in the achievable economic potential portfolio. Therefore, the 20-year, cumulative achievable economic potential for the industrial sector is 10 aMW at a levelized cost of less than or equal to \$160/MWh. For this sector, the achievable economic potential is equivalent to the achievable technical potential, because all of the achievable technical potential is considered economically feasible at the levelized cost threshold. Therefore, the achievable economic potential by end-use can be found in Table 4.14 and the 15 highest savings measures is equal to the achievable technical potential in Table 4.15, above.



## 5. Comparison to 2020 CPA

### 5.1. Overview

Overall, the 2022 CPA identified lower final year cumulative technical potential and achievable technical potential than the 2020 CPA. This section compares results from the two assessments and explains the reasons for the change.

The 2022 study focused on final year cumulative estimates of technical potential and incremental estimates of achievable technical potential. Cadmus defines the final year cumulative technical potential as the total aMW of savings that are considered technically feasible to achieve over the study horizon. For the 2022 CPA, that horizon is 2022-2041, and for the 2020 CPA, that horizon is 2020-2040.

### 5.2. Technical Potential

The 2022 CPA identified 233 aMW of technical potential, compared to 282 aMW in the 2020 CPA. The 17 percent decrease in cumulative, final year technical potential is heavily influenced by the transition from the Seventh Power Plan to the draft 2021 Power Plan, which is the primary resource for residential and commercial measures. Table 5.1 compares cumulative technical potential, by sector, from the 2020 and 2022 CPAs.

**Table 5.1. Technical Cumulative Potential Comparison**

Sector	2022 CPA			2020 CPA			Percent Change in Technical Potential
	Baseline Sales – 20-Year (aMW)	Technical Potential – 20-Year (aMW)	Technical Potential as % of Baseline Sales	Baseline Sales – 21-Year (aMW)	Technical Potential – 21-Year (aMW)	Technical Potential as % of Baseline Sales	
Residential	461	90	20%	440	100	23%	-10%
Commercial	667	131	20%	693	173	25%	-24%
Industrial	91	12	13%	88	9	10%	43%
<b>Total</b>	<b>1,219</b>	<b>233</b>	<b>19%</b>	<b>1,221</b>	<b>282</b>	<b>23%</b>	<b>-17%</b>

The following sections detail the changes between 2022 CPA and the 2020 CPA .

#### 5.2.1. Residential Sector Changes

The residential sector potential decreased 100 aMW of technical potential in the final year from the 2020 CPA to 90 aMW in the 2022 CPA. This is a 10 percent decrease that can be attributed to two major facts: first, the assumption that lighting, heating, and cooling market equipment is more efficient than in 2020 study; and second, the update in unit energy consumptions (UEC) and savings that align with the draft 2021 Power Plan.



Cadmus assumed a more efficient lighting baseline for standard-income residential customers compared to the 2020 CPA lighting baseline.<sup>20</sup> By increasing the efficiency of the lighting baseline, less lighting savings are achieved, because the incremental difference in consumption between the baseline and measure has decreased relative to the last CPA.

For example, more homes have LEDs in the 2022 CPA, resulting in less available lighting potential to install LEDs. In the 2022 CPA, all standard-income residential specialty and screw-base lighting measures are assumed to have an LED baseline. Thus, the market average baseline is more efficient than if the study had assumed an incandescent or halogen baseline (as was done in the 2020 CPA).

In addition to the lighting updates, Cadmus assumed an increase in efficient heating and cooling equipment over time based on City Light's assumptions about market adoption of efficient equipment. For example, Cadmus increased new construction, single-family heat pump saturations from 15 percent in the base year to 30 percent of homes in the final year to align with City Light's load forecasting assumptions (such as electrification conversion assumptions of non-electric heating equipment to electric heating equipment). Smaller impacts also contribute to the differences between CPAs. One smaller impact, but notable difference, relates to the increased adoption of electric vehicles in the 2022 CPA.

Table 5.2 provides a comparison of baseline sales and technical potential and the reasoning for the change.

**Table 5.2. Residential Cumulative Technical Potential Comparison**

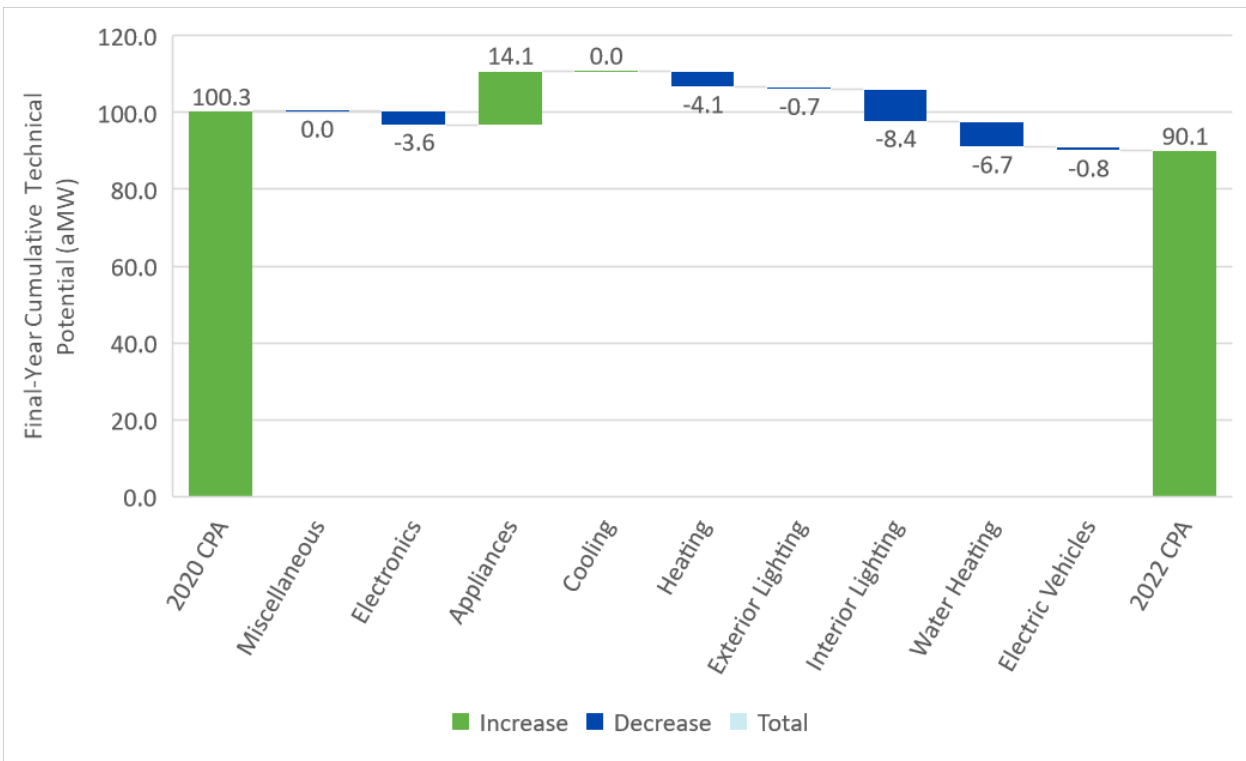
<b>Component</b>	<b>2022 CPA 20-Year (aMW)</b>	<b>2020 CPA 21-Year (aMW)</b>	<b>Percent Change</b>	<b>Reason for Change</b>
Baseline Sales (aMW)	461	440	5%	Updated sales forecast from City Light with adjustments from HVAC equipment adoption
Technical Potential (aMW)	90	100	-13%	Transition to LED lighting baseline for standard-income customers; more efficient baseline, UEC updates in draft 2021 Power Plan
Technical Potential as % of Baseline	20%	23%	N/A	

Figure 5.1 compares the residential technical potential at the end-use group level. The blue bars indicate all end-use groups that saw a decrease in technical potential from the 2020 study to the 2022 study. As described above, the most significant decrease, of 8.4 aMW, comes from the transition to LEDs as the baseline throughout the study for standard-income residential customers. Other notable dips in potential are for heating and water heating due to differences in end-use group consumptions and savings estimates in the draft 2021 Power Plan compared to the Seventh Power Plan. Finally, the potential for appliances increases as the result of higher savings estimates in the draft 2021 Power Plan compared to the Seventh Power Plan for measures such as refrigerators, freezers, and dryers.

<sup>20</sup> Cadmus assumed income-qualified customers have remaining lighting potential that can be obtained through direct replacement of halogen baseline equipment.



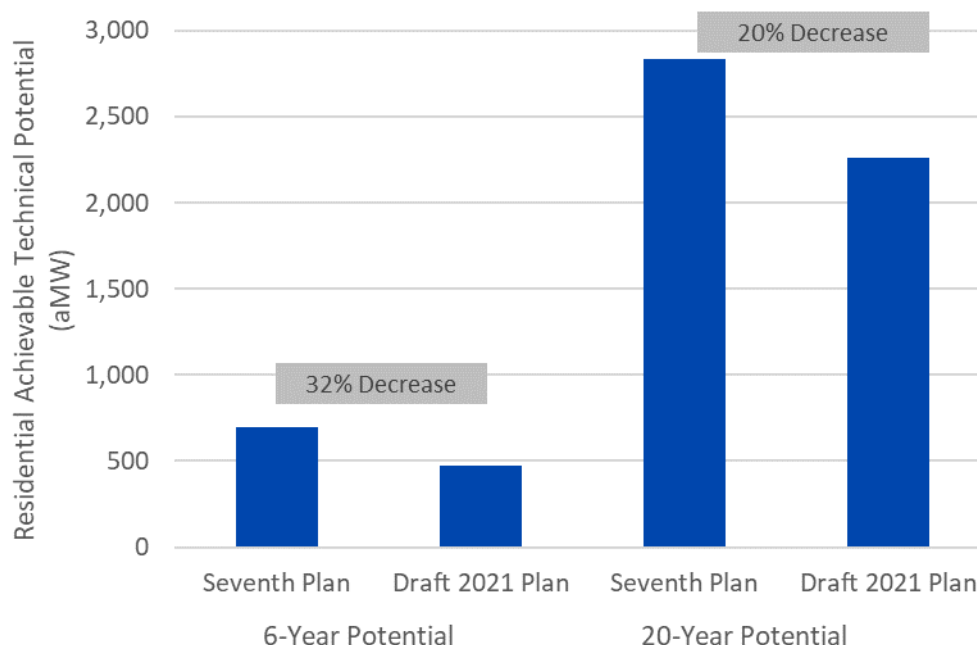
**Figure 5.1. Change in Cumulative Residential Technical Potential by End-Use Group**



These residential changes from the prior 2020 CPA correlate to the changes from Seventh Power Plan to draft 2021 Power Plan. Though the draft 2021 Power Plan added 11 new measures, the overall achievable technical 20-year potential decreased by 20 percent, as shown in Figure 5.2. The short-term achievable technical potential is more pronounced and decreases by 32 percent compared to the Seventh Power Plan, in part due to differences in ramp rates. The largest driver is the decrease in residential lighting potential compared to the Seventh Power Plan, with a decrease of more than 80 percent of the regional lighting achievable technical potential.



**Figure 5.2. Draft 2021 Power Plan and Seventh Power Plan Cumulative Residential Achievable Technical Potential (aMW)**



*Note: Draft 2021 Power Plan data last updated on 6/16/2020 and may not represent final planning values.*

### 5.2.2. Commercial Sector Changes

The 2022 CPA identified lower final-year cumulative technical potential than the 2020 CPA. One notable change relates to a decrease in the baseline sales as a result from latest CBSA data (2019 dataset version IV) that informed building energy end-use group intensities compared to prior CBSA data (2014 dataset version III). This new CBSA data showed a much higher saturation of efficient lighting compared to the estimates within the 2020 CPA. The 2022 study incorporated the latest CBSA data that included new lighting saturation data. CBSA IV data showed a large shift towards LED lamps and fixtures compared to the prior CBSA III. Table 5.3 compares technical potential in the commercial sector for the two CPAs.

**Table 5.3. Commercial Cumulative Technical Potential Comparison**

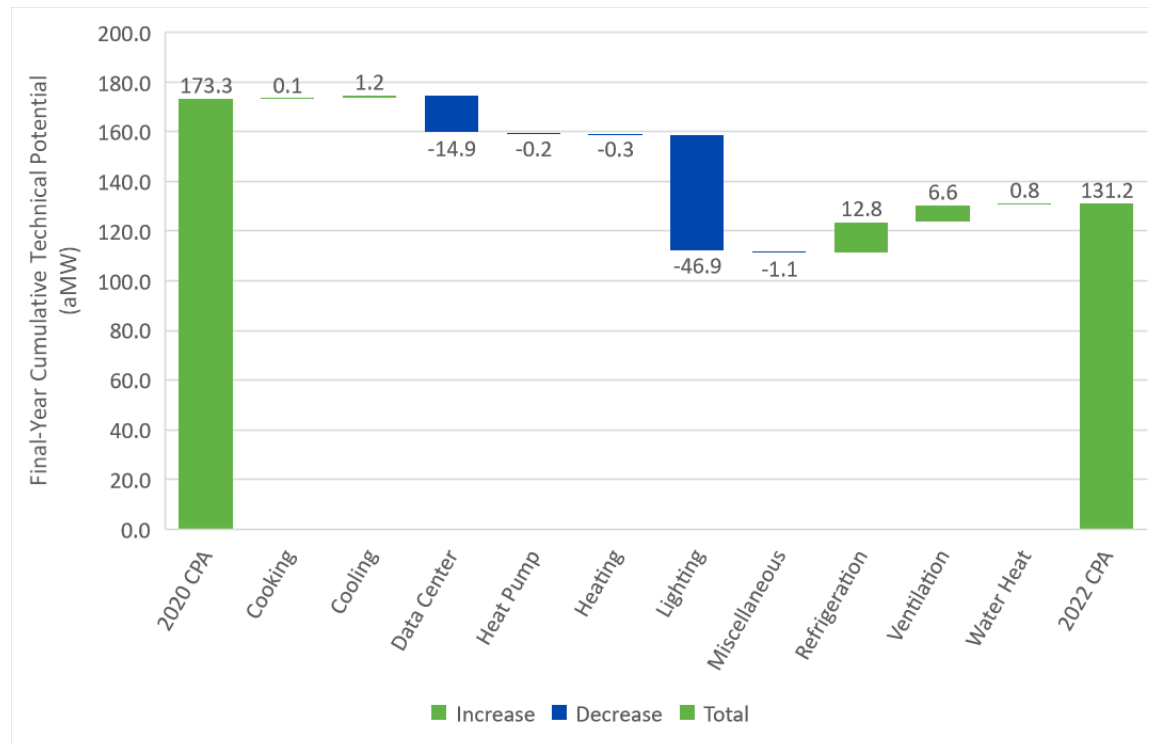
Component	2022 CPA	2020 CPA	Percent Change	Reason for Change
Baseline Sales	667	693	-4%	Updated sales forecast with adjustments from CBSA IV
Technical Potential	131	173	-24%	More efficient lighting baseline; transition to draft 2021 Power Plan
Technical Potential as % of Baseline	20%	25%	N/A	

Figure 5.3 illustrates the change in commercial technical potential between the 2020 and 2022 CPAs by end-use group. End-use groups exhibiting decreased technical potential include lighting, data center,



miscellaneous (laptops, showerhead, compressors, and washing machines), heating, and heat pump. The decrease in lighting potential alone makes up the difference between the 2020 and 2022 CPA technical potential.

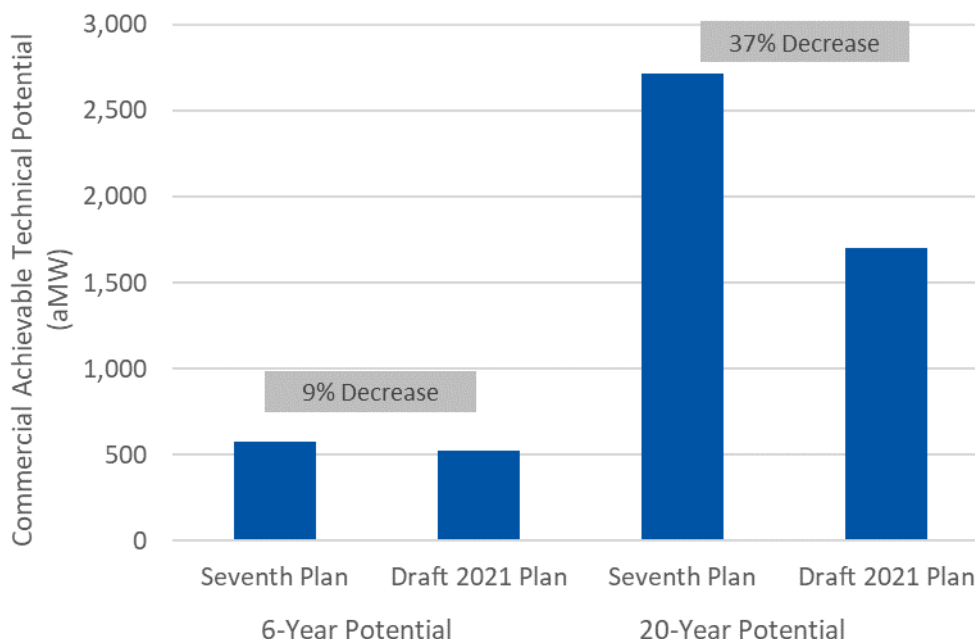
**Figure 5.3. Change in Commercial Cumulative Technical Potential by End-Use Group**



Changes from Seventh Power Plan to draft 2021 Power Plan contribute to the notable differences in potential. Figure 5.4 shows the overall achievable technical 20-year potential decreased by 37 percent. Though the draft 2021 Power Plan added 12 new commercial measures, commercial lighting potential decreased by 50 percent compared to the Seventh Power Plan base. As noted above, this is due in part to the high saturation of existing LED lamp and fixture applications in the commercial sector CBSA data. In addition, the draft 2021 Power Plan looked at fewer data center measures. Working with City Light, Cadmus added several specific data center measures back into the CPA to help minimize the gap in potential as well as to align with City Light's historical program participation with data center upgrades.



**Figure 5.4. Draft 2021 Power Plan and Seventh Power Plan Cumulative Commercial Achievable Technical Potential (aMW)**



*Note: Draft 2021 Power Plan data last updated on 6/16/2020 and may not represent final planning values.*

### 5.2.3. Industrial Sector Changes

The industrial sector in the 2022 CPA included new measures based on the draft 2021 Power Plan, such as HVAC measures, forklift battery chargers, and new methodology for compressors, fans, pumps, and other motor-driven systems. City Light also requested the addition of measures such as industrial generator block heaters, retro-commissioning, and welder system upgrades. These additions and changes in methodology increased the potential in the industrial sector compared to the prior CPA.

