

Public Health

Seattle & King County



US EPA's Institutional Control Implementation and Assurance Plan (ICIAP) for Seafood Consumption at the Lower Duwamish Waterway (LDW) Superfund Site



LDW Seafood Institutional Controls
Fun to Catch, Toxic to Eat Program

FINAL
August 2019

This Institutional Control Implementation and Assurance Plan (ICIAP) was prepared by Public Health – Seattle & King County (Public Health) for the United States Environmental Protection Agency (EPA) under a Cooperative Agreement (2017–2021). Public Health used a community participatory process to develop the ICIAP. This plan is based on valuable input from the 2018 Community Steering Committee—made up of members from the Vietnamese, Cambodian, and Latino fishing communities. As a “living road map” to guide the work of the EPA’s Duwamish Seafood Consumption IC Program, this ICIAP will be updated based on evaluation, monitoring, and community input throughout the cleanup process of the Lower Duwamish Waterway Superfund site.

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Acronyms

CHA: Community Health Advocate

cPAHs: carcinogenic polycyclic aromatic hydrocarbons

CSC: Community Steering Committee

DOH: Washington State Department of Health

ECOSS: Environmental Coalition of South Seattle

EPA: Environmental Protection Agency

HSCC: Healthy Seafood Consumption Consortium

IC: Institutional Control

ICIAP: Institutional Control Implementation and Assurance Plan

JHA: Just Health Action

LDW: Lower Duwamish Waterway

LDWG: Lower Duwamish Waterway Group

NEJAC: National Environmental Justice Advisory Council

NOAA: National Oceanic and Atmospheric Administration

PCBs: polychlorinated biphenyls

PRPs: Potentially Responsible Parties

RFA: Request for Application

RFP: Request for Proposal

ROD: Record of Decision

WIC: Women/Infants/Children

WDFW: Washington Department of Fish and Wildlife

Executive Summary

The goal of the Environmental Protection Agency’s Duwamish Seafood Consumption Institutional Control (IC) Program is to promote culturally appropriate, healthy actions that protect the health and well-being of fishing communities, especially pregnant women, nursing moms, and young children, from the contaminated resident seafood in the Lower Duwamish Waterway (LDW) Superfund site before, during, and after the cleanup.

Purpose of the ICIAP (Program Plan)

The Institutional Control Implementation and Assurance Plan (ICIAP) serves as a “living road map” that guides the work of the EPA’s IC program toward its goal. This plan describes the key strategies to promote healthy seafood consumption that can be carried out within the scope of the program. In addition, the ICIAP has recommendations for partnerships to address additional barriers that are outside the scope of the EPA’s program.

This program (also known as the Fun to Catch, Toxic to Eat Program) is part of the EPA's cleanup efforts on the Duwamish River. Public Health – Seattle & King County (Public Health) leads the program work for the EPA under a Cooperative Agreement (2017–2021). Public Health’s annual work plans will describe the tasks to implement and evaluate the IC strategies.

As part of the ongoing community participatory process, the EPA and Public Health will update the ICIAP based on evaluation, monitoring, and community input throughout the cleanup process for the LDW Superfund site.

Developing the ICIAP with Community Input

From June 2018 to May 2019, Public Health facilitated seven Community Steering Committee (CSC) workshops. Fifteen Community Health Advocates (CHAs) who had received prior training on this issue participated on the CSC. They represented fishers and community members who receive local seafood catch (including moms). They are also well connected to the local Vietnamese, Cambodian, and Latino fishing communities.

The CSC shared valuable insights and cultural expertise about the primary audiences for this program: Duwamish fishers and pregnant moms or caregivers of young children who receive local seafood catch. They

I feel very fortunate to be able to join this CSC group. I feel that I am being valued to be able to express and make decisions around the subject that matter to human life. I am valued and my voice is being heard—to make decisions and inputs to protect people’s health around contaminations in the Duwamish. ... At CSC, we are being empowered to be power in the communities.

—Cambodian CSC member, 2018

discussed the barriers that these groups face in protecting themselves from contaminated resident seafood. They worked together to identify and prioritize key IC strategies and recommendations for partnerships.

Background on the Lower Duwamish Waterway (LDW) Superfund Site

Over the past century, the Duwamish River became polluted with toxic chemicals from many sources, including stormwater runoff, wastewater, and industrial practices. In 2001, the EPA declared the last five-mile segment of the Seattle's only river the Lower Duwamish Waterway (LDW) Superfund site. Superfund is the name of a federal law that required the nation's most toxic sites to be identified and cleaned up. The river flows between Georgetown and South Park and through the industrial core of Seattle into Elliott Bay. Before entering Elliott Bay, the last mile of the Duwamish River splits into East and West Waterways. These two Waterways are operable units of Harbor Island Superfund site - which is separate from the LDW Superfund Site.

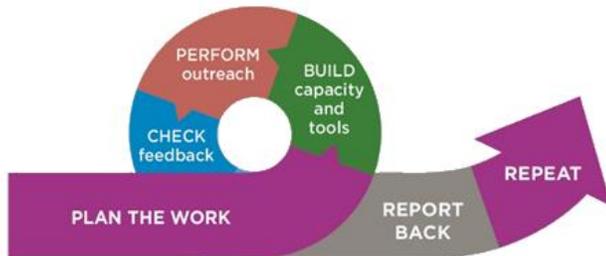
In 2014, the EPA issued a Final Cleanup Plan, also known as a "Record of Decision (ROD)," for cleaning up the contaminated mud on the river bottom. The ROD also requires Institutional Controls (ICs) to protect people who fish and eat the resident seafood, which is contaminated with high levels of polychlorinated biphenyls (PCBs). A common example of an IC is to issue a "seafood consumption advisory." This is a health warning to limit or avoid eating certain seafood caught from local waters due to chemical pollution. Health officials recommend salmon as the only seafood safe to eat from the Duwamish River because they spend only a short time in the river.

The LDW Fishers Study conducted between 2014-2016 found that more than 20 ethnic/language groups fish on the Duwamish River. Fishers from Asian/Pacific Islander (API) and Latino immigrant communities are catching, eating, and sharing the contaminated seafood from the river. Posted health warning signs have not been effective in reaching fishers who speak little to no English—most of these fishers speak Vietnamese, Cambodian (Khmer), or Spanish. The study also found that fishing offers many benefits: it is fun and relaxing; it provides fresh food and time for socializing; fishers learn from each other; and it creates a sense of community among fishers.

Environmental Justice & Community Participatory Process

Environmental Justice (EJ) is the “fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.”

Community Informs All Stages



All of the processes, they [Public Health] have always included us in the process. They make us feel important, we are united, and it's always been that way—they ask us to be part of everything, every step. We are making history, since it's not seen elsewhere. Normally, a decision is made in an office and that is it, but not here. They've included us, since we are the community—kind of like for the community, by the community.

—Latino CHA, 2018

The EPA recognizes the importance of a community-based approach to better understand the unique needs of the affected Duwamish fishing communities. Public Health's community participatory approach reflects the interrelated EJ principles of **capacity-building**, **meaningful involvement**, and **empowerment**. This program will require flexibility and continuous feedback to adapt to community input during program design, implementation, monitoring, and evaluation.

Independent from the EPA's program goal, the CSC defined its long-term EJ vision for the Duwamish River (see below). Achieving this vision is bigger than the EPA's cleanup process, and requires the efforts led by the communities, local governments, agencies, and community organizations working together toward this EJ vision.

Long-Term Environmental Justice Vision for the Duwamish River (2018 CSC):

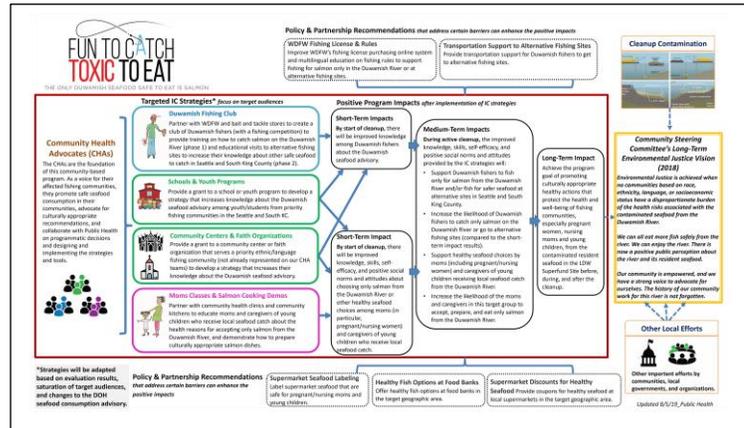
Environmental Justice is achieved when no communities based on race, ethnicity, language, or socioeconomic status have a disproportionate burden of the health risks associated with the contaminated seafood from the Duwamish River.

We can all eat more fish safely from the river. We can enjoy the river. There is now a positive public perception about the river and its resident seafood.

Our community is empowered, and we have a strong voice to advocate for ourselves. The history of our community work for this river is not forgotten.

Key Strategies & Recommendations

Public Health worked with the CSC to synthesize their input into a road map for the program. The road map summarizes the **targeted IC strategies** to reach the goal within the scope of the IC program. It also captures the CSC's **policy and partnership recommendations** to address additional barriers outside the EPA's scope. The EPA will encourage agencies and organizations at the Healthy Seafood Consumption Consortium to partner on these recommendations.



See Figure 3 in the report for the road map.

Targeted IC Strategies (inside the EPA's IC Program Scope)

- CHA Training & Outreach Strategy.** The CHAs are the foundation of this community-based program. Based on the Community Health Worker/Promotor Model, this strategy builds on the CHAs' strengths, cultural expertise and self-empowerment, while increasing their capacity (knowledge and skills) to promote healthy seafood consumption actions in their communities. As a voice for their community, they advocate for culturally appropriate recommendations and collaborate with Public Health and the EPA on programmatic decisions, strategies, and tools. Currently, Public Health is working with the Cambodian, Latino and Vietnamese CHA groups, representing some of the fishing communities that are most likely to eat contaminated seafood from the Duwamish River.
- Duwamish Fishing Club Strategy.** Public Health and the CHAs will partner with the Washington State Department of Fish and Wildlife (WDFW) and bait and tackle stores to create a club of Duwamish fishers (with a fishing competition). This club will provide training on how to catch salmon on the Duwamish River (phase 1) and educational visits to alternative fishing sites to increase knowledge about other safe seafood to catch in Seattle and South King County (phase 2).
- Moms' Classes at Health Clinics & Salmon Cooking Demos.** Public Health and the CHAs will partner with community health clinics and community kitchens to educate moms (particularly pregnant and nursing women) and caregivers of young children who receive local seafood catch. They will learn about health reasons for accepting only salmon from the Duwamish River and how to prepare culturally appropriate salmon dishes.
- Strategies by Influencers and Messengers (via Community Grants).** Public Health will provide grants to community centers/faith organizations and schools/youth programs to design additional strategies to

reach fishers and moms. This will also build new community partnerships with ethnic/language fishing communities not represented on the CHA teams.

- **Communications Strategy.** CHA teams and community grantees can incorporate media communications to complement their on-the-ground efforts. The CSC has prioritized multiple ways to use ethnic media (radio, TV news, print news) and online platforms (website and social media) in this program plan.

Policy & Partnership Recommendations (outside the EPA's IC Program Scope)

- **WDFW Fishing License & Rules.** Improve WDFW's online system for buying fishing licenses and provide multilingual education on fishing rules to support salmon-only fishing in the Duwamish River and fishing for other species at alternative sites.
- **Transportation Support to Alternative Fishing Sites.** Provide transportation support for Duwamish fishers to get to alternative fishing sites on a regular basis.
- **Supermarket Seafood Labeling.** Label supermarket seafood that is safe for pregnant/nursing moms and young children.
- **Healthy Fish Options at Food Banks.** Offer healthy fish options at food banks in the target geographic area.
- **Supermarket Discounts for Healthy Seafood.** Provide coupons for healthy seafood at local supermarkets in the target geographic area.

Monitoring, Evaluation, and Reporting

The ICIAP provides an initial framework on IC strategies to reach the program goal. For long-term success, each strategy will be monitored for specific outcomes and the program will be evaluated for its overall impact in the Duwamish fishing community before, during, and after cleanup. These findings and ongoing input from the CHAs, CSC, and community grantees will help to improve the strategies or adapt the program plan over time.

- **Assessment of community participatory process.** This ensures that the voices of the most affected are part of the process in developing, implementing, and evaluating the program. This assessment will focus on how the program affects the capacity building, meaningful involvement, and empowerment of the CHAs and CSC members.
- **Monitoring of specific IC strategies.** The strategies will be designed to help the affected groups gain relevant knowledge and skills; build self-efficacy or belief in their ability to take action; and foster positive social norms and attitudes around safe seafood consumption related to the Duwamish River. Evaluating each strategy will determine whether it achieves its objective, faces any challenges, or needs improvements.
- **Tracking of policy and partnership recommendations.** Through evaluation of the IC strategies, Public Health will monitor whether the Duwamish fishing communities continue to experience barriers, or if they benefit from policy, institutional, structural, or systems changes enacted through these partnerships. Public Health will track whether changes or actions have been made by agencies,

institutions, or organizational partners in response to these recommendations, and provide this context when reporting about the program impacts from the IC strategies.

- **Evaluation of positive program impacts.** After implementing the various IC strategies, the program can be evaluated for its impact in promoting healthy actions in the Duwamish fishing community by the start of cleanup (short-term), during active cleanup (medium-term) and after cleanup (long-term). These program impacts include:
 - Improved knowledge, skills, self-efficacy, and positive social norms and attitudes among Duwamish fishers and moms
 - Increased likelihood of Duwamish fishers to catch only salmon on the river
 - Increased likelihood for moms to accept, prepare, and eat only salmon from the river
 - Support for Duwamish fishers to fish for salmon only or fish at alternative sites
 - Support for moms to choose healthy seafood options
- **Reporting.** There are various types of reporting for the work being performed under the program, including annual work plans, quarterly progress reports, annual program fact sheets, evaluation plans, and presentations.

Modifying the ICIAP

The CSC will serve as an ongoing space to gather the voices of those most affected by the contaminated seafood and as a vehicle for them to share and discuss areas of improvement in the program with the EPA and Public Health. The CSC can propose changes to the ICIAP. Public Health will update the ICIAP as needed, based on community input and evaluation results.

While the goal of the program remains the same, the ICIAP will be updated when there are substantial changes to the core components of the program plan (including strategies, audiences, road map, and logic models). The EPA will review and approve the updates to the ICIAP and will make the final decision regarding changes to the ICIAP.

1.0 Introduction

The Lower Duwamish Waterway (LDW) Superfund site comprises a five-mile segment of the Duwamish River. The river flows between Georgetown and South Park and through the industrial core of Seattle into Elliott Bay. Before entering Elliott Bay, the last mile of the Duwamish River splits into East and West Waterways. These two Waterways are operable units of the Harbor Island Superfund site - which is separate from the LDW Superfund site. The United States Environmental Protection Agency (EPA) listed the LDW as a Superfund site in 2001, meaning it was eligible for a special federal cleanup program due to the threats posed to human health and the environment by toxic chemicals.

The EPA issued the LDW Superfund site Record of Decision (ROD) in November 2014. It is the EPA's final cleanup plan to reduce risks to people's health and the environment from the toxic chemicals (or contaminants) at the site (EPA, 2014). The cleanup plan provides details of the active cleanup of about 177 acres in the LDW and a period of natural recovery for the LDW. The cleanup plan also specifies the use of Institutional Controls (ICs) to reduce exposure of the communities that fish in the LDW to the toxic chemicals in its resident fish and shellfish.

This IC Implementation and Assurance Plan (ICIAP) (plan) describes the current and planned ICs to promote healthy seafood consumption as part of the EPA's Duwamish Seafood Consumption IC Program (program). Public Health – Seattle & King County (Public Health) prepared this ICIAP for the EPA under a Cooperative Agreement. The overall goal of the program is to promote culturally appropriate, healthy actions that protect the health and well-being of fishing communities, especially pregnant women, nursing moms, and young children, from the contaminated resident seafood (e.g., perch, flounder, sole, crab, mussels, clams) in the LDW Superfund site before, during, and after the cleanup. This plan is not intended to describe all ICs to be used in implementing the EPA's 2014 ROD—only those specific to promoting healthy seafood consumption and the existing fish consumption advisory.

Public Health's Community Steering Committee (CSC) provided valuable input and cultural expertise that guided the development of the ICIAP in 2018. This ICIAP serves as a "living road map" that guides the IC program work. It will be updated based on evaluation, monitoring, and community input throughout the LDW Superfund site cleanup process. The ICIAP will be paired with Public Health's annual Work Plans that detail the tasks and activities in implementing the strategies to reach the objectives and overall goal of the ICIAP.

1.1 What Are Institutional Controls (ICs)?

The ROD specifies the different types of ICs to be used for the entire LDW to reduce human exposure to toxic chemicals, protect the cleanup remedy, and protect the integrity of the cleanup. One type of IC described in the ROD is intended to protect people who consume local seafood catch from the toxic chemicals in LDW resident seafood (see ROD's *Remedial Action Objective 1: Reducing exposure to fish consuming populations from contaminants in fish from within the Superfund site*).

The EPA defines ICs as “non-engineering instruments, such as administrative and legal controls, that help to minimize the potential for human exposure to contamination and protect the integrity of the remedy.” ICs work by limiting land or resource use and by providing information that helps guide human behavior at properties where hazardous substances prevent unlimited use and unrestricted exposure (EPA, 2004). They are often used at Superfund sites to supplement active remediation measures, such as soil/sediment excavation and treatment, capping, and groundwater pumping and treatment, to reduce risks to human health.

A common example of an IC used to protect people from contaminated seafood is to issue a “seafood consumption advisory.” This is a health warning to limit or avoid eating certain meals seafood caught from local waters (e.g., lakes, rivers, or coastal waters) due to chemical pollution.

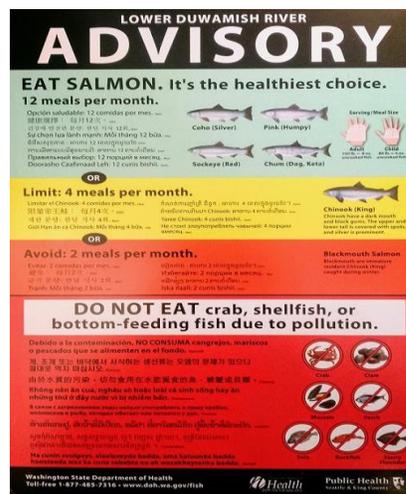
The Washington State Department of Health (DOH) issued the LDW Seafood Consumption Advisory in 2005 (DOH, 2005). It is the most restrictive seafood consumption advisory in Washington state. It recommends that the public not eat any resident crab, shellfish, or bottom-feeding fish (e.g., perch, flounder, and English sole) from the LDW Superfund site (of particular importance for pregnant and nursing women and young children under 6 years old). Salmon is recommended as the healthiest option to eat from LDW because salmon spend only a short time in the river.

The purpose of this ICIAP is not to update DOH’s seafood consumption advisory itself. Instead, the ICIAP details the strategies to be taken within the LDW fishing communities to promote safe seafood consumption practices that align with the advisory. Updating the advisory is a separate IC process associated with the cleanup, including fish tissue monitoring. Ongoing coordination between the EPA and DOH will occur throughout the cleanup to align with the objectives of the fish advisory as an IC. This will occur separately from implementation of this ICIAP.

1.3 Establishing the EPA’s Duwamish Seafood Consumption IC Program

The ROD for the LDW Superfund site describes activities to achieve the cleanup objectives. These include active cleanup (including enhanced natural recovery), monitored natural recovery, and the use of ICs. While the EPA’s cleanup plan includes the use of seafood consumption advisories as an IC, it also calls for minimizing reliance on seafood consumption advisories to the extent practicable.

The EPA’s first step in developing the seafood consumption ICs was to gather information about who fishes on the river and their fishing practices. The LDW Fishers Study collected this information through surveys and key informant interviews during 2015. The Lower Duwamish Waterway Group (LDWG)—comprising the City of Seattle, King County, the Port of Seattle, and The Boeing Company—led this study. See Section 2.2 for a summary of the LDW Fishers Study findings.



DOH’s LDW Seafood Consumption Advisory sign

The next step was to develop this ICIAP (including strategies and tools) to promote healthy seafood consumption within the LDW fishing communities. On April 3, 2016, the EPA and LDWG amended their existing Administrative Order on Consent (AOC) to include the development of ICs associated with seafood consumption. They amended the AOC again on July 9, 2018.

Under the amendments, LDWG shall support development and implementation of the ICs for LDW seafood consumption by providing, funding, or participating in the following:

- A planning group responsible for developing and implementing a plan for ICs
- Incentives for participation on the planning group by community members who have relevant knowledge or experience, subject to public agencies' legal authority to provide such incentives
- Technical materials to support the ICs
- Pilot-testing potential ICs, such as outreach campaigns developed using community-based social marketing principles
- Assessment of the pilot test and revisions to the plan
- Assessment of the plan's success and recommendations for future ICs on the LDW Superfund site

The amendments also include funding of the Cooperative Agreement between the EPA and Public Health, as well as providing support for planning and managing the meetings of the Healthy Fish Consumption Consortium.

