

# **Lower Duwamish Waterway Group**

*Port of Seattle / City of Seattle / King County / The Boeing Company*

## **LOWER DUWAMISH WATERWAY FISHERS STUDY IMPLEMENTATION PLAN**

**FINAL**

**Prepared for:**

**The US Environmental Protection Agency**

Region 10  
Seattle, WA

**The Washington State Department of Ecology**

Northwest Regional Office  
Bellevue, WA

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## Acronyms

Acronym	Definition
<b>AOC</b>	Administrative Order on Consent
<b>DOH</b>	Washington State Department of Health
<b>DRCC</b>	Duwamish River Cleanup Coalition
<b>Ecology</b>	Washington State Department of Ecology
<b>ECOSS</b>	Environmental Coalition of South Seattle
<b>EJ</b>	Environmental Justice
<b>EPA</b>	US Environmental Protection Agency
<b>FAQ</b>	frequently asked question
<b>FS</b>	feasibility study
<b>IC</b>	institutional control
<b>LDW</b>	Lower Duwamish Waterway
<b>LDWG</b>	Lower Duwamish Waterway Group
<b>Port</b>	Port of Seattle
<b>Public Health</b>	Public Health - Seattle & King County
<b>RI</b>	remedial investigation
<b>RM</b>	river mile
<b>T-105</b>	Terminal 105
<b>TAG</b>	Technical Advisory Group
<b>WDFW</b>	Washington State Department of Fish and Wildlife
<b>Windward</b>	Windward Environmental LLC

## Executive Summary

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This document presents the implementation plan for the Lower Duwamish Waterway (LDW) fishers study as outlined in the *Lower Duwamish Waterway Fishers Study Work Plan* (Windward 2013). This implementation plan provides details on how a pilot test and year-long survey for the study will be carried out by the Lower Duwamish Waterway Group (LDWG) under the Administrative Order on Consent (AOC) (EPA and Ecology 2000). This implementation plan is intended as a guide and may be adaptively modified through the course of the survey as needed in consultation with the US Environmental Protection Agency (EPA)/Washington State Department of Ecology (Ecology).

The goal of the fishers study is to gather information from people who either harvest or consume seafood from the LDW or who may assist in understanding aspects of seafood consumption from the LDW in order to inform the development of and improve the effectiveness of institutional controls related to the consumption of resident seafood.

This implementation plan:

- ◆ Summarizes the lessons learned from the 54 interviews with community representatives conducted by Environmental Coalition of South Seattle (ECOSS) in October/November 2013
- ◆ Presents the draft survey questions to be included in the survey
- ◆ Presents the approach for the pilot test, the year-long survey, and potential key informant interviews (which may be conducted during the survey to gather more in-depth information)
- ◆ Discusses the approach for community involvement, which includes opportunities for community representatives to be involved throughout the study

The design of the survey was based on the results of the ECOSS interviews, past survey findings and methods, and input from EPA/Ecology, public health advisors (i.e., representatives of Public Health – Seattle & King County [Public Health] and the Washington State Department of Health [DOH]), ECOSS, and the Duwamish River Cleanup Coalition (DRCC)/Technical Advisory Group (TAG). The identity of community representatives and key informants who participate in the study will be kept confidential following EPA guidance on human subjects. The identity of survey participants will not be recorded.

Approximately 10 pilot tests will be conducted in up to 10 languages prior to the survey to ensure that the survey questions are understood as intended and that the

questions are culturally appropriate. The survey will be revised, as needed, based on the results of the pilot.

The year-long survey will be conducted by ECOSS at locations on or near the Lower Duwamish Waterway (LDW) using a tiered approach in which the most popular fishing locations will be visited most often. Surveys will be conducted each week throughout the year, with a higher level of effort during the more popular fishing times. The survey will generally be administered verbally in English and other languages, but could also be self-administered in five different languages. Each time a survey is taken, the participant will be given a \$10 card. Additionally, up to 15 key informant interviews will be conducted during the year-long survey to gather more in-depth information within the scope of the study. Potential topics include risk perception or food preparation.

During the survey, the interim results will be discussed quarterly (or as needed) with EPA/Ecology, the public health advisors, DRCC/TAG, and interested community representatives. They will also be available to community representatives through other means (e.g., website, emails or phone calls, if requested). At the conclusion of the study, the results will be summarized in a data report and a fact sheet.

# 1 Introduction

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This document presents the implementation plan for the Lower Duwamish Waterway (LDW) fishers study as outlined in the *Lower Duwamish Waterway Fishers Study Work Plan* (Windward 2013), hereafter referred to as the Work Plan. This implementation plan provides details on how a pilot test and year-long survey for the study will be carried out by the Lower Duwamish Waterway Group (LDWG) under the Administrative Order on Consent (AOC) (EPA and Ecology 2000). This implementation plan is intended as a guide and may be adaptively modified in consultation with the US Environmental Protection Agency (EPA)/Washington State Department of Ecology (Ecology) through the course of the survey, as needed.

The goal of the fishers study is to gather information from people who either harvest or consume seafood from the LDW<sup>1</sup> or who may assist in understanding aspects of seafood consumption from the LDW in order to inform the development of and improve the effectiveness of institutional controls (ICs) related to the consumption of resident seafood.

This implementation plan presents an overview of the project (Section 2), lessons learned from the October/November 2013 Environmental Coalition of South Seattle (ECOSS) interviews with community representatives (Section 3), the draft survey questions to be used in the fishers study (Section 4), the approach for and results of the pilot test (Section 5), the survey design and interview methods (Section 6), the data management plan (Section 7), and the community representative involvement that will take place during the study (Section 8). Next steps, including the production of a final data report and fact sheet on the study findings, are discussed in Section 9.