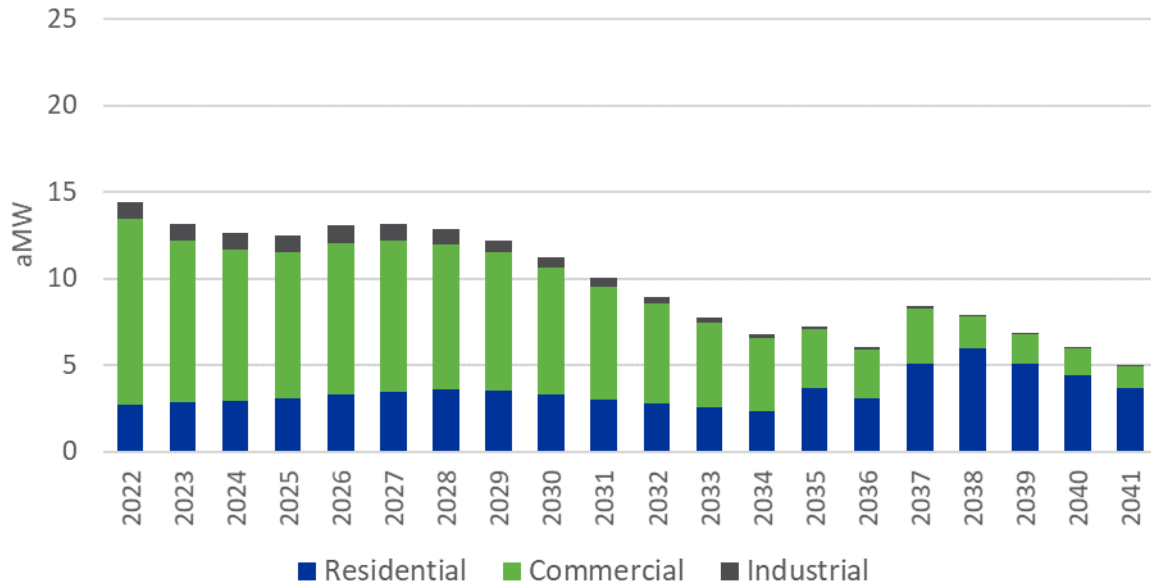
### 5.3. Achievable Technical Potential and Ramping

As with assessments of technical potential, Cadmus identified lower, cumulative, achievable technical potential. Because 20-year cumulative achievable technical potential is a subset of technical potential, factors contributing to lower cumulative achievable technical potential are the same as those previously discussed for technical potential.

Figure 5.5 shows incremental achievable technical potential from the 2022 CPA, and Figure 5.6 shows incremental achievable technical potential from the 2020 CPA. Incremental achievable technical potential in the first two years of the 2022 CPA is about 34 percent lower than the first two years of the 2020 CPA.



**Figure 5.5. Incremental Achievable Technical Potential—2022 CPA**



**Figure 5.6. Incremental Achievable Technical Potential—2020 CPA**

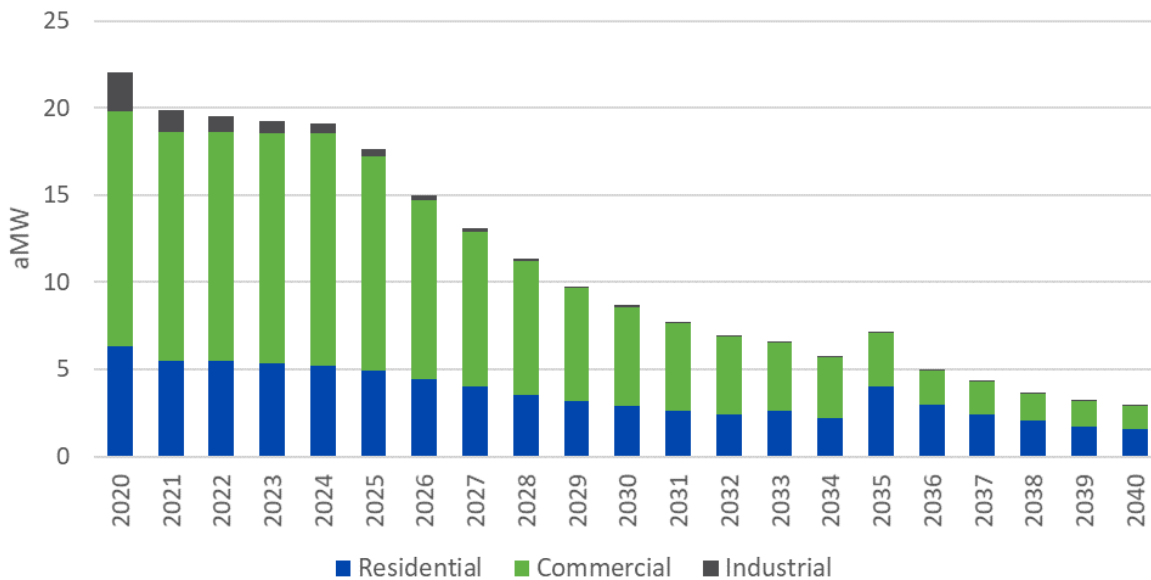


Figure 5.6 shows that the 2020 CPA determines that a higher proportion of total available potential will be realized in the study's early years than in the 2022 CPA. The two-year achievable potential in the 2020 CPA is equal to approximately 18 percent of the total 21-year achievable technical potential, whereas the two-year achievable potential in the 2022 CPA is equal to approximately 14 percent of the total 20-year achievable technical potential. This change is the result of two key factors—changes in ramp rate assumptions and the decrease in technical potential from the 2020 CPA to the 2022 CPA.

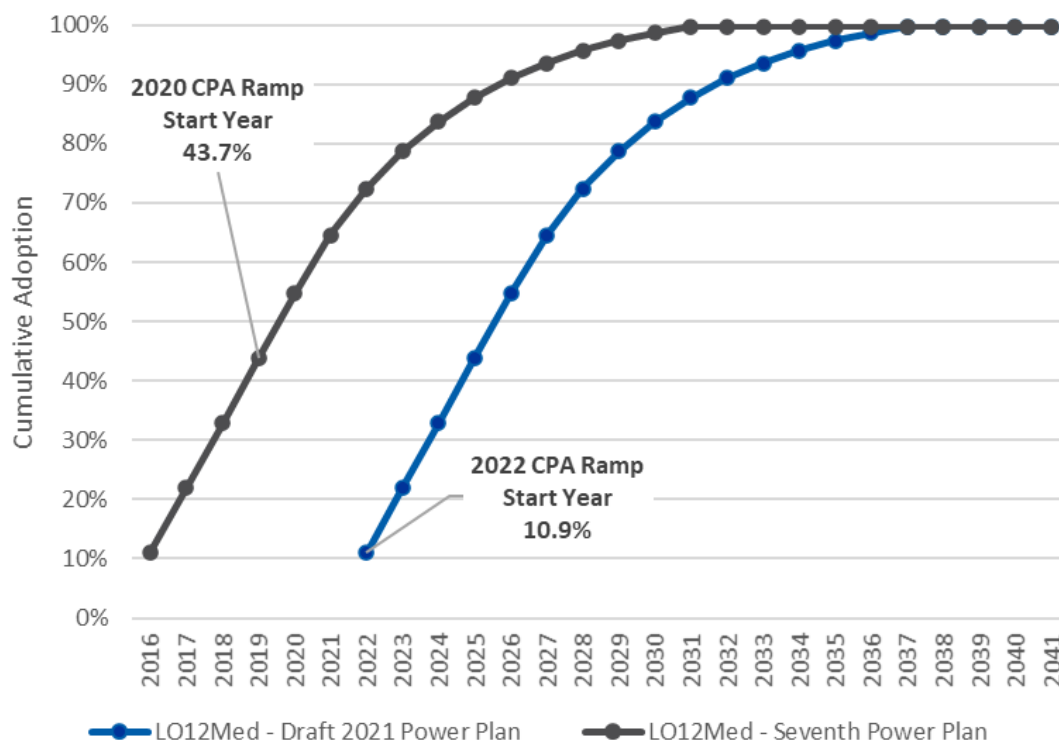


For the 2022 CPA, Cadmus used the draft 2021 Power Plan ramp rates rather than the Seventh Power Plan ramp rates (released in February 2016) used in the 2020 CPA. The change in the source of ramp rate data leads to a decrease in potential in the initial years of the study relative to the final year.

The Seventh Power Plan ramp rates ranged from 2016 to 2035. For the 2020 CPA, Cadmus took the ramp rate beginning in 2020 and extrapolated maximum saturation to extend from 2035 to the final year of the study (2040). For example, Figure 5.7 shows the ramp rate for multifamily ductless heat pumps used in the 2020 CPA and the 2022 CPA. The ramp rate is the LO12Med ramp rate, which indicates it is a lost opportunity ramp rate that reaches full saturation after 12 years and has a medium ramp-up speed. Using the Seventh Power Plan ramp rate, Cadmus started farther up on the curve, assuming an adoption rate of 44 percent in the first year and increasing until 100 percent adoption in 2031.

For the 2022 CPA, Cadmus used the ramp rates released from the draft 2021 Power Plan in 2020. The first year adoption is 11 percent and increases to 100 percent adoption in 2037. Therefore, though the adoption rate is the same in the final years of 2040 and 2041, the incremental adoption in the initial years of the study is drastically different. This leads to the differences in incremental potential in the initial years of the study between the 2020 and 2022 CPA.

**Figure 5.7. Comparison of 2020 CPA and 2022 CPA Ramp Rates**





## 5.4. IRP Achievable Economic Potential Comparison

The 2020 CPA achievable (economic) potential and the 2022 CPA IRP selected economic potential cannot be directly compared without acknowledging that the two studies use very different methodologies in determining what is consider “economic.” The 2020 CPA followed an economic cost-effectiveness criteria, based on City Light’s avoided supply costs for delivering electricity, whereas the 2022 CPA used the IRP optimization modeling to determine how much energy efficiency, as a resource, is cost-effective compared to other competing resources over the study horizon. Table 5.4 shows a comparison of the achievable (economic) potential between the two studies.

**Table 5.4. Achievable Economic Cumulative Potential Comparison**

Sector	2022 CPA			2020 CPA			Percent Change in Potential
	Baseline Sales – 20-Year (aMW)	Achievable Economic Potential – 20-Year (aMW)	Achievable Economic Potential as % of Baseline Sales	Baseline Sales – 21-Year (aMW)	Achievable Potential – 21-Year (aMW)	Achievable Potential as % of Baseline Sales	
Residential	461	18	4%	440	12	3%	53%
Commercial	667	77	12%	693	96	14%	-19%
Industrial	91	10	11%	88	4	5%	158%
<b>Total</b>	<b>1,219</b>	<b>105</b>	<b>9%</b>	<b>1,221</b>	<b>111</b>	<b>9%</b>	<b>-5%</b>

The 2022 CPA residential sector achievable economic potential increased by 53 percent, compared to the 2020 CPA. The 2022 CPA IRP selected appliance measures, such as refrigerators and freezers, whereas the 2020 CPA did not find these appliance measures cost-effective. In addition, the 2022 CPA IRP analysis selected more weatherization measures (impacting heating and cooling end-uses) compared to the 2020 CPA. These differences represent the majority of the change in achievable economic potential in the residential sector between the two studies.

The 2022 CPA commercial sector achievable economic potential decreased slightly, by 19 percent, compared to the 2020 CPA. Though there were increases in achievable economic potential in the refrigeration and ventilation end uses, the majority of change reflects the decrease in available lighting potential. The lighting end-use comparison between studies is described in the *Commercial Sector Changes* section above.

As described in the *Industrial Sector Changes* section, the industrial sector in the 2022 CPA included new measures that increased the achievable economic potential. In addition, 2022 CPA IRP portfolio optimization modeling selected all of the available industrial achievable technical potential. Slightly less than half of the technical potential in the 2020 CPA was determined to be cost-effective as achievable economic potential. These two factors represent the majority of the differences between the two studies.



## 6. Detailed Methodology

Cadmus' general methodology can be best described as a combined top-down/bottom-up approach. The top-down component began with the most current load forecast, adjusting for building codes, equipment efficiency standards, and market trends that are not accounted for through the forecast. Cadmus then disaggregated this load forecast into its constituent customer sectors, customer segments, and end-use components and projected out 20 years. The study calibrated the base year (2022) to City Light's sector-load forecasts produced in 2020.

The bottom-up component considered potential technical impacts of various ECMs and practices on each end use. Impacts could then be estimated, based on engineering calculations, and accounting for fuel shares, current market saturations, technical feasibility, and costs. The technical potential presents an alternative forecasts that reflects the technical impacts of specific energy efficiency measures. The achievable technical potential is then determined by applying ramp rates and achievability percentages to technical potential. The following section describes the CPA methodology in detail.

### 6.1. Developing Baseline Forecasts

City Light's sector-level sales and customer forecasts provided the basis for assessing energy efficiency potential. Prior to estimating potential, Cadmus disaggregated sector-level load forecasts by customer segment (business, dwelling, or facility types), building vintage (existing structures and new construction), and end-uses (all applicable end-uses in each customer sector and segment).

The first step in developing baseline forecasts was to determine the appropriate customer segments in each sector. Designations drew upon categories available in the study's key data sources—primarily City Light's nonresidential customer database (for the commercial and industrial sectors), and the U.S. Census Bureau's American Community Survey (for the residential sector)—then mapping the appropriate end-uses to relevant customer segments.

Upon determining appropriate customer segments and end-uses for each sector, Cadmus produced the baseline end-use forecasts, based on integration of current and forecasted customer counts with key market and equipment usage data.

For the commercial and residential sectors, calculating total baseline annual consumption for each end use in each customer segment used the following equation:

$$EUSE_{ij} = \sum_e ACCTS_i * UPA_i * SAT_{ij} * FSH_{ij} * ESH_{ije} * EUI_{ije}$$

Where:

- $EUSE_{ij}$  = total energy consumption for end use j in customer segment i
- $ACCTS_i$  = the number of accounts/customers in customer segment i



$UPA_i$	=	units per account in customer segment i ( $UPA_i$ generally equals the average square feet per customer in commercial segments, and 1.0 in residential dwellings, assessed at the whole-home level)
$SAT_{ij}$	=	the share of customers in customer segment i with end use j
$FSH_{ij}$	=	the share of end use j of customer segment i served by electricity
$ESH_{ije}$	=	the market share of efficiency level in equipment for customer segment and end use ij
$EUI_{ije}$	=	end-use intensity: energy consumption per unit (per square foot for commercial) for the electric equipment configuration ije

For each sector, total annual consumption could be determined as the sum of  $EUSE_{ij}$  across the end-uses and customer segments.

Consistent with other conservation potential studies, and commensurate with industrial end-use consumption data (which varied widely in quality), allocating the industrial sector's loads to end-uses in various segments and drawing upon data available from the Energy Information Administration.<sup>21</sup>

#### 6.1.1. Derivation of End-Use Consumption

End-use energy consumption estimates by segment, end-use, and efficiency level ( $EUI_{ije}$ ) provided one of the most important components in developing a baseline forecast. In the residential sector, the study used estimates on unit energy consumption (UEC), representing annual energy consumption associated with an end use and represented by a specific type of equipment (e.g., a central air conditioner or heat pump). The basis for the UEC values were derived from savings in the Council's draft 2021 Power Plan workbooks and savings analysis to calculate accurate consumption wherever possible for all efficiency levels of end-use technology. When Council workbooks did not exist for certain end-uses, Cadmus used results from NEEA's 2017 RBSA City Light oversample or conducted other research.

For the commercial sector, the study treated consumption estimates as end-use intensities that represented annual energy consumption per square foot served. To develop the end-use intensities, Cadmus developed electric energy intensities (total kWh per building square feet) based on NEEA's CBSA IV. Cadmus then benchmarked these electric energy intensities against various other data sources including CBSA III, historical forecasted and potential study data from City Light, and historical end-use intensities developed by the Council and NEEA.

To distribute the energy intensities Cadmus developed from the CBSA IV to end-use intensities for this potential study, Cadmus used assumptions specific to each building segment and each end-use:

- **Lighting.** The methodology for lighting end-use consisted of analyzing CBSA IV's lighting power density (lighting wattage per square foot) multiplied by the Council's interior lighting hours of use

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<sup>21</sup> U.S. Department of Energy, Energy Information Administration. 2010. *Manufacturing Energy Consumption Survey*.



by building type. Once lighting end-use intensity was calculated, Cadmus subtracted this portion of load from the total CBSA electric energy intensities (e.g., to estimate non-lighting intensities).

- **Non-lighting.** To distribute the remaining non-lighting CBSA electric energy intensities into end-uses, Cadmus used CBECS 2012 microdata to calculate percentages of end-use intensities across various end-use groups by building types as defined by the Council. Cadmus used the CBSA fuel shares and end-use saturations to adjust the distributions of CBECS end-use intensities to better represent City Light's commercial service territory. These finalized CBECS end-use intensities—adjusted with CBSA values where possible—were the basis for most of the end-use intensities in the commercial sector.
- **Computers and servers.** Cadmus developed energy intensities by building type for two end-uses—computers (desktops and laptops) and servers—using the CBECS number of units per square foot multiplied by unit consumption.
- **University.** The CBSA IV data lacked information on university building type, and the schools building type represented only K-12, as designated by the Council. Cadmus developed a more accurate electric energy intensity specific to university by calculating a ratio of the CBECS's university and school K-12 building types. Cadmus then used the CBSA school K-12 lighting power density and applied the Council's university lighting hours of use. Cadmus determined that the result was reasonable by benchmarking the university lighting end-use intensity developed for City Light against the ratio of CBECS University and School K-12 lighting loads.
- **Retail.** Low CBSA respondent counts and matching varying definitions of building type in Council and CBECS data caused concern, especially for the large and extra large retail building types, so Cadmus combined large and extra large retail building types for the CBSA electric energy intensities and lighting power density. Cadmus combined small and medium retail building types because it found counts and definitions were sufficient.

For the industrial sector, end-use energy consumption represented total annual industry consumption by end use, as allocated by the secondary data described above.

### 6.1.2. City Light Forecast Adjustments

Cadmus worked with the City Light load forecast team to adjust the baseline forecast to account for the impacts of COVID-19, increased market adoption of efficient, electric heating and cooling equipment, and to align this study's commercial and residential baseline forecasts with the City Light load forecasts.

Cadmus made the following adjustments to the heating and cooling residential forecasts using the 2018 Seattle City Code and City Light's electrification assumptions to account for changes in adoption patterns over time:

- Increased saturations of heat pumps in single-family and multifamily from the base year to 2041. City Light expects significant conversion to heat pumps for single-family homes traditionally heated by electric furnaces as well as the conversion of single-family homes traditionally heated by fuel oil.



- Decreased saturations for single-family and multifamily homes heated by electric furnaces and baseboard to account for increased heat pump conversion.
- Increase of UEC for all residential cooling measures to align more closely with City Light estimates.

The first two adjustments created a more efficient baseline, which means less potential for heating equipment than would have occurred if the baseline accounted only for changes in the federal standard. In this study, these adjustments are naturally occurring rather than having energy efficiency potential.

City Light's current forecast do not include the same level of climate change inducted impacts as does the Council. As described above, City Light projects different cooling loads instead of the Council's modelling of future weather. Accordingly, for measures where the Council adjusted unit savings based on future climate change impacts, Cadmus removed these future climate change impacts by using RTF workbooks assumptions instead, where feasible.

## 6.2. Measure Characterization

Because technical potential draws upon an alternative forecast, reflecting installations of all technically feasible measures, Cadmus chose the most robust set of appropriate ECMs. Cadmus measures by developing a comprehensive database of technical and market data for ECMs that applied to all end-uses in various market segments.

The database included the following measures:

- All measures in the Council's draft 2021 Power Plan conservation supply curve workbooks
- Active unit energy savings (UES) measures in the RTF
- Particular commercial technologies of interest to City Light, as identified and included for the study:
  - Airflow Management (Data Center)
  - Building Automation System Upgrades
  - Computer Room Air Conditioner
  - Cooling Towers
  - Economizer – Outside Air
  - Economizer – Water side
  - Freezer – Lab Grade
  - Heat Pump – Water Source
  - Heat Recovery Improvements
  - HVAC Retro-commissioning
  - LED Sign Lighting
  - Server – Virtualization
  - Water Heater Controls

Cadmus included only the Council and RTF measures applicable to sectors and market segments in City Light's service territory. For example, this study does not characterize measures for the agriculture sector or the residential manufactured home segment as these sectors are a small fraction of City Light's customer mix. Cadmus added measures if the RTF workbooks were not included in the Council's draft 2021 Power Plan or the RTF workbooks have been updated since the Council's draft 2021 Power Plan workbooks.