The EPA entered into a Cooperative Agreement with Public Health in January 2017 to develop a community-based program for seafood consumption ICs at the LDW Superfund site. The Cooperative Agreement establishes a community participatory process to develop culturally appropriate IC strategies (including tools and activities) that can be implemented and evaluated throughout the cleanup of the LDW Superfund site. On behalf of the EPA, Public Health's Environmental Health Services Division takes the lead in collaborating with the priority fishing communities and community partners to develop, implement, and evaluate the program work (see Section 3.0).

This ICIAP details the non-engineering approaches to promote safe seafood consumption in the LDW fishing communities. The IC strategies and other policy and partnership recommendations in this ICIAP were identified and prioritized by members of Public Health's 2018 CSC (see Section 3.2).

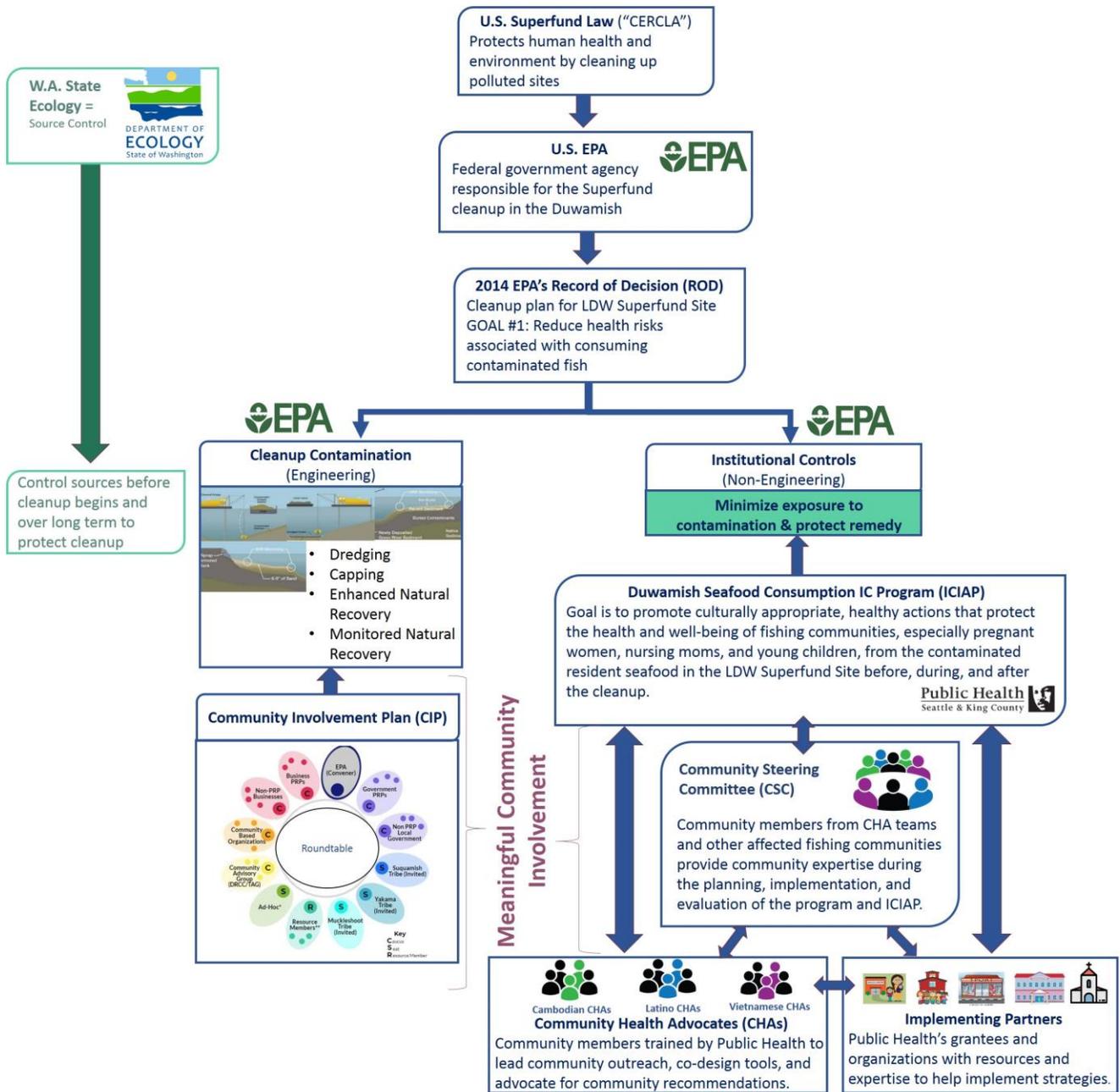
The EPA's guidance on ICs recommends routinely conducting critical evaluations of the ICs to determine whether the IC instruments remain in place and whether they meet the stated objectives and performance goals (EPA, 2010). As such, the ICIAP document will be reviewed, evaluated, and adapted over time. The CSC will continue to serve as a primary space for community members from highly impacted fishing communities to provide input to Public Health and EPA during the implementation and evaluation of the program. After the development of the ICIAP, the CSC will be expanded to include representation from other priority ethnic/language fishing communities of the LDW. These additional CSC members do not need to be trained CHAs, but they would bring diverse perspectives from other fishing communities.

In addition, Public Health and the CSC will collaborate with organizations to implement specific IC strategies. These implementing partners include Public Health’s grantees and other organizations that have relevant resources and expertise to help carry out the strategies (e.g., community health center, bait and tackle store, schools, faith organizations, and others).

The EPA will provide oversight of this program and is the final decision maker responsible for approving the contents of the ICIAP.

Given the regulatory context of the LDW Superfund site, the EPA is responsible for determining the IC tools and IC program associated with the site. While the EPA recognizes that input from the affected community is fundamental to developing effective and appropriate IC tools, the EPA must consider all relevant information when making decisions. This includes the legal authorities of the EPA, its guidance, and the LDW cleanup plan (ROD). Therefore, while the EPA fully intends to consider community input, it is possible that its final decisions will not reflect all input and recommendations provided by the community, due to regulatory limitations and federal grant restrictions.

Figure 1 The EPA’s LDW Superfund context for the Duwamish Seafood Consumption IC Program.



2.0 Background Information

2.1 Site Description

The Duwamish River, Seattle's only river, extends from the Green River in Tukwila and flows past the South Seattle neighborhoods of Georgetown and South Park. It travels through Seattle's industrial core before emptying out into Elliott Bay. Since the early 1900s, the Duwamish has served as Seattle's major channel for the surrounding industrial and port activities. It was altered from a natural estuary (where freshwater mixes with saltwater) into a five-mile industrial channel that is then split into East and West Waterways by the creation of Harbor Island before reaching Elliott Bay. As a result, 97 percent of the original habitat for salmon in the river was lost (National Oceanic and Atmospheric Administration [NOAA], 2014). Today, the Duwamish River Valley is both industrial and residential.

As damaged and polluted as the Duwamish River is today, the habitat here is crucial to ensuring the survival and recovery of federally threatened fish species, such as the Puget Sound Chinook salmon and Puget Sound steelhead. When these fish are young, they must spend time in this part of the Duwamish River as they swim from freshwater streams to the saltwater of the Puget Sound and Pacific Ocean (NOAA, 2014).

For over a century, the Duwamish River has been polluted with toxic chemicals from many sources—industries along its banks, stormwater pipes, and stormwater runoff from surrounding activities, streets, and roads. While environmental regulation and cleanup of some areas have helped reduce the sources of pollution, the historic and ongoing contamination continues to impact the organisms of the river and its surrounding communities.

In 2001, the EPA included the lower five miles of the Duwamish River, called the Lower Duwamish Waterway or LDW, as a Superfund site on the National Priorities List. The Superfund federal law requires the nation's most toxic sites to be identified and cleaned. The southernmost portion of the LDW Superfund site is in Tukwila, and it stretches north over five miles of the Duwamish River to the start of Harbor Island. The EPA is responsible for administering the cleanup of the contaminated sediments in the river, while the Washington State Department of Ecology (Ecology) is responsible for controlling sources of pollution to the river.

Due to the historic pollution, chemicals in the river that pose the most risk to human health are polychlorinated biphenyls (PCBs), dioxins/furans, carcinogenic polycyclic aromatic hydrocarbons and arsenic. The resident fish, crab and shellfish that spend their whole lives in the river build up these chemicals in their bodies. The EPA found 41 toxic chemicals in the sediments (mud) of the river that pose unacceptable risks to human health and the environment. Many of these chemicals stay in the environment for decades.

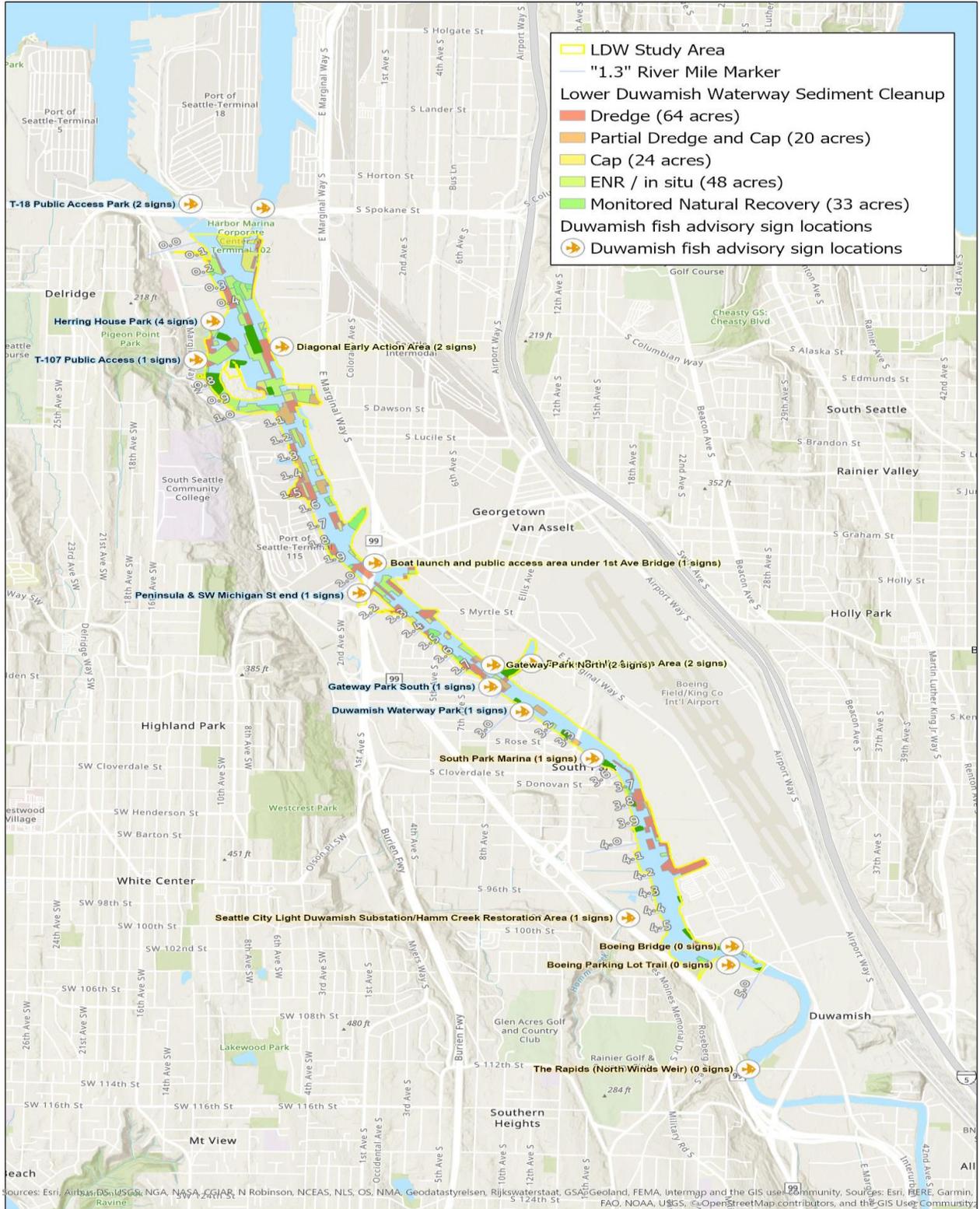
The City of Seattle, King County, the Port of Seattle, and The Boeing Company joined together to form LDWG, which conducted a comprehensive Remedial Investigation and Feasibility Study to investigate the nature and extent of the contamination and develop cleanup alternatives for the Superfund site. This investigation identified some of the most contaminated areas, called Early Action Areas, for early cleanup. Five Early Action

Areas were selected for cleanup by the EPA and Ecology. The early action cleanups were conducted in some of the most contaminated sediment areas of the LDW with the greatest opportunities for reducing PCB contamination in the sediment. In total, these early efforts cleaned up about 29 acres of sediment and reduced average surface sediment levels of PCB contamination by over one-half, a significant step forward in the cleanup of the Lower Duwamish.

In 2014, the EPA issued the ROD, which directs the cleanup for the rest of the LDW Superfund site. It aims to reduce the level of toxic chemicals in Duwamish River seafood to better protect people who fish within the Superfund site. The ROD requires both active cleanup measures, such as dredging (removing the toxic mud) and capping (covering the river bottom with clean dirt), and passive measures, such as natural recovery (natural sedimentation). The ICs are part of the ROD to protect people who catch the seafood and eat it.

The EPA estimates costs of about \$342 million over 17 years to complete the cleanup. This includes seven years of active cleanup of about 177 acres and 10 years of monitored natural recovery. Close to 100 Potentially Responsible Parties (PRPs) will be required to pay for the cleanup of the LDW Superfund site. Even after the cleanup activities, the EPA does not anticipate that people can safely eat seafood from the Duwamish River in *unlimited amounts*. Rather, ICs will be necessary beyond the span of the cleanup to protect people who consume fish and seafood, and the nature and extent of ICs will change over time.

Figure 2 Map of common fishing locations along the LDW Superfund site.



2.2 Overview of the LDW Fishing Communities

Effective and appropriate ICs are needed to protect the health of the LDW fishing communities from the contaminated seafood before, during, and after the cleanup activities. Although the DOH's LDW seafood consumption advisory was issued in 2005, the LDW Fishers Study indicated that an ethnically diverse community of fishers and families continue to eat seafood from the Duwamish. The study found that the DOH's LDW Seafood Advisory signs have not been effective for certain fisher groups, and that many do not know about or understand the advisory.

Based on the LDW Fishers Study key findings, the EPA and Public Health began the ICIAP development process with the following understanding:

- Fishers from over 20 ethnic/language groups continue to fish in the Duwamish River. The pollution in the river likely has disproportional impacts on communities of color and low-income families.
- Fishing is good for mental, social, and physical health. It is fun and relaxing; it provides fresh food and time for socializing; fishers learn from each other; and it creates a sense of community among fishers.
- A large percentage of fishers who caught polluted seafood and/or were less aware of the advisory are people of color and/or have limited English proficiency. These priority groups include:
 - Asians (mostly Vietnamese, Cambodian, Chinese, and Lao) and Pacific Islanders, Latinos, and multiracial/ethnic groups
 - Non-English speakers (including Khmer, Vietnamese, Spanish, Chinese, and Hmong)
 - Residents of South/West Seattle and areas south of the Seattle city limits (however, fishers travel as far as 33 miles to fish on the Duwamish River)

Additionally, Public Health's interpretations of the LDW Fishers Study data indicate a lack of community awareness about the higher risks of contaminated seafood to infants, young children, and the fetuses of pregnant women.

Efforts to promote healthy seafood consumption must connect with the local fishing culture. Rather than asking "Why don't fishers follow the advisory?" the question should be "How do we meet fishers' needs to promote healthy fish consumption?" The LDW Fishers Study provided a baseline understanding of possible reasons the LDW seafood advisory has not been effective. This program builds on the study's findings and uses a community participatory approach to better understand the unique needs and challenges/barriers of the affected Duwamish fishing community in order to design effective and appropriate ICs.

2.3 Environmental Justice and NEJAC Guidance

The National Environmental Justice Advisory Council (NEJAC) was established by the EPA on September 30, 1993, to provide independent advice to the EPA Administrator on broad, cross-cutting issues related to environmental justice.

The EPA defines environmental justice as the “fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies” (NEJAC, 2002).

The EPA has this environmental justice goal for all communities and persons across this nation. It will be achieved when everyone enjoys the same degree of protection from environmental and health hazards, and equal access to the decision-making process to have a healthy environment in which to live, learn, and work.

For more information:

<https://www.epa.gov/environmentaljustice>

The EPA’s ROD for the LDW Superfund site includes addressing environmental justice concerns before, during, and after implementation of the cleanup remedy (EPA, 2014). The ROD Section 13.2.8 specifies the following actions to address environmental justice concerns:

- Reduce human health risks as quickly as practicable, while also providing for long-term effectiveness and permanence.
- Conduct the LDW Fishers Study to learn more about the affected community (those who consume fish and shellfish from the LDW) to enhance outreach efforts.
- Continue consultation with affected tribes on recommendations for the remedy.
- Reduce the impacts of the cleanup on residents through green remediation techniques.

The ROD Section 13.2.4 of the ICs also specifies that the EPA will utilize the information gathered through the LDW Fishers Study “to develop appropriate and effective ICs, which will include other measures to provide additional protectiveness, such as outreach and education programs” (EPA, 2014).

The EPA relies on the existing Washington Department of Health (DOH) fish and shellfish advisory as part of the fish consumption IC for the Site. WDOH recommends no consumption of resident fish and shellfish from the LDW. Because salmon spend a limited amount of time in the LDW, they have low site-related body burdens of bio-accumulative contaminants. Consequently, salmon are not included in the LDW fish advisory and are part of the health messaging as the healthiest choice from the LDW. Salmon are included in the Puget Sound advisory which recommends eating the healthiest species (coho, chum, pink, sockeye) 12 meals per month and limiting consumption for other species (Chinook and Blackmouth) to 2 to 4 meals per month.

The DOH maintains a website and provides publications and other educational forums that cover healthy eating and seafood consumption. More information can be found at <http://www.doh.wa.gov/fish>.

In addressing the environmental justice impacts and ensuring that ICs are effective and appropriate, the EPA recognizes the importance of a community-based approach to better understand the unique needs of the affected Duwamish fishing community. Thus, the EPA is overseeing a community participatory process led by Public Health to develop the ICIAP based on the NEJAC guidance on seafood consumption issues in communities impacted by environmental injustice (NEJAC, 2002). See Section 3.2 for an overview of the community participatory process.

Based on the NEJAC guidance, the EPA and Public Health recognize that:

- Informational campaigns such as fish advisories typically focus on restricting or influencing behaviors. This assumes that people have access to other food options, and that changing behavior is appropriate. For communities impacted by environmental injustice (i.e., people who bear a disproportionate burden of environmental harms), those assumptions often do not apply.
- Affected communities must help determine how to effectively and appropriately address contaminated seafood consumption based on their local cultural context. It is crucial that those affected by seafood consumption ICs play a central role in developing and sharing the information, including identifying and promoting healthy options, that they deem appropriate to their needs and cultures.
- Capacity-building and empowerment within the affected community are important to ensure that they can meaningfully participate in decisions about activities that may affect their health.
- Seafood consumption advisories should be coupled with the cleanup of the contaminated environment.

2.4 CSC's Long-Term Environmental Justice Vision

In issuing the ROD, the EPA included addressing environmental justice concerns before, during, and after implementation of the cleanup by continuing to engage the community in meaningful ways. As described in Section 4.0, meaningful involvement, capacity building, and supporting community empowerment are core principles of the program. The EPA is committed to meaningful involvement throughout the remedial design and implementation of the cleanup, to mitigate the impacts on the affected fishing communities.

The CHAs play a valuable role in this program. Their ideas and input inform decisions at multiple levels: *on the ground* as they lead their outreach and engagement work in their community; in *program design* as they collaborate with Public Health on developing the ICIAP and IC tools; and in *program guidance* as they provide their community expertise to Public Health and EPA to help monitor the progress of the program's implementation before, during, and after the cleanup. For more information, see Section 4.2.

Independent from the EPA's overall goal for the seafood IC program, the 2018 CSC has identified its long-term environmental justice vision for the Duwamish River (see below). Achieving this vision is bigger than EPA's cleanup process, and requires the efforts led by communities, local governments, agencies, and community organizations. Together we can all work toward this environmental justice vision.

Long-Term Environmental Justice Vision for the Duwamish River (2018 CSC):

Environmental justice is achieved when no communities based on race, ethnicity, language, or socioeconomic status have a disproportionate burden of the health risks associated with the contaminated seafood from the Duwamish River.

We can all eat more fish safely from the river. We can enjoy the river. There is now a positive public perception about the river and its resident seafood.