## 2 Project Overview

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This section presents an overview of the study purpose, objectives, scope, tasks, organization, and schedule for the fishers study. An overview of the entire study, including the study tasks to be completed prior and subsequent to those detailed in this implementation plan, is provided in the Work Plan (Windward 2013).

### 2.1 PROJECT PURPOSE, OBJECTIVES, AND SCOPE

Both the remedial investigation/feasibility study (RI/FS) (Windward 2010; AECOM 2012) and EPA's Proposed Plan (EPA 2013) for the Superfund site propose utilizing ICs to ensure adequate protection of seafood consumers. ICs are administrative and legal tools intended to minimize the potential for human exposure to contaminants by

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<sup>1</sup> The term LDW is used throughout this document to describe the range of the survey, although some survey locations are just outside of the LDW proposed plan site boundary.



limiting resource use and influencing behavior. For example, providing notification to local communities that residual contamination remains at the site is a type of IC. Although the types of ICs applied at the LDW Superfund site will be developed after EPA has finalized its Record of Decision, both the RI/FS (Windward 2010; AECOM 2012) and EPA's Proposed Plan (EPA 2013) have identified fish advisories as a type of IC for the LDW cleanup.

A Government Accountability Office report (US GAO 2005) recommended that EPA ensure that the ICs applied at Superfund sites be effective and appropriate during the time they are needed, suggesting that EPA review IC recommendations, methodologies, and guidance documents. A current LDW IC is the existing fish advisory, which recommends no consumption of resident fish and shellfish. However, the existing fish advisories are not completely effective as community members report that they continue to consume these fish from the LDW. More information about ongoing fish consumption from the LDW is provided in Section 3.

A report on fish consumption prepared by the National Environmental Justice (EJ) Advisory Council (NEJAC 2002) noted that informational campaigns such as fish advisories, which are focused on restricting or influencing behaviors, assume that there are accessible substitute food sources for the fish consumers, and that changing behavior is appropriate. The Council noted that for communities with EJ characteristics, those assumptions often don't apply. Because the LDW fish-consuming community of the LDW displays EJ characteristics, developing appropriate ICs to adequately protect their health will require considering their unique needs in order to ensure that the ICs are effective.

The fishers study, performed by LDWG under the AOC (EPA and Ecology 2000) with EPA and Ecology, is designed to provide information that will help develop more effective ICs associated with EPA's LDW Superfund Cleanup.

The objective of the fishers study is to gather information from people who either harvest or consume seafood from the LDW or who may assist in understanding aspects of the consumption of resident seafood from the LDW. Key questions being investigated in the study are:

- ◆ How is the LDW currently being used for the collection and consumption of seafood, particularly resident seafood?
- ◆ What is currently known by the community about the risk of consuming seafood from the LDW? What are the perceived benefits of consuming seafood from the LDW?

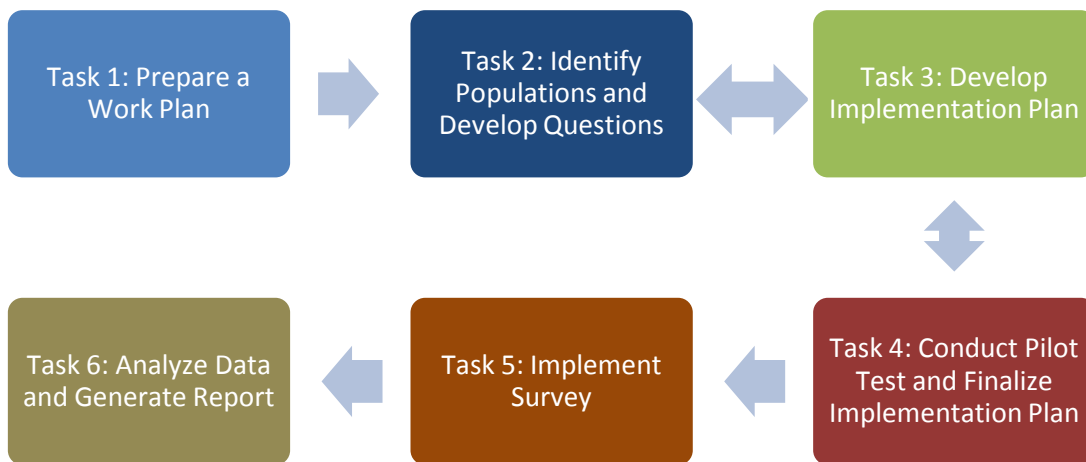
To develop effective and appropriate ICs, discussion regarding the perceived risks associated with the consumption of LDW resident seafood needs to include the perceived benefits. Therefore, the survey also collects some qualitative information on the perceived benefits of fishing in the LDW. Improving the understanding of seafood

consumers' current beliefs in both is necessary to develop effective and culturally appropriate ICs.

Although information gathered through this study is intended to inform the development and improve the effectiveness and appropriateness of ICs related to the consumption of LDW resident seafood, any measures to be implemented during or following the fishers study are outside the scope of this project per the AOC (EPA and Ecology 2000). These measures will be explored using different mechanisms and potentially with different parties or groups.

## 2.2 TASKS AND ORGANIZATION

The major tasks of the study are illustrated in Figure 2-1 and were discussed in detail in the Work Plan (Windward 2013). This implementation plan (Task 3) describes the pilot test (Task 4) and how the year-long survey will be carried out (Task 5).



**Figure 2-1. Tasks for the LDW fishers study**

The roles and responsibilities of the various participants in the study were also described in the Work Plan (Windward 2013). Under the oversight of EPA and Ecology, LDWG and its contractors (Windward Environmental LLC [Windward] and ECOSS) will conduct the fishers study in accordance with the AOC (EPA and Ecology 2000).