For the residential sector, these included the following:

- Freezer – Decommissioning
- New Construction Home
- Pool Pumps
- Refrigerator – Decommissioning
- Thermostat - Communicating Line Voltage
- Thermostat - Electronic Line Voltage
- Vehicle Engine Block Heater Control

In the commercial sector, additional RTF measures included the following:

- Demand Control Kitchen Ventilation
- Fan - VSD
- Pool Pumps
- Pump – VSD
- Walk-in - Evaporator Fan ECM Motor
- Weatherization – School

Cadmus classified the electric energy efficiency measures applicable to City Light’s service territories into two categories:

- **High-efficiency equipment (lost opportunity) measures** directly affecting end-use equipment (e.g., high-efficiency domestic water heaters), which follow normal replacement patterns based on expected lifetimes.
- **Non-equipment (retrofit) measures** affecting end-use consumption without replacing end-use equipment (e.g., insulation). Such measures do not include timing constraints from equipment turnover—except for new construction—and should be considered discretionary, given that savings can be acquired at any point over the planning horizon.

Each measure type’s relevant inputs include the following:

- **Equipment and non-equipment measures:**
  - Energy savings: average annual savings attributable to installing the measure, in absolute and/or percentage terms
  - Equipment cost: full or incremental, depending on the nature of the measure and the application
  - Labor cost: the expense of installing the measure, accounting for differences in labor rates by region and other variables
  - Technical feasibility: the percentage of buildings where customers can install this measure, accounting for physical constraints
  - Measure life: the expected life of the measure equipment
- **Non-equipment measures only:**
  - Percentage incomplete: the percentage of buildings where customers have not installed the measure, but where its installation is technically feasible. This equals 1.0 minus the measure’s current saturation
  - Measure competition: for mutually exclusive measures, accounting for the percentage of each measure likely installed to avoid double-counting savings



- Measure interaction: accounting for end-use interactions (e.g., a decrease in lighting power density causing heating loads to increase)

Cadmus derived these inputs from various sources, though primarily through the following:

- Northwest Energy Efficiency Alliance (NEEA) Commercial Building Stock Assessment (CBSA) IV, including Puget Sound Energy's oversample, where applicable<sup>22</sup>
- NEEA Residential Building Stock Assessment (RBSA) II with City Light's oversample
- The Northwest Power and Conservation Council's draft 2021 Power Plan conservation supply curve workbooks
- The Regional Technical Forum (RTF) unit energy savings (UES) measure workbooks

For many equipment and non-equipment inputs, Cadmus reviewed a variety of sources. To determine which source to use for this study, Cadmus developed the following hierarchy for costs and savings (and shown in Table 6.1):

1. The Council's draft 2021 Power Plan conservation supply curve workbooks, except in cases where a more recent version of RTF UES measure workbooks were submitted and not used in the Council's draft 2021 Power Plan
2. RTF UES measure workbooks
3. Secondary sources, such as American Council for an Energy-Efficient Economy work papers, Simple Energy and Enthalpy Model building simulations, or various technical reference manuals

Cadmus also developed a hierarchy to determine the source for various applicability factors, such as the technical feasibility and the percentage incomplete. This hierarchy differed slightly for residential and commercial measure lists.

### **RBSA Methodology**

For residential estimates, Cadmus relied on City Light's oversample in NEEA's 2016 RBSA. If City Light's subset did not have a sufficient sample to achieve 90 percent confidence with a  $\pm 10$  percent precision for a given estimate, estimates were derived from the sample of Puget Sound-area customers (e.g., City Light, Puget Sound Energy, Snohomish County Public Utility District, Tacoma Power) or for the broader Northwest, as found in the RBSA. If Cadmus could not calculate applicability factors from NEEA's RBSA, the study used applicability factors from the Council's draft 2021 Power Plan conservation supply curve workbooks. The resulting estimates reflected averages for the Northwest region and were not necessarily specific to City Light's service territory.

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<sup>22</sup> City Light did not have an oversample conducted as part of CBSA IV. To better represent the Seattle area (compared to regional values), Cadmus incorporated Puget Sound Energy's CBSA oversample data.



## **CBSA Methodology**

For the commercial sector, Cadmus first used the subset of City Light’s customers, including Puget Sound Energy’s oversample, in NEEA’s 2019 CBSA IV.

The original CBSA IV weights were constructed to represent the Council’s regional building counts. To represent City Light’s building counts, Cadmus reanalyzed the CBSA weights based on City Light’s totals of building square footage for specific building type buckets. Cadmus included only the CBSA data and the Puget Sound Energy’s oversample in the Council’s defined climate heating zone 1. While reviewing whether to include urban sites only in these analyses, Cadmus found that, for the heating zone 1 subset, 92 percent of the buildings were urban and 95 percent of building square footage was urban. Due to the limited impact of rural for all sites in the heating zone 1 subset, Cadmus did not make any further adjustments in the overall analysis.

Once Cadmus finalized City Light’s CBSA weights to match City Light’s total building square footage by building type bucket, these weights were used for all CBSA analysis in this study. Where respondent counts were sufficient for specific CBSA analyses, Cadmus used building type names as defined by the Council to produce more granular results.

If NEEA’s CBSA did not have sufficient data to estimate a particular value (for example, applicability factors) for a given measure, Cadmus relied on factors from the Council’s draft 2021 Power Plan conservation supply curve workbooks.

## **Measure Data Sources**

By data input, Table 6.1 lists the primary sources referenced in the study.



**Table 6.1. Key Measure Data Sources**

<b>Data</b>	<b>Residential Source</b>	<b>Commercial Source</b>	<b>Industrial Source</b>
Energy Savings	Draft 2021 Power Plan supply curve workbooks; RTF; Cadmus research	Draft 2021 Power Plan supply curve workbooks; RTF; Cadmus research	Draft 2021 Power Plan supply curve workbooks; RTF; Cadmus research
Equipment and Labor Costs	Draft 2021 Power Plan supply curve workbooks; RTF; Cadmus research	Draft 2021 Power Plan supply curve workbooks; RTF; Cadmus research	Draft 2021 Power Plan supply curve workbooks; RTF; Cadmus research
Measure Life	Draft 2021 Power Plan supply curve workbooks; RTF; Cadmus research	Draft 2021 Power Plan supply curve workbooks; RTF; Cadmus research	Draft 2021 Power Plan supply curve workbooks; RTF; Cadmus research
Technical Feasibility	NEEA RBSA; Cadmus research	NEEA CBSA; Cadmus research	Cadmus research; Industrial Council data
Percentage Incomplete	NEEA RBSA; City Lights program accomplishments; Cadmus research	NEEA CBSA; City Lights program accomplishments; Cadmus research	Cadmus research; Industrial Council data
Measure Interaction	Draft 2021 Power Plan supply curve workbooks; RTF; Cadmus research	Draft 2021 Power Plan supply curve workbooks; RTF; Cadmus research	Cadmus research

### 6.2.1. Incorporating Federal Standards, State and Local Codes and Policies

Cadmus' assessment accounted for changes in codes, standards, and policies over the planning horizon. These changes not only affected customers' energy-consumption patterns and behaviors, they also determined which energy efficiency measures would continue to produce savings over minimum requirements. Cadmus captured current efficiency requirements, including those enacted but not yet in effect.

Cadmus reviewed all local codes, state codes, federal standards, and local and state policy initiatives that could impact this potential study. For the residential and commercial sectors, the potential study considered the local energy code (2018 Seattle Energy Code, 2018 Washington State Energy Code, and 2018 Revised Code of Washington) as well as current and pending federal standards. Cadmus also assessed if, how, and when Washington state and Seattle City legislation impact the potential study. This legislation included the Seattle's Energy Benchmarking Program (SMC 22.920), Clean Buildings' bill (E3SHB 1257), and the Clean Energy Transformation Act (194-40-330).



Cadmus reviewed the following codes, standards, and policy initiatives:

**Federal standards.** All technology standards for heating and cooling equipment, lighting, water heating, motors, and other appliances not covered in or superseded by state and local codes.<sup>23</sup>

**2018 Seattle Energy Code.** The code prohibits new commercial and multifamily buildings from using electric resistance or fossil fuels for space heating effective June 1, 2021, and electric resistance or fossil fuels for water heating effective January 1, 2022. All other code provisions take effect March 15, 2021.<sup>24</sup>

**2018 Washington State Energy Code.** The code provides requirements for residential and commercial new construction buildings, except in cases where the 2018 Seattle Energy Code supersedes Washington code. The effective date is February 1, 2021.<sup>25</sup>

**Seattle's Energy Benchmarking Program (SMC 22.920).** This program requires owners of commercial and multifamily buildings (20,000 square feet or larger) to track energy performance and annually report to the City of Seattle. Though in effect since 2016, full enforcement of the program began on January 1, 2021.<sup>26</sup>

**2018 Revised Code of Washington (RCW 19.260.040).** These codes set minimum efficiency standards to specific types of products including computers, monitors, showerheads, faucets, residential ventilation fans, general service lamps, air compressors, uninterruptible power supplies, water coolers, portable air conditioners, high color rendering index (CRI) fluorescent lamps, commercial dishwashers, steam cookers, hot food holding cabinets, and fryers. The effective dates vary by product with the 2018 RCW signed on July 28, 2019.<sup>27</sup>

**Clean Buildings Bill (E3SHB 1257).** The law requires the Washington State Department of Commerce to develop and implement an energy performance standard for the state's existing buildings, especially large

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<sup>23</sup> Office of Energy Efficiency & Renewable Energy. "Standards and Test Procedures." Accessed June 2021. <https://www.energy.gov/eere/buildings/standards-and-test-procedures>

<sup>24</sup> City of Seattle, Office of the City Clerk. February 1, 2021. "Council Bill No: CB 119993. An ordinance relating to Seattle's construction codes."  
<http://seattle.legistar.com/LegislationDetail.aspx?ID=4763161&GUID=A4B94487-56DE-4EBD-9BBA-C332F6E0EE5D>

<sup>25</sup> Washington State Building Code Council. Accessed June 2021. <https://sbcc.wa.gov/>

<sup>26</sup> City of Seattle, Office of Sustainability and Environment. "Energy Benchmarking." Accessed June 2021. [https://www.seattle.gov/environment/climate-change/buildings-and-energy/energy-benchmarking#:~:text=Seattle's%20Energy%20Benchmarking%20Program%20\(SMC,to%20the%20City%20of%20Seattle.&text=Compare%20your%20building's%20energy%20performance,started%20saving%20energy%20and%20money](https://www.seattle.gov/environment/climate-change/buildings-and-energy/energy-benchmarking#:~:text=Seattle's%20Energy%20Benchmarking%20Program%20(SMC,to%20the%20City%20of%20Seattle.&text=Compare%20your%20building's%20energy%20performance,started%20saving%20energy%20and%20money).

<sup>27</sup> Washington State Legislature. Revised Code of Washington. December 7, 2020. "RCW 19.260.050 Limit on sale or installation of products required to meet or exceed standards in RCW 19.260.040."  
<https://app.leg.wa.gov/rcw/default.aspx?cite=19.260.050>



commercial buildings (based on building square feet) and provide incentives to encourage efficiency improvements. Effective date is July 28, 2019, with the building compliance schedule set to begin on June 1, 2026. Early adopter incentive applications begin in July of 2021.<sup>28</sup>

**Clean Energy Transformation Act (CETA) (194-40-330).** This act applies to all electric utilities serving retail customers in Washington and sets specific milestones to reach the required 100 percent clean electricity supply. The first milestone is in 2022, when each utility must prepare and publish a clean energy implementation plan with its own targets for energy efficiency and renewable energy.<sup>29</sup>

#### 6.2.1.1 Applying Federal Standards

Cadmus explicitly accounted for several other pending federal codes and standards. For the residential sector, these included appliance, HVAC, and water-heating standards. For the commercial sector, these included appliance, HVAC, lighting, motor, and water-heating standards. Figure 6.1 provides a comprehensive list of equipment standards considered in the study. Bars indicate the year in which a new equipment standard will be enacted. Some products will be subject to multiple standards over the planning horizon. However, Cadmus did not attempt to predict how energy standards might change in the future.

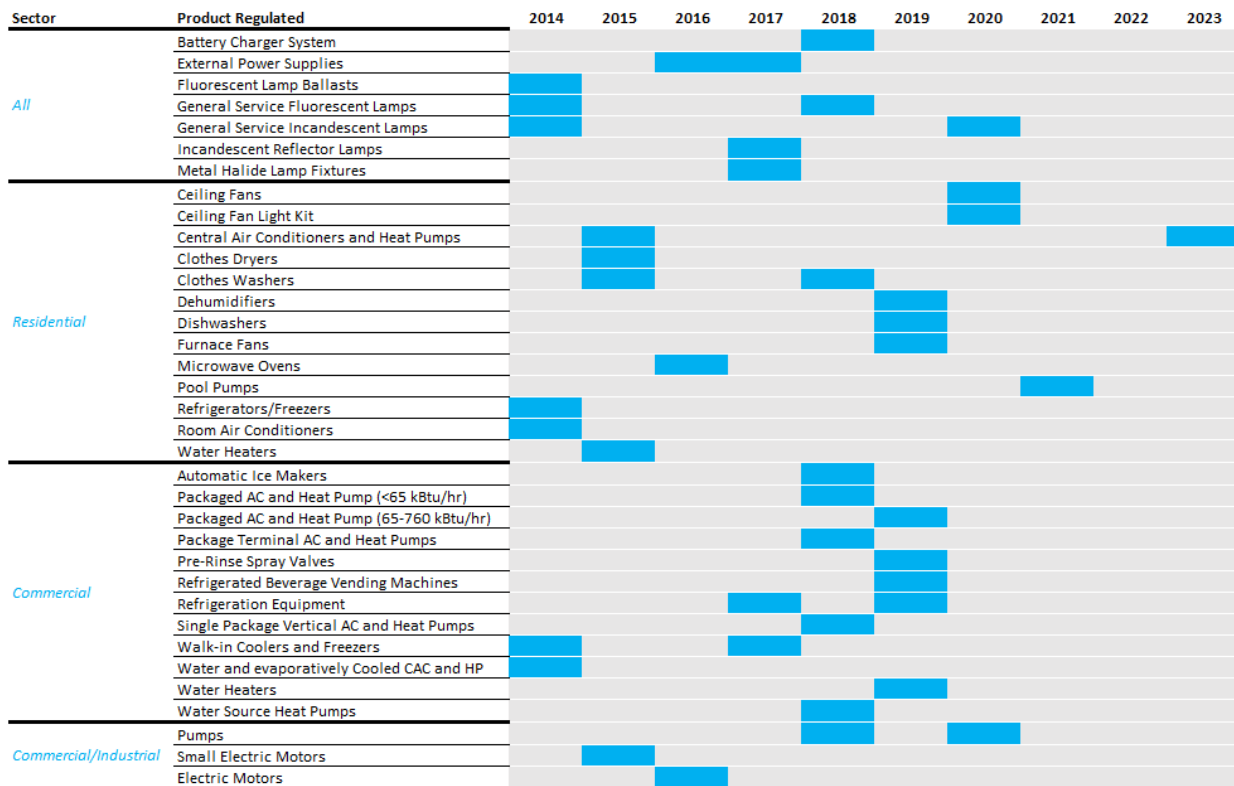
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<sup>28</sup> Washington State Department of Commerce. "Clean Buildings." Accessed June 2021. <https://www.commerce.wa.gov/growing-the-economy/energy/buildings/>

<sup>29</sup> Washington State Department of Commerce. "Clean Energy Transformation Act (CETA)." Accessed June 2021. <https://www.commerce.wa.gov/growing-the-economy/energy/ceta/>



**Figure 6.1. Equipment Standards Considered**



### 6.2.1.2 Treatment of State and Local Codes and Initiatives

Cadmus identified each type of code (local or state) and/or initiative (local and state) that would impact the measures in the CPA. Cadmus sorted each impact into four main categories.

- Measure applicability or savings adjustment.** Cadmus adjusted measure characterization inputs to account for local and state energy codes (2018 Washington State Energy Code and 2018 Revised Code of Washington). Where appropriate, Cadmus revised measure applicability, savings, and/or costs to reflect the impact of the code. For example, measures were removed entirely or over time (applicability set to zero) if code baselines were more efficient than the baseline data found in the RTF or Council workbooks (such as showerheads, fryers, steam cookers, and new construction homes).
- Equipment saturation adjustment.** Cadmus adjusted equipment saturations by year to account for the 2018 Seattle Energy Code. In addition, Cadmus adjusted new construction commercial and large multifamily buildings space heating equipment saturations to align with this code (such as ductless heat pump and air source heat pumps). These adjustments were also accounted for in the baseline forecast, as described in the *City Light Forecast Adjustments* section.
- Adoption ramp rate adjustment.** Cadmus accounted for initiatives and legislation that promote energy efficiency through customer incentives or penalties (Seattle's Energy Benchmarking Program and Clean Buildings bill). This also includes CETA in setting state-wide goals that require



City Light to set performance targets. These initiatives do not mandate an energy code or baseline for specific measures, rather they inherently speed up the rate of the adoption of energy efficiency through energy reduction requirements. City Light can also claim energy impacts through these initiatives; therefore, removing measures or adjusting baselines may not be appropriate within the context of the CPA. Cadmus reviewed and adjusted the prescribed ramp rates in the Council's draft 2021 Power Plan, where necessary, to address groups of measures that will be impacted. Changing the ramp rates (in most cases) will not impact the cumulative potential; rather it changes the timing of when the potential occurs. Cadmus adjusted ramp rates to measures currently in City Light's programs by increasing the allocated Council ramp rates up to the next tier (e.g., slow speed ramp moved to medium speed ramp).

- **No adjustment (already accounted for in the existing data).** Measures impacted by federal standards and in some cases by 2018 Revised Code of Washington, the Council's draft 2021 Power Plan workbooks, and Cadmus' equipment characterization are already accounted for as part of the initial development of the measure data.

### 6.2.1.3 Additional Codes and Standards Considerations

Cadmus identified two considerations that impact the characterization of this potential study. Starting with residential lighting, Cadmus reviewed the codes and standards as well as assessed the current situation related to LED lighting.

The Council's draft 2021 Power Plan and RTF residential lighting workbooks account for the Washington state code requirement (HB 1444) of the EISA backstop provision. Originally adopted from the federal standard, the EISA backstop provision requires higher-efficiency technologies (i.e., 45 lumens per watt or better). There are still pending legal challenges and, with the change in presidential administrations, uncertainty remains regarding if and how this standard will be reintroduced. For example, the Biden-Harris Administration, through the Department of Energy, has introduced a semiannual Unified Agenda of Federal Regulatory and Deregulatory Actions that includes possible amendments to EISA. Washington state did, however, adopt the EISA backstop provision. The savings in the draft 2021 Power Plan and RTF workbooks state a 45 lumens per watt baseline (for Washington only).

As a result, Cadmus developed a special case for residential lighting. After reviewing the Council and RTF workbooks, Cadmus concluded that the 45 lumens per watt baseline should be changed to an LED baseline for the CPA. Currently, there are no lighting technologies on the market that meet the 45 lumens per watt requirement other than CFLs or LEDs. Furthermore, major manufacturers have phased out production of CFLs. The market is rapidly adopting LEDs (according to the RBSA saturations and Council and RTF projections) and becoming the de facto baseline. Considering that LEDs are the only viable technology that meets Washington code, Cadmus used LEDs as the baseline for all standard-income applications but assessed potential for low-income homes. This adjustment to the lighting loads is effectively accounted for in City Light's baseline forecast and the CPA. The lighting impact by end-use can be found in Table 3.3 and Table 4.6, above.

Secondly, the 2018 Washington state energy code includes both residential and commercial new construction prescriptive and performance path requirement options. The CPA characterizes efficiency



improvements on a measure basis that aligns with the prescriptive path. The performance path includes the HVAC total system performance ratio (HVAC TSPR) requirement. HVAC TSPR is defined as the ratio of the sum of a building's annual heating and cooling load compared to the sum of the annual carbon emissions from the energy consumption of the building's HVAC systems. The variability in the HVAC TSPR from building to building cannot be easily captured in the CPA. For this study, Cadmus followed the prescriptive requirements in the 2018 Washington state energy code.