Our community is empowered, and we have a strong voice to advocate for ourselves. The history of our community work for this river is not forgotten.



2018 Community Steering Committee

3.0 Overview of the Duwamish Seafood Consumption IC Program

3.1 Program Goal

Public Health leads the community participatory process to develop, implement, and evaluate the IC strategies for the EPA’s Duwamish Seafood Consumption IC Program under a cooperative agreement with the EPA. This program is a component of the EPA’s cleanup efforts in the LDW Superfund site as defined in the EPA’s ROD or cleanup plan (Sections 1.0 and 2.0).

The overall goal for the program is to promote culturally appropriate, healthy actions that protect the health and well-being of fishing communities, especially pregnant women, nursing moms, and young children, from the contaminated seafood (e.g., perch, flounder, sole, crab, mussels, clams) in the LDW Superfund site before, during, and after the cleanup.



When the IC program launched in 2017, Public Health conducted multi-ethnic/multilingual focus groups to create the program brand (above). The multilingual logo will be used to brand program materials to attract the attention of fishers and to tie all program tools and activities together.

For people who fish at the LDW Superfund site, the program promotes catching, eating, and sharing only salmon from the river. Salmon spend a short time in the river and do not build up toxic chemicals during that period. In addition, the program promotes alternative fishing sites in King County that have safer seafood to eat than the LDW Superfund site.

These healthy actions are also promoted among people who receive and eat local seafood catch from friends and family who fish in the Duwamish River. The program also recommends that pregnant or nursing women and children under 6 years old take additional steps to further minimize their exposure to PCBs from seafood *already*

low in PCBs. These include eating only the skinless fillet of the safe fish (such as salmon), avoiding the guts (hepatopancreas) of crabs caught in the urban waters of Elliott Bay and Puget Sound, and grilling, steaming, or baking the fish so most of the fat drips off and is not consumed.

In leading the community participatory process for the EPA, Public Health collaborates with community members, agencies, and partner organizations to:

- Build or enhance community capacity to partner on program work.
- Design and implement culturally appropriate and effective IC strategies and tools.
- Support the community’s voice in agency decision-making related to this issue.

The community members that serve as CHAs are the foundation of this community-based program. They are valuable in helping to promote safe seafood consumption in their communities. As a voice for their community, they advocate for culturally appropriate recommendations and collaborate with Public Health on programmatic decisions, strategies and tools, including participating on Public Health’s Community Steering Committee (CSC).

In addition, Public Health aims to ensure that program activities are carried out in a manner that respects community members’ cultural values and right to autonomy and do not have unintended consequences, such as scaring people away from eating all seafood, stopping people from fishing, or exacerbating existing health inequities.

Coupled with the EPA’s ongoing efforts to clean up the pollution from the river, this program works toward the long-term vision of addressing environmental justice by protecting the health of those disproportionately impacted by the pollution (see Section 2.0 for more about the Duwamish fishing community).

3.2 Developing the ICIAP with Community Input

In conducting the community participatory process for developing this program and ICIAP, Public Health was guided by NEJAC (2002) recommendations to the EPA about how to address seafood consumption issues in communities impacted by environmental injustice (see Section 2.0). Furthermore, Public Health is guided by King County’s Equity and Social Justice framework of working “upstream” where the needs are greatest and partnering with communities for equitable outcomes. (For more information, see <https://kingcounty.gov/elected/executive/equity-social-justice/vision.aspx>.)

Like NEJAC, Public Health recognizes that informational campaigns *alone* that focus *only* on individual behavior change are not effective, sustainable, or fair—they place an undue burden on the communities that face environmental injustice. Therefore, the plan identifies complementary measures to address the broad factors (e.g., social, economic, and environmental barriers) that will be needed to support healthy seafood consumption (see Section 3.3).

In keeping with the NEJAC recommendation to engage affected communities to inform the development of appropriate strategies, in June 2018 Public Health established a CSC made up of 15 CHAs who are community

members with cultural expertise and connections to the Vietnamese, Cambodian, and Latino fishing communities. These language/cultural groups were prioritized based on the LDW Fishers Study findings.

For the purposes of developing the program plan, the 2018 CSC had a balanced representation of the primary target audiences: fishers, moms of young children, and community members who receive and eat local seafood catch. Each member had recently received training about this issue and had some experience conducting outreach in their communities on this topic (see Section 5.1 for more information about the CHA Training and Outreach Strategy and Appendix A for the 2018 CSC Group Charter). Building the members' capacity beforehand helped set the foundation for their work on the CSC, including identifying IC strategies for the program.



2018 Community Steering Committee: Tatiana Martinez-Interiano, Paco Ramos, Emma Maceda-Maria, Luz Cardenas, Binh Tran, Vien Nguyen, Soun Hour Pov, Sean Phuong, Roxana Urias, Kevin Duong, Mai Hoang, Sophorn Sim, Kanitha Khiev (not in photo), Quan Phan (not in photo), and Songly Toek (not in photo).

Public Health worked with the CSC over six workshops (June–December 2018) to develop components of the draft IC plan based on the ideas that the CSC prioritized according to their needs and cultures. Public Health worked with the CSC to synthesize their input into a road map for the program (see Section 3.3). The EPA participated at all CSC workshops to learn from the CSC and share the EPA's perspectives about the IC work and updates about the cleanup process.

In May 2019, the EPA and Public Health met with the CSC to review the components of the draft IC plan, report back on the EPA's early comments on the draft IC plan, and capture additional details on the strategies for fishers and moms.

Public Health was intentional in designing the CSC workshops to be accessible to all language groups present and to foster a comfortable atmosphere for mutual sharing and learning among the CSC, Public Health, and the EPA. To this end, the following approaches were taken:

- Public Health designed and facilitated a mix of different formats: large group discussions, talk-show expert panel format, small group interactive activities (e.g., mapping exercises, puzzle game, drawing, storytelling), team-building icebreakers, individual written reflections, taking turns reading/presenting information in team members' preferred languages, and prioritizing (vote by individuals, language groups, and CSC as a whole).
- Public Health prepared agendas and workshop materials with input from bilingual CHA facilitators (who were liaisons to their team members on the CSC). Materials (e.g., PowerPoint slides, activity handouts, videos) were translated into Spanish, Vietnamese, and Khmer. Public Health debriefed with facilitators after each CSC meeting to capture feedback that would inform the next workshop. In addition, EPA staff provided input on the workshop agendas and materials. Each workshop built on the previous workshop, while also incorporating a review of previous topics or concepts from prior workshops.
- Public Health assigned homework to the CSC members to capture additional feedback from their CHA teams and/or communities to inform further discussions at the next workshop.
- Public Health contracted with external interpreters to support the CSC workshops so that the facilitators could actively participate during the workshops. The interpreters translated print materials that facilitators then reviewed in preparation for each workshop.

See Appendix D for CSC meeting materials (agendas, presentations, and notes). For more information about the long-term purpose and role of the CSC, please see Section 4.2.



A “talk show panel” of fishers discuss IC strategies and barriers during the CSC meeting (September 15, 2018). All CSC meetings were simultaneously conducted in English, Spanish, Vietnamese, and Khmer.

I think that since I started in this program with these training classes, I have been able to deepen and expand my understanding in this program. All the leaders and facilitators of the program are very passionate and dedicated to this work. They have printed out all the materials for each meeting for us, and worked a lot with the vision of creating a good outcome for the meeting, including allowing us to have an exchange that is open, liberated, and comfortable for each member of the group.

—Vietnamese CSC member, 2018

I'm really happy to be in this meeting. I really feel free to share my thoughts and my opinions because I know that I have my voice to speak out for my community, so the EPA and Public Health know about my community voice.

—Cambodian CSC member, 2018

I really liked the format of collecting feedback from every member It was fun and it was a way to feel free and liberated ... to say my opinion in an open way, without being judged.

—Latino CSC member, 2018



Paco Ramos reviews with the CSC how people get exposed to the PCBs in the seafood from the LDW (September 15, 2018).

Everybody is very supportive and respectful when it comes to ideas. It feels like our voices have been heard by the EPA/Public Health regarding the environmental injustices within diverse communities.

—Cambodian CSC member, 2018

My time in the CSC has felt very rewarding. Not only have I learned so much, I have also been able to build a better and stronger relationship with my coworkers from all three teams I have also been able to see how we come from different ethnicities and backgrounds, yet in one way or another we have many similarities. We come together and there are no differences between us We are all here for the same reason/purpose: to bring our community a voice.

—Latino CSC member, 2018

My experience in CSC is very awesome. In the beginning I didn't know what is CSC, but as I continue through the CSC meetings, the goal and objective gets clearer We have fun while we develop goals and strategies, and at the end I see the results we have done in the CSC.

—Vietnamese CSC member, 2018



The CSC's "moms talk show" panel discussed IC strategies to promote healthy seafood options (including the barriers and their recommendations for policy and partnerships) (October 6, 2018).

3.3 Road Map for the Program

By the final CSC meeting in December 2018, Public Health worked with the CSC to synthesize all input from prior CSC workshops into a high-level road map for the program. The resulting diagram summarizes the IC strategies (within the program scope) that the CSC identified to reach the program's overall goal in terms of short-, medium-, and long-term impacts (Figure 3). The road map also captures the CSC's policy and partnership recommendations (outside the program scope) to address certain barriers and further enhance the positive impacts. The IC program, along with the cleanup and other local community and government efforts, can support the CSC's long-term environmental justice vision.

A more detailed description of specific objectives, strategies, and recommendations, as well as the measurable outcomes and impacts to be evaluated, is provided in Sections 5.0 and 6.0.

The following are the key elements and descriptions of the road map:

- **Program Boundary:** The boundary of the EPA's Duwamish Seafood Consumption IC Program is shown with a red dotted line. Some activities are within the scope of the program, while other actions fall outside the EPA's LDW ROD for the IC work (i.e., outside the box).
- **IC Strategies:** The CHAs are the foundation of this community-based program. Through the CHA training and outreach strategy, the CHAs promote safe seafood consumption in their communities, advocate for culturally appropriate recommendations, and collaborate with Public Health on programmatic decisions, strategies and tools. The CHAs will participate in designing and implementing some of the IC-targeted strategies. The CHAs will provide input and/or participate in designing and implementing the various IC-targeted strategies within the program scope:
 - fisher-targeted strategies (blue boxes)
 - strategies for influencers and messengers (schools, youth programs, community centers and faith organizations) (dark green boxes)
 - moms-targeted strategies (pink boxes).

For influencers and messengers, Public Health will provide a grant to a community-based organization to design and implement the specific strategy.

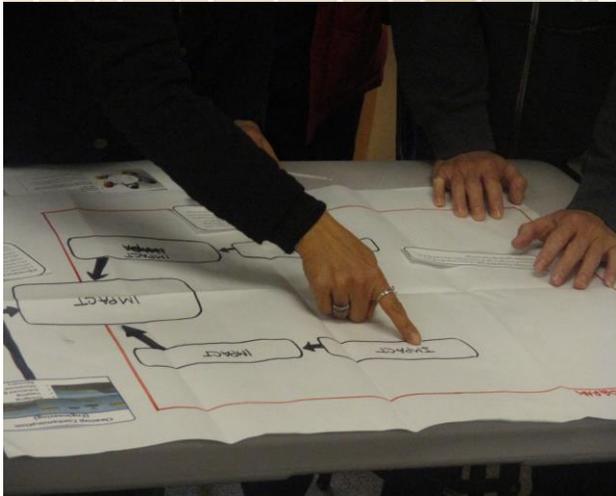
Media Communications will complement the on-the-ground IC strategies (e.g. CHA outreach, Duwamish fishing club) and will be integrated as needed within the various strategy work.

- **Policy and Partnership Recommendations:** Light green boxes outside the program boundary indicate the recommendations for partnerships or institutional/policy changes to address additional barriers for

the priority audiences. These recommendations fall outside the boundary of the programⁱ. Agencies or organizations with relevant resources or expertise can help respond to or lead these recommendations.

- **Program Impacts:** Black boxes are the impacts that the program is envisioned to make in the short-term period (prior to the start of active cleanup), medium-term period (during active cleanup), and long-term period (after the completion of active cleanup and monitoring). The long-term impact statement reflects achieving the overall goal of the program.
- **Direction of Influence:** Blue arrows indicate direction of influence. Latino CSC members indicated that increasing knowledge among fishers will also increase knowledge among moms. They also indicated that schools/youth programs and community centers/faith organizations would primarily influence the awareness of moms, because they are typically the ones in the household to participate in those community venues.

ⁱ Two CSC subgroups placed these recommendations outside the box, except for the Cambodian CSC subgroup. They drew recommendations that support healthy seafood options at the market and food banks inside the box (within the scope of the program) because they believe that Public Health and the EPA can help directly influence the appropriate agencies or organizations to respond to these recommendations (without necessarily funding such responses directly).

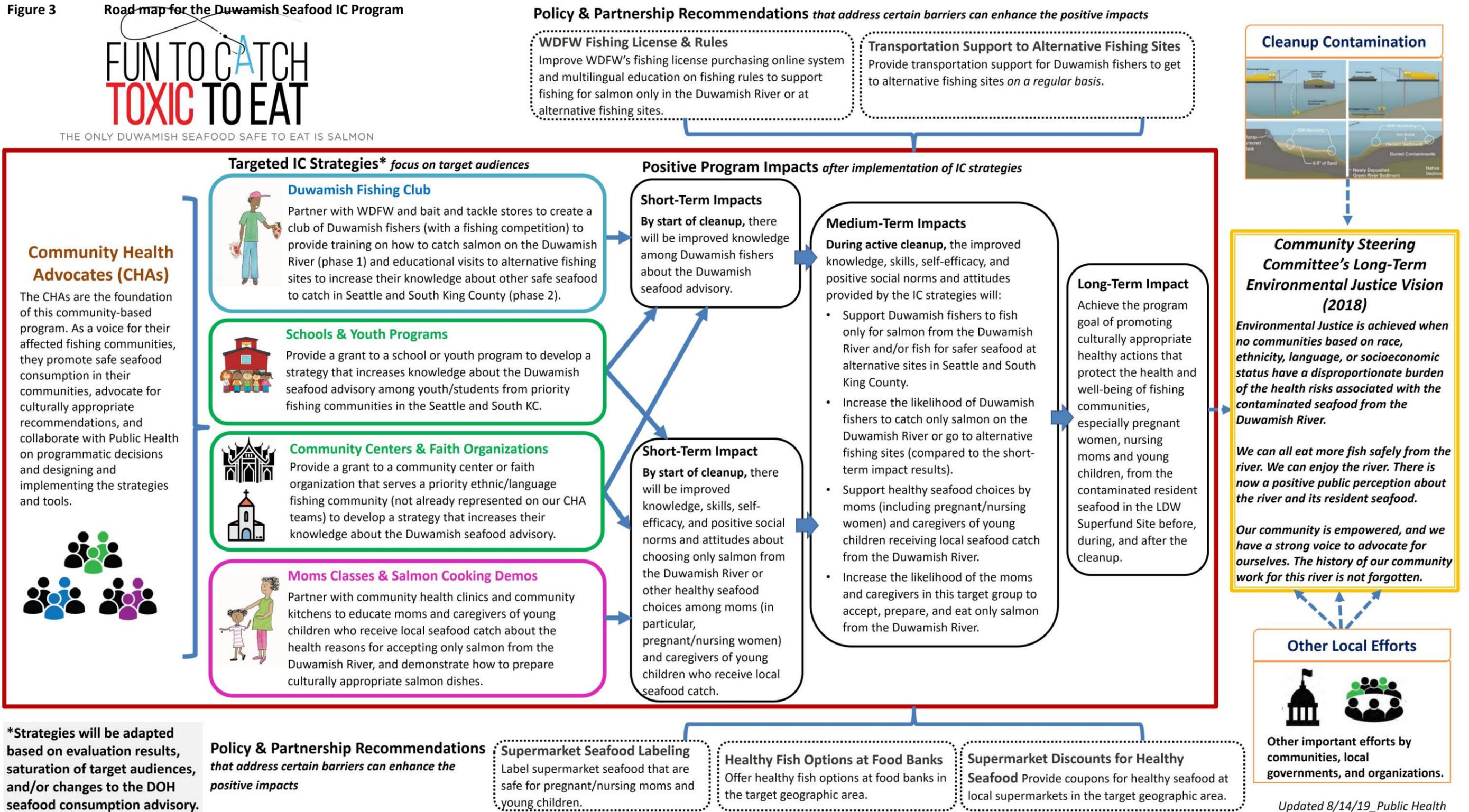


During the final CSC workshop in 2018, the CSC pulled together the components of the plan that they had developed over the past five workshops into the “road map.” All three language groups came up with similar road maps, with a few differences (as noted in the report).

Figure 3 Road map for the Duwamish Seafood IC Program

FUN TO CATCH TOXIC TO EAT

THE ONLY DUWAMISH SEAFOOD SAFE TO EAT IS SALMON



3.4 Multi-Level Health Promotion Approach

A person’s health is influenced by many external factors, sometimes beyond the control of the individual. Such factors—also called the social determinants of health—are the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life (such as economic policies and systems, social norms, social policies, and political systems). For more information on social determinants of health, see World Health Organization (https://www.who.int/social_determinants/en/) and U.S. Department of Health and Human Services (<https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health>).

To holistically address a public health problem, the program must work across multiple levels:

- Individual level to increase awareness, knowledge, and skills
- Interpersonal level or community networks to create social norms, supportive peer-networks, and collective action
- Institutions, systems, and policies through which agencies and organizations with resources and authority can help tackle “upstream barriers” to healthy seafood consumption practices that are outside the control of the most impacted fishing communities of the LDW Superfund site

Focusing only on changing individual behaviors, without addressing these higher-level upstream factors—and the root causes of the pollution problem—places an unfair burden on people who did not cause the pollution, which is an environmental injustice.

Tengland (2012) cites that a behavior change model that does not sufficiently respect the right to autonomy of the individuals involved may risk increasing health inequalities.

NEJAC (2002) states that “with risk avoidance strategies such as fish consumption advisories, the responsibility for addressing environmental contamination and its harmful human health effects is allocated to those who are made to bear the risks of contamination rather than to the sources of that contamination. Furthermore, because risk avoidance strategies place this responsibility on those who are exposed to environmental toxic chemicals, they will necessarily impose a greater burden on communities of color, low-income communities, tribes, and other indigenous peoples. As has been amply demonstrated, it is members of these groups who are among the most exposed.”

To support the program’s overall goal and further protect the health of the most at risk, this program will encourage partnerships with government agencies and relevant organizations (e.g., food banks, supermarkets, nonprofits) to address the additional barriers to fishing at alternative sites or obtaining healthy seafood options at the supermarkets or food banks.