The public health advisor is Public Health-Seattle and King County (Public Health) with input from the Washington State Department of Health (DOH). The public health advisor will provide input throughout the fishers study to both EPA/Ecology and LDWG.

The LDW fishers study community includes individuals who harvest, prepare, and/or consume LDW resident seafood. In addition to the public health advisors, community

representatives will also be involved throughout the fishers study,<sup>2</sup> providing insight into their communities, with the intent to maximize the representation of the various community groups that are members of the LDW fishers study community. ECOSS staff are also active members of many diverse cultural and community groups, and thus ECOSS is also able to provide important feedback on the cultural appropriateness of different aspects of the study. Details on opportunities for community members to be involved in the study are provided in Section 8. In addition, LDW stakeholders (e.g., the tribes, Duwamish River Cleanup Coalition [DRCC]/Technical Advisory Group [TAG]) that have been participating in the review of LDW RI/FS documents will provide input through the LDW RI/FS stakeholder process established by EPA and Ecology, which applies to all formal AOC deliverables, including this implementation plan.

### **2.3 SCHEDULE**

The pilot test of the survey (Task 4) began as directed by EPA/Ecology once they had completed their review of the draft implementation plan and EPA issued their approval and confirmed that a waiver for the use of human subjects had been provided by the EPA Human Subjects Research Review group. The results of the pilot test were used to revise the survey as needed and were incorporated into the implementation plan (Sections 5.4 and 5.5). The year-long survey will begin upon the approval of the final implementation plan by EPA/Ecology and the EPA Human Subjects Research Review group.

## **3 Lessons Learned from ECOSS Interviews**

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This section presents information regarding the interviews of community representatives conducted by ECOSS in October and November of 2013. These interviews (hereafter referred to as the ECOSS interviews) were conducted under Task 2.

### **3.1 SCOPE OF INTERVIEWS**

The primary goal of Task 2 was to gather input from community representatives for consideration in the design of the survey, such as the best way to obtain the information sought in the survey, including how questions should be asked and what survey locations should be included to achieve a broad representation of populations who fish and/or consume seafood from the Duwamish. A secondary goal of Task 2 was to identify community representatives who may be interested in continued involvement in the fisher study.

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<sup>2</sup> The level of involvement is up to each individual.

### 3.1.1 Interviewees

For the ECOSS interviews, a list was compiled to identify the organizations that could provide important connections and access points within the various cultural and geographic communities in and around the Duwamish Valley. The contact list for the interviews was developed primarily by ECOSS with input from LDWG members, EPA, Ecology, Public Health, DOH, and DRCC/TAG. Overall, a total of 54 interviews with community representatives were conducted by ECOSS during October and November of 2013, each of which generally took between an hour and an hour and a half to complete. Interviewees were given \$10 store cards after the interviews. The communities/groups represented in these interviews included the following:

- ◆ Various Asian and Pacific Islander communities (i.e., Filipino, Vietnamese, Cambodian, Hmong, Laotian, Mienh, Thai, Japanese, Korean, Chinese, and Bhutanese communities)
- ◆ Mexican, Central American, and South American communities
- ◆ Somali and East African communities
- ◆ Bosnian community
- ◆ Homeless community
- ◆ Area organizations (e.g., DRCC/TAG and the South Park Neighborhood Association)

Two other ethnic groups (i.e., Somali Bantu and Burmese) were identified, but attempts to interview community representatives from these groups were not successful. Additionally, no representatives from the Mongolian and Russian communities were identified. ECOSS also attempted to contact urban Native American fishers through the Seattle Indian Health Board for their input, but these attempts were unsuccessful. The complete list of organizations/groups that were included in the fall 2013 ECOSS interviews (and those that did not participate) is provided as part of Appendix A.

### 3.1.2 Interview questions

The questions asked as part of the ECOSS interviews were developed with input from EPA, Ecology, Public Health, DOH, ECOSS, LDWG, and Windward. The topics covered in these interviews included the following:

- ◆ Question 1 - Fishing locations along the LDW
- ◆ Question 2 - Suggestions for approaching fishers
- ◆ Question 3 - Language preferences and translation suggestions
- ◆ Question 4 - Incentives for survey participation and reasons why people fish
- ◆ Question 5 - Barriers to survey participation

- ◆ Question 6 – Risk perceptions
- ◆ Question 7 – Suggestions for contacting other people who fish along the LDW
- ◆ Question 8 – Additional information that might be requested during the survey
- ◆ Questions 9 and 10 – Continued involvement of interviewees in the fishers study

The interview form, which includes the full text of the ECOSS interview questions, is provided in Appendix A.

### 3.2 KEY FINDINGS FROM INTERVIEWS

This section presents a summary of the key findings from the interviews. Results are summarized both overall for all interviewees and for subsets of this group when applicable. In some cases, it was helpful to summarize results both for fishers and non-fishers. Additionally, the results were examined for ethnic groups for which there were five or more participants (East African, Latino, Mienh/Lao/Hmong, Latino, and Vietnamese), and results for these groups are noted when there are trends that differ from the overall results.

#### 3.2.1 Fishing locations along the LDW

Question 1 of the ECOSS interviews asked interviewees whether they fish on the LDW, and if so, where they fish along the LDW. A total of 25 people (46% of the 54 individuals interviewed) indicated that they fish along the LDW. In addition, some of the people who do not fish said that they have fished there in the past (n = 1), know people who do (n = 3), or get fish from people who fish along the LDW (n = 2).