### 6.2.2. Adapting Measures from the RTF and Draft 2021 Power Plan

To ensure consistency with methodologies employed by the Council and to fulfill requirements of WAC 194-37-070, Cadmus relied on ECM workbooks developed by the RTF and the Council to estimate measure savings, costs, and interactions. In adapting these ECMs for this study, Cadmus adhered to the following principles:

- **Deemed ECM savings in RTF or Council workbooks must be preserved:** City Light relies on deemed savings estimates provided by the Bonneville Power Administration (BPA) that largely remain consistent with savings in RTF workbooks in demonstrating compliance with I-937 targets. Therefore, Cadmus sought to preserve these deemed savings in the potential study to avoid possible inconsistencies among estimates of potential, targets, and reported savings.
- **Use inputs specific to City Light's service territory:** Some Council and RTF workbooks relied on regional estimates of saturations, equipment characteristics, and building characteristics derived from the RBSA and CBSA. Cadmus updated regional inputs with estimates, calculated either from City Light's oversample of CBSA and RBSA or from estimates affecting the broader Puget Sound area. This approach preserved consistency with Council methodologies while incorporating Seattle-specific data.

Cadmus' approach for adapting Council's and RTF's workbooks varied by sector, as described in the following sections.

#### 6.2.2.1 Residential and Commercial

Cadmus reviewed each residential Council workbook and extracted savings, costs, and measure lives for inclusion in this study. Applicability factors (such as the current saturation of an ECM) largely derived from City Light's oversample of RBSA, adjusted for City Light's program accomplishments. If Cadmus could not develop a City Light-specific applicability factor from the RBSA, it used the Council's regional value.

In addition to extracting key measure characteristics, Cadmus identified each measure as an equipment replacement measure or a retrofit measure. Key distinctions between these two types of measures included the following:

- Savings for equipment replacement measures were calculated as the difference between measure consumption and baseline consumption. For instance, for the heat pump water heater measure, Cadmus estimated the baseline consumption of an average market water heater and used the Council's deemed savings to calculate the consumption for a heat pump water heater. This approach preserved the deemed savings in Council workbooks.



- Savings for retrofit measures were calculated in percentage terms relative to the baseline end-use consumption but reflected the Council's and RTF's deemed values. For instance, if the Council's deemed savings were 1,000 kilowatt-hour (kWh) per home for a given retrofit measure and Cadmus estimated the baseline consumption for the end use to which this measure was applicable as 10,000 kWh, relative savings for the measure were ten percent. Cadmus did not apply relative savings from the Council's workbooks to baseline end-use consumption because doing so would lead to per-unit estimates that differed from Council and RTF values.

Cadmus also accounted for interactive effects presented in Council and RTF workbooks. For instance, the Council estimated water heating, heating, and cooling savings for residential heat pump water heaters—with the heating and cooling savings as the interactive savings. Because installation of a heat pump water heater represents a single installation, Cadmus employed a stock accounting model, which combined interactive and primary end-use effects into one savings estimate. Though Cadmus recognizes this approach could lead to overstating or understating savings in an end use, in aggregate—across end-uses—savings matched the Council's deemed values.

Cadmus generally followed the same approach with the commercial sector; however, because of the mixture of lighting measures considered in the Council's draft 2021 Power Plan, Cadmus chose to model all commercial lighting measures as retrofits and none as equipment replacements. Savings and costs for these measures reflected this decision.

#### **6.2.2.2 Industrial**

Cadmus adapted measures from the Council's *Industrial\_Tool\_2021P\_v08* and *IND\_AllMeasures\_2021P\_V8* workbooks for inclusion in this study for the following key industrial measure inputs:

- Measure savings (expressed as end-use percentage savings)
- Measure costs (expressed in dollar per kWh saved)
- Measure lifetimes (expressed in years)
- Measure applicability (percentage)

Cadmus mapped each Council industry type to industries found in City Light's service territory. These included foundries, miscellaneous manufacturing, stone and glass, transportation equipment manufacturing, other food, frozen food, water, and wastewater. Cadmus identified applicable end-uses using the Council's assumed distribution of end-use consumption in each industry. Table 6.2 shows the distribution of end-use consumption and the list of industries considered in this study.



**Table 6.2. Distribution of End Use Consumption by Segment**

<b>Cadmus Segment</b>	<b>Process Air Compressor</b>	<b>Lighting</b>	<b>Fans</b>	<b>Pumps</b>	<b>Motors Other</b>	<b>Process Other</b>	<b>Process Heat</b>	<b>HVAC</b>	<b>Other</b>	<b>Process Electro-Chemical</b>	<b>Process Refrigeration</b>
Foundries	7%	9%	10%	18%	15%	0%	21%	9%	5%	6%	0%
Frozen Food	4%	8%	4%	4%	12%	0%	4%	7%	1%	3%	53%
Misc. Manufacturing	7%	11%	7%	10%	16%	0%	11%	17%	9%	6%	6%
Other Food	12%	4%	2%	8%	11%	0%	0%	9%	8%	2%	44%
Transportation Equip	6%	20%	6%	8%	11%	0%	0%	28%	7%	14%	0%
Wastewater	0%	5%	30%	44%	15%	0%	0%	0%	6%	0%	0%
Water	12%	4%	0%	71%	0%	0%	0%	7%	6%	0%	0%
Stone and Glass	8%	5%	7%	13%	20%	2%	25%	6%	3%	2%	7%

To incorporate broader secondary data, Cadmus aggregated some Council end-uses into broader end-uses. Table 6.3 shows the mapping of Council end-uses to Cadmus end-uses.



**Table 6.3. Council and Cadmus End-Uses**

<b>Council End-Use</b>	<b>Cadmus End-Use</b>
Pumps	Pumps
Fans and Blowers	Fans
Compressed Air	Process Air Compressor
Material Handling	Process Electro Chemical
Material Processing	Motors Other
Low Temp Refer	Process Refrigeration
Pollution Control	Other
Other Motors	Motors Other
Drying and Curing	Process Heat
Heat Treating	Process Heat
Heating	Process Heat
Melting and Casting	Process Heat
HVAC	HVAC
Lighting	Lighting
Other	Other

### 6.3. Estimating Conservation Potential

As discussed, Cadmus estimated two types of conservation potential, and City Light determined a third potential—achievable economic—through the IRP’s optimization modeling, as shown in Figure 6.2.



**Figure 6.2. Types of Conservation Potential**



- **Technical potential** assumes that all technically feasible resource opportunities may be captured, regardless of their costs or other market barriers. It represents the total energy efficiency potential in City Light’s service territory, after accounting for purely technical constraints.
- **Achievable technical potential** is the portion of technical potential assumed to be achievable during the study’s forecast, regardless of the acquisition mechanism. For example, savings may be acquired through utility programs, improved codes and standards, and market transformation.
- **Achievable economic potential** is the portion of achievable technical portion determined to be cost-effective by the IRP’s optimization modeling, in which either bundles or individual energy efficiency measures are selected based on cost and savings. The cumulative potential for these selected bundles constitutes achievable economic potential.

The following sections describe Cadmus’ approach to estimating each type of potential.

### 6.3.1. Technical Potential

Technical potential includes all technically feasible ECMs, regardless of costs or market barriers. Technical potential divides into two classes: discretionary (retrofit) and lost opportunity (new construction and replacement of equipment on burnout).

Another important aspect in assessing technical potential is, wherever possible, to assume installations of the highest-efficiency equipment that are commercially available. For example, this study examined CFL and LED general-service lighting in residential applications. In assessing technical potential, Cadmus assumed that, as equipment fails or new homes are built, customers will install LED lighting wherever technically feasible, regardless of cost. Where applicable, CFLs would be assumed as installed in sockets ineligible for LEDs. This study treated competing non-equipment measures in the same way, assuming installation of the highest-saving measures where technically feasible.



In estimating technical potential, it is inappropriate to merely sum up savings from individual measure installations. Significant interactive effects can result from installations of complementary measures. For example, upgrading a heat pump in a home where insulation measures have already been installed can produce fewer savings than upgrades in an uninsulated home. Analysis of technical potential accounts for two types of interactions:

- **Interactions between equipment and non-equipment measures:** As equipment burns out, technical potential assumes it will be replaced with higher-efficiency equipment, reducing average consumption across all customers. Reduced consumption causes non-equipment measures to save less than they would if the equipment had remained at a constant average efficiency. Similarly, savings realized by replacing equipment decrease upon installation of non-equipment measures.
- **Interactions between non-equipment measures:** Two non-equipment measures applying to the same end use may not affect each other's savings. For example, installing a low-flow shower head does not affect savings realized from installing a faucet aerator. Insulating hot water pipes, however, causes water heaters to operate more efficiently, thus reducing savings from either measure. This study accounted for such interactions by stacking interactive measures, iteratively reducing baseline consumption as measures were installed, thus lowering savings from subsequent measures.

Although, theoretically, all retrofit opportunities in existing construction—often called discretionary resources—could be acquired in the study's first year, this would skew the potential for equipment measures and provide an inaccurate picture of measure-level potential. Therefore, the study assumed these opportunities would be realized in equal, annual amounts, over the 20-year planning horizon. By applying this assumption, natural equipment turnover rates, and other adjustments described above, annual incremental and cumulative potential could be estimated by sector, segment, construction vintage, end use, and measure.

This study's technical potential estimates drew upon best-practice research methods and standard utility industry analytic techniques. Such techniques remained consistent with the conceptual approaches and methodologies used by other planning entities (such as the Council in developing regional energy-efficiency potential) and remained consistent with methods used in City Light's previous CPAs.

### 6.3.2. Achievable Technical Potential

The achievable technical potential summarized in this report is a subset of the technical potential that accounts for market barriers. To subset the technical potential, Cadmus follows the approach of the Council and employs two factors:

- **Maximum achievability factors** represent the maximum proportion of technical potential that can be acquired over the study horizon.
- **Ramp rates** are annual percentages values representing the proportion of cumulative 20-year technical potential that can be acquired in a given year (discretionary measures) or the



proportion of technical annual potential that can be acquired in a given year (lost opportunity measures).

Achievable technical potential is the product of technical potential and both the maximum achievability factor and the ramp rate percentage. Cadmus assigned maximum achievability factors to measures based on the Council's draft 2021 Power Plan supply curves. Ramp rates are measure-specific and were based on the ramp rates developed for the Council's draft 2021 Power Plan supply curves but were accelerated based on the program accomplishments of City Light. The following sections provide additional detail about ramp rates.

### **6.3.2.1 About Measure Ramp Rates**

The study applied measure ramp rates to lost opportunity and discretionary resources, although interpretation and application of these rates differed for each class, as described below. Measure ramp rates were based on the Council's draft 2021 Power Plan. As described above in *Treatment of State and Local Codes and Initiatives* section, Cadmus accounted for initiatives and legislation that promote energy efficiency through customer incentives or penalties (Seattle's Energy Benchmarking Program and Clean Buildings bill) by accelerating ramp rates for measures that are offered by City Light programs. These initiatives and legislation (including CETA) are viewed as mechanisms to speed up the rate of the adoption for energy efficiency.

For measures not specified in the draft 2021 Power Plan, the study assigned a ramp rate considered appropriate for that technology—i.e., the same ramp rate as a similar measure in draft 2021 Power Plan or Seventh Power Plan.

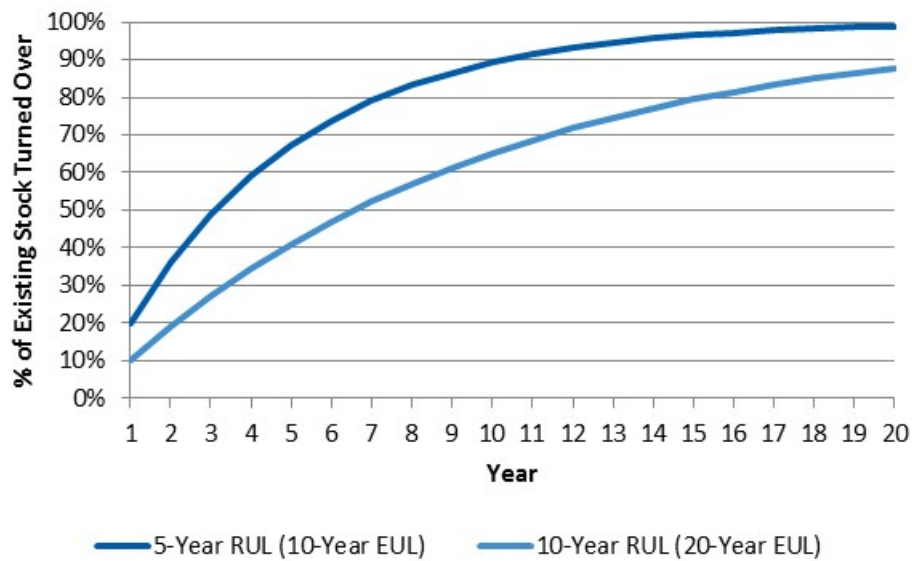
### **Lost Opportunity Resources**

Quantifying achievable technical potential for lost opportunity resources in each year required determining amounts technically available through new construction and natural equipment turnover. New construction rates drew directly from City Light's customer forecast. The study developed equipment turnover rates by dividing units into each year by the measure life. For example, if 100 units initially had a 10-year life, one-tenth of units (10) would be replaced. The following year, 90 units would remain, and one-tenth of these (9) would be replaced and so on over the study's course.

As the mix of existing equipment stock ages, the remaining useful life (RUL) would equal—on average—one-half of the effective useful life (EUL). The fraction of equipment turning over each year would be a function of this RUL; thus, technical potential for lost opportunity measures would have an annual shape before applying ramp rates, as shown in Figure 6.3. The same concept applied to new construction, where resource acquisition opportunities became available only during home or building construction. In addition to showing an annual shape, Figure 6.3 demonstrates that amounts of equipment turning over during the study period were a function of the RUL: the shorter the RUL, the higher the percentage of equipment assumed to turn over.



**Figure 6.3. Existing Equipment Turnover for Varying Remaining Useful Life (RUL)**

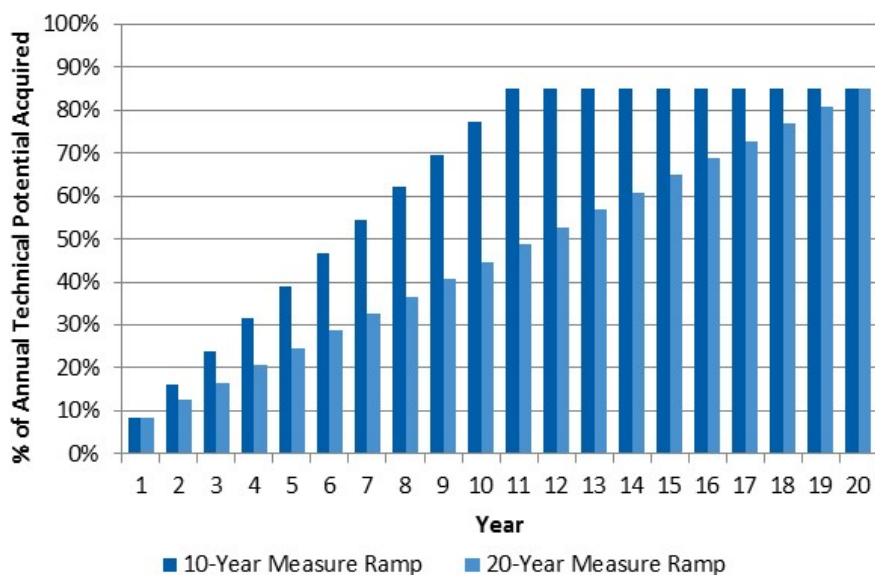


In addition to natural timing constraints of equipment turnover and new construction rates, Cadmus applied measure ramp rates to reflect other resource acquisition limitations (such as market availability over the study's horizon). These measure ramp rates had a maximum ranging from 60 percent to 100 percent, reflecting the Council's measure-specific assumptions about the percentage of technical potential could be achieved over a 20-year planning horizon.

Figure 6.4 shows a measure with a maximum achievable percentage of 85 percent that ramps up over ten years. This measure would reach full market maturity—85 percent of annual technical potential—by the end of that period, while another measure might take 20 years to reach full maturity. Measures that were ramped over 20 years in this CPA included some newer technologies, such as heat pump dryers, whereas measures that were ramped over a shorter time period included more mature and accepted technologies, such as various LED lighting technologies.



**Figure 6.4. Examples of Lost Opportunity Ramp Rates**



To calculate annual achievable technical potential for each lost opportunity measure, Cadmus multiplied technical resource availability and measure ramping effects together, consistent with the Council’s methodology. In the early years of the study horizon, a gap occurs between assumed acquisition and the maximum achievability. These lost resources can be considered unavailable until the measure’s EUL elapses. Therefore, depending on EUL and measure ramp rate assumptions, some potential may be pushed beyond the twentieth year, and the total lost opportunity, achievable economic potential may be less than the maximum achievable percentage of the technical potential.

Figure 6.5 shows a case for a measure with a five-year RUL/10-year EUL. The spike in achievable technical potential, starting in Year 11—after the measure’s EUL—results from acquisition of opportunities missed at the beginning of the study period.



**Figure 6.5. Example of Combined Effects of Resource Availability and Measure Ramping Based on 10-Year EUL**

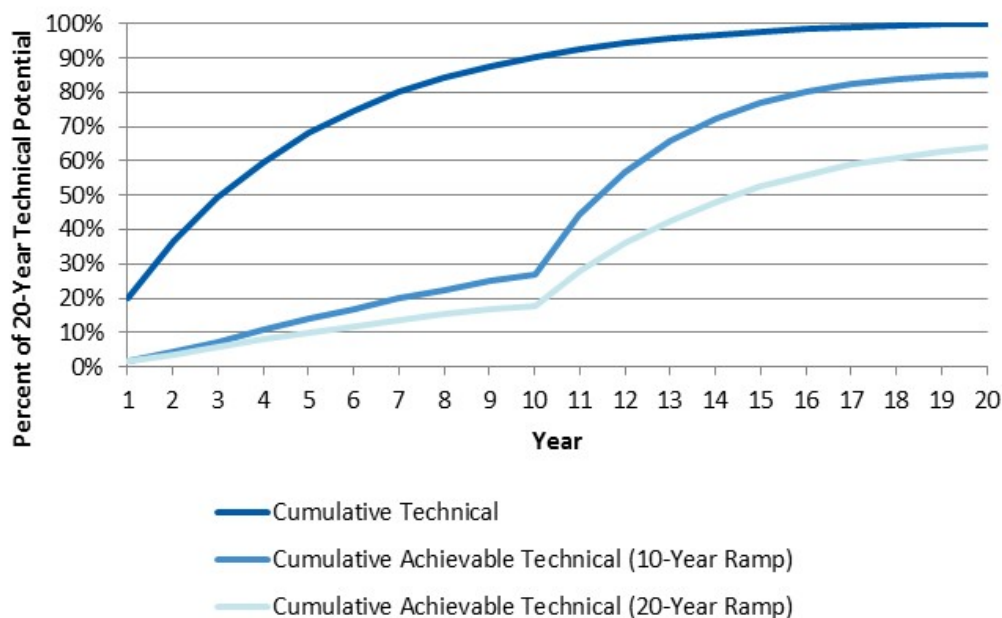


Table 6.4 illustrates this method, based on the same five-year RUL/10-year EUL measures on a 10-year ramp rate (the light blue line in Figure 6.5), assuming 1,000 inefficient units would be in place by Year 1. In the first ten years, lost opportunities would accumulate as the measure ramp-up rate caps the availability of high-efficiency equipment. Starting in the eleventh year, the opportunities lost during the previous ten years become available again. Table 6.4 also shows that this EUL and measure ramp rate combination results in 85 percent of technical potential achieved by the close of the study period.