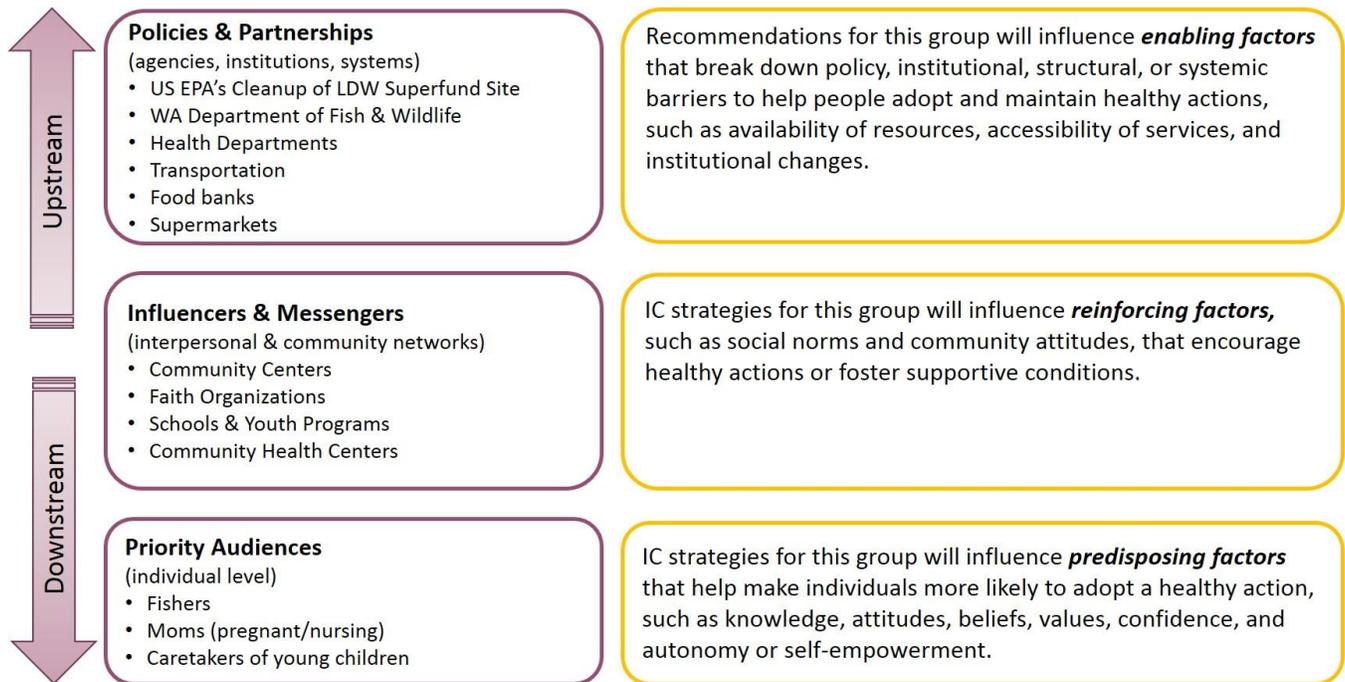
Public Health uses the following theories and planning models as a basis for the road map, designing the IC-targeted strategies, community participatory approach, and evaluating outcomes and impacts:

- **Socio-Ecological Model** accounts for the interrelationship between the individual and the social determinants of health. This is a systems model with multiple bands of influence. At the core of the model is the individual, surrounded by four bands of influence: interpersonal, organizational, community, and policy. Public health programs will implement public health activities at these five levels to maximize synergies of intervention for the greatest impact. For more information, see <https://www.cdc.gov/cancer/nbccedp/sem.htm>.
- **Integrative Model of Behavior Change** (Fishbein & Yzer, 2003) can be used as a guide for designing strategies around the needs of priority groups. This model considers (1) a person’s attitudes, social norms, and confidence in the behavior (self-efficacy); (2) the person’s intention to engage in the behavior; (3) whether the person has the skills to perform the behavior; and (4) whether there are environmental constraints or barriers to performing the behavior.
- **Collective Action Model** (Lavery, S.H., Smith, M.L., Esparza, A.A., Hrushow, A., Moore, M., & Reed, D.F., 2005) is a community-based participatory process that fosters community empowerment, which requires people individually and collectively to acquire capacity (knowledge, understanding, skills, and commitment) to improve the social determinants of health that have a powerful influence on people’s health status.
- **Critical Health Literacy** (Mogford, Gould, & DeVoght, 2010) refers to an individual’s understanding of the social determinants of health combined with building the skills and aligning with the person’s “compass,” or passion, which can lead to acting on an issue that addresses the “upstream” factors that affect health equity.
- **Community-Based Social Marketing** (Lee & Kotler, 2012; McKenzie-Mohr, 2011) is a planning framework that integrates planning models and behavioral research from marketing, health, environment, and social psychology. The framework provides steps for designing interventions (or strategies) to address barriers to healthy actions. It uses the following five social marketing principles (known as the five P’s), which the 2018 CSC applied to detail out some of the targeted IC strategies in Section 5.0:
 - Product—tangible goods and services
 - Price—monetary or non-monetary incentives
 - Place—when/where to perform behavior, acquire goods, or receive services
 - Promotion—messaging: what, who, how, where
 - Policy—upstream policy and institutional/system changes that will require partnerships with relevant agencies or organizations to address additional barriers

Figure 4 illustrates Public Health’s multi-level health promotion framework for addressing different factors that together can increase the likelihood of achieving health protection for Duwamish fishing communities. The ICIAP combines strategies tailored to promote healthy actions at the individual and community network levels with recommendations on policies and partnerships that can help improve access to healthy seafood options for fishing communities with the greatest barriers. As part of the community participatory process, Public Health

will partner with the CHAs and relevant organizations/agencies to implement the IC strategies and further inform the recommendations.

Figure 4 Multi-level health promotion approach



3.5 Target Audiences and Partnerships

One size does not fit all when it comes to developing strategies and tools to protect the health of historically marginalized and underserved communities. The seafood advisory signs posted along the Duwamish River have not been effective in *reaching everyone*, particularly immigrant/refugee fishers who speak little to no English.

This ICIAP identifies targeted IC strategies to reach the high-priority fishing communities who are more likely to catch, eat, and share the contaminated seafood, as well as strategic recommendations for agencies and organizations to address additional barriers (such as transportation barriers to alternative fishing sites or financial barriers to healthy seafood options at supermarkets).

The 2018 CSC identified and prioritized the specific target audiences and partnerships for the program (see

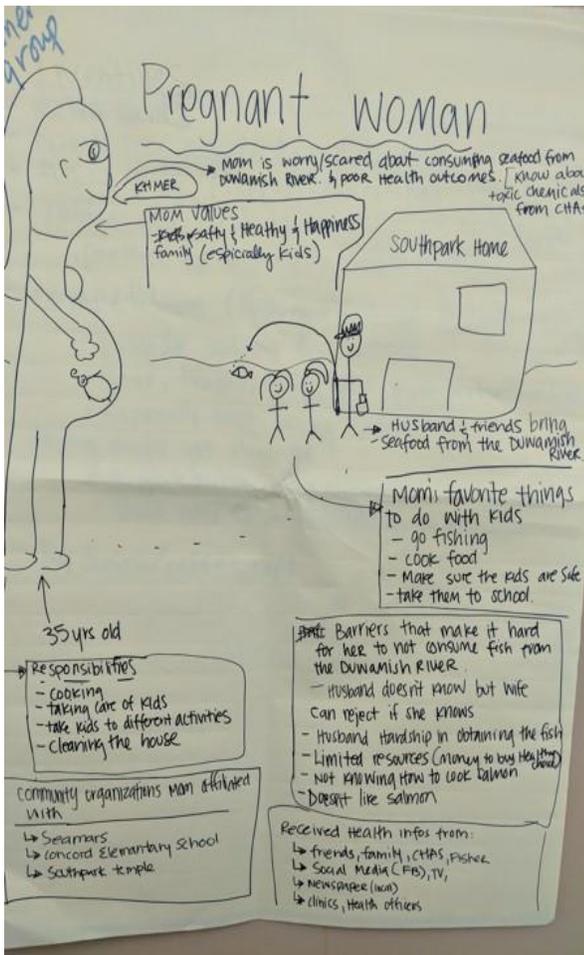
Figure 4). There are three levels of audiences, from the individual person whom the healthy action is meant to benefit, the community or household member who can help influence that individual person to adopt the healthy action, and the decision makers who work in agencies and organizations that can help address additional barriers to the healthy actions:

- 1. Priority Audiences (individual level):** Refers to those who are the most critical for the program to reach. The priority audience is not always the group most affected by the health issue. For this program, fishers and moms who receive local catch are our priority audiences. Their individual actions can influence the health of the group most sensitive to PCBs: fetuses, babies, and young children.
- 2. Messengers and Influencers (interpersonal and community networks):** Refers to people and trusted community-based organizations who have the most significant and direct influence on the fishers and moms. These include members of the local fishers' and moms' interpersonal or community networks, who are essential partners for health promotion activities.
- 3. Policies & Partnerships (agencies, institutions, and systems):** Refers to partnerships with decision makers at agencies and organizations with resources or authority to address additional barriers to safe seafood consumption practices. To truly eliminate health disparity, the policies, institutions, and systems that allow inequity to occur must be changed. Multi-sector community collaboration is required to create changes that make healthier lifestyle choices an easy and feasible option for every member of the community. For more information on these concepts, see https://smhs.gwu.edu/cancercontroltap/sites/cancercontroltap/files/PSE_Resource_Guide_FINAL_05.15.15.pdf.

3.5.1 Priority Audiences: Fishers and Moms

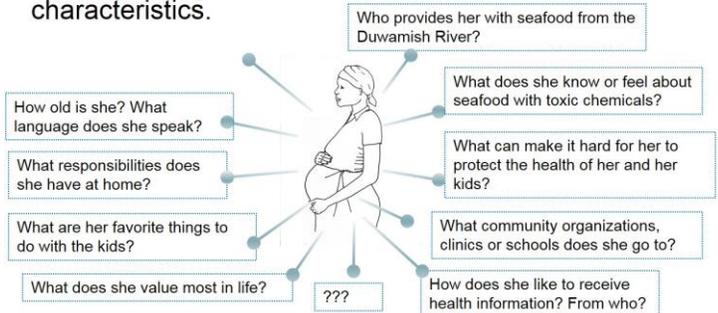
IC strategies are best tailored to the priority audiences to be culturally appropriate and effective. The highest-priority audiences are the fishers, pregnant/nursing moms, and young children who consume seafood from the Duwamish River.

Public Health reviewed the LDW Fishers Study findings to better understand the primary audiences' values, beliefs, and barriers, and captured additional input from CHAs during the trainings and CSC meetings. Table 1 and Table 2 summarize the audience profiles for fishers and moms. Strategies focused on youth are discussed in Section 3.5.2.



Small Group Activity

What's her story? Write or draw symbols for these characteristics.



The CSC developed profiles of a mom who is most likely to receive and prepare contaminated seafood from the LDW. This type of information helps to tailor the strategies and messages to reach the target audience.

Table 1 Audience profile of fishers who catch seafood from LDW. Sources: LDW Fishers Study and CHAs’ input.

Fisher Audience Profile
<p>Demographics</p> <ul style="list-style-type: none"> • There are more than 20 ethnic/language groups fishing along the LDW. Fishers who catch and eat the LDW resident seafood are primarily from Asian, Pacific Islander, or multiracial groups. Those who are least likely to be aware of the Duwamish seafood advisory are fishers with limited English proficiency or non-English speakers (mostly Vietnamese, Spanish, Khmer).^a • Most fishers are males between 30 and 50 years old.^a • Most fishers who catch the LDW resident seafood live in South/West Seattle and areas south of Seattle.^a
<p>Values, Beliefs & Practices</p> <ul style="list-style-type: none"> • Chemical risks did not appear to be well understood without visible evidence. Risks needed to be directly observed to be believed.^{a,b} • Sharing fish caught with family, friends, and neighbors (including elders and moms) is a cultural practice.^{a,b} • LDW fishers primarily go fishing for recreation and social interaction. Secondarily, they fish to obtain fish to eat. Fishing is an important source of stress reduction.^{a,b} • Groups of fishers enjoy competing with one another for the first or biggest catch. Fishing can consume all their attention when they are fishing—it can be “addictive.”^b • Fishing is an important family activity and seen by many as a cultural practice passed down from generation to generation, while adapting skills and knowledge to the fishing environment.^b • Fishers describe the Duwamish River as a good spot to fish that is close and convenient.^a • The convenience and accessibility of fish and seafood from the Duwamish River can outweigh concerns about the risks of contamination.^b
<p>Barriers</p> <ul style="list-style-type: none"> • There is a general low level of awareness of the Duwamish seafood advisory, particularly about the health risks and who is most sensitive to PCBs.^{a,b} • LDW fishers identified that the main challenges with fishing elsewhere are lack of time and lack of transportation.^{a,b} • LDW fishers identified that the main challenges with catching salmon on LDW are not knowing how to catch salmon, not knowing the fishing rules related to salmon on the LDW, and the cost of a license.^{a,b} <p>^aLDW Fishers Study ^bInput from CHAs during trainings and CSC meetings in 2018</p>

Table 2 Audience profile of moms who prepare seafood from LDW. Sources: LDW Fishers Study and CHAs' input.

Moms Audience Profile
<p>Demographics</p> <ul style="list-style-type: none"> • Moms who receive and prepare seafood from LDW are from the same priority ethnic/racial groups as the most at-risk fishers. They also prefer to speak a non-English language.^{a,b} • Moms in the target audience are pregnant or nursing or have children under 6 years old. The moms themselves are most likely under 40 years old.^b • While the focus is on moms, it is important also to include other family caregivers of young children (e.g., fathers, grandparents, aunts, and uncles).^b
<p>Values, Beliefs, and Practices</p> <ul style="list-style-type: none"> • Fish is viewed as a healthy food (healthier than meat) and wild-caught fish is seen as fresher than store-bought fish.^{a,b} • Showing gratitude for the fish received from a spouse or friend/neighbor is a common courtesy and “it can appear rude and disrespectful of the fisher’s effort if one declines a fish.”^b • Moms prioritize the health of their babies, children, and family (including making health and meal decisions for the household).^b • There is a belief that “you can cook off the chemical contamination in the seafood, similar to killing bacteria and viruses in seafood.”^b • Moms enjoy spending time with their children at parks, schools, community centers, faith organizations, libraries, and other community gathering spaces.^b • Pregnant and nursing moms will access community health clinics (such as WIC and lactation programs).^b
<p>Barriers</p> <ul style="list-style-type: none"> • Moms identified the main challenges with eating only salmon on LDW: lack of knowledge about the health issue, and not knowing culturally appropriate recipes that steam, bake, or grill skinless fillets of fish to minimize exposure to PCBs.^b • Moms identified the main challenges with declining to eat seafood from the LDW: not able to afford a healthy seafood option at the supermarket; not knowing which seafood at the supermarket is safe for pregnant/nursing moms and young children; not having a credible source of information to explain the reason for declining the seafood; and the cultural value of accepting a gift and not wasting food.^b • Moms identified challenges with consuming only skinless fillets of salmon or avoiding eating crab guts: they find cultural value in preparing seafood using traditional recipes and cooking methods, which helps them maintain a connection to their ethnic heritage across generations.^{a,b}
<p>^aLDW Fishers Study</p> <p>^bInput from CHAs during trainings and CSC meetings in 2018</p>

3.5.2 Influencers and Messengers

The 2018 CSC identified important influencers and messengers that have direct ties to LDW fishers and moms. They fall under the following categories in order of influence:

1. Youth and Students—primarily those who come from fishing households.
2. Community Centers—specifically serving the priority ethnic/language fishing communities of LDW.
3. Faith Organizations—specifically serving the priority ethnic/language fishing communities of LDW.
4. Clinics or Community Health Centers—WIC, maternal child health, nutritional programs, and others.

Libraries were mentioned as a good place to post outreach materials to reach moms. Family, relatives, and friends are important influencers and messengers and are currently a focus of the CHAs’ outreach.

Table 3 lists examples provided by the 2018 CSC, reflective of some of the groups and places that reach the Cambodian, Vietnamese, and Latino communities.

Media sources are influential on a broad scale and are discussed specifically in the Communications Strategy (Section 5.7). Agencies also have broad influence and are discussed specifically as part of recommendations for Policies and Partnerships (Sections 3.3.5 and 5.6).

Table 3 Examples of influencers and messengers in the communities.

Schools & Youth Programs	Community Centers	Faith Organizations (Temples/Churches)	Clinics
<p>Examples:</p> <ul style="list-style-type: none"> • Concord Elementary • Cleveland High School • Chief Sealth High School • After-school clubs • Van Lang Vietnamese class • PTA 	<p>Examples:</p> <ul style="list-style-type: none"> • SPIARC (South Park Info and Resources Center) • Ba Mien market on MLK • Community Fisher Group • Khmer Community of White Center 	<p>Examples:</p> <ul style="list-style-type: none"> • Holy Family (Sagrada Familia) Church • Khmer Temple in South Park • Co Lam temple • Vietnamese Martyrs Parish in Tukwila 	<p>Examples:</p> <ul style="list-style-type: none"> • NeighborCare (serves Khmer & many other communities) • SeaMar

3.5.3 Policies & Partnerships

As the 2018 CSC was developing the targeted IC strategies, they highlighted institutional, structural, or systemic barriers that are beyond the control of a fisher or mom. These are reflected in the policy and partnership recommendations in Figure 1 and Section 5.6.

Specifically, these partnerships with agencies or organizations can help address additional barriers to alternative fishing sites (e.g., transportation support), salmon fishing on the LDW (e.g., the Washington Department of Fish and Wildlife [WDFW] fishing licenses and rules), and other healthy seafood options (e.g., food banks and seafood supermarkets).

Policy and partnership recommendations fall outside the scope of the EPA Duwamish Seafood Consumption IC Program. The EPA convenes the Healthy Seafood Consumption Consortium (HSCC), which engages with agencies and organizations as one forum for partnering with other parties to address ideas that are beyond the scope of the EPA’s Duwamish Seafood Consumption IC Program.



The CSC created the “road map” and discussed with each other how they believe their proposed strategies can achieve programmatic impacts that contribute to their long-term environmental justice vision—as well as how the policy and partnership recommendations relate to these impacts.

4.0 Community Participatory Process for the Duwamish Seafood Consumption IC Program

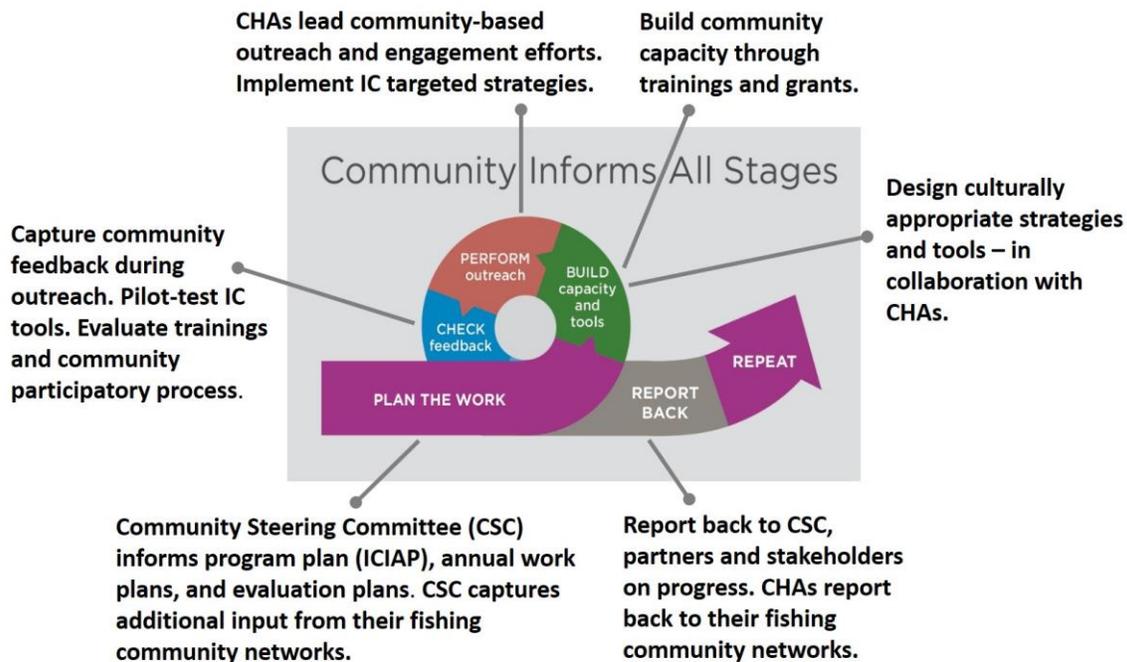
This program addresses the environmental justice impacts related to seafood consumption at the LDW Superfund site and ensures that ICs are designed using a community participatory approach that reflects the interrelated principles of **capacity-building, meaningful involvement,** and **empowerment.** The program’s specific approaches based on these environmental justice principles are described below.

The EPA’s overall goal for the Duwamish Seafood IC Program is to promote culturally appropriate, healthy actions that protect the health and well-being of fishing communities, especially pregnant women, nursing moms, and young children, from contaminated resident seafood in the LDW Superfund site before, during, and after the cleanup.

Reflective of a community participatory process, this program will require flexibility and continuous feedback to adapt to community input during program design, implementation, monitoring, and evaluation.

The stages of the community participatory process are summarized in Figure 5. The figure shows that the process has a loop-back mechanism that repeats over time across different stages of the work.

Figure 5 Community participatory process for the Duwamish Seafood Consumption IC Program.



4.1 Capacity Building

NEJAC (2002) states: “[T]here are functions that advisories could usefully serve but that the typical advisory does not attempt to serve, e.g., capacity-building or empowerment in the affected group.... The fourth function that advisories might serve—capacity-building and empowerment—are [sic] important to securing environmental justice.”

Building or enhancing the capacity of community members to be program partners is needed to build a sustainable foundation for the program work. Capacity can take the form of knowledge, skills, and self-empowerment to act. Capacity cannot lie solely within one agency, since no single agency can replicate the inroads, trust, and expertise that exist within the communities themselves. Capacity building enhances meaningful involvement (Section 4.1). With more knowledge and experience around a topic, community members can actively engage in the program work. Furthermore, involving those affected by a given problem increases their collective ability to find solutions.

This program emphasizes capacity-building among community members and community-based organizations.

- **CHA Training and Outreach Strategy** is focused on building the capacity of community members who represent and/or are connected to the priority fishing communities of the Duwamish River. The CHAs and their facilitators lead community-based outreach work, inform program planning and tools development, and advocate for community recommendations in agency decision-making processes (see Section 5.1).
- **Public Health’s Grant-Making Process** will provide grants to build the capacity of community-based organizations to be sustainable partners. In 2018, the CSC prioritized community centers, faith organizations, schools, and youth programs as valuable influencers and messengers for the program. In 2019, Public Health will initiate the first grant-making process to select a community-based organization to develop and implement an IC strategy, including IC tools and activities (see Section 5.4).