Of the 25 people who reported fishing along the LDW, 23 people provided information regarding where they fish. The survey asked individuals to indicate what fishing zones they visited, rather than asking individuals to identify specific locations. This information is summarized in Table 3-1. The fishing zones identified in this table are shown on Map 3-1.

**Table 3-1. Fishing locations identified in the fall 2013 ECOSS interviews**

Fishing Zone No.	Fishing Zone	No. of Respondents	Percentage of Total <sup>a</sup>
1	Harbor Island (downstream of RM 0); includes Spokane Street Bridge	19	83%
2	RM 0 to RM 1.0, West; includes T-105	13	57%
3	RM 0 to RM 1.0, East	6	26%
4	RM 1.0 to RM 2.0, West	4	17%
5	RM 1.0 to RM 2.0, East	3	13%
6	RM 2.0 to RM 3.0, West	2	9%
7	RM 2.0 to RM 3.0, East	2	9%
8	RM 3.0 to RM 4.0, West; includes the South Park neighborhood	2	9%

Fishing Zone No.	Fishing Zone	No. of Respondents	Percentage of Total <sup>a</sup>
9	RM 3.0 to RM 4.0, East	3	13%
10	RM 4.0 to RM 5.0, West	5	22%
11	RM 4.0 to RM 5.0, East	7	30%
12	Upstream of RM 5.0	7	30%

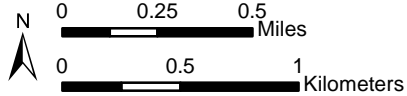
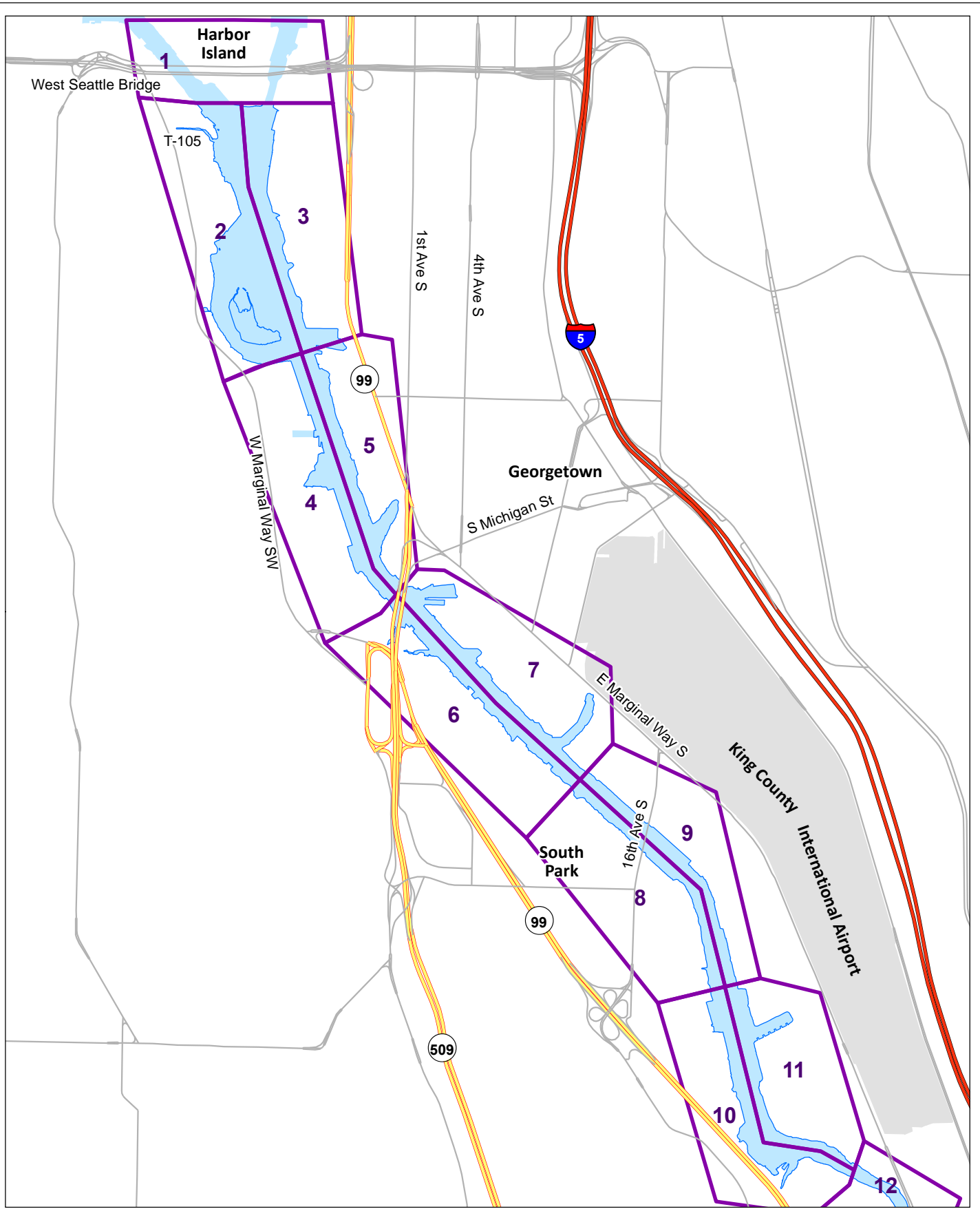
<sup>a</sup> A total of 23 people provided information about their fishing locations.

RM – river mile

T-105 – Terminal 105

Responses from the Vietnamese interviewees indicated that zone 1 was the most popular fishing zone for this group. Similarly, responses from the Mienh/Lao/Hmong interviewees indicated that zones 1 and 2 were the most popular. The East African and Latino groups were generally not fishers, and thus there is no information regarding the popularity of the fishing zones.

