US EPA's Duwamish Waterway Superfund Site and the Seafood Consumption Institutional Controls Program

This chapter explains the purpose of the United States Environmental Protection Agency's (US EPA) Duwamish Seafood Consumption Institutional Controls (IC) Program, which is led by Public Health Seattle & King County (Public Health).

For background information, it gives an overview of the Lower Duwamish Waterway Superfund Site, including the history of the river, US EPA's Cleanup Plan for the site, and the Environmental Justice (EJ) guidance.

It also summarizes what we know about the communities that fish on the Duwamish River – those who are most at risk to the contaminated seafood in the river.

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The Duwamish Seafood Consumption IC Program (Program) is part of United States Environmental Protection Agency's (US EPA) Superfund Cleanup of the LDW Superfund Site. US EPA is developing this Program through a five-year (2017-2021) Cooperative Agreement with Public Health Seattle & King County (Public Health). Public Health is managing the community-based process to design and implement cultural appropriate and effective IC tools and activities on US EPA's behalf.

Public Health is working with long-standing partners in the Duwamish community, including Just Health Action (JHA), Duwamish River Cleanup Coalition (DRCC), Environmental Coalition of South Seattle (ECOSS), and others, to engage affected fishing communities in building community capacity for sustainable outcomes.

Public Health's overall goal for US EPA's Duwamish Seafood Consumption IC Program is to protect the health and wellbeing of fishers (and their families and friends, especially pregnant women and young children) from the contaminated resident seafood from the Duwamish Waterway Superfund Site (e.g., perch, flounder, sole, crab, mussels, clams).

Public Health will partner with community members, agencies and organizations to build community capacity, design culturally appropriate and effective IC tools, and ensure that our program activities do not have unintended consequences (such as scaring people from eating all seafood or stopping people from fishing).



Findings from US EPA's Lower Duwamish Waterway (LDW) Fishers Study, other relevant community-based projects and NEJAC recommendations are guiding the development, implementation and evaluation of the Program (see Sections 1.4-1.5).

Community members involved in the US EPA's LDW Fishers Study and JHA's pilot projects voiced an interest in learning about Duwamish Seafood Consumption Advisory so they can educate their friends and families. This would ensure that the message would be conveyed in a culturally and linguistically appropriate manner.

One of the key strategies of the Duwamish Seafood Consumption IC Program is to build the capacity of Community Health Advocates (CHA's) to conduct peer outreach and engagement in their communities, while empowering themselves to advocate for the protection of their health and the river.

Coupled with US EPA's on-going cleanup efforts of the river, the CHA Training and Outreach Strategy supports the Program's long-term goal of addressing EJ impacts by adequately protecting the health of those disproportionately impacted by the pollution.

The purpose of the CHA Training & Outreach Strategy is to build the capacity of CHA's to:

- 1. Raise awareness and promote culturally-appropriate healthy options that reduce or prevent community exposure to the Duwamish seafood contaminants.
- 2. Inform Public Health about the unique community needs and barriers to adopting the healthy options.
- 3. Empower themselves to advocate to decision-makers for the protection of their health from historical and continuing sources of seafood contamination in the Duwamish River.



The only Duwamish River seafood safe to eat is Salmon El único pescado del río Duwamish que es seguro para comer es el salmon

Loại hải sản an toàn nhất để ăn từ sông Duwamish là cá hồi

ត្រីដែលចាប់់ពីស្ទឹងឌូរ៉មមីស្មានដរត្រីសាលម៉ុនមួយគរ់ដែលមានស្ទ៉វរថិភាពក្នុងការបរិភភាគ





The Duwamish River is Seattle's only river. The Duwamish River connects from the Green River in Tukwila. It flows down between the South Seattle neighborhoods of Georgetown and South Park, then through Seattle's industrial core, and empties into Elliott Bay.

The Duwamish River and the surrounding land has been a valuable part of what is now South Seattle's ecosystem for thousands of years. It was first used by Native Americans for transportation, fishing, and shellfish harvesting (DRCC, 2018).

The D<u>kh</u>^{w'}Duw'Absh (Duwamish Tribe) are "The People of the Inside". The Duwamish Tribe's ancestral lands cover Elliott Bay and throughout the Duwamish River Watershed. The Duwamish Tribe's current Longhouse sits on the Duwamish River, at the site of their historic winter fishing village, a National Historic Site.

The Muckleshoot Tribe is a federally recognized Tribe, made of descendants of the Duwamish and Upper Puyallup people. They have fishing rights to conduct seasonal, commercial, ceremonial, and subsistence net-fishing operations in the river. The Suquamish Tribe is also a federally recognized Tribe and actively manages seafood resources just downstream of the Duwamish River (UW, JHA, and DRCC/TAG, 2013).