Public Health provides opportunities for capacity building that include formal training, agency expert panel workshops, and ongoing technical assistance from staff. Likewise, CHAs and community partner grantees bring expert knowledge about their culture, fishing practices, and community that informs the development of the program itself.

The following are ways that Public Health and its community partners currently support capacity-building of CHAs and their facilitators:

- Hire and train community members who represent and/or are connected to priority fishing communities to become CHAs (see Section 5.1).
- Coordinate and conduct training workshops for facilitators and CHAs (if needed) to increase relevant knowledge and skills related to the program work.

- Foster opportunities to build skills that enhance CHAs' success in their role and align with their personal interests and program goals (e.g., leadership, public speaking, collecting community feedback, and outreach planning).

The following are ways that Public Health currently supports capacity building of community-based organizations:

- Provide technical assistance to grantees regarding design, implementation, and evaluation of their projects to ensure that they align with program goals.
- Provide background training to key staff of new grantees.
- Provide technical assistance to grantees to ensure that they know how to manage their contract agreements per the Cooperative Agreement and federal grant requirements.

Attending this training in this project, I have learned so much, I feel ... I have been given the powerful swords by the King!"

—Cambodian CHA, 2018

A Khmer idiom describes an empowered, authoritative, or influential person as having been "given the sword by the King."

4.2 Meaningful Involvement

NEJAC (2002) states: “Involvement by those affected at each point in the risk communication process would go far toward enabling them to shape the process so that it is not only relevant and appropriate, but also useful and empowering from the perspective of the community or tribe.”

Meaningful involvement is the mutual learning and collaborative process by which both community and agencies can work together toward the program goal and objectives. Each partner brings to the table unique expertise that collectively informs programmatic decisions.

In this program, Public Health centers the community voices of those who are most affected by contaminated seafood at the LDW Superfund site. CHAs and other community representatives (fishers, moms, and people who eat local seafood) bring expert knowledge about their cultures, fishing practices, and community. Their ideas and input guide programmatic work and inform agency decisions at multiple levels:

- *On the ground:* CHAs lead their own community outreach efforts to meet the program goal and strategic objectives. While engaging with their communities, they capture additional feedback and recommendations to share with Public Health, the EPA, and other stakeholders.
- *Program design:* CHAs collaborate with Public Health and its consultants to design IC tools, from the conceptual stage to content development to the broader community pilot-testing stage. They help ensure that the tools will be useful to and resonate with the program’s target audiences.
- *Program guidance:* CHAs as part of the CSC will help monitor the progress of the program’s implementation before, during, and after the cleanup. The CSC and Public Health will review the evaluation findings to identify recommendations for changes to the ICIAP over time.

Overall, a community participatory process is meaningful only if community input is captured in a timely manner that helps to inform certain decisions, products, or actions by Public Health, the EPA, or other agencies. Thus, a key objective for meaningful involvement is to support CHAs in empowering themselves to influence IC programmatic decisions and relevant policy recommendations toward protecting the health of their fishing communities from contaminated LDW seafood.

The program has three areas that CHAs and community partner grantees can meaningfully inform and participate in:

- **The CSC** serves as Public Health’s community advisory group to provide input on ways to adaptively manage the program, including reprioritizing efforts as needed based on community feedback and evaluation results. Established in 2018 with some CHAs and their facilitators to develop the initial ICIAP, the CSC will evolve over time to include additional community members from other priority ethnic fishing communities.

The EPA will be involved in the CSC workshops to ensure that updates on the cleanup process and decisions made by the EPA related to the program work are shared in a timely manner. In addition, the

CSC can engage with Public Health’s grantees and other implementing partners to share lessons learned from each other’s work. Furthermore, CSC members can coordinate around collective actions to advance the IC strategies and recommendations. Public Health will also report on evaluation results to the CSC to adaptively manage and reprioritize (if needed) the program’s work.

- **Design of IC tools and activities** (see Section 5.0) must involve those whom the program is trying to reach with the tools. Such involvement is a best practice. Public Health defines IC tools as products that can support healthy actions and are not simply informational materials. Ideas for tools originate from the community, including the CHAs. When designing a program tool, Public Health begins by consulting with CHAs to capture, at a high level, the messaging or design elements that are important to include. Before finalizing a robust new tool, Public Health may carry out a pilot-testing phase among community



Fishers from our CHA teams worked with Public Health and the graphic designer on ways to improve the old guide on advisories in King County (August 23, 2018). Public Health revised the guide based on their input and pilot-tested the new version with fishers who read English, Spanish, Vietnamese, or Khmer.

members who represent the target audience. All tools will be available in multiple languages. The EPA has final review and approval of program tools.

- **The EPA’s Duwamish Healthy Seafood Consumption Consortium (HSCC or Fishers Consortium)** brings together agencies, organizations, and the CHAs to discuss and collaborate on efforts that promote healthy seafood consumption in the fishing community. It is a venue in which the CHAs can directly

engage with stakeholders that may help address their community recommendations, particularly those that fall outside the scope of the EPA's program.

Examples of follow-up actions and tools developed in response to community recommendations identified in the HSCC from 2017 to 2018 (prior to the CSC process) include program logo/brand identity; website; digital story videos; videos on Duwamish fishing rules and health (in partnership with WDFW and University of Washington); boat tour collaborations with Duwamish River Cleanup Coalition, Port of Seattle, and LDWG; an expert panel workshop on supermarket seafood with DOH and the Public Health seafood inspector; an expert panel source control workshop with Ecology's LDW Source Control Workgroup; and an expert panel workshop on the cleanup with EPA staff.



The EPA's Healthy Seafood Consumption Consortium (June 6, 2018).

- **Public Health's grant-making process** will provide opportunities for CHAs or CSC members to participate in reviewing funding applications submitted in response to Public Health's grant-making processes (such as a Request for Proposal (RFP) or Request for Application (RFA)). Public Health recently completed an RFA process in late 2018 for a community-based organization to manage the Latino CHA team. The team helped to review the written applications and interview the candidates (including

developing interview questions and scoring the candidates). A similar team will be assembled to select community partners to implement the IC strategies.

All of the processes, they [Public Health] have always included us in the process. They make us feel important, we are united, and it's always been that way—they ask us to be part of everything, every step. We are making history, since it's not seen elsewhere. Normally, a decision is made in an office and that is it, but not here. They've included us, since we are the community—kind of like for the community, by the community.

—Latino CHA, 2018, shared with a candidate for Public Health's RFA

4.3 Empowerment

NEJAC (2002) states, in reference to a community-based project located near hundreds of industrial sites and toxic hazards in California: “It is crucial that those affected play central roles in developing and disseminating the information that they deem appropriate to their needs. Such efforts—led by those in the community and supported by the EPA and other agencies—can contribute to the larger goals of what the Laotian Organizing Project calls ‘participatory learning and culturally-appropriate organizing.’ The EPA and other agencies should view this as an opportunity to work with communities on the ground as they work to empower themselves.”

Popularized by Paulo Freire, the concept of empowerment does not mean giving power or taking it away. Rather, it is about one's own capacity to think critically and make autonomous, informed decisions—i.e., one's ability to act versus one's willingness to be compliant with authorities (Anderson and Funnell, 2010).

The IC program is designed to promote empowerment as both a process and an outcome. Through meaningful involvement, the IC program supports the self-empowerment of community members who are CHAs and/or CSC members for the program.

Empowerment as a process relates to capacity building and meaningful involvement of the CHAs and community partners in helping to guide the EPA's IC program work to be effective and appropriate in promoting healthy seafood consumption within their communities. When affected people take ownership of helping to design solutions and implement certain actions, their communities cease to be “victims” of the problem and become “partners” in the solutions. This empowerment approach fully respects the participating individuals' right to self-determination (Tengland, 2012).

Empowerment is also an outcome resulting from the IC program, because of the capacity (knowledge, skills, and confidence) that CHAs develop. This capacity helps them protect their own health and that of their communities by making informed decisions about seafood consumption within the LDW Superfund site. The CHAs impart their knowledge through community outreach, and also provide community recommendations to decision makers from agencies and organizations involved in protecting the health of fishing communities.

I feel very fortunate to be able to join this CSC group. I feel that I am being valued to be able to express and make decisions around the subject that matter to human life. I am valued and my voice is being heard—to make decisions and inputs to protect people’s health around contaminations in the Duwamish. Being here at CSC, we provide the inputs, strategies, and tools to reach out to most affected groups, to have a plan to help protect their health. We create strategies, tools, and plans for fishers to have healthy alternatives to help protect their families’ health. At CSC, we are being empowered to be power in the communities.

—Cambodian CSC member, 2018

We are all here for the same reason/purpose: to bring our community a voice, to figure out ways to reach out to our community and give them other options. We want to inform them and empower them, but at the same time they empower us. I’m beyond happy that we are all here and that we have come together. I appreciate all the work we have done and it’s amazing to see how far we’ve come together as one team, not three.

—Latino CSC member, 2018

5.0 Key IC Elements: Objectives, Strategies, and Tools

This section describes the planned and implemented IC strategies and tools to help reach the program’s goal of promoting culturally appropriate, healthy actions that protect the health and well-being of fishing communities, especially pregnant women, nursing moms, and young children, from contaminated seafood in the LDW Superfund site before, during, and after the cleanup. This section also lists policy and partnership recommendations that are beyond the scope of this program but are important to achieving the program’s goal.

The section is organized by (1) targeted IC strategies (for CHAs, fishers, moms, influencers, and messengers); (2) policy and partnership recommendations (for agencies and institutions); and (3) communications strategy (for priority ethnic/language groups—see



Training of the Vietnamese CHA team by Kevin Duong of ECOSS in 2018.

Figure 4). Each targeted IC strategy has an objective that aligns with the overarching IC programmatic goal as well as specific measurable outcomes on which to evaluate its effectiveness. These elements are summarized in the various logic model tables; see Table 5–7.

To date, the CSC has identified social marketing elements (the first “four P’s”) for IC strategies targeted toward fishers and moms (see Section 3.0). The CSC’s ideas for the “fifth P or policy” of the social marketing elements are captured in the policy and partnership recommendations (outside the scope of the EPA’s program). Other IC strategies within the scope of the program will be designed in partnership with Public Health’s grantees. Additionally, this section includes a list summarizing the existing or recommended tools. However, for descriptions and status of the IC tool, see Appendix C. Note that more tools may be developed in the future as other ethnic groups that are fishers are targeted and that these will be documented in Public Health’s annual work plans or future updates to the ICIAP.

5.1 Community Health Advocate (CHA) Training and Outreach Strategy

CHA Objective —To build the capacity of community members from priority LDW fishing communities to raise awareness and promote culturally appropriate, healthy seafood consumption actions.

CHA Strategy —Public Health will implement a community-informed, culturally appropriate training curriculum and provide technical support to help CHAs gain capacity to reach out about healthy actions that protect themselves and their fishing communities, especially pregnant women, nursing moms, and young children, from the contaminated seafood in the LDW Superfund site before, during, and after the cleanup.

The program’s CHAs are community members who represent fishers, moms, and people who eat local seafood catch. They also belong to the priority ethnic/language groups identified in the LDW Fishers Study. Currently, Public Health have trained three teams of CHAs (Cambodian, Vietnamese, and Latino).

The CHAs are valuable in helping to promote safe seafood consumption in their communities, especially since, according to the LDW Fishers Study, word of mouth is one of the key avenues for fishers to learn about issues related to fishing. In addition, the CHAs bring community recommendations and cultural expertise to program design and planning (including developing IC tools and the ICIAP). This is part of their roles as CHAs, CSC members, and/or participants in the EPA’s HSCC.

At the start of this program from 2017 to 2018, Public Health collaborated with Just Health Action (JHA) and Environmental Coalition of South Seattle (ECOSS) to develop and pilot a CHA training curriculum. On June 22, 2018, on behalf of the EPA, Public Health and JHA completed the first version of *US EPA’s Duwamish Seafood Consumption Institutional Controls Program: Community Health Advocate Training Curriculum* (Gould, Ho & Lee, 2018).

The CHA training and outreach strategy is modeled after the Community Health Worker/Promotor Model (Latino Health Access, Visión y Compromiso, & Esperanza Community Housing Corporation, 2011), in which peer health workers reach out to communities that historically face barriers to accessing resources and services. The trainings build upon the CHAs’ strengths, cultural expertise, and self-empowerment, while increasing their capacity (knowledge and skills) to take actions based on JHA’s Critical Health Literacy model (Mogford, Gould & DeVoght, 2010).

On behalf of the EPA, Public Health has managed the CHA training and outreach efforts as a foundational component of the program prior to and throughout the ICIAP development. Methods for evaluating the CHA objectives and strategies relative to the overall programmatic goal are discussed further in Section 6.2.1. See Appendix B for the preliminary evaluation plan for the CHA strategy developed in 2018.

Current status: To date, the program has trained 23 Cambodian, Latino, and Vietnamese CHAs, representing some of the fishing communities that are most likely to eat seafood from the Duwamish River (as identified in the LDW Fishers Study). Each group has a lead bilingual facilitator who collaborates with Public Health to provide support and coaching to the CHAs. For information about recruitment criteria and roles and responsibilities of the CHAs, please see Chapter 3 of the CHA training curriculum (Gould, Ho & Lee, 2018).



The CHAs engage and build relationships with EPA staff, Public Health staff, and each other during the CSC meetings. The meetings were conducted simultaneously in English, Spanish, Vietnamese, and Khmer.

5.2 Duwamish Fishing Club Strategy

Fisher Objective—To increase knowledge, skills, self-efficacy, and positive social norms and attitudes among Duwamish fishers around fishing only for salmon on the Duwamish River (phase 1); and fishing for other, safer seafood at alternative sites in Seattle and South King County (phase 2).

Fisher Strategy—Public Health and the CHAs will partner with WDFW and bait and tackle stores to create a club of Duwamish fishers (with a fishing competition) to provide training on how to catch salmon on the Duwamish River (phase 1) and educational visits to alternative fishing sites to increase their knowledge about other safe seafood to catch in Seattle and South King County (phase 2).

The description of this fisher strategy is based on input provided during the CSC meetings in 2018 and then in a follow-up discussion with the CSC on May 18, 2019. The CSC identified forming a fishing club with Duwamish fishers who primarily catch resident seafood as a strategy to promote safe seafood consumption by:

1. Teaching fishers about salmon fishing on the Duwamish River during salmon season (phase 1).
2. Providing educational visits to alternative fishing sites in King County’s Puget Sound during non-salmon season (phase 2).

The CSC shared a number of key observations that contributed to the development of this strategy. Most notably, catching resident species (such as flounder and sole) on the Duwamish River is much easier than catching salmon because of the year-round availability of the resident seafood and the different techniques and gear needed for salmon fishing. WDFW salmon fishing regulations on the Duwamish River are not readily understood, and transportation is a barrier for some fishers to accessing alternative fishing sites. Furthermore, among the Duwamish fishing community, risk perception is generally based on visual signs of water pollution or spoilage in the fish. The current social norm is to dismiss health concerns unless these visual signs are present (as reported in the EPA’s LDW Fishers Study).

CSC members also shared that they like to go fishing in groups for the social interaction (similar to the findings from the EPA’s LDW Fishers Study). They also like to compete with each other to determine who caught the biggest fish or who caught the first fish.

The fishing club as a targeted IC strategy will involve CHAs and other experts and use peer groups (fishers talking to fishers) in order to:

- Increase knowledge and awareness about the Duwamish seafood consumption advisory, fishing rules, and alternative fishing sites for safe seafood to catch and eat.
- Create positive social norms and attitudes around consuming only salmon from the Duwamish River and other safe seafood from alternative nearby fishing sites.

- Increase skills and self-efficacy (i.e., belief in one’s own ability) among the Duwamish fishers related to catching salmon on the Duwamish River.

During a follow-up discussion with the CSC in May 2019, they set priorities for the Duwamish fishing club, as follows: First, focus on providing salmon fishing classes or clinics on the Duwamish River (in phase 1), because Duwamish fishers are already familiar with the site. Furthermore, this will focus on the priority healthy action of the Duwamish seafood consumption advisory. Next, during phase 2, the club may provide educational visits to alternative Puget Sound fishing sites in King County with safer fish and crab to catch outside of salmon season.

The CSC proposed the following specific social marketing elements for the strategy, which Public Health will work with the CHAs and key partners to further refine after the initial approval of the ICIAP:

- 1. TARGET AUDIENCE:** The club will target Duwamish fishers who catch primarily resident seafood, but who want to learn how to catch salmon on the Duwamish River. See Table 1 in Section 3.5 for the audience profile of the Duwamish fishers.
- 2. PROMOTION:** Fisher CHAs will help recruit members to the club as part of an annual cohort according to the target audience criteria. Approximately 10 fishers per year is a manageable club size for one or two fisher CHAs to co-lead. The CSC identified the following recruitment channels:
 - Connect with fishers along the Duwamish River and other community locations where fishers are known to gather. It is important to have fisher CHAs help with recruitment, because they will know how to approach and talk with the other fishers.
 - Connect with other longtime fishers to have them share information about the club with their social network of fishers.
 - Connect with people who receive fish from the fishers, so they can reach out to the fishers they know.
 - Provide messaging to fishers through social media.
 - Post flyers about the club at bait and tackle shops, food banks, libraries, community centers, clinics, and other gathering places for the targeted fishing communities in Seattle and South King County.
- 3. PRODUCT:** Public Health and the CHAs will develop two structured activities for the club, which will be evaluated for effectiveness in meeting the strategy’s objective:
 - **Phase 1:** Salmon fishing classes and fishing clinics (along with a fishing competition) where CHAs and other experts will provide multilingual education about the Duwamish seafood consumption advisory, salmon fishing gear and techniques, and salmon fishing rules. The classes will focus on knowledge and skill-building around salmon fishing on the Duwamish River. They will likely be carried out in partnership with WDFW and/or sporting goods stores that have experts who can co-teach.
 - **Phase 2:** Educational visits (along with a fishing competition) at alternative fishing sites for club members who have completed Phase 1. Public Health’s *Go Fishing in King County: Seafood Safe to Catch and Eat* will serve as the basis for the educational lesson, which includes Duwamish health messages; how to identify alternative fishing sites with safe seafood to catch based on

the advisories; and tips on fishing rules. According to fishers in the CSC, Duwamish fishers will likely have the basic gear needed to fish in nearby Puget Sound sites.

4. PLACE: Location and timing of the club activities.

- Phase 1: A salmon fishing class could take place in a local bait and tackle store one to two months prior to salmon season, and then a fishing clinic for on-the-river instruction can be offered during salmon season.
- Phase 2: Educational visits to alternative sites will happen when salmon is *not* in season, at Puget Sound locations in Seattle and South King County identified in Public Health's *Go Fishing in King County: Seafood Safe to Catch and Eat* as having safe saltwater fish and crab. For example, the CSC suggested Lincoln Park, Seahurst Pier, Des Moines Pier, Redondo Pier, and Seattle's Shilshole Pier. The specific process and criteria for identifying alternative sites (and frequency of visits) for the club will be designed in partnership with the CSC and other CHA fishers and submitted to the EPA for review and approval.

5. PRICE: This social marketing element covers incentives that help address certain barriers, while motivating the fishers to adopt the healthy action.

A fishing competition will be employed as part of the club's salmon fishing clinic on the Duwamish River and educational visits to alternative fishing sites. Fishers are strongly motivated to compete, and will receive recognition in multiple ways if they win the competition. This can include posting a photo of the winner with their fish on websites and social media or at bait and tackle stores, a trophy, and a winner's T-shirt. The CSC recommended the following incentives for club participants, which the EPA has determined are likely within the scope of the IC program:

- Hats for participants that brand the club and include the Duwamish health message
- Waterproof fishing lanyards with Duwamish health message that can hold a fishing license and catch record card for participants
- Water bottles with Duwamish health message
- Winner's T-shirt with Duwamish health message
- Tackle box with the program's health message for the winner

Carpooling as transportation support to alternative fishing sites as part of the club's educational visits:

- The CSC discussed that the most feasible options are to carpool or meet at the site. They shared that carpooling is typically how informal fishing groups do it. A public bus is likely not the best option, because it is preferred that the group stay together, and the bus might stop far away from the fishing site, take a long time, or be late. In addition, fishers have a lot of gear, and carrying it on the bus can be challenging. The fisher CHAs believe that most fishers would prefer to take their own car or carpool.

Methods for evaluating the effectiveness of this fisher-targeted strategy relative to the overall programmatic goal are discussed further in Section 6.2.2.

Current status: Additional development and implementation planning will need to occur before all the social marketing elements of this strategy can be fully addressed. Public Health recognizes that funding by the EPA for

some elements of this strategy will be subject to the rules and regulations of the EPA's Cooperative Agreement and federal grant requirements and requires additional information to verify that it is within scope and appropriately tailored to support the purpose of the EPA's ICs for the LDW Superfund site. When adequate information is available to ensure that these elements can be supported by the EPA and are demonstrably necessary to achieve the EPA's Superfund IC program goals, an addendum to the ICIAP Report may be submitted to the EPA for its review and approval.