In addition to the information regarding the fishing zones, several interviewees mentioned that it might be helpful to note that the LDW is also referred to as El Rio, Snakehead, or Spokane Bridge by local fishers.



Map 3-1. Fishing survey zones used in the ECOSS Interviews



### 3.2.2 Suggestions for approaching fishers

Question 2 of the ECOSS interview asked interviewees if they had suggestions for approaching individuals fishing along the LDW. A total of 53 interviewees provided feedback on this topic. The following summarize the key concerns and suggestions expressed by the interviewees for approaching fishers:

- ◆ **Interviewer appearance** (n = 18, or 34%) – Many of the interviewees stressed the importance of not looking like a game warden (or other government official) and said that it was important to quickly reassure fishers about this. Other respondents suggested that the interviewers dress like fishermen (or perhaps be fishermen themselves).
- ◆ **Friendly and conversational approach** (n = 10, or 19%) – Many interviewees stressed the importance of manner and recommended being friendly and starting the conversation by asking questions such as “having any luck?”
- ◆ **Incentives for participation** (n = 7, or 13%) – Interviewees suggested that surveyors let people know about the incentives for participation (\$10 cards) when asking them if they would be willing to take the survey.
- ◆ **Language and culture** (n = 6, or 11%) – Interviewees stressed the importance of having surveyors who are respectful of the fisher’s culture (e.g., have an understanding of cultural traditions and who preferably speak the fisher’s language).
- ◆ **Build trust** (n = 5, or 9%) – Interviewees said that some fishers may be nervous about talking to strangers and suggested that (if possible) an introduction from another fisher or community member would be helpful. They also suggested that surveyors hang around for a while so they are recognized by fishers and that they not look in a fisher’s bucket to inspect the catch.
- ◆ **Introduction** (n = 4, or 8%) – Interviewees suggested that surveyors should introduce themselves to the fisher (give their name and show their identification to help reassure the fisher that they are not government officials).
- ◆ **Explain the purpose of the survey** (n = 4, or 8%) – Interviewees said that fishers taking the survey will want to know why they are being asked these questions.
- ◆ **Confidentiality of survey** (n = 2, or 4%) – Interviewees suggested that surveyors reassure fishers about the confidentiality of the survey and let them know that they do not need to show identification or give their name for participation.

Trends for the various ethnic groups generally followed the above patterns. The most common responses were the importance of incentives for participation for the East African interviewees, and the appearance of the surveyor for the Latino, Mienh/Lao/Hmong, and Vietnamese interviewees.



Other suggestions mentioned by interviewees included:

- ◆ **Survey timing** – Most fishers are out during the warmer summer months (spring/summer) or during salmon seasons. The best times of the day are mornings, evenings, and weekends (exact times may depend on tides); although some people (e.g., people who work non-traditional hours or who are retired) may fish at any time.
- ◆ **Length of the survey** – Keep the survey short (e.g., 10 minutes) and have a shorter version of the survey for people who have already participated.
- ◆ **Safety** – For safety reasons, interviewers should go out in teams of two or more.

It should be noted that some of the topics discussed in response to Question 2 were also discussed by interviewees in response to other questions in the ECOSS interview.

### 3.2.3 Language preferences and translation suggestions

Question 3 of the ECOSS interview asked interviewees about language preferences and suggestions. Responses are summarized as follows:

- ◆ **Oral vs. written survey** – Oral survey would likely be preferred by most fishers (some fishers may not be able to read the survey), although some individuals might prefer to fill the survey out on their own if that is an option. It was suggested that including pictures (e.g., types of fish) in the survey, when appropriate, would be helpful.
- ◆ **Language** – Many interviewees emphasized the importance of speaking their language. Most of the interviewees indicated that fishers would likely prefer taking the survey in their primary language.

Of the 54 interviews, a total of 38 interviewees<sup>3</sup> indicated a preferred language for taking the survey. Of the subset of 25 interviewees who reported fishing along the LDW, 15 indicated a preferred fishing language. Preferred languages for both of these groups are identified in Table 3-2. The most common responses from fishers were Mienh, Lao, English, Vietnamese, and Hmong. It should be noted that some interviewees indicated multiple preferred languages (e.g., Mienh and Lao).

**Table 3-2. Preferred languages identified in the fall 2013 ECOSS interviews**

Preferred Language	Fishers Only (n = 15) <sup>a</sup>		All Respondents (n = 38)	
	Number	Percentage <sup>b</sup>	Number	Percentage <sup>b</sup>
Mienh	8	53%	9	24%
Lao	5	33%	5	13%
English	3	20%	5	13%
Vietnamese	2	13%	6	16%

<sup>3</sup> Only 15 of these 38 interviewees reported that they fished along the LDW.

Preferred Language	Fishers Only (n = 15) <sup>a</sup>		All Respondents (n = 38)	
	Number	Percentage <sup>b</sup>	Number	Percentage <sup>b</sup>
Hmong	2	13%	2	5%
Spanish	1	7%	6	16%
Thai	1	7%	1	3%
Khmer	0	0%	4	11%
Amharic	0	0%	3	8%
Somali	0	0%	2	5%
Bosnian	0	0%	1	3%
Bhutanese	0	0%	1	3%
Chinese	0	0%	1	3%
Korean	0	0%	1	3%

<sup>a</sup> This category includes only those individuals who reported that they fish along the LDW.

<sup>b</sup> Percentages were calculated based on the number of respondents who indicated a preferred language (n = 15 for fishers and n = 38 for all respondents). Some respondents indicated more than one language, and thus the percentages add up to more than 100%.