Long after settlers arrived in 1850, the river was dredged and straightened in 1913, giving a place for industry to move in and shape modern Seattle (DRCC, 2018).

Since the early 1900s, the Duwamish River has served as Seattle's major channel for the surrounding industrial and port activities. Today, the Duwamish area is both industrial (42%) and residential (29%) (WRIA 9, 2005).



Source: Duwamish Tribe (www.duwamishtribe.org)



The Duwamish River changed from a natural estuary (where freshwater mixes with saltwater) into a five-mile industrial channel, called the Lower Duwamish Waterway (LDW)¹. As a result, 97 percent of the original habitat for salmon in the Duwamish River was lost (NOAA, 2014).

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



Mid-1800s

Today

A comparison of the original Duwamish River to the current straightened-shape of the river. Source: Burke Museum blog (Waterlines Project)

¹ For simplicity, this manual will use the term "Duwamish River" when referring to the Lower Duwamish Waterway Superfund Site.

1.3 Lower Duwamish Waterway Superfund Site

For over a century, the Duwamish River became polluted with toxic chemicals from many sources – industries along its banks, storm water pipes, and storm water runoff from surrounding activities, streets and roads. While environmental regulation and cleanup of some areas have helped reduce pollution sources, the historic contamination and ongoing sources continue to impact the people and the river.

In 2001, the US EPA designated the five-mile Lower Duwamish Waterway a Superfund Site. Superfund is the name of a federal law that requires the nation's most toxic sites to be identified and cleaned up. The US EPA is responsible for administering the cleanup of the contaminated sediments in the river, while WA State Department of Ecology (Ecology) is responsible for controlling sources of pollution to the river. Due to the historic pollution, the US EPA found over 40 toxic chemicals in the sediments (mud) of the river. The levels in the sediments pose unacceptable risks to humans and the environment. Many of these contaminants stay in the environment for a long time. The resident (or native) fish, crab and shellfish that spend their whole lives in the river build up the contaminants in their bodies. The contaminants that pose the most risk to human health are: polychlorinated biphenyls (PCBs), dioxins/furans, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), and arsenic.

From the late 1990s through 2015, King County, City of Seattle, The Boeing Company, Port of Seattle and Earle M. Jorgensen Company cleaned up the most polluted spots along the river. These "early action" cleanups reduced the PCB contamination in the Duwamish River by approximately 50 percent.

In 2014, the US EPA issued its Final Cleanup Plan (called a Record of Decision). This Plan directs the cleanup for the rest of the LDW Superfund Site. It aims to reduce the level of contaminants in the resident seafood to better protect people who fish from the Duwamish River. The Plan requires both active cleanup measures, like dredging (removing the toxic mud) and capping (containment), and passive ones, such as natural recovery (natural sedimentation). Institutional Controls (ICs) are part of the Plan to protect people who fish and eat the resident seafood (see Section 1.3).



Source: US EPA

US EPA estimates the cleanup to cost about \$342 million and will take 17 years: 7 years of active cleanup of about 177 acres and 10 years of monitored natural recovery. For this Superfund site, hundreds of Potentially Responsible Parties (PRPs) will be required to pay for the cleanup. Even after the cleanup, the US EPA does not anticipate that people can safely eat resident Duwamish resident seafood in *unlimited* amounts.







Containment



Natural Recovery



The different cleanup measures in the US EPA's Cleanup Plan for the LDW Superfund Site. Source: US EPA



Institutional Controls (ICs) are "administrative and legal tools intended to minimize the potential for human exposure to contaminants by limiting resource use and influencing behavior".

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

WA State Department of Health (WDOH) issued the Duwamish Seafood Consumption Advisory in 2003. It is the most restrictive seafood consumption advisory in Washington State.

It advises the public not to eat any resident crab, shellfish, or bottom-feeding fish (e.g., perch, flounder and English sole) from the Duwamish River (this is particularly important for pregnant and nursing mothers and young children). Salmon are the healthiest option because they spend a short time in the river.



Duwamish Seafood Consumption Advisory Sign. Source: WA DOH

In 2005, the US Government Accountability Office (GAO) recommended that the US EPA ensure that ICs applied at Superfund sites be effective and appropriate during the time they are needed. This will be particularly important for addressing Environmental Justice (EJ) impacts on affected communities.



Source: National Environmental Justice Advisory Council (NEJAC, 2002)

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. (See Chapter 2 for further discussion about EJ.)

When developing the Duwamish Superfund Cleanup Plan, US EPA identified EJ concerns, particularly for those who catch and eat resident seafood from the Duwamish River.