As described, amounts of achievable potential are a function of the EUL and measure ramp rate. The same 10-year EUL measure, on a slower 20-year ramp rate, would achieve less of its 20-year technical potential—also shown in Table 6.4. Across all lost opportunity measures in this study, approximately 77 percent of technical potential appears achievable over the 20-year study period.



**Table 6.4. Example of Lost Opportunity Treatment: 10-Year EUL Measure on a 10-Year Ramp**

Year	Incremental Stock Equipment Turnover (Units)	Cumulative Stock Equipment Turnover (Units)	Measure Ramp Rate	Installed High- Efficiency Units	Missed Opportunities for Acquisition in Later Years (Units)	Missed Opportunities Acquired (Units)	Cumulative Units Installed	Cumulative Percent of Technical Achieved
1	200	200	9%	17	180	0	17	9%
2	160	360	16%	26	130	0	43	12%
3	128	488	24%	30	92	0	73	15%
4	102	590	31%	32	65	0	106	18%
5	82	672	39%	32	44	0	138	20%
6	66	738	47%	31	29	0	168	23%
7	52	790	54%	29	19	0	197	25%
8	42	832	62%	26	11	0	223	27%
9	34	866	70%	23	6	0	246	28%
10	27	893	77%	21	2	0	267	30%
11	21	914	85%	18	0	153	438	48%
12	17	931	85%	15	0	110	563	60%
13	14	945	85%	12	0	78	653	69%
14	11	956	85%	9	0	55	717	75%
15	9	965	85%	7	0	38	762	79%
16	7	972	85%	6	0	25	793	82%
17	6	977	85%	5	0	16	814	83%
18	5	982	85%	4	0	10	828	84%
19	4	986	85%	3	0	5	836	85%
20	3	988	85%	2	0	2	840	85%

### Discretionary Resources

Discretionary resources differ from lost opportunity resources due to their acquisition availability at any point within the study horizon. From a theoretical perspective, this suggests that all achievable technical potential for discretionary resources could be acquired in the study's first year. From a practical



perspective, however, this outcome is realistically impossible due to infrastructure and budgetary constraints and customer considerations.

Furthermore, due to interactive effects between discretionary and lost opportunity resources, immediate acquisition distorts the potential for lost opportunity resources. For example, if one assumes that all homes would be weatherized in the program's first year, potentially available high-efficiency HVAC equipment would decrease significantly (i.e., a high-efficiency heat pump would save less energy in a fully weatherized home).

Consequently, the study addressed discretionary resources in two steps:

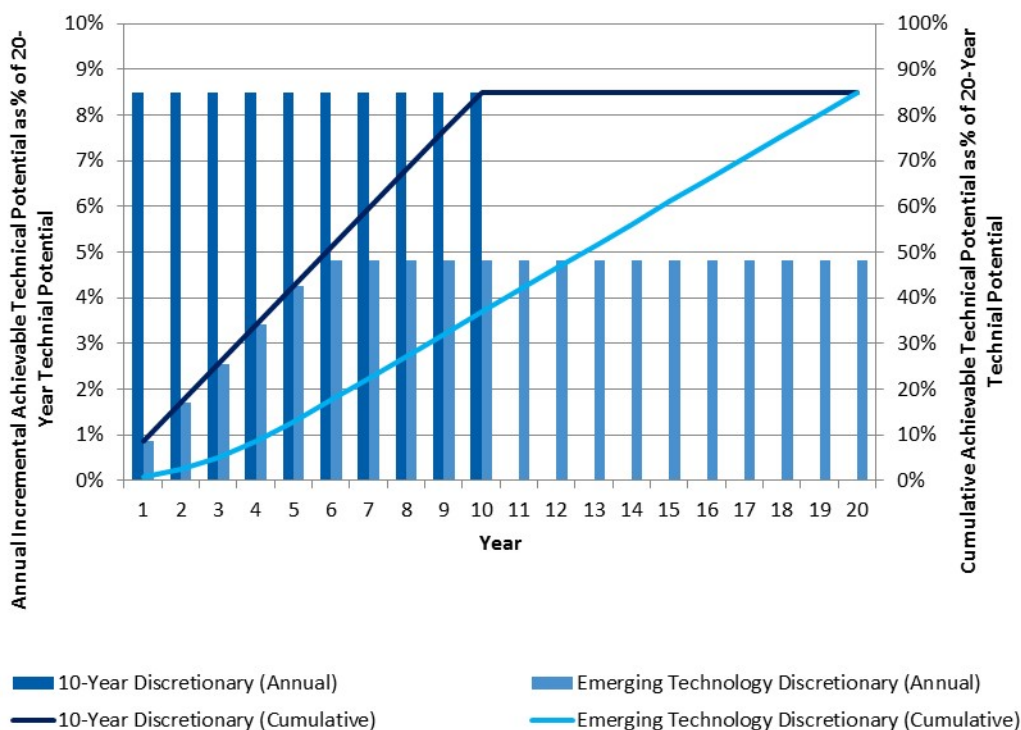
1. Developing a 20-year estimate of discretionary resource technical potential, assuming technically feasible measure installations would occur equally (at 5 percent of the total available) for each year of the study, avoiding the distortion of interactions between discretionary and lost opportunity resources previously described.
2. Overlaying a measure ramp rate to specify the timing of achievable discretionary resource potential, thus transforming a 20-year cumulative technical value into annual, incremental, achievable technical values.

The discretionary measure ramp rates specify only the timing of resource acquisition and do not affect the portion of the 20-year technical potential achievable over the study period.

Figure 6.6 shows incremental (bars) and cumulative (lines) acquisitions for two different discretionary ramp rates. A measure with an 85 percent maximum achievability on the 10-year discretionary ramp rate reaches full maturity in ten years, with market penetration increasing in equal increments each year. A measure with an 85 percent maximum achievability on the emerging technology discretionary ramp rate would take longer to reach full maturity, though also gaining 85 percent of the total technical potential. Ultimately, it would arrive at the same cumulative savings as the measure on the ten-year ramp rate.



**Figure 6.6. Examples of Discretionary Measure Ramp Rates**



### 6.3.3. Development of Conservation IRP Inputs

Cadmus worked with City Light to determine the format of inputs into the IRP model. Cadmus compiled energy efficiency potential into the levelized costs bundles shown in Table 6.5. Cadmus spread the annual savings estimates over 8760-hour load shapes to produce hourly bundles. The number and delineating values of the electric levelized cost bundles remain unchanged from the 2020 CPA.

**Table 6.5. Electric Levelized Cost Bundle**

Bundle	\$/MWh	Bundle	\$/MWh
1	(\$9,999,999) to \$10	10	\$90 to \$100
2	\$10 to \$20	11	\$100 to \$110
3	\$20 to \$30	12	\$110 to \$120
4	\$30 to \$40	13	\$120 to \$130
5	\$40 to \$50	14	\$130 to \$140
6	\$50 to \$60	15	\$140 to \$150
7	\$60 to \$70	16	\$150 to \$160
8	\$70 to \$80	17	\$160 to \$9,999,999
9	\$80 to \$90		



Cadmus derived the levelized cost for each measure using the following formula.

$$\text{LCOE} = \frac{\sum_{t=0}^n \frac{\text{Expenses}_t}{(1+i)^t}}{\sum_{t=0}^n \frac{E_t}{(1+i)^t}}$$

Where:

- LCOE = The levelized cost of conserved energy for a measure
- Expenses<sub>t</sub> = All net expenses in the year t for a measure using the costs and benefits outlined in Table 6.6
- i = The discount rate
- n = The lifetime of the analysis (20-years)
- E<sub>t</sub> = The energy conserved in year t

Cadmus grouped the achievable technical potential by levelized cost over the 20-year study horizon, allowing City Light's IRP model to select the optimal amount of energy efficiency potential, given various assumptions regarding future resource requirements and costs. The 20-year total resource levelized cost calculation incorporates numerous factors, which are consistent with the expense components shown in Table 6.6.

**Table 6.6. Levelized Cost Components**

Type	Component
Costs	Incremental Measure Equipment and Labor Cost
	Incremental Operations and Maintenance (O&M) Cost
	Administrative Adder
Benefits	Present Value of Non-Energy Benefits
	Present Value of Transmission and Distribution (T&D) Deferrals
	Secondary Energy Benefits
	10% Conservation Credit

The levelized cost calculation incorporates several factors:

- **Incremental measure cost:** This study considered costs required to sustain savings over a 20-year horizon, including reinstallation costs for measures with useful lives less than 20 years. If a measure's useful life extended beyond the end of the 20-year study, Cadmus incorporated an end



effect that treated the measure's cost over its EUL,<sup>30</sup> considered an annual reinstallation cost for the remainder of the 20-year period.<sup>31</sup>

- **Incremental operations and maintenance (O&M) costs or benefits:** As with incremental measure costs, O&M costs were considered annually over the 20-year horizon. Cadmus used the present value to adjust the levelized cost upward for measures with costs above baseline technologies and downward for measures that decreased O&M costs.
- **Administrative adder:** Cadmus assumed program administrative costs of 16 percent of incremental measure costs in the residential sector and 22 percent of incremental measure costs in the commercial and industrial sectors.
- **Non-energy benefits:** A reduction in levelized costs for measures that saved resources (such as water or detergent). For example, the value of reduced water consumption from installing a low-flow shower head would reduce that measure's levelized cost. Council and RTF workbooks provide measure level non-energy benefit assumptions.
- **10 percent conservation credit and transmission and distribution (T&D) deferrals:** Each are treated as reductions in levelized cost for electric measures. The addition of this credit, per the Northwest Power Act, was consistent with the Council methodology and effectively served as an adder to account for unquantified external benefits from conservation when compared to other resources.<sup>32</sup>
- **Secondary energy benefits:** A reduction in levelized costs for measures saving energy on secondary fuels. This treatment was necessitated by Cadmus' end-use approach to estimating technical potential. An example is R-60 ceiling insulation costs for a home with a gas furnace and an electric cooling system. For the gas furnace end use, Cadmus classified energy savings that R-60 insulation produced for electric cooling systems, conditioned on the presence of a gas furnace, as a secondary benefit that reduced the measure's levelized cost. This adjustment affected only the measure's levelized costs; the R-60's magnitude of energy savings on the gas supply curve was not affected by considering secondary energy benefits.

The approach adopted in calculating a measure's levelized cost of conserved energy aligned with that of the Council, considering the costs required to sustain savings over a 20-year study horizon (including reinstallation costs for measures with useful lives less than 20 years). If a measure's useful life extended beyond the end of the 20-year study, Cadmus incorporated an end effect, treating the measure's levelized cost over its useful life as an annual reinstallation cost for the remainder of the 20-year period.

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<sup>30</sup> This refers to levelizing over the measure's useful life, equivalent to spreading incremental measure costs in equal payments, assuming a discount rate of City Light's weighted average cost of capital.

<sup>31</sup> This method is applied to measures with a useful life of greater than 20 years and those with a useful life extending beyond the 20th year at the time of reinstallation.

<sup>32</sup> Northwest Power and Conservation Council. January 1, 2010. *Northwest Power Act*.  
<https://www.nwcouncil.org/reports/northwest-power-act>



For example, Figure 6.7 shows the timing of initial and reinstallation costs for a measure with an eight-year lifetime, in context with the 20-year study. As a measure's lifetime in this study ends after the study horizon, the final five years (Year 17 through Year 20) were treated differently, leveling measure costs over the measure's eight-year life and treating these as annual reinstallation costs.

**Figure 6.7. Illustration of Capital and Reinstallation Cost Treatment**

	Year																			
Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Initial Capital Cost	■																			
Reinstallation Cost									■								■	■	■	■

As with incremental measure costs, Cadmus considered O&M costs annually over the 20-year horizon. The present value was used to adjust the levelized cost upward for measures with costs above baseline technologies and downward for measures that decreased O&M costs.

#### 6.3.4. Achievable Economic Potential

According to WAC 194-37-070, City Light must consider conservation potential estimates using avoided costs equal to a forecast of regional market prices. Regional market price forecasts, however, do not reflect all costs for City Light to meet future resource need. Therefore, in the 2022 CPA, to assess the value of conservation and develop the economic potential, City Light used its IRP framework. The 2020 IRP Progress Report provided the foundation for the analysis to evaluate the achievable economic potential on its conservation programs.<sup>33</sup> In past conservation potential assessments, City Light used a conservation screening methodology that was based on a high-level avoided cost from the most recent IRP. This new integrated methodology evaluates conservation potential alongside power supply and other demand-side resource choices to more discretely target the conservation attributes that meet City Light's resource needs. This methodology creates a more equivalent way of looking at supply and demand-side resources.

This new framework also supports development of cost-effective targets for meeting CETA and preparation of a CEIP every four years. With the current regulatory timeline for the CPA and CEIP and with the City Light's 2022 IRP process in progress, City Light also included eight different scenarios [ see section Portfolio Optimization Modeling] to test the robustness of the conservation targets and considered feedback from its IRP Technical Advisory Group in setting the targets.

##### 6.3.4.1 City Light's IRP Portfolio Framework

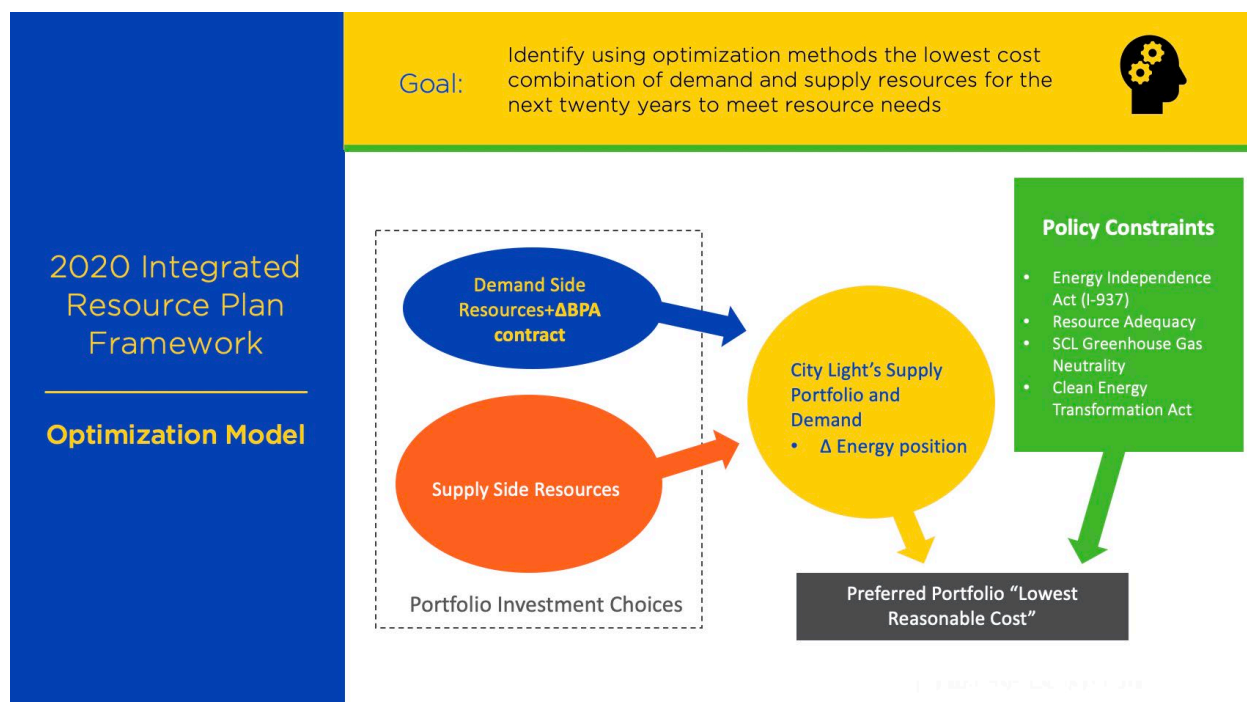
The IRP framework is a decision support system that develops an optimal resource strategy, given the current forecasts of supply-side and demand-side resource costs and future load and market conditions. By using this framework for the CPA, the benefit of the conservation path is determined by establishing an

<sup>33</sup> City Light. *2020 Integrated Resources Plan Progress Report*.  
<https://www.seattle.gov/Documents/Departments/CityLight/2020IRPProgessReport.pdf>



optimal portfolio with conservation alongside resources that minimize the net present value (NPV) of City Light's total incremental portfolio cost. For the CPA, resources of all types are set up for analysis on an equivalent basis between 2022 to 2041. The model also uses end effects to capture CETA's requirements beyond the 20-year analysis and to make every portfolio equivalent. Each portfolio meets City Light's resource needs and compliance obligations. Figure 6.8 is a high-level overview of City Light's IRP framework.

**Figure 6.8. High Level IRP Framework**



The IRP framework captures several factors in selecting a resource strategy by methodically evaluating interactions between different options and policies. These interactions include the following:

- **City Light's Monthly Energy Resource Adequacy.** Resource adequacy is having sufficient generation, energy efficiency, storage, and demand-side resources to serve loads across a wide range of conditions.
- **Washington Energy Independence Act (I-937) compliance.**<sup>34</sup> In 2006, Washington voters approved Initiative 937 (I-937), which requires that major utilities invest in all cost-effective energy efficiency measures and sets targets for adding Northwest renewable energy as a percentage of load. Eligible renewable resources include water, wind, solar energy, geothermal energy, landfill gas, wave, ocean or tidal power, gas for sewage treatment plants, bio-diesel fuel, and biomass

<sup>34</sup> Washington State Legislature. RCW 19.285. Energy Independence Act.  
<https://apps.leg.wa.gov/rcw/default.aspx?cite=19.285>



energy. In 2020, the renewable energy target increased to 15 percent of load, and this target does not increase beyond the current level. The law also includes provisions to keep costs affordable for utilities. Today, City Light can comply under the “no load growth” option.

- **Clean Energy Transformation Act (CETA) clean electricity compliance.**<sup>35</sup> Approved by the Washington Legislature in 2019, CETA provides electric utilities in Washington a clear mandate to phase out greenhouse gas emissions. CETA requires that utilities eliminate the use of coal-fired resources after December 31, 2025. Additionally, all electricity sold to customers must be greenhouse gas neutral starting January 1, 2030, and greenhouse gas free by 2045. To be greenhouse gas neutral, a utility must supply at least 80 percent of its load with a combination of renewable and non-emitting resources. Utilities may use alternative compliance options during the greenhouse gas neutral period for no more than 20 percent of load.
- **Greenhouse gases.** City Light applies the Social Cost of Greenhouse Gases when evaluating conservation programs, developing IRPs, and evaluating mid- to long-term resource options during resource acquisition.
  - **City Light’s greenhouse gas neutrality policy.** Since 2005, City Light has accounted for the greenhouse gas emissions used to serve retail load and purchased offsets for those emissions to be greenhouse gas neutral.<sup>36</sup>
  - **Clean Energy Transformation Act’s social cost of greenhouse gases requirement.** CETA establishes that a utility must incorporate a social cost of greenhouse gases in making resource decisions. CETA also sets a minimum cost that a utility must use from a technical study published in August 2016 by the Interagency Working Group on Social Cost of Greenhouse Gases. CETA also stipulates that a utility may use a higher cost if it can establish a reasonable basis for doing so.
- **Bonneville Power Administration (BPA) contract impacts.** Load and energy efficiency programs impact City Light’s BPA power contract deliveries. As load declines, City Light receives less BPA power. The ability to add energy efficiency creates a choice for City Light and gives the utility some control over how much BPA power City Light receives. When a conservation path reduces City Light’s BPA power deliveries, BPA’s power costs are reduced and the change in BPA’s contribution to resource adequacy is taken into account.
- **Hourly energy sales and energy purchases.** Conservation’s impact on hourly demand and City Light’s ability to reshape its existing hydro power resources to this change in load shape is taken into account in the IRP models. The models account for the hours when conservation makes City

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<sup>35</sup> Washington State Legislature. RCW 19.405. Washington Clean Energy Transformation Act.  
<https://app.leg.wa.gov/RCW/default.aspx?cite=19.405>

<sup>36</sup> Climate Registry summary of City Light’s utility-specific emission factors:  
<https://www.theclimateregistry.org/our-members/cris-public-reports/>



Light more surplus and sells more power, and it also accounts for when conservation reduces City Light's market purchases.