### 3.2.4 Incentives for survey participation and reasons why people fish

Question 4 of the ECOSS interviews consisted of two parts: incentives to participate in the survey and why people fish.

#### 3.2.4.1 Incentives for survey participation

Of the 37 interviewees who answered Question 4, the vast majority indicated that cards were a good incentive for participation (n = 31, or 84%). This was also true for the various ethnic groups that were evaluated (i.e., the majority of interviewees in each group indicated that the cards were a good incentive). Some of the interviewees provided suggestions regarding what types of cards would be most appreciated, the most popular of which was Walmart (n = 5). Other suggestions included other grocery stores<sup>4</sup> (n = 3), universal gift cards (n = 2), fishing stores or bait shops (n = 2), Big 5 Sports (n = 1), and gas stations (n = 1).

In addition to \$10 cards, 11 interviewees provided other suggestions to encourage survey participation, which included the following:

- ◆ Giving participants raffle tickets for fishing gear, gift cards, or other prizes (n = 4)
- ◆ Setting up a table/booth or hold an event to encourage participation (n = 3)
- ◆ Providing access to discounted fishing licenses (n = 1)
- ◆ Giving participants a gift bag with fishing gear, such as a fishing tackle (n = 2)
- ◆ Providing participants with food or coffee (n = 2)

<sup>4</sup> Other grocery store suggestions included Albertsons, QFC, Red Apple, Stock Box, and Grocery Outlet.

- ◆ Giving participants cash (n = 2)

Some of these interviewees noted that some incentives (e.g., a tent) could potentially be combined with other incentives, such as providing coffee and \$10 cards.

### 3.2.4.2 **Reasons for fishing**

Question 4a of the survey asked interviewees why people fish. Of the 54 interviews conducted, 42 people answered this question. Many interviewees provided multiple reasons. The top reasons given for why people fish include the following:

- ◆ **Obtaining food or fresh fish** (n = 28, or 67%) – Some interviewees indicated that they fished specifically to get fresh fish, while others indicated that they were looking for a free source of food.
- ◆ **Recreation/social activity** (n = 25, or 60%) – Some interviewees indicated that they fished for fun, recreation, family time, the sport/thrill of fishing, leisure, to see friends, and to get fresh air.
- ◆ **Spend quality time alone** (n = 6, or 14%) – Some interviewees indicated that they fished to spend time by themselves, away from wives or children.
- ◆ **Cultural practices or traditions** (n = 5, or 12%) – Some interviewees said that they fished because it was part of their culture.
- ◆ **Sharing with friends/family or selling fish for extra money** (n = 5, or 12%) – Some interviewees indicated that they fished to make extra money or to help provide friends and family with food.

The top responses for the overall survey results (obtaining food/fresh fish and recreation/social activity) were the same as those reported for the ethnic groups for which sufficient information was available (East African, Vietnamese, and Mienh/Lao/Hmong).

### 3.2.5 **Barriers to survey participation**

Question 5 of the ECOSS interview asked interviewees about barriers to survey participation (i.e., what would discourage or prevent people from participating in the survey). Of the 41 interviewees who provided answers to this question, the top five suggestions, which were also common answers to Questions 2 and 3, included the following:

- ◆ **Appearance of the surveyor** (n = 21, or 51%) – Do not look like a game warden or the government.
- ◆ **Survey length** (n = 20, or 49%) – Keep the survey short and do not ask too many questions; use a shorter version of the survey for repeat participants.
- ◆ **Build trust** (n = 15, or 37%) – Be friendly and respectful, rather than rude or aggressive, to build trust.

- ◆ **Confidentiality** (n = 6, or 15%) - Do not ask to see a person's fishing license or identification; avoid asking personal questions.
- ◆ **Don't look at catch** (n = 5, or 12%) - Do not look in a fisher's bucket or ask to see their catch; general questions such as, "How's it going today?" are okay.

Other things mentioned that might discourage participation included language issues (n = 2), lack of participation incentives (n = 1), not wanting to take a break from fishing (n = 1), scaring people with the pollution issues (n = 1), and not following up with participants to make them feel included (n = 1).

The results by ethnic group are summarized as follows:

- ◆ **East African** - Of the three interviewees who answered this question, the top response was the appearance of the surveyor (n = 2).
- ◆ **Latino** - Of the six interviewees who answered this question, the top response was the importance of building trust (n = 4).
- ◆ **Vietnamese** - Of the seven interviewees who answered this question, the top responses were the importance of building trust (n = 4) and the appearance of the surveyor (n = 3).
- ◆ **Mienh/Lao/Hmong** - Of the nine interviewees who answered this question, the top responses were the importance of building trust (n = 5) and the appearance of the surveyor (n = 5).

### 3.2.6 Risk perceptions

Question 6 of the ECOSS interview asked interviewees about the perception of risk associated with the LDW. The first part of this question asked whether people are aware of the risks associated with eating seafood from the LDW. Of the 23 people who answered this part of the question, 13 said that people were aware (57%), and 10 said that people were not aware (43%). Of the 15 people who provided information regarding whether they were concerned about the risks, 10 people said that they were concerned, while 5 people said that they were not concerned. Along these lines, several interviewees suggested that (if applicable) it may make survey participants more comfortable if the surveyors share that they also enjoy fishing so fishers do not feel that they are being judged.

In addition, interviewees were asked about the best way to distribute information about the safety of eating seafood from the LDW. Common responses for the 25 people who provided information on this topic included the distribution of information via:

- ◆ Word of mouth, such as by talking with friends (n = 9, or 36%); this was the most common response (n = 6) for the eight Mienh/Lao/Hmong interviewees who answered this question.