In 2013, US EPA identified in their *EJ Analysis for the LDW Superfund Cleanup* that the people who eat the seafood are a community that is disproportionately impacted by the LDW Superfund Site.

"Particularly for the tribal and subsistence fishers and others who consume seafood at a higher rate than the general population, risks from eating contaminated seafood would be even higher, representing a significant environmental justice concern: an existing pre-cleanup adverse disproportionate impact for these groups of individuals." (US EPA, 2013)

To address the EJ impacts and ensure that ICs are effective and appropriate, the US EPA is using a community-based approach to better understand the unique needs of the affected Duwamish fishing community.

US EPA's (2016) *LDW Fishers Study* found that more than 20 ethnic/language groups fish on the river; certain fisher groups are more likely to eat and share the resident seafood; and many do not know or understand the Duwamish Seafood Consumption Advisory (see Section 1.5).

In developing the Duwamish Seafood Consumption IC Program, US EPA and Public Health are following guidance from the National Environmental Justice Advisory Council (NEJAC) about how to address seafood consumption issues in EJ communities (NEJAC, 2002). In summary, the NEJAC guidance states:

- 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 with EJ characteristics, those assumptions often do not apply.
- Affected communities must help determine what ways to address contaminated seafood consumption are "effective" and "appropriate" based on their local cultural context. And their expertise should guide every aspect of the seafood consumption IC process.

"Such efforts – led by those in the community, and supported by the US EPA and other agencies – can contribute to the larger goals of what the Laotian Organizing Project calls "participatory learning and culturally-appropriate organizing." US EPA and other agencies should view this as an opportunity to work with communities on the ground as they work to empower themselves." (NEJAC, 2002)

- Capacity-building and empowerment within the affected community are important to securing EJ. 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.
- Seafood consumptions advisories should be coupled with cleanup of the contaminated environment.

"Finally, even where agencies, together with affected groups, opt to continue to issue advisories, they need to redouble their efforts to prevent and reduce new sources of contamination and to cleanup and restore environments and fisheries that are already contaminated....."No one wants consumption advisories in place any longer than necessary."" (NEJAC, 2002)



Lower Duwamish Waterway (LDW) Fishers Study (US EPA, 2016)

As a first step in addressing the EJ concerns specific to Duwamish fishers, US EPA wanted to better understand the Duwamish Fishing Community. They conducted the LDW Fishers Study (2012-2016) as part of the ongoing Duwamish Superfund Cleanup efforts. A team of multi-lingual staff from ECOSS collected the data: 403 surveys with fishers along the river; and 22 in-depth interviews with fishers and people who eat Duwamish seafood.



Some of the key findings are:

- Many fishers continue to catch and eat resident seafood. Over 20 ethnic/language groups fish in the Duwamish River. The pollution in the river likely has more impacts on communities of color and low-income people.
- Fishing is good for mental, social and physical health. Fishing offers many benefits: it is fun and relaxing, it provides fresh food and time for socializing, fishers learn from each other, and there is a sense of community among fishers.



- A large percentage of fishers who caught the polluted resident seafood and/or were less aware of the advisory information are people of color and/or are Limited English Proficient. These priority groups include:
 - Asians (mostly Vietnamese, Cambodian, Chinese and Lao) and Pacific Islanders, Latinos, and multi-racial/multi-ethnic groups.
 - Non-English speakers (including Chinese and Hmong).
 - Residents South/West Seattle area and areas south of Seattle city limit. (Fishers come from within 33 miles to the Duwamish River.)
- The advisory information is hard to understand. The signs posted on at fishing locations are not effective in reaching all fishers. It is hard to connect health risks with chemicals that you cannot see in the water or fish.
- There is a need to provide options that encourage people to eat healthier fish, while maintaining their fishing culture.

Furthermore, Public Health found that the study findings indicate a lack of community awareness about the higher risks to pregnant women, babies and children from consuming contaminated resident seafood in the Duwamish River.

> US EPA's LDW Fishers Study (2016) concluded that "effective risk communication (including providing healthy options for continuing to fish and incorporate fish into diets) should respect fisher perspectives, build on existing models to help fishers to understand unseen risk, and integrate this information into local knowledge and lifestyles."

Duwamish Superfund Site Health Impact Assessment (HIA) Report (UW, JHA and DRCC/TAG, 2013)

The Health Impact Assessment (HIA) focused on the community health changes that may result from US EPA's proposed cleanup of the river. The HIA included consultations with community advisors, interviews with key informants, and focus groups with fishers. It provided recommendations to US EPA and other agencies on ways to minimize health impacts, maximize health benefits, and reduce health disparities in the affected populations.