**Third-party system transmission costs.** For City Light, new supply resources will interconnect with another utility's transmission system. In the IRP framework, these transmission costs include the cost of moving power across other utility's transmission systems. Current limitations on moving power from specific locations of the transmission system is also taken into account. Table 6.7 provides a high-level comparison of the 2020 CPA methodology to the 2022 CPA methodology and important factors driving the updated targets.

**Table 6.7. Achievable (Economic) Potential Methodology Comparison**

	2020 CPA Approach	2022 CPA Approach
Screening Method	Compare levelized avoided cost to measure levelized cost	Compare NPV of benefits to NPV of measure/resource cost
Calculation of Net Benefits (Value Components)		
Bonneville Power Administration	Application of Market Revenue, GHG costs, and BPA power costs without adjustment for change in hourly and monthly shapes and net energy position	Accounts for hourly changes in City Light energy position, reductions in GHG emissions consistent with CETA, and monthly changes to BPA power deliveries
Net Market Position		
GHG		
I-937 Need	Low cost renewable energy credit (REC) to meet I-937 requirements	Recognizes, by conservation measure groupings, the benefit in reducing I-937 (with multiple compliance options) and winter and summer resource adequacy when competitive with other resource options
Resource Adequacy Need	None	
Third-Party Transmission Costs	Flat annual BPA transmission rate	Conservation measures that are competitive with resources help reduce third-party transmission costs

The 2022 CPA approach is better able to recognize the identified resource needs from City Light's new load forecast and more up-to-date alternative resource costs. The result is a CPA target based on the evaluation of conservation's monthly and hourly shapes to more closely match City Light's resource needs. The new analysis also takes into account CETA compliance and BPA contract high water impacts.

Overall, this new approach provides a better way for City Light to weigh the tradeoffs of different levels of investment in conservation. The combination of these factors led to selection of conservation at different levelized costs levels in the 2022 CPA than used in the 2020 CPA.

#### 6.3.4.2 Conservation Resource Inputs into the IRP Framework

A main input into the IRP framework is the levelized costs bundles shown in Table 6.5. City Light created these bundles to minimize modeling run time. To evaluate all possible combinations of 17 levelized cost bundles for each of the three customer classes would have required optimization of the portfolio for approximately 5,000 combinations of conservation bundles. City Light further reduced the number of

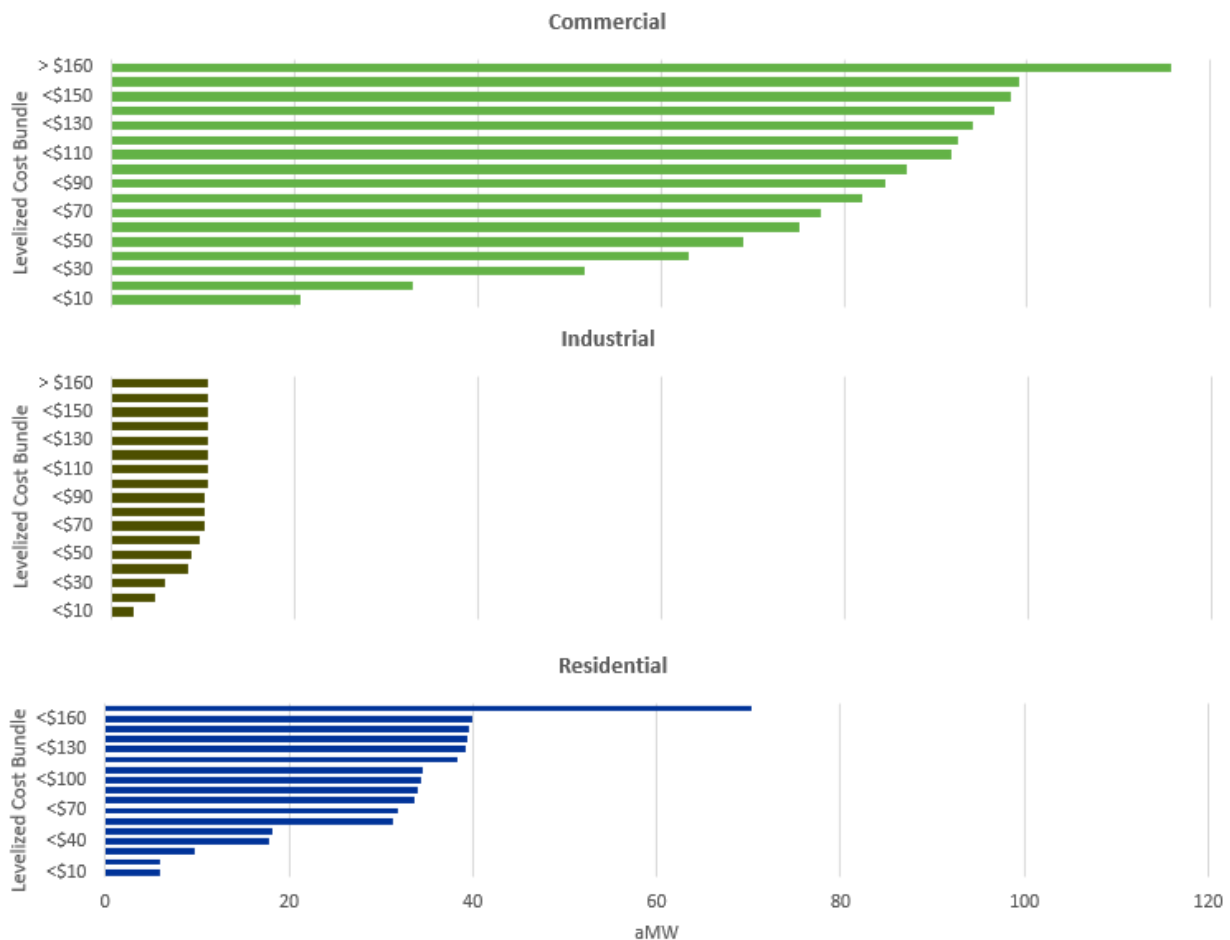


combinations to evaluate by combining cost bundles where the achievements did not significantly increase, even at higher levelized cost bundles.

Figure 6.9 illustrates where City Light combined cost bundles. For example, residential levelized cost bundles \$10/MWh and \$20/MWh were combined because the additional achievement with the higher cost bundle was negligible. This led to eight residential, seven industrial, and eleven commercial cost bundles for a total of 616 bundles that included the no-conservation savings option for each customer class. This led to shorter run times without sacrificing precision.

The figure also shows the elasticity of the conservation supply curves by customer class. The industrial supply curve becomes inelastic at \$60/MWh, while the residential supply curve becomes inelastic above \$70/MWh. The commercial supply curve shows the highest elasticity but reaches high inelasticity above \$130/MWh. The inelasticity of conservation places a limit to the amount of conservation potential that can be relied upon to contribute to the portfolio.

**Figure 6.9. Conservation Supply Curves – 2041 Cumulative Savings**



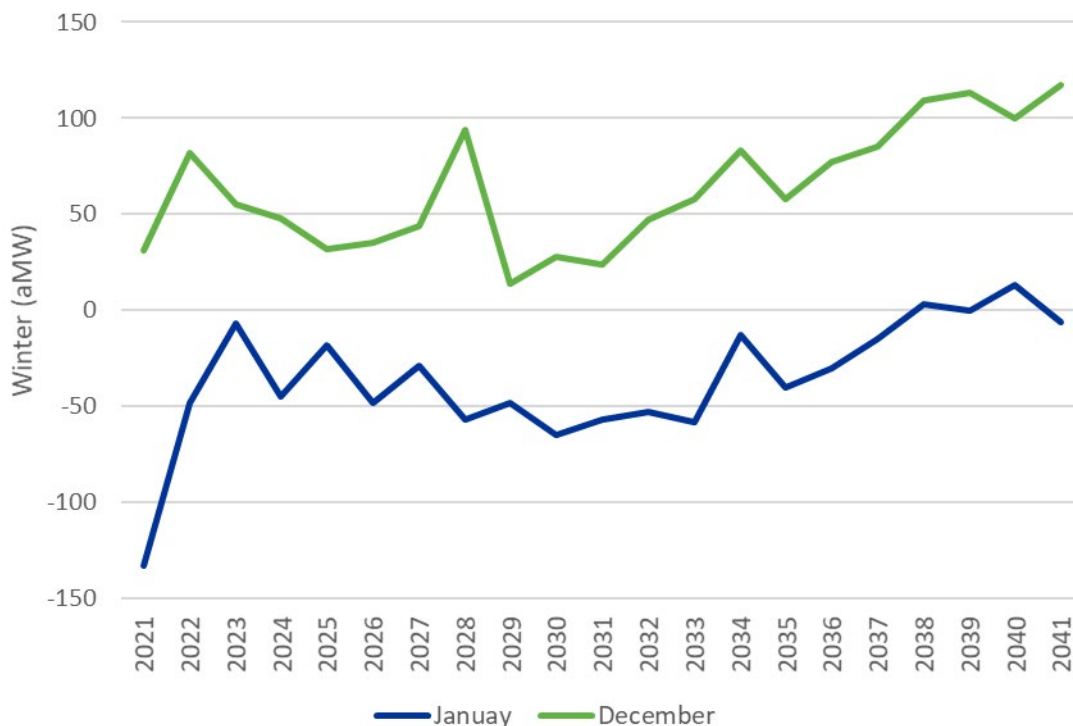
The adjusted cost bundles and energy savings are the starting point for input into the IRP framework. The hourly conservation inputs allow City Light to reflect the seasonal and hourly economic benefits of



conservation to the hydro system and to the overall generation portfolio. For each conservation sector (residential, commercial, and industrial) being evaluated, City Light's IRP framework develops an energy resource adequacy contribution for meeting City Light's resource adequacy needs.<sup>37</sup> Once this contribution is established, City Light conducts its portfolio optimization modeling. Refer to Volume 3 of this report for more information on the IRP framework.

Figure 6.10 and Figure 6.11 show that City Light has winter and summer energy resource adequacy needs that must be met.<sup>38</sup>

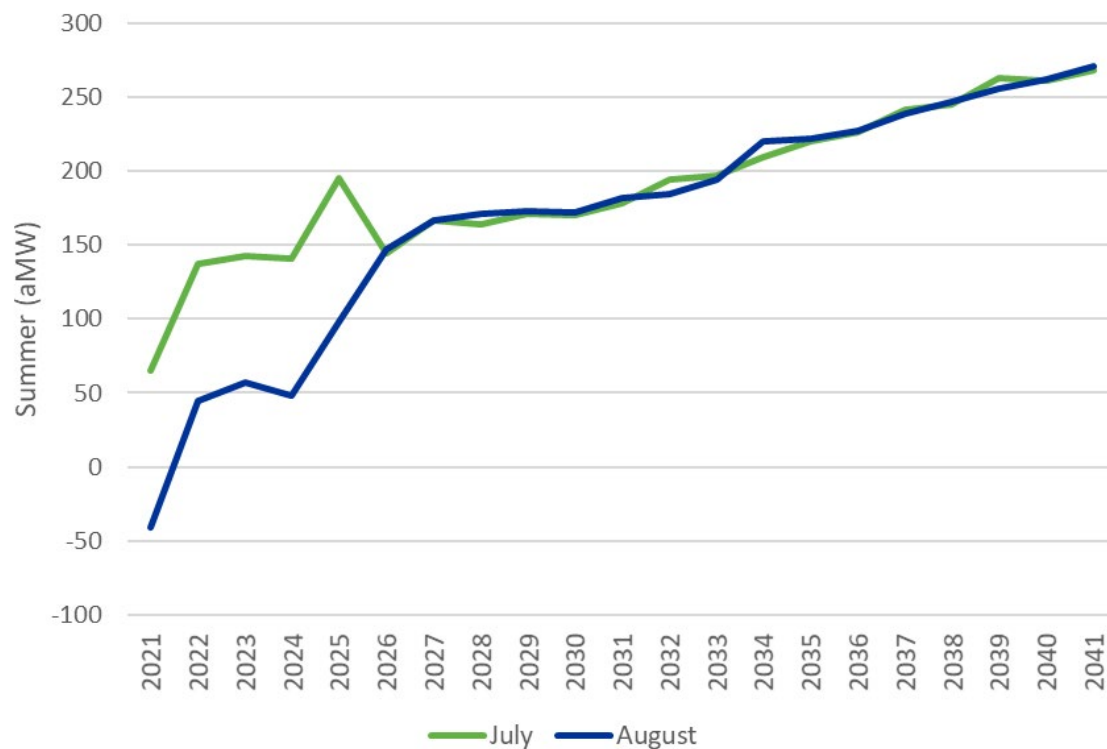
**Figure 6.10. Winter Resource Adequacy Needs (2021-2041)**



<sup>37</sup> City Light's Hydro Risk and Reliability Analyzer (HydRRA) is the tool that calculates energy resources adequacy needs and contributions.

<sup>38</sup> Resource adequacy needs are established using simulations of loads and resources in HydRRA, assuming no new supply and conservation resources, a market reliance of 200 aMW, and an achievement of an adequacy target of loss of load events (LOLEV) no greater than two every ten years.



**Figure 6.11. Summer Resource Adequacy Needs (2021-2041)**

In the 2020 CPA, City Light did not identify any resource adequacy needs. New to the 2022 CPA are City Light's resources adequacy needs, which were found using the new IRP Framework, as shown in Figure 6.10 and Figure 6.11. The load forecast used in the 2022 CPA, which includes additional electrification from new codes and faster EV growth, leads to winter resource adequacy needs.

Summer resource adequacy needs are also identified in the 2022 CPA, as shown in Figure 6.11. This is due to changing regional power supply and demand, which has reduced and altered the reliability of surplus energy available from the wholesale market when City Light's hydro supply is low and demand is high.<sup>39</sup>

Once these needs are identified, seasonal resource adequacy contributions of conservation by sector are developed for every year of the study.<sup>40</sup> Figure 6.12 and Figure 6.13 show the December and August resource adequacy contribution multipliers for conservation, respectively.

These multipliers indicate the energy contribution to resource adequacy relative to the monthly energy savings of each conservation bundle. For example, as shown in Figure 6.12 and Figure 6.13, approximately 1.0 aMW of commercial savings improves resource adequacy by 0.5 aMW in August 2030, while 1.0 aMW

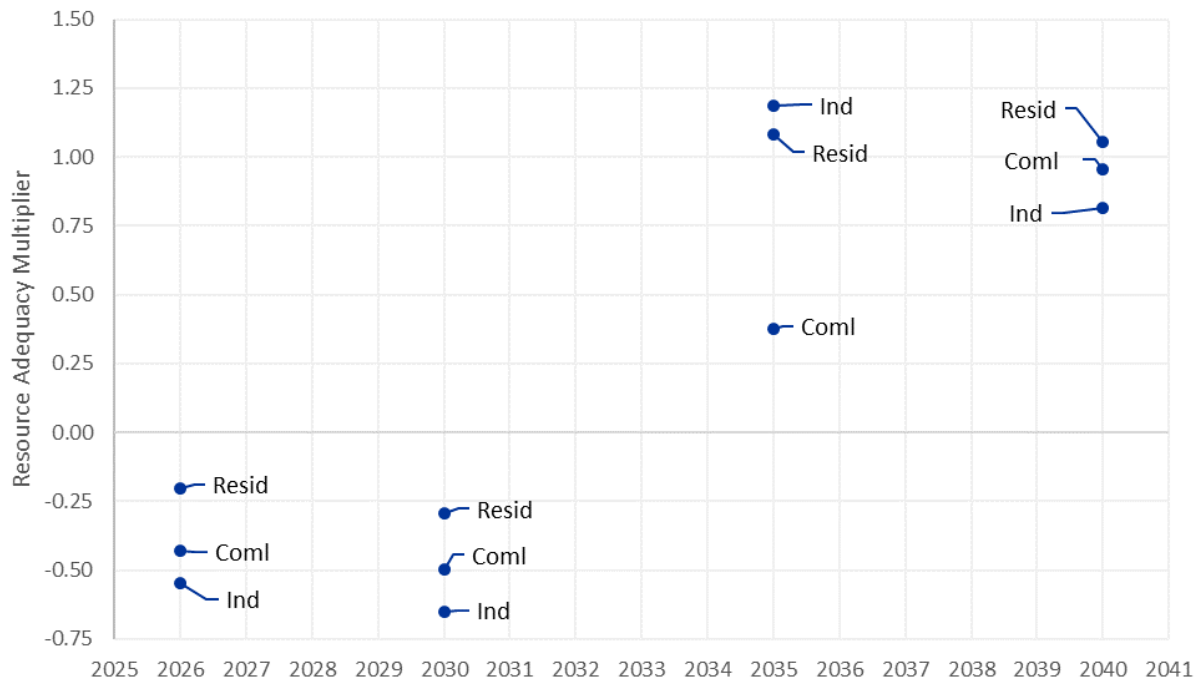
<sup>39</sup> City Light. *2020 Integrated Resources Plan Progress Report*.  
<https://www.seattle.gov/Documents/Departments/CityLight/2020IRPPProgressReport.pdf>

<sup>40</sup> HydrRA is used to develop the seasonal and annual resource adequacy contributions of conservation by sector.



of commercial savings reduces the resource adequacy need for December 2030 by 0.5 aMW.<sup>41</sup> Conservation can reduce BPA power deliveries more in the winter than in the summer largely because of how the power deliveries are defined in the BPA contract.<sup>42</sup>

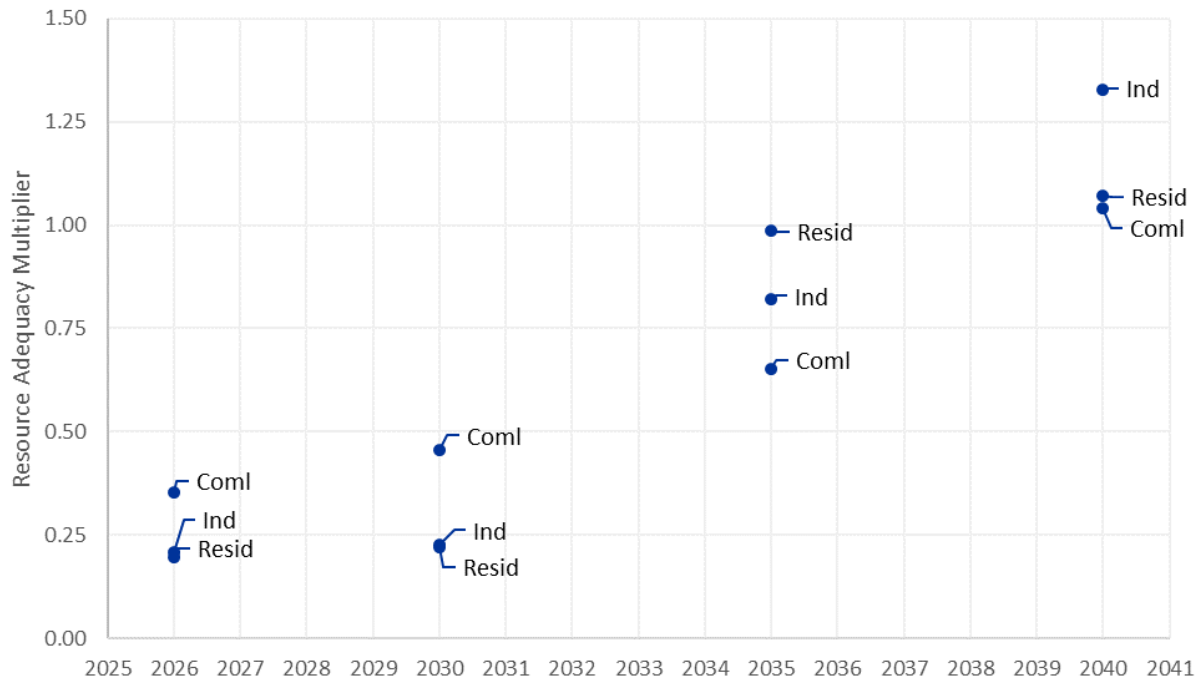
**Figure 6.12. December Energy Resource Adequacy Contribution**



<sup>41</sup> The resource adequacy contribution is applied across all conservation measures within a particular bundle and sector.