- ◆ Media, such as ethnic or community newspapers and TV (n = 9, or 36%); this was the most common response (n = 3) for the four East African interviewees who answered this question.
- ◆ Announcements and/or postings at community/senior centers, churches, or community gatherings (n = 4, or 16%)
- ◆ Letters or flyers distributed in the community (n = 4, or 16%)
- ◆ Advisory signs (n = 3, or 12%)

### 3.2.7 Suggestions for contacting other people who fish along the LDW

Question 7 of the ECOSS interview asked interviewees for suggestions regarding ways to contact other individuals who fish or obtain fish from the LDW. The top suggestions from the 26 interviewees who responded to this question included the following:

- ◆ At seafood markets, food banks, or other places where people get food (n = 6, or 23%)
- ◆ At churches or mosques (n = 5, or 19%)
- ◆ At community or senior centers (n = 5, or 19%)
- ◆ Through the community or elders (n = 5, or 19%)
- ◆ Via media, including TV, radio, internet, and newspapers (n = 4, or 15%)
- ◆ Through word of mouth (n = 2, or 8%)

There were no clear trends associated with the responses provided by the various ethnic groups.

### 3.2.8 Additional information that might be requested during the survey

Question 8 of the ECOSS interview asked interviewees for suggestions of other questions that might be asked or additional information that might be requested of survey participants. Of the 26 interviewees who provided suggestions, the two main topics were as follows:

- ◆ **Purpose of the survey** (n = 8, or 31%) – Survey participants might wish to know how the information collected as part of the survey would be used.
- ◆ **Seafood consumption risks and cleanup of the LDW** (n = 16, or 62%) – Survey participants might have questions regarding the risks associated with consumption of seafood collected from the LDW (e.g., is it safe?) or the cleanup of the LDW. Surveyors should be able to discuss or make available information regarding these topics if asked by a participant during the survey.

### 3.2.9 Continued involvement of interviewees in the fishers study

Questions 9 and 10 of the ECOSS interview asked interviewees about their willingness to stay involved and help with the fishers study in the future. Table 3-3 provides a summary of these results. Of the total number of interviewees who provided an answer, the majority (over 75%) indicated that they were willing to stay involved with the survey and/or help with the pilot test. The percentage of fishers willing to stay involved or help with the pilot test was lower. The interviewees were not asked to specify how they would like to stay involved or their preferred level of involvement. Section 8 provides details regarding planned follow-up to further ascertain this interest.

**Table 3-3. Willingness of interviewees to continue their involvement in the fishers study**

Response	Question 9: Are you interested in staying involved in the survey?		Question 10: Would you be willing to help us further with this study by taking a pilot version of the survey?	
	All Respondents (n = 54)	Fishers Only (n = 25) <sup>a</sup>	All Respondents (n = 54)	Fishers Only (n = 25) <sup>a</sup>
Yes	34 (77%) <sup>b</sup>	11 (58%)	33 (77%)	10 (56%)
Maybe	3 (7%) <sup>b</sup>	2 (11%)	3 (7%)	2 (11%)
No	7 (16%) <sup>b</sup>	6 (32%)	7 (16%)	6 (33%)
No response <sup>c</sup>	10	6	11	7

<sup>a</sup> This category includes only those interviewees who reported that they fish along the LDW.

<sup>b</sup> Percentages were calculated based on the number of interviewees who responded to this question (i.e., the number of interviewees who did not respond was excluded from the total before percentages were calculated).

<sup>c</sup> No response indicates that the interviewee was not asked this question (e.g., because the surveyor or the interviewee were out of time).

### 3.3 USE OF INFORMATION FROM ECOSS INTERVIEWS

Information gathered as part of the ECOSS interviews, as summarized in Section 3.2, was used to help shape the survey design. Examples of how this information was used include the development of the Tier 1 and 2 locations (based on the fishing zone information provided in Section 3.2.1), the languages selected for inclusion in the survey (Section 3.2.3), and best practices for approaching fishers along the LDW (Sections 3.2.2 and 3.2.5). Section 6 presents the survey design, which relied heavily on information from the ECOSS interviews and information from the other surveys (as summarized in Appendix E).

### 3.4 ECOSS RE-CONTACT EFFORT AND FOLLOW-UP

In February 2014, ECOSS staff re-contacted ECOSS interview participants who had expressed an interest in having continued involvement in the study. The purpose of this effort was to clarify how people would like to be involved. In total, 38 people were contacted. Four were contacted by email, seven were contacted by phone, and the rest



were contacted in person. Specifically, people were provided with four options for involvement (based on consultation with ECOSS staff):

1. Reviewing and commenting on study documents (posted on the web) including:
  - ◆ Implementation plan (including ECOSS interview summary)
  - ◆ Data report
  - ◆ Fact sheet presenting the study results
  - ◆ Quarterly updates
2. Attending a project meeting to discuss:
  - ◆ Any of the posted documents listed above
  - ◆ Results of the pilot test
  - ◆ Preliminary results of the study (including the survey and key informant interviews)
3. Receiving a phone call or meeting with ECOSS staff to discuss any of the above items
4. Joining an email list to receive notification when documents are posted on the web or when meetings that community representative may attend will be held

ECOSS asked for individuals' contact information if they expressed an interest in one (or more) of the options above. Most people were interested in Option 3 (receiving a phone call) or Option 4 (joining an email list). Seven individuals said they were interested in Option 2 (attending a meeting). Of those seven, four were staff from DRCC/TAG. Five people expressed an interest in Option 1 (reviewing documents); of these, three were staff from DRCC/TAG. A draft version of this implementation plan was provided to DRCC/TAG through EPA and emailed to the two community members who were not members of DRCC/TAG staff. Two follow-up contacts were made to see if the two community members had suggestions, comments, or questions on the draft implementation plan. Neither asked questions or provided comments.