As described in Section 5.6 of this document, the following are determined to be outside the scope of the EPA's program and could be supported through partnerships outside of the program:

- transportation support (such as renting a van or mini-bus) to go to alternate fishing locations
- supplying fishing gear
- supplying pliers, because they are associated with compliance with WDFW fishing regulation requirements specific to barbless hooks—not with promotion of the health messaging
- supplying store cards to bait and tackle stores

Through evaluation of the strategies, if Public Health finds additional health barriers that cannot be addressed within the scope of the EPA's program, then Public Health may consider its broader health equity responsibilities per King County's equity and social justice ordinance to explore other programs or partnerships that could address these barriers.



The fishers' group of the CSC reviewed and discussed their ideas for IC strategies, including objectives, measurable outcomes, impacts, and policy and partnership recommendations (November 3, 2018).

5.2.1 Fisher-Targeted Tools

The following are existing tools developed specifically for fishers:

- King County's Guide for Fish Advisories (Public Health and CHAs redesigned and piloted with fishers in 2018)
- Fun to Catch, Toxic to Eat Program website with health information for moms and young children (www.kingcounty.gov/duwamish-fishing) See Section 5.7.2 for more information about Public Health's website.
- Duwamish Fishing Rules and Health Videos, Nos. 1–6 (partnership between Public Health, CHAs, WDFW and UW Superfund Research Center)

The following are recommended tools specific for fishers identified prior to the ICIAP:

- Digital story videos by fishers (created by CHAs)
- Kiosk with message board at Spokane Street Bridge on the Duwamish River (Public Health needs additional feedback from fishers on its potential usability and support in meeting program goal)
- Updated DOH Duwamish Fish Advisory Sign (led by DOH)
- WDFW smart app that integrates fishing rules and fish advisories (led by WDFW and DOH)

Several of these tools are or have been included in existing and past Work Plans for the Cooperative Agreement. Future tool development will be incorporated into Public Health's annual Work Plan submitted to the EPA. Public Health recognizes that funding by the EPA for proposed tools will be subject to the rules and regulations

of the EPA’s Cooperative Agreement and federal grant requirements. See Appendix C for descriptions and status on the latest tools.

5.3 Moms Classes and Salmon Cooking Demos

Moms and Caregivers Objective—To increase knowledge, skills, self-efficacy, and positive social norms and attitudes among moms and caregivers of young children who receive local seafood catch, encouraging them to accept only salmon from the Duwamish River and prepare culturally appropriate salmon dishes.

Moms and Caregivers Strategy—Public Health and the CHAs will partner with community health clinics and community kitchens to educate moms and caregivers of young children in classes (such as WIC, Maternal Support Services, nutrition, and lactation programs) about the health reasons for accepting only salmon from the Duwamish River, and advise them on preparing culturally appropriate salmon dishes.

The description of this moms and caregivers strategy is based on input during the CSC meetings in 2018 and then in a follow-up discussion with the CSC on May 18, 2019. The CSC identified educating moms (in particular pregnant/nursing moms) and caregivers of young children where they gather as a strategy to promote safe seafood consumption. Specifically to reach pregnant/nursing moms and caregivers of young children, the CSC identified community health clinics and community kitchens in South/West Seattle and South King County as key partners in this strategy to:

1. Teach about the contaminated seafood in the Duwamish River and promote ways to protect the health of their young children.
2. Provide a cooking demonstration on how to prepare culturally appropriate salmon dishes.

The CSC shared that when they receive local seafood catch from fishers who are their neighbors, friends, or family members, it can be perceived as rude to decline the gift or ask where it was caught. There’s also the cultural value of not letting any food go to waste. However, according to some moms whose husbands or partners fish in the Duwamish, fishers are primarily interested in fishing as an activity, and would not be disappointed if their families don’t eat the fish. One mom CHA explained: “Back in our home country, where there is not much food...it is a big trip for the fishers to go out fishing for the main purpose of bringing something home to eat. Here, the husbands go out fishing because they love it, and if I explained to them that the fish they caught from the Duwamish River is not safe for our young children, they will understand.”

The CSC also shared that moms may find it easier to decline a resident fish or crab from the Duwamish River if they can share with the fisher a credible source of information (such as a brochure) about the health concern. Also, they can talk with the fisher in a way that shows that they care for his health and that of his family.

When it comes to eating only salmon from the Duwamish River, the CSC shared that for some people in their community, salmon is not their preferred fish because of the taste, and also because they don't know how to prepare a culturally appropriate dish.

This targeted IC strategy will involve CHAs and partners from the community health clinics and community kitchens to encourage safe seafood consumption by:

- Increasing knowledge and awareness about the Duwamish seafood consumption advisory.
- Creating positive social norms and attitudes that support consumption of salmon from the Duwamish River.
- Increasing skills and self-efficacy (i.e., belief in one's own ability) around preparing culturally appropriate salmon dishes and declining resident seafood from the Duwamish River.

The CSC proposed the following specific social marketing elements for the strategy below, which Public Health will work with the CHAs and key partners to further refine after the initial approval of the ICIAP:

- 1. TARGET AUDIENCE:** Moms, in particular pregnant or nursing women and those with young children under 6 years old, who receive local seafood catch, are another primary target audience for the program. This is because their individual actions can influence the health of the group most sensitive to PCBs: fetuses, babies, and young children. While the following strategies are focused on moms, they can be expanded, as appropriate, to capture other family caregivers of young children. See Table 2 in Section 3.5 for the audience profile of the Duwamish fishers.
- 2. PROMOTION:** By partnering with community health clinics that have classes for pregnant/nursing moms and other caregivers of young children, we will reach one of our primary target audiences. Not everyone in an existing class will receive local catch—but they may know other moms who do. So class attendees could serve as messengers to help transfer knowledge and create new social norms and attitudes.
- 3. PRODUCT:** Public Health and the CHAs will develop the following activities (along with specific tools), which will be evaluated for effectiveness in meeting the strategy's objective:
 - Educational video focused on moms with the branded message of “healthy baby, healthy mom, happy dad/fisher”
 - Class presentation and discussion around Duwamish seafood advisory
 - Salmon cooking demonstration/workshop
 - Cookbook with culturally appropriate salmon dishes
- 4. PLACE:** The classes will be held at community health clinics as part of their existing programs (such as WIC, Maternal Support Services, nutrition, and lactation programs). If salmon cooking demos cannot be held in the classroom setting, they will be held later at a community kitchen.
- 5. PRICE:** This social marketing element covers incentives that help address certain barriers, while motivating moms or caregivers to take on the healthy action. The CSC recommended the following

incentives for class/workshop participants, which the EPA has determined are likely within the scope of the IC program:

- reusable shopping bags with Duwamish health message
- kids' water bottles with Duwamish health message
- kitchen towels with Duwamish health message
- steamer baskets for fish

Methods for evaluating the effectiveness of the moms-targeted strategy relative to the overall programmatic goal are discussed further in Section 6.2.3.

Current Status: The salmon cooking demos and salmon recipe cards as part of the CHAs' community outreach are part of the existing Work Plans under the Cooperative Agreement. As part of the upcoming Work Plan, Public Health and the CHAs will create an educational video for moms and design a class activity that fits within the existing health clinic programs. Furthermore, the CHAs will create additional culturally appropriate recipe cards to add to the cookbook.

Additional development and implementation planning will need to occur before all the social marketing elements of this strategy can be fully addressed. Public Health recognizes that funding by the EPA for some elements of this strategy will be subject to the rules and regulations of the EPA's Cooperative Agreement and federal grant requirements and requires additional information to verify that it is within scope and appropriately tailored to support the purpose of the EPA's ICs for the LDW Superfund site. When adequate information is available to ensure that this element can be supported by the EPA and is necessary for the purposes of achieving the EPA's Superfund IC program goals, an addendum to the ICIAP Report may be submitted to the EPA for its review and approval.

As described in Section 5.6 of this document, the following are outside the scope of the EPA's program and could be supported through partnerships outside of the program:

- store cards or coupons to buy fish at the supermarket
- transportation support for moms to the classes and workshops
- cooking tools (e.g., cutting boards, knife sharpeners for filleting salmon)
- child care at the events
- meals (other than light refreshments) at the events

Through evaluation of the strategies, if Public Health finds that additional health barriers cannot be addressed within the scope of the EPA’s program, then Public Health may consider its broader health equity responsibilities per King County’s equity and social justice ordinance to explore other programs or partnerships that could address these barriers.



Cambodian and Latino CHA teams conducted salmon cooking demos using traditional ethnic recipes in 2018.

5.3.1 Moms-Targeted Tools

The following are existing tools developed specifically for moms who receive and prepare local seafood catch:

- Salmon recipe cards by CHA teams (created by Public Health and CHAs)
- Fun to Catch, Toxic to Eat program website with health info for moms and young children (www.kingcounty.gov/duwamish-fishing)
- Duwamish Fishing Rules and Health Videos Nos. 1 and 6 (partnership between Public Health, CHAs, WDFW and UW Superfund Research Center)

The following are recommended tools specifically for moms identified prior to the ICIAP:

- Digital story videos by moms (to be created by CHAs)
- Educational brochure or video specific for pregnant or nursing moms (Public Health and CHAs to partner with community health clinics or WIC programs)

Future development of additional tools will be incorporated into Public Health’s annual Work Plan submitted to the EPA. Public Health recognizes that funding by the EPA for proposed tools will be subject to the rules and regulations of the EPA’s Cooperative Agreement and federal grant requirements. If additional tools outside of those described are proposed that warrant amending this ICIAP, the proposed tools and details around implementation will be submitted to the EPA as an addendum to this plan for the EPA’s review and approval.

See Appendix C for descriptions and status on the latest tools.

5.4 Strategies by Influencers and Messengers

Other strategies focused on influencers and messengers will be designed to help increase awareness and knowledge among Duwamish River fishers and local moms (priority audiences), as well as building new community partnerships with ethnic/language communities not already represented on the CHA teams.

In developing this ICIAP, the 2018 CSC identified the top three types of community-level influencers and messengers who can help reach the priority audiences:

- **Community Centers:** Community or neighborhood centers that offer focused programming for ethnic/language groups can serve as potential partners for this program. Specific ethnic/cultural communities may manage these centers or specific programs within these centers. For other ethnic/language groups not currently reached by the CHAs, community centers can serve as messengers in these communities.
- **Faith Organizations:** Temples, churches, and other places of worship serve as a gathering place for many community members. Many CHAs already conduct outreach at places of worship in their communities. For other ethnic/language groups not currently reached by the CHAs, faith organizations can serve as messengers in these communities.
- **Schools & Youth Programs:** Youth have been identified by the CSC as a target community because of their proximity to and influence on both fishers and mothers. They themselves are among the most sensitive groups to PCBs. Thus, educating youth about healthy seafood consumption at an early age can help inform their healthy food choices as they get older.

While young children might not make all decisions about meals and seafood choices in the household, they can share information with parents and caregivers who do. This avenue of education is particularly common with parents or caregivers from households where English is not the primary language (such as refugee/immigrant households). Children in these households are likely to be bilingual and can navigate the internet for their parents. While it is an equity concern to rely solely on young children to inform their parents, a youth strategy within a set of other strategies can help enhance the overall impact of the program. Schools and other youth programs can be valuable partners to reach children from fishing families.

Public Health will issue grants over time to build the capacity of community partners to develop specific strategies (including tools or activities):

- **Community Partner Grant No. 1**—Public Health will fund a community center or faith organization to develop a strategy (including developing a tool or activity) that increases knowledge about the Duwamish seafood advisory in priority ethnic/language fishing communities that are not represented by the CHA teams.
- **Community Partner Grant No. 2**—Public Health will fund a school or youth program to develop a strategy (including developing a tool, such as a youth activity coloring book) that increases knowledge

about the Duwamish seafood advisory among youth/students from priority fishing communities in the Seattle (South, West, Southeast) and South King County areas.

Current Status: Identifying the first organizational partner through a grant-making process (such as an RFP) is included in Public Health’s current 2019 Work Plan submitted to the EPA as a part of the Cooperative Agreement. Public Health recognizes that funding by the EPA for this strategy will be subject to the rules and regulations of the EPA’s Cooperative Agreement and federal grant requirements.

5.5 Policy and Partnership Recommendations (Outside the Scope of the EPA’s Program)

As discussed in Section 3.4, addressing “upstream” barriers is key to supporting healthy seafood consumption practices. Some are beyond the control of the individual and are outside the scope of the EPA’s Duwamish Seafood Consumption IC Program for the purposes of the Lower Duwamish Waterway Superfund site cleanup.

Other agencies and organizations with appropriate authority or resources can help with the following areas that are outside the scope of the EPA’s program:

1. Help address additional barriers to:

- Obtaining salmon fishing licenses and understanding the fishing rules on the LDW
- Accessing salmon fishing gear (including pliers and store cards at bait and tackle stores)
- Going to fish at alternative sites with safer seafood to catch
- Finding healthy and affordable seafood options at supermarkets and food banks (including store cards or coupons to buy fish at the supermarket)

2. Provide additional incentives to encourage participation by community members:

- Cooking tools (e.g., cutting boards, knife sharpeners for filleting salmon)
- Transportation support (such as renting a van or mini-bus) to go to alternate fishing locations or to moms’ classes or workshops)
- Childcare during the events
- Meals (other than light refreshments) at events

The EPA convenes the multi-stakeholder HSCC, which brings together agencies, organizations, and the CHAs to collaborate on efforts that promote healthy seafood consumption in the fishing community. The Consortium is intended to provide a forum to explore possible partnerships with groups that can help implement, support, and/or advocate for recommendations that fall beyond the scope of the EPA’s IC program.

Creating actionable items will require direct engagement and coordination with the appropriate agencies or organizations with resources and/or authority to address these recommendations. Public Health will work with the CHAs to share their recommendations to appropriate agencies or organizations, such as at the HSCC, in an effort to find mechanisms to address the recommendations.

Since the actions needed to address the policy and partnership recommendations are beyond the scope of the EPA's Duwamish Seafood Consumption IC program for the purposes of the Lower Duwamish Waterway Superfund site cleanup, Public Health will not measure the impact of these recommendations. Instead, Public Health will informally monitor responses to these recommendations to provide context when reporting the evaluation findings of the IC strategies and program impacts (see Section 6.2.5 for more information).

The CSC identified and prioritized the following recommendations (outside the scope of the EPA's program) to improve fishers' access to salmon fishing on the LDW and other alternative fishing sites to share with the HSCC and appropriate agencies or organizations:

- 1. Improve the WDFW fishing license purchasing online system and multilingual education on fishing rules to support fishing for salmon only in the Duwamish River and at alternative fishing sites.** Many CHAs across the ethnic/language groups mentioned the challenge they or their community members have with purchasing a fishing license and not fully understanding the fishing rules. For example, the license vendors assume that a fisher needs a Social Security number to buy a license. But according to WDFW, an SSN is obtained if the fisher is a U.S. citizen. Non-citizens may still buy licenses with a form of valid ID (resident or non-resident to Washington state). In addition, the WDFW rules booklet is available only in English, and updates on the rules can change quickly, particularly with salmon fishing.

Salmon is a heavily regulated fish in Washington, and the LDW fishing rules are complicated. Confusion about fishing rules creates an additional barrier to adopting healthy actions such as switching to salmon fishing on the LDW or fishing at alternative sites where different licensing and rules may apply. This is especially true for fishers with limited English proficiency or limited access to the internet.

- 2. Provide transportation support for Duwamish fishers to alternative fishing sites on a regular basis.** The LDW Fishers Study and the CSC have identified transportation as one of the biggest barriers to accessing alternative fishing sites. Fishers choose sites along the LDW because of convenience and accessibility. There may be a need for partnerships with transportation agencies (such as King County Metro) to offer transportation support to LDW fishers on a regular basis, particularly outside of salmon season.

The CSC identified and prioritized the following recommendations (outside the scope of the EPA's program) to support healthy seafood options for pregnant/nursing moms and caregivers of young children) to share with the HSCC and appropriate agencies or organizations:

- 1. Label supermarket seafood that is safe for pregnant/nursing moms and young children.** The CSC shared that it would be valuable to make it as easy as possible for pregnant/nursing moms and caregivers of young children to identify the safest supermarket seafood for them (the most sensitive populations to PCBs). In the past, DOH attempted a supermarket campaign that labeled fish and seafood in the market as "healthy choice" if they were low in toxic chemicals. However, the campaign ended due to lack of funding and resources. The DOH produces a pocket-sized trifold guide to healthy seafood options for pregnant women and nursing mothers. CHAs share these materials during their outreach. To revive a supermarket labeling

campaign in King County will require separate funding and resources, along with co-leadership by DOH, Public Health, and/or supermarkets in the targeted geographic areas.

2. **Provide coupons for healthy seafood at local supermarkets in the target geographic area.** The CSC shared that the cost of seafood at the supermarket is a barrier. If a mom declines seafood caught from the LDW, it is more likely that she will replace it with food available in the house. To prevent the unintended consequence of reduced fish consumption (and reduced protective factors of healthy fish consumption), it will be valuable to partner with organizations or supermarkets to offer coupons for seafood to overcome the financial barrier.
3. **Offer healthy fish options at food banks in the target geographic area.** The LDW Fishers Study and the CSC identified food banks as important places that serve fishing families who are likely to fish and eat contaminated seafood from the LDW. The CSC recommended that food banks in the geographic target area offer healthy fish options, which would require collaborating with food banks and other organizations.

5.6 Communications Strategy

Media communication alone is not enough to protect the health of communities, but it can complement the on-the-ground implementation of the IC strategies by CHAs and community partners by reinforcing key health messages. Media can also help make the program's brand more recognizable in the different communities. Media sources of interest include ethnic media (radio, TV news, print news) and online platforms (websites and social media). Specific sources of media will vary depending on the ethnic/language group. In addition to the information provided in this subsection, further details and timelines for implementing the communication and media strategy will be incorporated into Public Health's annual Work Plan submitted to the EPA as a part of the Cooperative Agreement. Methods for monitoring the responses to the communication efforts relative to the overall programmatic goal are discussed further in Section 6.2.6.

5.6.1 Prioritized Communication Strategies and Media Sources

According to the LDW Fishers Study, both internet and non-internet media ranked high as preferred sources of information among Duwamish fishers:

- For LDW fishers overall, the most preferred media source of information is internet or social media, followed by TV, then newspapers. These three media sources also ranked high for LDW Asian fishers (of whom 37 percent identify as Vietnamese and 24 percent identify as Cambodian/Khmer). LDW Latino fishers ranked internet or social media and TV the highest in terms of preference.
- LDW fishers overall who prefer a language other than English ranked TV the highest, followed by newspaper, then internet or social media.
- LDW fishers who catch resident seafood ranked TV, internet, or social media and newspapers the highest. Although the sample size was low, Asians ranked TV highest and Latinos ranked internet or social media highest.
- Radio was consistently the lowest-ranked source of media, both overall and across the different subgroups.

The 2018 CSC identified and prioritized communication strategies and sources of media. Table 4 summarizes the top choice across the three ethnic/language groups and top choices within each subgroup. In contrast to the LDW Fishers Study findings, the CSC ranked radio as a top choice for the Cambodian and Latino subgroups. While survey participants of the LDW Fishers Study may not have identified radio as a top choice for a source of information, the CSC members identified radio as a strategic communication avenue that their community uses regularly. Public Health will test this strategy and recalibrate if necessary.

Public Health will implement the website and social media strategy with contributions from the CHA teams and according to the website and social media strategy (Section 5.7.3). Furthermore, each CHA team will design its own ethnic media strategy (print, TV, and/or radio) as part of its CHA outreach and engagement work. These communication/media activities are part of the existing and future work plans, as complementary efforts to the CHAs' outreach work.



The CHAs collaborated with Public Health, WDFW, and the UW Superfund Research Center to produce short “How to” educational videos on fishing rules and health related to the Duwamish River in 2018.

Table 4 Prioritized communications strategies and media sources.

Common Communications Strategy	Vietnamese-Focused Communications Strategy	Cambodian-Focused Communications Strategy	Latino-Focused Communications Strategy
<p>Facebook Ad Campaign was identified by the 2018 CSC as the top communications strategy across the three language/cultural groups.</p>	<p>Additional communication strategies specific to the Vietnamese community are:</p> <ol style="list-style-type: none"> 1. Write and translate press releases with updates and send to appropriate ethnic media on our list 2. Facebook Live interviews 	<p>Additional communication strategies specific to the Cambodian community are:</p> <ol style="list-style-type: none"> 1. Radio show interviews 2. Write and translate blog items and hope for republishing 	<p>Additional communication strategies specific to the Latino community are:</p> <ol style="list-style-type: none"> 1. Radio and TV ads 2. Radio show interviews
<p>The common sources for media across these three groups are:</p> <ul style="list-style-type: none"> • Facebook (personal) • Facebook PHSKC • YouTube • KING 5 News • KOMO News • Seattle Times • Radio 92.5 • KIRO News 	<p>Top media sources specific to this community are:</p> <ul style="list-style-type: none"> • Vietnamese Today • Seattle Viet Times • Vietnamese NW • Radio 93.3 • Facebook Vietnamese in Seattle, in Tacoma 	<p>Top media sources specific to this community are:</p> <ul style="list-style-type: none"> • Voice of America • Radio Free Asia AM1000 • Facebook Khmer/RFA News • WA Fish & Wildlife Facebook • 94.9 	<p>Top media sources specific to this community are:</p> <ul style="list-style-type: none"> • Univision • El Rey 1360 AM • La Raza • TV Azteca

5.7.2 Website and Social Media Strategy

The website and social media strategy is one component of the overall communications strategy to complement the traditional ethnic media communications. In spring 2018, a University of Washington Master of Public Health practicum student reviewed the LDW Fishers Study findings for communication preferences; researched search engine optimization and Facebook advertising strategies; and conducted focus groups with the Cambodian, Vietnamese, and Latino CHA teams. The following is a set of activities Public Health is planning and implementing as the website and social media strategy based on this review and research, as well as input from Public Health’s digital communications specialist and webmaster.