<sup>42</sup> As an example, the resource adequacy contribution of conservation in the winter before 2035 is negative for two primary reasons. First, City Light's BPA annual energy entitlement is below the maximum annual contractual energy entitlement ("high water mark"). Second, because existing power deliveries are shaped more toward the winter, a load reduction means a bigger power delivery reduction in the winter compared to the summer. Once loads begin to increase in 2035, the difference between the annual entitlement and the maximum annual contractual energy entitlement becomes smaller, this leads to an increase in the resource adequacy contribution of conservation.



**Figure 6.13. August Energy Resource Adequacy Contribution**

#### 6.3.4.3 Portfolio Optimization Modeling

The targets for 2022 CPA achievable economic conservation result from a systematic evaluation of the choices in supply-side and demand-side resources and are based on City Light's most recent estimates of load, resource costs, conservation savings, and future power market conditions. Technology and regulations are constantly evolving and the region's energy supply changes, so City Light obtained and included more up-to-date information about new resource costs and market conditions since its 2020 IRP Progress Report.

Nevertheless, because the future is unknown, City Light relied on more than one analysis. City Light reviewed a range of potential futures, or scenarios, to evaluate the factors that could change the targets for achievable economic potential.<sup>43</sup> Detailed information about the IRP's updated inputs, assumptions, and scenarios can be found in Volume III.

The IRP framework found that across all scenarios reviewed, five different conservation combinations rose to the top. Across the scenarios, the optimal result included all measures with a net levelized cost of \$40/MWh and below for the residential sector, \$70/MWh and below for the commercial sector, and \$160/MWh and below for the industrial sector. Table 6.8 shows the scenarios that were evaluated and in which scenario the five conservation bundles listed were optimal.

<sup>43</sup> In addition to good utility practice, WAC 194-070 requires City Light to test multiple scenarios.



**Table 6.8. Scenarios – Cumulative Achievable Economic Potential Results by Sector and Time Period**

Scenarios	Optimal Conservation Bundle By Levelized Cost and Sector	Achievable Economic Potential – aMW			
		2-Year (2022-2023)	4-Year (2022-2025)	10-Year (2022-2031)	20-Year (2022-2041)
1. Baseline 2. Resource Adequacy need delayed to 2030 3. Forced selection of low cost demand response options	Residential ≤ \$40/MWh Commercial ≤ \$70/MWh Industrial : All Bins	19	35	77	106
4. Use short-term REC purchases to meet I-937 5. No I-937 renewable energy requirement	Residential ≤ \$20/MWh Commercial ≤ \$50/MWh Industrial ≤ \$60/MWh	15	28	63	85
6. No future winter Resource Adequacy needs	Residential ≤ \$40/MWh Commercial ≤ \$100/MWh Industrial ≤ \$60/MWh	21	39	84	114
7. High Load 2030 to 2041	Residential ≤ \$70/MWh Commercial ≤ \$130/MWh Industrial : All Bins	22	41	93	136
8. High Load 2030 to 2041 and no RPS	Residential ≤ \$70/MWh Commercial ≤ \$100/MWh Industrial : All Bins	21	40	88	129

The analysis shows two-year targets that range from 30 percent lower to 4 percent higher than the 2020 CPA's two-year target of 21.3 aMW.

The eight scenarios show that City Light's conservation target can be sensitive to existing future conditions. Under some conditions, City Light's conservation targets are sensitive to I-937 compliance opportunities. For example, if City Light's current long-term load forecast is unchanged going forward and assuming I-937 can be met with renewable energy credits (RECs) that cost less than conservation, then the lower end of the range would be more desirable. Compared to the 2020 CPA, investments at the low end of the range still emphasize investment in higher-cost commercial and industrial measures but lower-cost residential measures. In other words, only residential measures with levelized costs of \$20 and below should be considered part of the conservation portfolio when lower-cost RECs are assumed to be available in the future and are part of the compliance option.

Conversely, if load is 5 percent higher compared to the current forecast in 2030 and 11 percent higher in 2041, then City Light would benefit by investing in conservation near the top end of the range. This higher load growth has little impact on the conservation target relative to the baseline scenario because the achievable economic target for the baseline scenario is currently at the inelastic portion of the achievable economic conservation potential. The analysis also shows that, in the future, greater conservation



investment and more demand response programs can be complementary. Demand response potential is outlined in Appendix E.

In summary, the optimal decision for economic conservation is an achievable economic target that recognizes the long-run benefit of conservation investments in supporting portfolio diversification.

With policies and new regulations aimed at mitigating the impacts of climate change, conservation continues to play a significant role in supporting a clean energy future and environmental equity.

Finally, though not the highest possible conservation level, the CPA target represents a robust strategy in the sense that it is chosen most frequently across various scenarios and performs well even in scenarios where it was not optimal.

Results from the 2022 CPA analysis are also being used to establish renewable energy, conservation, and demand response targets for City Light's 2022 Clean Energy Implementation Plan. Table 6.9 shows the optimal portfolio decisions for the 2022 CPA and the Clean Energy Implementation Plan. The portfolio is considered the most robust at this time; it represents the lowest reasonable cost and risk and was selected based on how it performed across the most scenarios. The table shows the projected new supply-side resources, changes in BPA power deliveries from the contractual high water mark, and the cumulative conservation savings. To keep the table simple, BPA and conservation savings are shown only for three representative years. City Light will continue to refine the long-term resource strategy in the 2022 IRP and through its work helping customers choose the resources that best meet their power needs.

**Table 6.9. Optimal Portfolio Decisions**

<b>Portfolio Resource Change</b>	<b>Year</b>	<b>Capacity</b>
Spot RECs	2024	5
Spot RECs	2025	24
OR Solar Addition	2026	100
Gorge Wind Addition	2026	25
SE WA Solar Addition	2026	300
Gorge Wind Addition	2027	50
SE WA Solar Addition	2030	25
SE WA Solar Addition	2032	25
BPA aMW below Max	2026, 2030	-75
BPA aMW below Max	2041	-31
Cumulative Conservation Savings aMW (2-Year)	2023	19
Cumulative Conservation Savings aMW (4-Year)	2025	35
Cumulative Conservation Savings aMW (20-Year)	2041	106



## 7. Glossary of Terms

These definitions draw heavily from the NAPEE Guide for Conducting Energy Efficiency Potential Studies and the State and Local Energy Efficiency Action Network.<sup>44</sup>

**Achievable potential:** The amount of energy use that efficiency can realistically be expected to displace.

**Benefit-cost ratio:** The ratio (as determined by the Total Resource Cost [TRC] test) of discounted total benefits of the program to discounted total costs over some specified time period.

**Conservation potential assessment:** A quantitative analysis of the amount of energy savings that exists, proves cost-effective, or could potentially be realized through implementation of energy-efficient programs and policies.

**Cost-effectiveness:** A measure of relevant economic effects resulting from implementation of an energy efficiency measure. If the benefits of this selection outweigh its costs, the measure is considered cost-effective.

**Economic potential:** Refers to the subset of technical potential that is economically cost-effective compared to conventional supply-side energy resources.

**End use:** A category of equipment or service that consumes energy (e.g., lighting, refrigeration, heating, process heat).

**End use consumption:** Used for the residential sector, this represents per-UEC consumption for a given end use, expressed in annual kWh per unit. (Also called unit energy consumption [UEC]).

**End-use intensities:** Used in the commercial and institution sectors, energy consumption per square foot for a given end use, expressed in annual kWh per square foot per unit.

**Energy efficiency:** The use of less energy to provide the same or an improved service level to an energy consumer in an economically efficient way.

**Effective useful life:** An estimate of the duration of savings from a measure. EUL is estimated through various means, including the median number of years that energy efficiency measures installed under a program remain in place and operable. EUL also is sometimes defined as the date at which 50 percent of installed units remain in place and operational.

**Levelized cost:** The result of a computational approach used to compare the cost of different projects or technologies. The stream of each project's net costs is discounted to a single year using a discount rate (creating a net present value) and divided by the project's expected lifetime output (MWhs).

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<sup>44</sup> SEEACTION. 2012. *Energy Efficiency Program Impact Evaluation Guide. NAPEE Guide for Conducting Energy Efficiency Potential Studies and the State and Local Energy Efficiency Action Network*. Prepared by Steven R. Schiller, Schiller Consulting, Inc. [www.seeaction.energy.gov](http://www.seeaction.energy.gov)



**Lost opportunity:** Refers to an efficiency measure or efficiency program seeking to encourage selection of higher-efficiency equipment or building practices than that typically chosen at the time of a purchase or design decision.

**Measure:** Installation of equipment, subsystems, or systems, or modifications of equipment, subsystems, systems, or operations on the customer side of the meter, designed to improve energy efficiency.

**Portfolio:** Either (a) a collection of similar programs addressing the same market, technology, or mechanisms; or (b) the set of all programs conducted by one organization.

**Program:** A group of projects with similar characteristics and installed in similar applications.

**Retrofit:** An efficiency measure or efficiency program intended to encourage replacement of functional equipment before the end of its operating life with higher-efficiency units (also called “early-retirement”), or the installation of additional controls, equipment, or materials in existing facilities for reducing energy consumption (e.g., increased insulation, lighting occupancy controls, economizer ventilation systems).

**Resource Adequacy:** having sufficient resources, generation, energy efficiency, storage, and demand-side resources to serve loads across a wide range of conditions.

**Technical potential:** The theoretical maximum amount of energy use that could be displaced by efficiency, disregarding all non-engineering constraints (such as cost-effectiveness or the willingness of end-users to adopt the efficiency measures).

**Total resource cost (TRC) test:** A cost-effectiveness test that assesses the impacts of a portfolio of energy efficiency initiatives on the economy at large. The test compares the present value of efficiency costs for all members of society (including costs to participants and program administrators) compared to the present value of benefits, including avoided energy supply and demand costs.

**Utility cost test (UCT):** A cost-effectiveness test that evaluates impacts of efficiency initiatives on an administrator or an energy system. It compares administrator costs (e.g., incentives paid, staff labor, marketing, printing, data tracking, reporting) to accrued benefits, including avoided energy and demand supply costs. Also called the program administrator cost test (PACT).





## Legislation Text

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**File #:** Appt 02072, **Version:** 1

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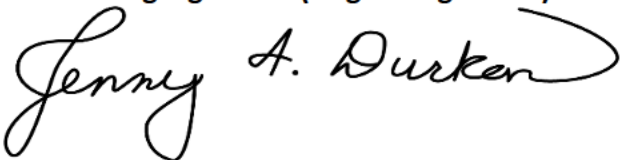
Appointment of Jose Ulises Nino Rivera as member, Seattle Bicycle Advisory Board, for a term to August 31, 2023.

The Appointment Packet is provided as an attachment.





## City of Seattle Boards & Commissions Notice of Appointment

<b>Appointee Name:</b> <i>Jose Ulises Nino Rivera</i>		
<b>Board/Commission Name:</b> <i>Seattle Bicycle Advisory Board</i>		<b>Position Title:</b> <i>Member</i>
<input checked="" type="checkbox"/> <b>Appointment</b> OR <input type="checkbox"/> <b>Reappointment</b>		<b>City Council Confirmation required?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Appointing Authority:</b> <input type="checkbox"/> City Council <input checked="" type="checkbox"/> Mayor <input type="checkbox"/> Other: <i>Fill in appointing authority</i>		<b>Term of Position: *</b> 9/1/2021 to 8/31/2023  <input type="checkbox"/> <i>Serving remaining term of a vacant position</i>
<b>Residential Neighborhood:</b> <i>Roosevelt</i>	<b>Zip Code:</b> <i>98105</i>	<b>Contact Phone No.:</b> [REDACTED]
<b>Background:</b> <i>Jose has degrees in Computer Science and Biology, and currently is a Staff Software Engineer at Lyft where he develops open-source networking software infrastructure. His professional career has helped him develop systems-level thinking applicable to urban infrastructure. He co-founded and led Uplyft Unidos, Lyft's Latinx employee resource group. Jose served as the 2020-2021 Get Engaged member on SBAB. He is excited to continue to serve on the board and advocate for bicycle transportation. He hopes to use his tenure to focus on the role of bicycle infrastructure in Seattle's climate action goals.</i>		
<b>Authorizing Signature (original signature):</b>   <b>Date Signed (appointed):</b> <i>11/8/21</i>		<b>Appointing Signatory:</b> <i>Jenny Durkan</i> <i>Mayor</i>

\*Term begin and end date is fixed and tied to the position and not the appointment date.



# Jose Ulises Nino Rivera

## EDUCATION

**JOHNS HOPKINS UNIVERSITY**  
MENG IN COMPUTER SCIENCE  
May 2016 | Baltimore, MD GPA: 4.0

## DIVERSITY

Founded and led Uplyft Unidos, Lyft's LatinX Employee Resource Group. Focused on LatinX recruiting, successfully hosting several networking events, and interview batch days resulting in several dozen hires.

## WRITING

**INFOQ | MITIGATING CASCADING FAILURE AT LYFT**  
This article was also published in InfoQ's service mesh eMagazine.

**LYFT ENG | PUBLIC ARTICLES**  
Several blog posts from my time at Lyft.

## SPEAKING ENGAGEMENTS

**QCON LONDON 2020** March 02nd, 2020, London, UK  
Next Generation Client APIs in Envoy Mobile

**ENVOYCON/KUBECON NA 2019**  
San Diego, CA  
Envoy Mobile in Depth: From Server to Multi-platform Library

**VELOCITY** 2019 | San Jose, CA and Berlin, Germany

- How Lyft Migrated to a Service Mesh
- Deploying hybrid topologies with Kubernetes and Envoy: A look at service discovery

**KUBECON NA 2018** December 12th, 2018 | Seattle, WA

- Keynote: Envoy Project Update
- Evolving Legacy Systems into Kubernetes at Lyft: A Hybrid Environment

**GONORTHWEST** July 17th, 2018 | Seattle, WA  
Go in the Envoy Ecosystem

**KUBECON EUROPE 2018** May 2nd, 2018 | Copenhagen, Denmark  
Developer Productivity with Envoy

## EXPERIENCE

### LYFT | SENIOR SOFTWARE ENGINEER

Q2/2019 – Present | Seattle, WA  
Client Networking Team

- Designed, implemented, and open sourced Envoy Mobile, a new client networking library based on the Envoy project.
- Focused on the implementation of the library's core networking aspects: DNS, HTTP, threading design, bridging platform (iOS, Android) stacks with the native C++ core.
- Architected and implemented a revamped version of the HTTP stack that allows for extensibility via HTTP filters. This platform will enable future work around smart network behavior, security, compression, and protocol experimentation (QUIC).
- Created a real-time time-series metrics pipeline to extract metrics out of Lyft's mobile clients.
- Led cross-company collaboration to build solutions on top of the Envoy Mobile platform.

### LYFT | SENIOR SOFTWARE ENGINEER

01/01/2019 – Present | Seattle, WA  
Tech Lead (since Q3 2018) for Lyft's Networking team.

- Defined the team's roadmap for H2 2018 and H1 2019, advancing projects involving multiple teams across Lyft's Infrastructure org. The roadmap focuses on projects for developer productivity, and site reliability through self healing systems. The network team's work was foundational in decomposing Lyft's monolith and building Lyft's modern, service-oriented architecture.
- Created onboarding documentation and curricula that was used to onboard half a dozen new Network team members.

### LYFT | SOFTWARE ENGINEER

08/15/2016 – Present | Seattle, WA  
Server Networking Lead in Lyft's Networking team. Our team standardizes how machines at Lyft handle traffic and communicate.

- Member of the team that implemented and open sourced Envoy, a C++ Edge/Service communications bus. Current maintainer of the project. Focused on Envoy's Outlier Detection, Rate limit, Concurrency, and Control Plane subsystems.
- Developed, open source, and maintain Ratelimit. Ratelimit is a go/gRPC generic rate limit service used in production at Lyft and other industry peers to enable network and application level global ratelimiting in a distributed system.
- Designed, implemented, and rolled out Lyft's control plane solution for Envoy. The platform has enabled Lyft to deploy data plane changes at unprecedented speed. Moreover, the modern control plane has been crucial in Lyft's migration to Kubernetes based infrastructure, making an internally hybrid service mesh transparent to service owners.

### FLATIRON HEALTH | SOFTWARE ENGINEERING INTERN

06/01/2015-08/15/2015 | New York City, NY

- Engineer a highly parallel Apache Spark cluster to improve Flatiron's data pipeline efficiency.

## RESEARCH

### SARIA LAB | RESEARCH ASSISTANT

Spring 2015 – Spring 2016 | Baltimore, MD

- Designed and developed Dashan: a modular, multi-level system to extract, organize, and analyze Electronic Medical Records. The system has been deployed to several hospitals in the Hopkins Medical System.



# Seattle Bicycle Advisory Board

12 Members: Pursuant to Resolution 31572, all members subject to City Council confirmation, 2-year terms:

- 7 Mayor- appointed
- 5 City Council- appointed

## Roster:

*D	**G	RD	Position No.	Position Title	Name	Term Begin Date	Term End Date	Term #	Appointed By
8	M	3	1.	Member	Yasir Alfarag	9/1/2021	8/31/2023	2	Mayor
2	F	5	2.	Member	Kashina Groves	9/1/2020	8/31/2022	1	City Council
3	M	4	3.	Member	Jose Ulises Nino Rivera	9/1/2021	8/31/2023	1	Mayor
1	F	4	4.	Member	Andrea Lai	9/1/2021	8/31/2023	2	City Council
1/9	F	1	5.	Member	Diane Teh-Mei Walsh	9/1/2021	8/31/2023	1	Mayor
			6.	Member	Vacant	9/1/2021	8/31/2023		City Council
6	M	2	7.	Member	Andrew Dannenberg	9/1/2020	8/31/2022	2	Mayor
6	F	1	8.	Member	Meredith Hall	9/1/2020	8/31/2022	1	City Council
6	F		9.	Member	Sarah Udelhofen	9/1/2020	8/31/2022	2	Mayor
6	M	2	10.	Member	Patrick Taylor	9/1/2020	8/31/2022	1	City Council
9	F	3	11.	Member	Maimooma Rahim	9/1/2020	8/31/2022	1	Mayor
			12.	Get Engaged Member	Vacant	9/1/2021	8/31/2022	1	Mayor

## SELF-IDENTIFIED DIVERSITY CHART

SELF-IDENTIFIED DIVERSITY CHART					(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Male	Female	Transgender	NB/ O/ U	Asian	Black/ African American	Hispanic/ Latino	American Indian/ Alaska Native	Other	Caucasian/ Non- Hispanic	Pacific Islander	Middle Eastern	Multiracial
Mayor	3	3			1		1			2		1	2
Council	1	3			1	1				2			
Other													
Total	4	6			1	1	1			4		1	1

## Key:

\*D List the corresponding *Diversity Chart* number (1 through 9)

\*\*G List *gender*, M= Male, F= Female, T= Transgender, NB= Non-Binary, O= Other, U= Unknown

RD Residential Council District number 1 through 7 or N/A

*Diversity information is self-identified and is voluntary.*





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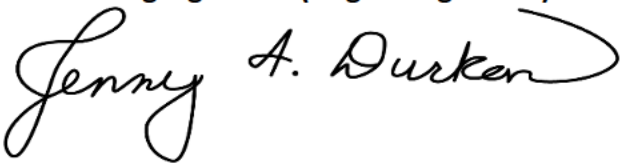
Appointment of Diane Teh-Mei Walsh as member, Seattle Bicycle Advisory Board, for a term to August 31, 2023.