The following summarizes the HIA recommendations related to Institutional Controls and Subsistence Fishing:

- ICs are a public health intervention.
- ICs should be designed to engage and empower people to participate meaningfully in stages (planning, implementation, and monitoring) for success.
- Informational advisories (e.g., signs) are not enough.
- ICs should go beyond just restrictive and informational actions, and include emphasizing positive options for safe fishing and healthy seafood consumption.
- Need for innovative thinking about "alternatives" that promote safe and healthy seafood consumption.
- Need for periodic reassessment due to changing demographics of target audiences.
- Partner with communities to design culturally appropriate outreach, education and risk communication.



Image: Patrick Robinson, West Seattle Herald







Just Health Action's Duwamish Fishing Community Engagement Pilot Projects (2014-2017)

Just Health Action (JHA) and Public Health collaborated on three Duwamish Fishing Community Engagement Pilot Projects.

JHA is a Seattle-based non-profit organization that advocates for reducing health inequities that result from social, political, environmental, and economic conditions.

From 2014-2017, JHA received a Seattle Duwamish River Opportunity Fund Grant from the City of Seattle to pilot community-based projects with two fishing communities and to address the HIA subsistence fisher recommendations.

Specifically, JHA, Public Health and other partners engaged with Vietnamese and Latino community members, who may be or may know people who are consuming contaminated resident seafood from the Duwamish River.

In addition, the project piloted a Community Health Advocate training based on the "Promotor(a) Model". Community members helped develop culturallyappropriate outreach tools and techniques, such as a digital story video, fishing rules factsheet, and a map guide of King County fishing sites and their advisory information.

Furthermore, the community members empowered themselves to educate agencies, including Public Health, US EPA and WA State Department of Fish and Wildlife. For more information on these pilot projects, see Chapter 2.



History of the Duwamish River:

- Duwamish River Cleanup Coalition (DRCC) at <u>http://duwamishcleanup.org/superfund-info/river-history-and-photos/</u>
- Duwamish Tribe at http://www.duwamishtribe.org/events.html
- WRIA 9 Steering Committee's Chapter 3.0 Impacts on Salmonid Habitat in WRIA 9: History, Factors of Decline, and Policy Recommendations at http://your.kingcounty.gov/dnrp/library/2005/kcr1876/CHAPTERS/Ch3-History.pdf
- NOAA's A River Reborn: Restoring Salmon Habitat along Seattle's Duwamish River at <u>https://response.restoration.noaa.gov/about/media/river-reborn-restoring-salmon-habitat-along-seattles-duwamish-river.html</u>

Lower Duwamish Waterway Superfund Site:

- US EPA's Lower Duwamish Waterway Superfund Site at <u>https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.cleanup&id=1</u> 002020
- US EPA's *Duwamish Superfund Site Toxic History, Engineering Solutions* YouTube video at <u>https://www.youtube.com/watch?v=YM42zcsGLBU&feature=youtu.be</u>
- DRCC at http://duwamishcleanup.org/superfund-info/

About the Duwamish Fishing Communities:

- US EPA's Lower Duwamish Waterway Fishers Study Report at http://ldwg.org/Assets/FS/LDW FishersStudy datareport and appendices FINAL 12.23.16. pdf
- UW, Just Health Action (JHA) and DRCC/TAG's Health Impact Assessment (HIA): Proposed Cleanup Plan for the Lower Duwamish Waterway Superfund Site at http://deohs.washington.edu/health-impact-assessment-duwamish-cleanup-plan
- JHA's Fishing and Us digital story video at <u>https://www.youtube.com/watch?v=NDmkoBJpKYU</u>



- The Duwamish River is part of the ancestral lands of Native Americans. It changed drastically from a natural estuary to an industrial channel; yet, the habitat here is crucial to ensuring the survival and recovery of threatened fish species.
- More than 20 ethnic/language groups fish on the Duwamish River. A large percentage of fishers who catch the contaminated resident seafood and/or are less aware of the advisory information are people of color and/or are Limited English Proficient making this an Environmental Justice issue.
- The Duwamish Seafood Consumption Institutional Controls (IC) Program is part of US EPA's LDW Superfund Cleanup. Public Health is managing the community-based process for US EPA to design and implement culturally-appropriate and effective IC tools and activities.
- Public Health's overall goal for the IC program is to protect the health and wellbeing of fishers (and their families and friends, especially pregnant women and young children) who are most likely to eat the contaminated resident seafood from the Duwamish River Superfund Site (e.g., perch, flounder, sole, crab, mussels, clams).