1. Develop and pilot-test a website with target audiences.

Public Health is hosting the EPA’s LDW Superfund Site Seafood IC program’s website. This website task is included in the 2017–18 Work Plan under the Cooperative Agreement. In 2019, Public Health launched the program website at www.kingcounty.gov/duwamish-fishing.

Objectives for the multilingual website as an IC tool:

1. To promote healthy options to the target Duwamish audiences (fishers, pregnant/nursing moms, parents of young children, youth, people who receive/consume catch from fishers).
2. To provide a central place to access additional health promotion tools (e.g., videos, maps, recipe cards).
3. To learn about upcoming Public Health and CHA outreach activities.
4. To share sufficient background information on the cleanup and source control (with links to additional resources: websites, fact sheets, other agencies’ videos, etc.). In addition, relevant cleanup data (e.g., fish tissue data) will be provided in brief EPA fact sheets with links to websites of responsible authorities.

As part of the website design process in 2018, Public Health consulted with interested CHAs to identify key topics to address on the website. In addition, CHA teams provided content for their specific team website pages. Public Health drafted website content with the EPA and Ecology that aligns with the program’s key messages, and designed the layout with guidance from Public Health’s digital communications specialist and webmaster.

In November 2018, Public Health conducted usability testing to pilot a mockup of the website translated into Spanish, Vietnamese, and Khmer. Pilot testing of the website assessed the following questions:

- Is the website easy to navigate, and how do target users complete a task (such as finding relevant health information, etc.)?
- Is the website content easily understood in English, Spanish, Khmer, and Vietnamese (with a balance of visual and text)?
- Are there areas for improving the layout and design of the website to make it user-friendly?

The target audiences for website pilot testing were fishers and people who receive and eat local seafood catch (including moms of young children) from the Vietnamese, Cambodian, and Latino communities. Participants had

to have some familiarity with using the internet. Of the 31 participants in the three test groups, 14 (47%) were fishers, 26 (84%) eat locally caught seafood, and nine (29%) were parents or caregivers of young children under 6 (two of whom were also pregnant or nursing). In two instances, children of fishers participated in the pilot testing because they were the ones who would research the information online for their fisher fathers.

Public Health revised the website (in terms of content and layout) according to the testing results, such as the common challenges with using the website mockup that were found across the three language groups (Spanish, Vietnamese, and Khmer).

2. Focus website promotion on online strategies.

The most frequent response for preferred media source of information for participants in the LDW Fishers Study was the internet or social media. Further, CHA focus group participants believed that because the website is an online tool, online strategies were the most useful. While many fishers from the study, particularly fishers who catch resident seafood, do not prefer to use the internet or social media for information, many of them will likely ask younger or English-speaking family members (such as children) to use the internet to research information (such as fishing regulations).

Nevertheless, it will be important to use traditional forms of media and in-person outreach to reach these populations. Online promotion strategies could target fishers' family members, who may be more likely to access online media sources and may share information they find with their fishing relatives. Participants in the CHA focus groups overwhelmingly indicated that Google and Facebook were their preferred sources of information.

CHAs can also help promote the website through their own Facebook groups and networks.

3. Use targeted Facebook advertising to promote the website.

Participants in the Cambodian, Vietnamese, and Latino CHA groups overwhelmingly indicated that they personally use Facebook, that members of their communities commonly use Facebook, and that Facebook would be an appropriate platform to promote the website.

According to Public Health's digital communications specialist, Facebook advertising may lose some of its effectiveness during the time of execution, because the climate of social media advertising is shifting. The program will pilot Facebook advertising as part of the 2019 or 2020 Work Plan to see if it is effective in promoting the website, and adapt the Communications Strategy as needed.

4. Target Facebook advertisements to specific ZIP codes.

Targeting by geographic area will increase the likelihood that Facebook advertisements reach the target population. The majority of LDW resident fishers and fishers overall live in West or South Seattle, or south of Seattle—areas that are represented by the following ZIP codes: 98116, 98136, 98126, 98106, 98134, 98144,

98108, 98118, 98116, 98136, 98146, 98146, 98166, 98168, 98148, 98158, 98188, 98057, 98055, 98056, 98032, 98031, 98030, 98198, 98023, 98033, 98092, 98002, and 98001.

5. Target Facebook advertisements to Spanish, Vietnamese, and Khmer speakers.

According to the LDW Fishers Study, the most common non-English languages preferred by LDW fishers are Spanish, Vietnamese, and Khmer; languages spoken by the three CHA groups. The majority of focus group participants indicated that they preferred posts in either English and their native language or just their native language. Selecting these three languages would allow for CHA involvement in generating culturally and linguistically appropriate messaging.

6. Consider audience segmentation by gender and age.

The LDW Fishers Study found that although the majority of LDW fishers are male, females are the primary preparers of fish. CHA focus group participants indicated that women could both act as gatekeepers for the type of fish they serve in their household and work to change fishing practices of their husbands or partners. It is important that both men and women receive health information about fish from the LDW. Members of the CHA teams and CSC describe the differential roles that men and women in their communities play in the process of catching and preparing fish, and suggest creating different advertisements for men, who tend to be fishers, and women, who tend to be preparers according to their cultural norms. For example, advertisements targeting men could highlight fishing for salmon, while advertisements targeting women could highlight the importance of ensuring that the fish a family eats is safe for consumption.

In addition, Public Health's pilot testing of the program website identified that younger members of fishing households (e.g., children of fishers) will assist their parents who are not as skilled in navigating the internet and/or are limited English proficient in researching information online. Tailoring ads that appeal to youth/teens in fishing families/households may be beneficial to all members of the household.

7. Consider targeting users interested in fishing.

One approach is to use existing Facebook pages and groups followed by fishers and moms to promote the website (see Table 4). Depending on the Facebook page or group, it may be appropriate to post the content directly or message an administrator of the Facebook group asking that they post the content.

8. Focus search engine efforts on Google.

Google was overwhelmingly the most used search engine according to all focus groups. In developing the English and translated versions of the program website, keywords should be integrated in order to generate search engine hits. Public Health will use the [Google Keyword Planner](#) to test how frequently keywords are used in King County.

Google advertising may be a good fit for driving traffic the website. Because audience members may not know where they can find this information (they may not associate fishing guidance with Public Health), Public Health can identify key search terms that will raise the website’s listing on Google search returns.



The program launched its multilingual website in 2019 at www.kingcounty.gov/duwamish-fishing.

6.0 IC Maintenance Elements: Monitoring, Evaluation, and Reporting

The EPA’s IC Guidance (2010) emphasizes the review of the ICIAP and monitoring of the IC strategies for long-term success in achieving the programmatic goal and objectives. Public Health will evaluate the IC program on specific measurable outcomes and impacts related to the strategies inside the program’s scope.

All strategies are designed to reach the program’s goal to promote culturally appropriate, healthy actions that protect the health and well-being of fishing communities, especially pregnant women, nursing moms, and young children, from the contaminated seafood (e.g., perch, flounder, sole, crab, mussels, clams) in the LDW Superfund site before, during, and after the cleanup.

Public Health and the EPA recognize that some barriers (institutional, structural, and systemic) to achieving the program goal and the CSC’s long-term environmental justice vision may not be fully addressed within the scope of the EPA’s program. While evaluation and measurement will be limited to those portions of the work within the program scope, Public Health will monitor and track the recommendations on the policies and partnerships outlined in Figure 3 outside the program scope and discussed in Section 5.6 to provide a context within which to understand the impacts of the program strategies. Policy and partnership recommendations that address certain barriers can enhance the positive impacts, although not all fall within the scope of the EPA’s program.

The following sections outline approaches to evaluating the IC strategies and the community participatory process. To date, a preliminary evaluation plan of the CHA training and outreach strategy has been developed (Appendix B in this document). Appendix B also includes evaluation instruments and a monitoring database piloted in 2018 for the CHA training, outreach, and CSC involvement process. Aspects of evaluating the community participatory process are integrated into certain pilot evaluation tools.

For the other strategies, a general approach, with key evaluation objectives and considerations, is described below. Public Health will work with the CSC, grantees, and other key implementing partners to prepare evaluation plans for these strategies. Appendix B will be updated with these evaluation plans.

6.1 Evaluation of the Community Participatory Process

Routine assessment of the community participatory process is a key evaluation objective to inform continuous quality improvement of the program. Of primary relevance to the specific activities outlined in the ICIAP is the evaluation of the program’s efforts to address the EJ principles of **capacity building, meaningful involvement, and empowerment**.

Community Participatory Objective – To support CHAs in empowering themselves to influence IC programmatic decisions and relevant policy recommendations toward protecting the health of their fishing communities from contaminated LDW seafood.

As described in Section 4.2, to meet this objective, Public Health has been and will continue to collaborate with CHAs in co-designing IC tools; involve the CSC in ICIAP planning, implementation, and evaluation; and provide technical support to CHAs and the CSC in engaging directly with decision makers in forums such as the EPA's HSCC.

Monitoring - Following best practices for evaluating community engagement as an indicator of success, this evaluation will include routine assessment of whether the right community members are at the table; whether the process and structure of meetings allow for all voices to be heard and equally valued; how community members are involved in developing, implementing, and evaluating the program; how community input informs decision-making at various levels within the program; and what types of learning have occurred among participants, staff, partners, and community members (Sufian, Grunbaum, Tabia, Akintobi, Dozier, Eder, & White-Cooper, 2011).

Focus groups and interviews with CHAs, facilitators, staff, CSC members, grantees, and other community-based partners will be conducted annually to capture experiences and perspectives about the program's overall community participatory process. Findings will be shared through presentations to the CSC and evaluation reports to the EPA. Public Health expects local community-based organizations who are partners on this program to bring their own expertise and cultural lenses to engage in ways that they feel appropriate. To ensure that the experiences of CHAs who leave the program are captured, Public Health will develop and offer an exit interview for CHAs as part of the process evaluation.

6.2 Evaluation of IC Strategies & Other Monitoring

This program is a component of EPA's LDW ICIAP, specific to promoting the safe fish consumption by promoting culturally appropriate, health actions that protect the health and well-being of fishing communities from contaminated seafood in the site. Evaluating the specific IC strategies will determine whether each targeted objective is achieved and identify any actionable challenges and pitfalls. Given its Public Health expertise, Public Health will lead the evaluation process, including developing evaluation methods; performing the evaluations; and reporting the results of evaluations. Given the regulatory context of the LDW Superfund site, the EPA will work with Public Health during the evaluation process to ensure that the evaluations include the regulatory and legal requirements associated with the Superfund site where needs be.

This section outlines the evaluation components (i.e., objectives, outcomes, and impacts) of the logic models for the IC strategies that target CHAs, fishers, and moms. Logic models for these targeted IC strategies are provided in Table 5–Table 7. Evaluation methods will be similar to those used for the CHA outreach and training strategy evaluation and for the LDW Fisher's Study (quantitative and qualitative).

Public Health will design the evaluation during the development of the strategies. Data collection will occur as part of implementing the strategies. Evaluation methods will be tailored based on the strategy's level of engagement with the target audiences. The frequency of implementation and evaluation may decrease over time as the target audiences are saturated.

Types of possible evaluation approaches are outlined below:

- **For strategies that take a group or cohort of community members through a series of educational activities**, evaluation of changes in knowledge, self-efficacy, behaviors, and development of skills can be assessed using a pretest - posttest approach (before and after engagement with the group and with follow-up) based on findings from surveys and field observations. Focus groups and/or interviews can be used to gather information about attitudes & perspectives, barriers & challenges, and overall process.
- **For strategies that include individual (one-off) classes or demonstrations**, outcomes of interest (success of the presentation in providing relevant messaging) can be gathered using presentation evaluation questionnaires.
- **Outreach events and educational activities** (such as part of the CHAs' outreach strategy) may also include a single survey assessment to collect basic descriptive demographic information about the audience, assess their knowledge of the health message shared during the presentation, or gather feedback about the presentation.

Specific measurable outcomes and evaluation methods for the strategies will be identified through a Public Health–convened evaluation workgroup (involving EPA, CSC members, and community partner grantees). The CSC and community partner grantees will help ensure the methods are culturally appropriate and feasible to administer. In addition, Public Health will provide technical assistance to its grantees as they design the strategies, logic model, and evaluation plans for the influencers and messengers. Public Health will report on the outcomes to the CSC and the EPA after full implementation of each strategy (see IC Strategy Evaluation Report in Table 8).

Furthermore, Public Health will monitor and track the responses to the policy and partnership recommendations and the program's communications (ethnic media/social media) efforts. No specific logic models or evaluation methods will be developed for these.

6.2.1 Monitoring of Community Health Advocate (CHA) Training and Outreach Strategy

The CHA strategy focuses on building capacity among representatives of priority local fishing communities to make informed decisions about their health, promote healthy actions in their communities, and engage with agency decision makers around the LDW seafood contamination issue. Over a one-year period, CHAs are trained to conduct outreach in their preferred languages with local community members about the Duwamish contamination and seafood consumption health issue, and to promote healthy actions related to the Duwamish Seafood Consumption Advisory (see Section 5.1.1). The training evaluation covers a period of the “in-classroom” phase, followed by a community outreach practice phase where facilitators or Public Health staff provide observational feedback.

CHA Training and Outreach Objective —To build the capacity of CHA community members from priority fishing communities to raise awareness and promote culturally appropriate, healthy seafood consumption actions within the Duwamish fish-consuming communities.

Monitoring—The CHA strategy will be evaluated for its ability to achieve outcomes outlined in its logic model (Table 5). A preliminary evaluation plan describing the approach to assess; the effectiveness of the curriculum and impact of the training experience and activities on the CHAs’ level of confidence, empowerment, knowledge, and skills; effectiveness of CHAs in raising awareness and informing decisions on the local seafood consumption health issue; and the process of implementing a community-informed and culturally appropriate CHA training program is included in Appendix B, as well as examples of evaluation instruments and a monitoring database that were piloted in 2018. Public Health will update Appendix B with updated or refined evaluation tools for the CHA strategy in 2019.



The CHAs provided multilingual outreach at the Duwamish River Festival, including on the LDWG-hosted boat tour of the LDW (August 18, 2018).

Table 5 Logic model for CHA training and outreach objective and strategy

Objectives & Strategies	Outcomes	Short-Term Impact (By the start of active cleanup)	Medium-Term Impact (During Active Cleanup)	Long-Term Impact (Post Cleanup)
<p>CHA Objective:</p> <p>To build the capacity of community members from priority fishing communities to raise awareness and promote culturally appropriate, healthy seafood consumption actions within the Duwamish fish-consuming communities.</p> <p>CHA Strategy:</p> <p>Public Health will implement a community-informed, culturally appropriate training curriculum and provide technical support so CHAs can gain capacity to reach out about healthy actions that protect themselves and their fishing communities, especially pregnant women, nursing moms, and young children, from the contaminated seafood in the LDW Superfund site</p>	<p>CHAs who complete the training can:</p> <ul style="list-style-type: none"> • Demonstrate knowledge based on the information provided in the training, including but not limited to Duwamish seafood advisory, alternative fishing sites, and the history of the Duwamish River. • Demonstrate skills, including but not limited to providing a balanced health message, designing and conducting peer-to-peer outreach, and effective use of IC tools. <p>All CHAs after the training will:</p> <ul style="list-style-type: none"> • Commit to fish for or eat only salmon from the Duwamish River. 	<p>There is improved knowledge among Duwamish fishers about the Duwamish seafood advisory (compared to the baseline from the 2015 data-year in the LDW Fishers Study).</p> <p>Improved knowledge, skills, self-efficacy, and positive social norms and attitudes are found among moms (in particular, pregnant/nursing women and caregivers of young children) who receive and/or prepare local catch about receiving, preparing, and eating only salmon from the Duwamish River.</p>	<p>The improved knowledge, skills, self-efficacy, and positive social norms and attitudes provided by the IC strategies will:</p> <ul style="list-style-type: none"> • Increase the likelihood of Duwamish fishers to catch only salmon on the Duwamish River or go to alternative fishing sites. • Increase the likelihood of this target group to receive and prepare only salmon from the Duwamish River. 	<p>Achieve the program goal of promoting culturally appropriate, healthy actions that protect the health and well-being of fishing communities, especially pregnant women, nursing moms, and young children, from the contaminated seafood in the LDW Superfund site.</p>

Objectives & Strategies	Outcomes	Short-Term Impact (By the start of active cleanup)	Medium-Term Impact (During Active Cleanup)	Long-Term Impact (Post Cleanup)
before, during, and after the cleanup.	<ul style="list-style-type: none"> Commit to sharing the Duwamish advisory information and healthy alternative seafood choices to fishers and people who receive local seafood catch whom they know. 			

6.2.2 Monitoring of Fisher-Targeted IC Strategy—Duwamish Fishing Club

The CSC identified the Duwamish Fishing Club as a fisher-targeted IC strategy to meet the program’s long-term goal to protect the health of the fishers on the Duwamish River from the contaminated seafood. The fisher-targeted strategy is designed to increase knowledge among Duwamish fishers through skill-building and to create supportive social and community networks (see Section 5.2 for more details on the strategy). Commitment to culturally appropriate, healthy actions related to safe fish consumption is a primary outcome. Additional constructs of interest for evaluation include self-efficacy and the extent to which positive social norms and attitudes are created among fishers to support healthy actions—such that there will be an increased likelihood of Duwamish fishers to fish only for salmon in the Duwamish River.

Fisher Objective—To increase knowledge, skills, self-efficacy, and positive social norms and attitudes among Duwamish fishers around fishing only for salmon on the Duwamish River (phase 1); and fishing for other, safer seafood at alternative sites in Seattle and South King County (phase 2).

Please see Section 5.2 for a description and the current status of this fisher-targeted strategy.

Monitoring— For the fisher-targeted strategy, there will be a process and pre-post outcome evaluation for each phase of the strategy: phase 1 for salmon fishing classes on the Duwamish River and phase 2 for educational visits to alternative fishing sites. Both phases of activities will be evaluated for their ability to achieve outcomes outlined in the Logic Model for the Fishers-Targeted IC Objective and Strategy (Table 6). Evaluation plans will be developed in partnership with the CSC and key partner organizations needed to implement the components of this fisher-targeted strategy.

Table 6 Logic model for fishers—targeted IC objective and strategy.

Objectives & Strategies	Outcomes	Short-Term Impact (By the start of active cleanup)	Medium-Term Impact (During Active Cleanup)	Long-Term Impact (Post Cleanup)
<p>Fisher Objective:</p> <p>To increase knowledge, skills, self-efficacy, and positive social norms and attitudes among Duwamish fishers around fishing only for salmon on the Duwamish River (phase 1); and fishing for other, safer seafood at alternative sites in Seattle and South King County (phase 2).</p> <p>Fisher Strategy:</p> <p>Public Health and the CHAs will partner with WDFW and bait and tackle stores to create a club of Duwamish fishers (with a fishing competition) to provide training on how to catch salmon on the Duwamish River (phase 1) and educational visits to alternative fishing sites to increase their knowledge about other safe</p>	<p>Fishers who participate in the club can:</p> <ul style="list-style-type: none"> • Demonstrate knowledge about the advisory and the salmon fishing rules for the Duwamish River. • Demonstrate positive attitudes and self-efficacy about catching only salmon from the Duwamish River. • Demonstrate confidence and skills in using salmon fishing techniques on the Duwamish River. • Demonstrate knowledge of alternative fishing site locations and ability to provide a name of an alternative fishing area when asked (phase 2). <p>At least 90% of fishers who participate in the club will:</p>	<p>There is improved knowledge among Duwamish fishers about the Duwamish seafood advisory (compared to the baseline from the 2015 data year in the LDW Fishers Study).</p> <p>In addition, short-term impact evaluation will capture baseline data on:</p> <ul style="list-style-type: none"> • skills, self-efficacy, social norms, and attitudes about salmon fishing on the Duwamish River • the likelihood of Duwamish fishers to catch only salmon from the river or go to alternative sites. 	<p>The improved knowledge, skills, self-efficacy, and positive social norms and attitudes provided by the IC strategies will:</p> <ul style="list-style-type: none"> • Support Duwamish fishers to fish only for salmon from the Duwamish River and/or fish for safer seafood at alternative sites in Seattle and South King County. • Increase the likelihood of Duwamish fishers to catch only salmon on the Duwamish River or go to alternative fishing sites (compared to 	<p>Achieve the program goal of promoting culturally appropriate, healthy actions that protect the health and well-being of fishing communities, especially pregnant women, nursing moms, and young children, from the contaminated seafood in the LDW Superfund site.</p>

Objectives & Strategies	Outcomes	Short-Term Impact (By the start of active cleanup)	Medium-Term Impact (During Active Cleanup)	Long-Term Impact (Post Cleanup)
seafood to catch in Seattle and South King County (phase 2).	<ul style="list-style-type: none"> • Commit to fish only for salmon in the Duwamish River. • Commit to sharing with other fishers about alternative fishing locations with safer seafood options. 		the short-term impact results).	