The Appointment Packet is provided as an attachment.





## City of Seattle Boards & Commissions Notice of Appointment

<b>Appointee Name:</b> <i>Diane Teh-Mei Walsh</i>		
<b>Board/Commission Name:</b> <i>Seattle Bicycle Advisory Board</i>		<b>Position Title:</b> <i>Member</i>
<input checked="" type="checkbox"/> <b>Appointment</b> OR <input type="checkbox"/> <b>Reappointment</b>		<b>City Council Confirmation required?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Appointing Authority:</b> <input type="checkbox"/> City Council <input checked="" type="checkbox"/> Mayor <input type="checkbox"/> Other: <i>Fill in appointing authority</i>		<b>Term of Position: *</b> 9/1/2021 to 8/31/2023  <input type="checkbox"/> <i>Serving remaining term of a vacant position</i>
<b>Residential Neighborhood:</b> <i>West Seattle</i>	<b>Zip Code:</b> <i>98116</i>	<b>Contact Phone No.:</b> [REDACTED]
<b>Background:</b> <i>Diane has a background in landscape architecture and previously worked at SDOT in the Public Space Management Program. She typically bikes with her kids in tow, transporting them to school, parks, and playdates. Diane believes an inclusive bicycle program should address the economic, social/cultural, physical and perceived safety barriers to make the transportation system more equitable.</i>		
<b>Authorizing Signature (original signature):</b>   <b>Date Signed (appointed):</b> 11/8/21		<b>Appointing Signatory:</b> <i>Jenny Durkan</i> <i>Mayor</i>

\*Term begin and end date is fixed and tied to the position and not the appointment date.



# DIANE TEH-MEI WALSH



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## EXPERIENCE

### **PLANNING AND DEVELOPMENT SPECIALIST II, PUBLIC SPACE MANAGEMENT PROGRAM, Seattle, WA**

*The Seattle Department of Transportation*

*June 2014—June 2017*

- Work primarily focused on shoreline street ends program coordination, piloting the play streets program, and other PSM program development work. Responsibilities included overseeing project management, directing the strategic planning process by planning and evaluating priorities for program work, assisting with program budget management, policy development, facilitating community stewardship, and ensuring equitable public outreach and engagement.

### **PUBLIC SPACE MANAGEMENT GRADUATE INTERN, Seattle, WA**

*The Seattle Department of Transportation*

*July 2013—May 2014*

- An internship spanning my third year within UW's Master of Landscape Architecture program. Supported the development of Public Space Management program areas by conducting best practices and precedent research pertaining to neighborhood and business amenities, alley activation, play streets, pavement to plaza programs, and landscape infrastructure management. Prepared presentations for public meetings, conferences, and other public outreach events. Supported the Shoreline Street End program as well as the coordination and development of the pilot Play Streets program.

### **CREW LEADER & PRO-CREW MEMBER, Oakland, CA**

*The Student Conservation Association*

*May 2009—May 2010*

- Co-led two summer high school crews in San Mateo County performing conservation-related work. Responsible for ensuring a healthy, safe, and fun work environment for students from underserved communities. Incorporated environmental education days to foster a sense of stewardship for the environment and facilitated team-building and leadership activities to promote confidence and job-readiness skills.
- Participated in two pro-crews; Lassen Volcanic National Park (re-vegetation of Jeffrey Pines), Sonoran Desert National Monument (ecological restoration).

### **LOCAL PRODUCE CONSULTANT, San Francisco, CA**

*The San Francisco Wholesale Produce Association*

*March 2008—April 2010*

- Responsible for outreach to small, local growers and local wholesalers who were interested in new marketing avenues and local sourcing. Assisted in facilitating relationships between interested parties. Projects included: a market-wide pilot study to evaluate amount of local produce at the market and to assess opportunities to increase total volume of local produce; a study of wholesale farmer's market operations around the country; and marketing efforts to increase the visibility of the SFWPM within the Bay Area.



**RESEARCH & DEVELOPMENT ASSISTANT**, San Francisco, CA

*The Sierra Club*

*September 2007—January 2008*

- Research of prospective donors – individual, corporate and foundation. Responsible for acknowledgements of major gifts.

**‘PARKS FOR PEOPLE’ INTERN & RESEARCH/DEVELOPMENT INTERN**, San Francisco, CA

*The Trust for Public Land*

*February 2007—September 2007*

- Responsible for various aspects of community outreach, research of potential project sites, and the creation of fliers and Powerpoint presentations. Research of prospective donors – individual, corporate and foundation.

## **EDUCATION**

**UNIVERSITY OF WASHINGTON**, Seattle, WA

2011-2014

- Master's of Landscape Architecture

**GARDEN FOR THE ENVIRONMENT**, San Francisco, CA

2007

- Gardening and Composting Educator Training Program. Awarded a Master Gardener Certificate.

**UNIVERSITY OF CHICAGO**, Chicago, IL

2002-2006

- B.A. Major in Environmental Studies, Thesis: "A Study of Community Gardens as Catalysts for Positive Social Change."

**INTERNATIONAL HONORS PROGRAM**, England, Tanzania, India, New Zealand, Mexico

2004-2005

- Third-year study abroad program examining the environmental and cultural impacts of globalization through critical studies in development economics, environmental management, and social movements around the globe.

## **SKILLS**

**SOFTWARE:** Adobe Creative Suite, Microsoft Office, Google SketchUp, ArcGIS, AutoCAD

**LANGUAGES:** English, French



# Seattle Bicycle Advisory Board

12 Members: Pursuant to Resolution 31572, all members subject to City Council confirmation, 2-year terms:

- 7 Mayor- appointed
- 5 City Council- appointed

## Roster:

*D	**G	RD	Position No.	Position Title	Name	Term Begin Date	Term End Date	Term #	Appointed By
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1	F	4	4.	Member	Andrea Lai	9/1/2021	8/31/2023	2	City Council
1/9	F	1	5.	Member	Diane Teh-Mei Walsh	9/1/2021	8/31/2023	1	Mayor
			6.	Member	Vacant	9/1/2021	8/31/2023		City Council
6	M	2	7.	Member	Andrew Dannenberg	9/1/2020	8/31/2022	2	Mayor
6	F	1	8.	Member	Meredith Hall	9/1/2020	8/31/2022	1	City Council
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			12.	Get Engaged Member	Vacant	9/1/2021	8/31/2022	1	Mayor

## SELF-IDENTIFIED DIVERSITY CHART

SELF-IDENTIFIED DIVERSITY CHART					(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
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Council	1	3			1	1				2			
Other													
Total	4	6			1	1	1			4		1	1

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\*\*G List gender, M= Male, F= Female, T= Transgender, NB= Non-Binary, O= Other, U= Unknown

RD Residential Council District number 1 through 7 or N/A

Diversity information is self-identified and is voluntary.





## Legislation Text

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**File #:** Appt 02074, **Version:** 1

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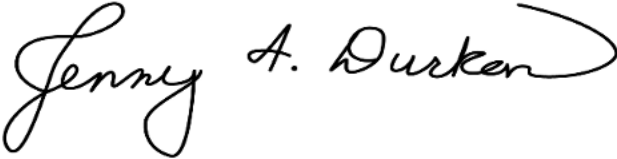
Appointment of Amin Amos as member, Seattle Transit Advisory Board, for a term to August 2, 2023.

The Appointment Packet is provided as an attachment.





## City of Seattle Boards & Commissions Notice of Appointment

<b>Appointee Name:</b> <i>Amin Amos</i>		
<b>Board/Commission Name:</b> <i>Seattle Transit Advisory Board</i>		<b>Position Title:</b> <i>Member</i>
<input checked="" type="checkbox"/> <b>Appointment</b> OR <input type="checkbox"/> <b>Reappointment</b>		<b>City Council Confirmation required?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Appointing Authority:</b> <input type="checkbox"/> City Council <input checked="" type="checkbox"/> Mayor <input type="checkbox"/> Other: <i>Fill in appointing authority</i>		<b>Term of Position: *</b> 8/3/2021 to 8/2/2023  <input type="checkbox"/> <i>Serving remaining term of a vacant position</i>
<b>Residential Neighborhood:</b> <i>Capitol Hill</i>	<b>Zip Code:</b> <i>98102</i>	<b>Contact Phone No.:</b> [REDACTED]
<b>Background:</b> <i>Amin's earliest experiences with transit were bus-oriented and expanded to other modes as they became available. Making transit accessible and enjoyable to use are his primary objectives. He's a proud owner of a Mariners-themed ORCA card and Mt. Baker is his favorite transit station.</i>		
<b>Authorizing Signature (original signature):</b>   <b>Date Signed (appointed):</b> 11/8/21		<b>Appointing Signatory:</b> <i>Jenny Durkan</i> Mayor

\*Term begin and end date is fixed and tied to the position and not the appointment date.



# Amin Amos

## SUMMARY

I have a background in technical support engineering and business analysis. I am ultimately interested in helping build and improve technical products and processes.

## EXPERIENCE

Support Engineer, **Mux**, Seattle, WA (Remote) 11/2020 - Present

- Respond to customer-developer inquiries regarding video-on-demand and live streaming products
- Review and modify externally facing technical documentation
- Submit and review code changes for JavaScript and Python SDKs
- Create scripts and reusable functions to improve customer experience
- Troubleshoot API request and response errors
- Format, create, and track customer feature requests and engineering bugs
- Assist Sales team with urgent customer questions

Technical Support Engineer, **Apptio**, Bellevue, WA 08/2019 - 11/2020

- Translate bug reports from customers into actionable user stories for the engineering team
- Answer customer questions related to product functionality via email and phone
- Investigate discrepancies in data or financial logic to mitigate unexpected results or performance issues
- Write scripts in vanilla JavaScript to automate repetitive tasks
- Explain and demonstrate REST API best practices to customers

Technical Analysis Senior Associate I, **ThreeBridge Solutions**, Minneapolis, MN 08/2018 - 03/2019

- Consulted as a Technical Business Analyst for a data warehouse migration project
- Collaborated with data architects to ensure technology recommendations reflected business needs
- Interviewed stakeholders; documented and organized requirements
- Proofread and edited technical and non-technical deliverables

Technical Analysis Associate II, **ThreeBridge Solutions**, Minneapolis, MN 01/2017 - 10/2018

- Consulted as SAP Business Analyst at Fortune 500 medical supply firm
- Investigated financial anomalies, traced source of non-standard transactions
- Performed software acceptance testing for new billing solution
- Produced reports using SAP Business Intelligence and Microsoft Excel
- Researched new SAP Finance features, wrote test cases and assisted with business requirements
- Trained business users on SAP Finance processes

## CREDENTIALS

**AWS Certified Cloud Practitioner** 05/2020 - 03/2023

Cloud native services will become more popular over time. This is Amazon's first certification in a path to other exams.

**Flatiron School - Software Engineering** 06/2019 - 03/2020

Started my software development journey with this immersive educational program. Technical course subject matter included object orientation, DOM manipulation, and REST APIs. Beyond code I explored cultural facets like blogging, tech conferences, and open source software.

**Hamline University**, St. Paul, MN

Bachelor of Business Administration – Finance

12/2016

## TECHNICAL SKILLS

Python, Ruby on Rails, HTML, CSS, JavaScript, SQL, Amazon Web Services (S3, EC2), Agile (Scrum, Kanban), Customer Success, Requirements Gathering



# Seattle Transit Advisory Board

12 Members: Pursuant to Resolution 31572, all members subject to City Council confirmation, 2-year terms:

- 7 Mayor- appointed
- 5 City Council- appointed

## Roster:

*D	**G	RD	Position No.	Position Title	Name	Term Begin Date	Term End Date	Term #	Appointed By
6	M	3	1.	Member	Bryce Kolton	8/3/20	8/2/22	2	City Council
		4	2.	Member	Emily Walton Percival	8/3/20	8/2/22	1	City Council
5	M	4	3.	Member	Andrew Martin	8/3/20	8/2/22	2	City Council
6	F	6	4.	Member	Michelle Zeidman	8/3/21	8/2/23	3	City Council
			5.	Member	Vacant	8/3/21	8/2/23		City Council
1	F	3	6.	Member	Keiko Budech	8/3/20	8/2/22	2	Mayor
6	F	3	7.	Member	Barbara Wright	8/3/20	8/2/22	2	Mayor
		1	8.	Member	Art Kuniyuki	8/3/20	8/2/22	1	Mayor
	F	7	9.	Member	Erin Tighe	8/3/21	8/2/23	4	Mayor
6	F	7	10.	Member	Autumn Sharp	8/3/21	8/2/23	1	Mayor
2	M	3	11.	Member	Amin Amos	8/3/21	8/2/23	1	Mayor
6	M	3	12.	Get Engaged Member	Andrew Parker	9/1/20	8/31/21	1	Mayor

## SELF-IDENTIFIED DIVERSITY CHART

SELF-IDENTIFIED DIVERSITY CHART					(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Male	Female	Transgender	NB/ O/ U	Asian	Black/ African American	Hispanic/ Latino	American Indian/ Alaska Native	Other	Caucasian/ Non- Hispanic	Pacific Islander	Middle Eastern	Multiracial
Mayor	2	4			1	1				3			
Council	2	1							1	2			
Other													
Total	4	5			1				1	5			

## Key:

\*D List the corresponding Diversity Chart number (1 through 9)

\*\*G List gender, M= Male, F= Female, T= Transgender, NB= Non-Binary, O= Other, U= Unknown

RD Residential Council District number 1 through 7 or N/A

Diversity information is self-identified and is voluntary.





## Legislation Text

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**File #:** Appt 02076, **Version:** 1

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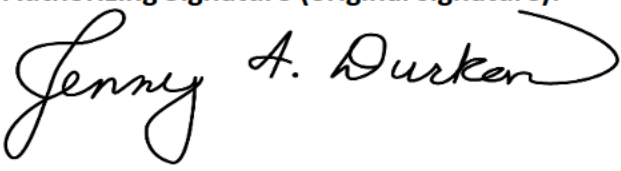
Appointment of Robin Schwartz as member, Seattle School Traffic Safety Committee, for a term to March 31, 2023.

The Appointment Packet is provided as an attachment.





## City of Seattle Boards & Commissions Notice of Appointment

<b>Appointee Name:</b> <i>Robin Schwartz</i>		
<b>Board/Commission Name:</b> <i>School Traffic Safety Committee</i>		<b>Position Title:</b> <i>Member</i>
<input checked="" type="checkbox"/> <b>Appointment</b> OR <input type="checkbox"/> <b>Reappointment</b>		<b>City Council Confirmation required?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Appointing Authority:</b> <input type="checkbox"/> City Council <input checked="" type="checkbox"/> Mayor <input type="checkbox"/> Other: <i>Fill in appointing authority</i>		<b>Term of Position: *</b> 4/1/2020 to 3/31/2023  <input type="checkbox"/> <i>Serving remaining term of a vacant position</i>
<b>Residential Neighborhood:</b> <i>South Park</i>	<b>Zip Code:</b> <i>98108</i>	<b>Contact Phone No.:</b> [REDACTED]
<b>Background:</b> <i>Robin Schwartz has spent many hours working and volunteering in the Duwamish Valley and for Concord Intl. Elementary School over the last 10 years. Her focus has been equity, especially with regards to resources from City of Seattle and Seattle Public Schools.</i>		
<b>Authorizing Signature (original signature):</b>   <b>Date Signed (appointed):</b> 11/15/21		<b>Appointing Signatory:</b> <i>Jenny Durkan</i> <i>Mayor</i>

\*Term begin and end date is fixed and tied to the position and not the appointment date.



## **Robin Schwartz**



### *OBJECTIVE*

As an engaged member of the SPS community and one who is particularly concerned with Title 1 school communities, I would like to help elevate the voices of my peers to achieve more safe outcomes for our students.

### *SUMMARY*

I have spent many hours working and volunteering in the Duwamish Valley and for Concord Intl. Elementary School over the last 10 years. My focus has been equity, especially with regards to resources from City of Seattle and Seattle Public Schools.

### *COMMUNITY INVOLVEMENT*

Member, Concord International Elementary School PTA, 2013/2014  
Board Member, Concord International Elementary School PTA, 2014-2021  
Member of the following groups: South Park Neighborhood Association, Georgetown Community Council, Greening Concord Steering Committee, Duwamish Valley Affordable Housing Coalition, Friends of Duwamish Waterway Park  
Founder/admin of SPS Title 1 Schools community group (an online group)

### *EMPLOYMENT*

Development and Advocacy Manager, Duwamish River Cleanup Coalition 2017-present  
Teacher, the Learning Tree Montessori Preschool, Seattle, WA 2013-2017  
Nanny 2006-2013  
Teacher, the Learning Tree Montessori Preschool, Seattle, WA 1995-2006

### *EDUCATION*

B.A., Interdisciplinary Arts and Sciences, University of Washington Bothell 2006



# Seattle School Traffic Safety Committee

11 Members: Pursuant to Ordinance 124168, 6 members subject to City Council confirmation, 3-year terms:

- 6 Mayor- appointed
- 5 Other Appointing Authority: Seattle Police Department, Seattle Department of Transportation, Seattle Public Schools, King County Metro

## Roster:

*D	**G	RD	Position No.	Position Title	Name	Term Begin Date	Term End Date	Term #	Appointed By
			1.	Seattle Police Department Representative	Vacant	4/1/2019	3/31/2022	1	Chief of Police
6	F	3	2.	Seattle Transportation Representative	Jennifer Meulenberg	4/1/2019	3/31/2022	1	Director of Transportation
6	M	1	3.	Seattle Public School District No. 1 Representative	Richard Staudt	4/1/2019	3/31/2022	1	Superintendent of Seattle Public Schools
6	F	7	4.	Seattle Public School District No. 1 Representative	Yvonne Carpenter	4/1/2019	3/31/2022	1	Superintendent of Seattle Public Schools
6	F	6	5.	Representative of Parents	Mary Ellen Russell	4/1/2019	3/31/2022	2	Mayor
			6.	King County Metro Representative	Vacant	4/1/2021	3/31/2024		Metro Transit General Manager
		1	7.	Member At Large	Robin Schwartz	4/1/2020	3/31/2023	1	Mayor
			8.	Member At Large	Vacant	4/1/2019	3/31/2022	1	Mayor
	F	5	9.	Member At Large	Marilyn K. Firman	4/1/2021	3/31/2024	2	Mayor
6	F	3	10.	Pedestrian Safety Representative	Margaret McCauley	4/1/2020	3/31/2023	2	Mayor
6	M	6	11.	Bicycle Safety Representative	Leland Bruch	4/1/2020	3/31/2023	2	Mayor

## SELF-IDENTIFIED DIVERSITY CHART

SELF-IDENTIFIED DIVERSITY CHART					(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Male	Female	Transgender	NB/ O/ U	Asian	Black/ African American	Hispanic/ Latino	American Indian/ Alaska Native	Other	Caucasian/ Non- Hispanic	Pacific Islander	Middle Eastern	Multiracial
Mayor	1	3								3			
Council													
Other	1	2								3			
Total	2	5								6			

## Key:

\*D List the corresponding *Diversity Chart* number (1 through 9)

\*\*G List *gender*, M= Male, F= Female, T= Transgender, NB= Non-Binary, O= Other, U= Unknown

RD Residential Council District number 1 through 7 or N/A

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