6.2.3 Monitoring the Moms-Targeted IC Strategy—Health Clinic Classes & Salmon Cooking Demos

The CSC identified moms’ classes at health clinics and salmon cooking demos as part of a moms-targeted strategy to meet the program’s long-term goal to protect the health of pregnant and nursing women and caregivers of young children who receive local seafood catch. Moms-targeted strategies are designed to increase knowledge, awareness, and self-efficacy among local mothers and other caregivers of young children (see Section 5.3 for more details on the strategy). Group-based activities capitalize on the benefits of peer/social support for creating new social norms and supporting healthy actions. Key outcomes include having moms commit to eating salmon only from the Duwamish River or other healthy seafood options, and to sharing information with fishers and other moms/caregivers.

Moms & Caregivers Objective—To increase knowledge, skills, self-efficacy, and positive social norms and attitudes among moms and caregivers of young children who receive local seafood catch related to accepting only salmon from the Duwamish River and preparing culturally appropriate salmon dishes.

Please see Section 5.3 for a description and the current status of this mom-targeted strategy.

Monitoring—This strategy will be evaluated for its ability to achieve outcomes outlined in the Logic Model for Moms-Targeted Objective and Strategy (Table 7). Evaluation plans will be developed in partnership with the CSC and key partner organizations needed to implement these strategies.

Table 7 Logic model for moms—targeted objective and strategy.

Objectives & Strategies	Outcomes	Short-Term Impact (By the start of active cleanup)	Medium-Term Impact (During Active Cleanup)	Long-Term Impact (Post Cleanup)
<p>Moms & Caregivers Objective</p> <p>To increase knowledge, skills, self-efficacy, and positive social norms and attitudes among moms and caregivers of young children who receive local seafood catch related to accepting only salmon from the Duwamish River and preparing culturally appropriate salmon dishes.</p> <p>Moms & Caregivers Strategy</p> <p>Public Health and the CHAs will partner with community health clinics and community kitchens to educate moms and caregivers of young children in classes (such as WIC, Maternal Support Services, nutrition, and lactation programs) about the health reasons for</p>	<p>Participants in the classes can:</p> <ul style="list-style-type: none"> • Demonstrate knowledge of the Duwamish seafood advisory, including the health risks to pregnant/nursing women and young children. • Demonstrate confidence and communication skills required to tactfully refuse gifts of Duwamish resident seafood from family, friends, and neighbors. • Demonstrate skills on how to prepare healthy fish meals (including skinless salmon fillet meals for pregnant/nursing moms and young children). <p>At least 90% of participants in the classes will:</p>	<p>Improved knowledge, skills, self-efficacy, and positive social norms and attitudes about choosing only salmon from the Duwamish River or other healthy seafood choices exist among moms (in particular pregnant/nursing women) and caregivers of young children who receive local seafood catch.</p> <ul style="list-style-type: none"> • In addition, short-term impact evaluation will capture baseline data on the likelihood of the moms and caregivers in this target group to accept, prepare, and eat only salmon from the Duwamish River. 	<p>The improved knowledge, self-efficacy, and positive social norms and attitudes provided by the IC strategies will:</p> <ul style="list-style-type: none"> • Support healthy seafood choices by moms (including pregnant/nursing women) and caregivers of young children receiving local catch from the Duwamish River. • Increase the likelihood of the moms and caregivers in this target group to accept, prepare, and eat only salmon from the Duwamish River. 	<p>Achieve the program goal of promoting culturally appropriate, healthy actions that protect the health and well-being of fishing communities, especially pregnant women, nursing moms, and young children, from the contaminated seafood in the LDW Superfund site.</p>

Objectives & Strategies	Outcomes	Short-Term Impact (By the start of active cleanup)	Medium-Term Impact (During Active Cleanup)	Long-Term Impact (Post Cleanup)
<p>accepting only salmon from the Duwamish River, and how to prepare culturally appropriate salmon dishes.</p>	<ul style="list-style-type: none"> • Commit to sharing the Duwamish advisory information and healthy alternative seafood choices with people they know who fish or receive local catch. • Commit to accepting, preparing, and eating only salmon from the Duwamish River or other alternative healthy seafood options. 			

6.2.4 Monitoring of Strategies by Influencers and Messengers

The CSC highlighted the need for strategies by influencers and messengers who can help achieve the program goals. Public Health will provide grants to community-based organizations that can serve as influencers and messengers for the program (see Section 5.0 for more details). The specific strategies, outcomes, impacts, and evaluation plans will be developed with these grantees.

The following have been prioritized by the 2018 CSC as part of this ICIAP:

1. Public Health will provide a grant to a community center or faith organization that serves a priority ethnic/language fishing community (not already represented on our CHA teams) to develop a strategy (including developing a tool or activity) that increases knowledge about the Duwamish seafood advisory.
2. Public Health will provide a grant to a school or youth program to develop a strategy (including a tool, such as a youth activity coloring book) that increases knowledge about the Duwamish seafood advisory among youth/students from priority fishing communities in the Seattle (South, West, Southeast) and South King County areas.

Grants will be funded for a two-year period at a time, to allow for a design and planning phase during year 1, followed by pilot implementation and evaluation of the strategy's community-based process and pre-post outcomes during year 2. Public Health will work with the grantee to identify specific program outcomes and develop appropriate participatory evaluation plans.

6.2.5 Monitoring of Policy and Partnership Recommendations

The CSC identified and prioritized policy and partnership recommendations to address additional barriers (beyond the scope of this program) that the most at-risk fishers and their families may face when accessing healthy seafood options on the river, at other sites, in the supermarkets, or in the food banks (see Section 5.0 for more details).

Through evaluation of the strategies outlined in this document, Public Health will monitor whether the LDW fishing communities continue to experience barriers, or if they benefit from policy, institutional, structural, or systems changes enacted through these partnerships. Public Health will track whether changes or actions have been made by agencies, institutions, or organizational partners in response to these recommendations, and provide this context when reporting about the program impacts from the IC strategies. This information will be part of reporting about the medium-term and long-term impacts. As previously described, Public Health may consider its broader health equity responsibilities per King County's equity and social justice ordinance to explore other programs or partnerships outside the scope of the EPA's program that could address these barriers.

6.2.6 Monitoring of Communications Strategy

The communications strategy will involve a combination of traditional ethnic media and online (website and social media) strategies. Together, they can complement the on-the-ground efforts by CHAs and community partners to implement the various program strategies.

The following are examples of types of metrics the program may capture, depending on the objective for the specific communications or media strategy:

- For radio or TV ads, the ad sales team at the radio or TV station can provide impressions (the rough number of people tuning in during a given time), which can be used to infer traffic to a website based on the timing of ad placements.
- For online ads (Facebook, YouTube, or Google) placed by Public Health, Public Health will be able to see impressions (the number of times the ad is served) and clicks to the website (as well as web traffic itself). Some qualitative input from Facebook can be obtained/derived in the form of comments.

It is generally not resource-efficient to evaluate outcomes for every media effort implemented, so Public Health and CHA teams will need to identify feasible methods for monitoring responses to the media efforts conducted as part of the program work.

In addition, Public Health can learn whether community members have seen or heard about the issue through one of the program's media efforts, either through feedback from the CHAs' outreach work or during the formal evaluation of the program impacts (similar to the questions asked on the LDW Fisher Study survey).

6.3 Evaluation of Program Impacts

The IC strategies have been designed to leverage the benefits of supportive social networks to establish health-promoting social norms, build knowledge and skills, and foster self-efficacy, while also lowering certain barriers to healthy seafood consumption. **Evaluation of the overall impact of the IC strategies on achieving the program goal will be planned and managed using participatory approaches in the design, analysis, interpretation, and dissemination.** The evaluation will assess positive and negative outcomes, and primary and secondary long-term impacts produced by the IC strategies, including intended and unintended consequences (Organisation for Economic Co-operation and Development [OECD-DAC], 2010).

The planning and design of the impact evaluation will occur in partnership with the EPA, CSC, and community partner grantees, with the purpose of assessing short-term, medium-term, and long-term impacts of the collective IC strategies. Once Public Health has partnered with community-based organizations to design and implement all the IC strategies, Public Health will form an evaluation workgroup (involving the EPA, CSC members, and community partner grantees) to begin scoping the plan for the program's short-term impacts, usually after two to three years of implementing the current IC strategies.

The evaluation workgroup will also outline plans for evaluating medium- and long-term impacts at key points during active cleanup and post-cleanup phases—with a general frequency of every five to seven years. To capture these impacts, the program will need to implement multiple IC strategies over a period of five to seven years using the LDW Fishers Study as a baseline. Public Health will take into account the trends in population change in the relevant geographic communities, as well as responses to the policy and partnership recommendations and communications efforts. As they are developed, evaluation plans for programmatic impacts will be included in the Program Impact Evaluation Reports (see Table 8).

With the LDW Fishers Study as a baseline, surveys and interview methods can be used to evaluate changes in knowledge and healthy actions among fishers since before the ICIAP implementation. Evaluation approaches to determine impacts of specific strategies may include identifying a comparison group of non-participating fishers (those who have not participated in the specific strategy), depending on how effectively issues of selection bias and contagion (fishers having received the message vicariously) can be addressed.

The impacts produced by strategies targeting fishers and moms will be evaluated at multiple points of the LDW Superfund site cleanup process as determined by the EPA. Impact evaluation will be conducted for summative purposes—to inform whether to continue, discontinue, replicate, or scale up specific strategies. Impact of the strategies on awareness, self-efficacy, and fishing practices (e.g., catching resident seafood versus salmon only on the LDW), and the creation of new social norms can be assessed, and common outcomes may be compared to findings from the LDW Fishers Study as baseline.

6.4 Reporting

Table 8 summarizes the various types of reporting back and reporting out for work being performed under the program. Public Health will update, as needed, this ICIAP based on community input (CSC and other community feedback) and evaluation results. While the goal of the program remains the same, the ICIAP will be updated when there are substantial changes to the core components of the program plan, including strategies, audiences, road map, and logic models. The EPA will review and approve the updates to the ICIAP.

Table 8 Types of reporting for the Duwamish Seafood Consumption IC Program.

What is the type of reporting?	How frequent?	Who is the main audience of the report?	What's covered?	Who is responsible for the reporting?
1. Work Plans	Annually	EPA	<ul style="list-style-type: none"> Describe the planned work for an upcoming year, including identifying the specific tasks associated with agreements and this ICIAP document; activities associated with implementing the tasks/ICIAP; tools that will be developed; resources needed to accomplish the work; and time frames to implement the work. 	Public Health
2. Progress Reports	Quarterly	EPA	<ul style="list-style-type: none"> Status on activities, tools, and other deliverables by Public Health staff, Community Health Advocates, and grantees under the Cooperative Agreement between EPA and PHSKC. Quarterly results of outreach by CHAs and Public Health. Quarterly expenditures. 	Public Health
3. IC Strategy Evaluation Report	2 years	EPA, CSC, CHA teams, and HSCC	<ul style="list-style-type: none"> Results of the evaluation of each IC strategy that have been fully implemented in the prior year (including community participatory process). Evaluation plan will be attached. List of recommendations from Public Health and CSC for changes or improvements to IC strategies to achieve performance objectives. 	Public Health
4. Program Impact Evaluation Report	~ 5–7 years	EPA, CSC, CHA teams, and HSCC	<ul style="list-style-type: none"> Results of the evaluation of the impacts (short-, medium-, and long-term) of the program after implementation of multiple strategies over a period of 5–7 years. Evaluation plan will be attached. List of recommendations based on CSC input for revising/updating the ICIAP (as needed) if there are 	Public Health

What is the type of reporting?	How frequent?	Who is the main audience of the report?	What's covered?	Who is responsible for the reporting?
			substantial changes to the core components of the program plan (e.g., objectives, strategies, audience, road map, and logic models) to achieve progress toward the program's overall goal.	
5. Program Fact Sheet (multilingual)	Annually	General Public, Stakeholders	<ul style="list-style-type: none"> • Highlights of program updates, major milestones, and evaluation findings related to: <ul style="list-style-type: none"> ○ raising community awareness ○ building community capacity ○ designing tools with community input ○ supporting the community voice 	Public Health
6. Presentation (multilingual)	As Needed	CSC, CHA teams, priority fishing communities via CHAs, and other community networks	<ul style="list-style-type: none"> • Discuss changes or updates needed for the ICIAP and/or program components. • Report back on evaluation findings. • Capture CSC input on recommended changes to ICIAP and/or proposed tasks/activities for next year's Work Plan. • Share and learn about implementation efforts (CHA outreach, Public Health's grantees, implementing partners, etc.). • Share updates/progress on the IC work and the EPA's cleanup. 	Public Health & EPA
7. Presentation	Semi-Annual	EPA's HSCC (includes stakeholders and partners)	<ul style="list-style-type: none"> • Share updates on the program's progress and tools. • Discuss partnership opportunities to help address recommendations beyond the scope of the EPA's Duwamish Seafood Consumption IC Program. • Learn from CHAs' efforts on the ground, including community feedback. 	Public Health & EPA

What is the type of reporting?	How frequent?	Who is the main audience of the report?	What's covered?	Who is responsible for the reporting?
8. Presentation	As Needed	TBD (Duwamish Community Involvement Group; TTC; stakeholders)	<ul style="list-style-type: none"> Share updates on the program's progress and tools. 	Public Health & EPA

7.0 IC Modification & Termination Elements

As illustrated in Figure 5, the program uses a continuous improvement process that provides a feedback loop to continuously capture community input.

Public Health's CSC will serve as an ongoing space to center the voices of those most affected by the contaminated seafood and as a vehicle for them to share and discuss areas of improvement in the program to the EPA and Public Health. It is also a place for sharing and learning regarding CHAs' outreach efforts, implementation of IC strategies by community partners, Public Health's evaluation findings, and the EPA's progress on the cleanup process.

The EPA and Public Health anticipates that the IC strategies will be adaptive (modified or terminated) overtime based on evaluation results, saturation of target audiences, and/or changes to DOH seafood consumption advisory for the LDW Superfund site.

It is anticipated that the CSC membership will evolve over time and will consistently capture the voices of CHAs and other fishing community representatives. The EPA, Public Health, and the CSC will engage as needed with partner organizations and agencies who can help implement the IC strategies and/or policy and partnership recommendations within the scope of the EPA's program. Recommendations that fall outside the scope of the EPA's program will be brought to the HSCC as an opportunity to collaborate and coordinate with other partner agencies who may have the ability and authority to address those recommendations.

The CSC can propose changes to the ICIAP regarding how best to adaptively manage the program to achieve program goals. The EPA will make the final decision on what changes are to be made in the ICIAP.

8.0 References

- Anderson, R.M. & Funnell, M.M. (2010). Patient Empowerment: Myths and Misconceptions. *Patient Education and Counseling*, June 2010; 79(3): 277–282. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2879465/>
- Environmental Protection Agency. (2010). *Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites. Interim Final. November 2010.* EPA-540-R-09-001. Retrieved from <https://semspub.epa.gov/work/05/404284.pdf>
- Environmental Protection Agency. (2014). *Record of Decision (ROD): Lower Duwamish Waterway Superfund Site, November 2014.* Retrieved from <https://semspub.epa.gov/work/10/715975.pdf>
- Fishbein, M. & Yzer, M.C. (2003). Using theory to design effective health behavior interventions. *Communication Theory*, 13(2): 164–183. Retrieved from <https://academic.oup.com/ct/article-abstract/13/2/164/4110433>
- Gould, L., Ho, K. & Lee, S. (2018). *US EPA’s Duwamish Seafood Consumption Institutional Controls Program: Community Health Advocate Training Curriculum, Final Draft, May 2018, Version 1.0.* Prepared by Public Health – Seattle & King County and Just Health Action for EPA Region 10.
- Latino Health Access, Visión y Compromiso & Esperanza Community Housing Corporation. (2011). *The Promotor Model: A Model for Building Healthy Communities, A Framing Paper, March 29, 2011.* Retrieved from http://www.visionycompromiso.org/wordpress/wp-content/uploads/TCE_Promotores-Framing-Paper.pdf
- Lavery, S.H., Smith, M.L., Esparza, A.A., Hrushow, A., Moore, M. & Reed, D.F. (2005). The Community Action Model: A Community-Driven Model Designed to Address Disparities in Health. *American Journal of Public Health*. 2005 April, 95(4): 611–616. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1449228/>
- Lee, N.R. & Kotler, P.A. (2012). *Social Marketing: Influencing Behaviors for Good (4th Ed).* Los Angeles: SAGE.
- McKenzie-Mohr, D. (2011). *Fostering Sustainable Behavior: An Introduction to Community-based Social Marketing (3rd Ed).* New Society Publishers.
- Mogford, E., Gould, L. & DeVoght, A. (2010) Teaching critical health literacy as a means to action on the social determinants of health. *Health Promotion International*, March 2011; 26(1): 4–13. Retrieved from <https://doi.org/10.1093/heapro/daq049>
- National Environmental Justice Advisory Council. (2002). *Fish Consumption and Environmental Justice: A Report developed from the National Environmental Justice Advisory Council Meeting of December 3–6, 2001.*

November 2002 (revised). Retrieved from https://www.epa.gov/sites/production/files/2015-02/documents/fish-consump-report_1102.pdf

National Oceanic and Atmospheric Administration. (2014). A River Reborn: Restoring Salmon Habitat along Seattle's Duwamish River (May 27, 2014). Retrieved from <https://response.restoration.noaa.gov/about/media/river-reborn-restoring-salmon-habitat-along-seattles-duwamish-river.html>

Organisation for Economic Co-operation and Development. (2010). *Quality Standards for Development Evaluation*. DAC Guidelines and Reference Series. OECD Publishing.

Piotrow, P. T., Kincaid, D. L., Rimon, J. G., & Rhinehart, W. (1997). Health communication: Lessons from family planning and reproductive health. Westport, Connecticut, Praeger. Retrieved from <http://www.comminit.com/evidencesummit/content/piotrow-p-t-kincaid-d-l-rimon-j-g-rhinehart-w-1997-health-communication-lessons-family-p>

Sufian, M., Grunbaum, J. A., Tabia, H., Akintobi, A., Dozier, M., Eder, M. & White-Cooper, S. (2011). *Program Evaluation and Evaluating Community Engagement*. In Principles of Community Engagement (pp. 162–182). U.S. Department of Health and Human Services, NIH Publication No. 11-7782. Retrieved from https://www.atsdr.cdc.gov/communityengagement/pce_program_process.html

Tengland, P-A. (2012). Behavior Change or Empowerment: On the Ethics of Health-Promotion Strategies, *Public Health Ethics*, 5, 140–153. Retrieved from: <https://academic.oup.com/phe/article-abstract/5/2/140/1491548?redirectedFrom=fulltext>

World Health Organization. (1986). *Ottawa Charter for Health Promotion, 1986*. Retrieved from http://www.euro.who.int/_data/assets/pdf_file/0004/129532/Ottawa_Charter.pdf

Washington Department of Health. (2005). *Health Consultation: Lower Duwamish Waterway Site: Updated Fish Consumption Advisory and Evaluation of Marine Tissue Collected from the Lower Duwamish Waterway in August and September 2004*. Prepared by the Washington State Department of Health under a Cooperative Agreement with the Agency for Toxic Substances and Disease Registry. DOH 333-103 September 2005

Water Resource Area Inventory 9 Steering Committee. (2005). *WRIA 9: History, Factors of Decline, and Policy Recommendations, Chapter 3.0—Impacts on Salmonid Habitat*. Retrieved from <http://your.kingcounty.gov/dnrp/library/2005/kcr1876/CHAPTERS/Ch3-History.pdf>

9.0 List of Appendices

Appendix A—2018 Community Steering Committee Group Charter

Appendix B—2018 Preliminary Evaluation Plan for the Community Health Advocate Outreach & Training Strategy (including instruments and monitoring database)

Appendix C—Summary of Tools for Fishers and Moms

Appendix D—Community Steering Committee Meetings (agendas, presentations, and notes)