## **4 Draft Survey Questions**

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This section summarizes the process followed to develop the draft survey questions as well as an overview of the questions. The draft survey questions were used in the pilot test. After the completion of the pilot test, the questions were refined for use in the year-long survey.

## 4.1 DEVELOPMENT OF SURVEY QUESTIONS

The draft survey questions were designed to address the project objectives and associated key questions from Section 2.1 and were developed based on previous surveys, information gained through the ECOSS community representative interviews, and input from EPA, Ecology, ECOSS, LDWG, DRCC/TAG, and public health advisors from DOH and Public Health.

Previous surveys that were reviewed for format and wording included those from the following studies:

- ◆ *Asian and Pacific Islander seafood consumption study in King County, Washington* (EPA 1999) – The interview form from this study was reviewed primarily to learn how questions about risk perception and communication methods were worded.
- ◆ *King County Combined Sewer Overflow Water Quality Assessment for the Duwamish River and Elliott Bay* (King County 1999) – This study included a creel survey at locations on the LDW and in Elliott Bay, which provided an example of how to format a short survey as well as ideas about what other information might be helpful (e.g., weather conditions).
- ◆ LDW fisher awareness of fish advisory survey (Barry 2013) – This study, which was conducted to determine the effectiveness of signage, was reviewed for the questions on advisory awareness as well as seafood consumption. This survey was performed at two locations along the LDW (i.e., the Spokane Street Bridge and Terminal 105).
- ◆ Palos Verdes (California) shelf survey (EPA and FCEC 2013) – Similar to the King County (1999) survey, this survey was useful to learn how a short survey could be organized. In addition, the Palos Verdes survey included language about personal privacy and the rights of survey participants.

In addition, Public Health developed a question bank of risk perception questions related to fish consumption based on a review of several additional studies from the East Coast and Midwest. This question bank was reviewed to help determine the risk perception questions for the LDW survey.

The ECOSS interviews (discussed in Section 3) provided current, local information that was useful in developing the LDW survey questions. The interviewees identified several elements that they felt should or should not be included in the surveys and provided input regarding how the surveys should be conducted. Interviewees indicated that it was very important that fishers' time be respected and that the survey be short (Sections 3.2.2 and 3.2.5) and confidential (Section 3.2.5). Responses to some questions in the interviews were also helpful in developing multiple-choice response options to include in the survey. Specifically, the interview results provided response options for the reasons why people fish (Section 3.2.4.2), as well as options for



communicating information regarding the safe consumption of seafood (Section 3.2.6). In addition, several people identified topics/issues they would prefer not to be asked about (e.g., whether they have a license or if the surveyor can look at their catch).

The consultation process for developing the survey questions included opportunities for input through multiple communication routes. An early version of the draft survey questions was provided to EPA, Ecology, Public Health, DOH, ECOSS, DRCC/TAG, and LDWG. Some input was provided in writing, and other input was provided during meetings held on December 18, 2013, January 14, 2014, and May 8, 2014. These meetings were attended by representatives of EPA, Public Health, DOH, ECOSS, DRCC/TAG, LDWG, and Windward. Ecology attended the December 18 meeting and called in to the January 14 meeting. In addition, ECOSS performed two trials of the draft version of the survey as described in Section 5.2.2. The draft survey questions were revised based on input from reviewers and from the trials performed by ECOSS.

## **4.2 DRAFT SURVEY QUESTIONS**

The draft survey includes about 20 questions<sup>5</sup> divided into 5 main sections, plus an additional 5 questions in a sixth section for individuals willing to talk longer. The complete draft survey is provided in Appendix B and is summarized here. The survey sections and their general topics are as follows:

- ◆ Section A. Introduction
- ◆ Section B. Purpose of fishing
- ◆ Section C. Fishing habits (for fishers who eat LDW seafood other than salmon)
- ◆ Section D. Contamination awareness and communication
- ◆ Section E. Additional information
- ◆ Section F. Questions for those willing to talk longer

In Section A, the surveyor introduces him/herself and tells the participant about the purpose of the study (i.e., to help us understand fishing in and the consumption of seafood from the LDW) and how the information is to be used (i.e., to help us learn how to better protect people who fish in the Duwamish). Participants are then informed that the survey is expected to take about 10 to 15 minutes, and they will receive a \$10 card for their participation. Their answers are to be kept anonymous and cannot be linked back to them. Participants are also informed that they do not have to answer any questions they do not want to answer, and they may stop the interview at any time. Surveyors then ask the participant if they have any questions and for the participant's consent to start the survey.

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<sup>5</sup> The number of questions a respondent would answer would depend on the answers they give and if they have taken the survey before.

In Section A, the surveyor asks if the participant has taken the survey before. If so, the participant takes a shorter version of the survey for which they still receive a \$10 card.

In Section B, participants are asked what they are fishing for today and what have they fished for in the past, why they choose to fish in the LDW and what they do with their catch, including whether they share it with family or others. Depending on their responses, participants are then asked why they choose to eat and/or share the resident LDW seafood they catch or why they choose not to eat or share it. Pictures (see Appendix B) are used to assist participants in reporting the general types of seafood they collect (e.g., salmon, finfish other than salmon, crab, clams, or other [which they may specify]).

Section C is only for participants who report that they eat or share any part of their catch of resident seafood<sup>6</sup> and have not taken the survey before. This section has questions about when participants fish (i.e., which seasons) and how often. It also includes questions about where else in the LDW participants fish (selecting a zone from the map [in Appendix B]) and if they fish in nearby locations (outside of the LDW) as well.

Section D has questions about contamination awareness and communication. Participants are asked what they have seen or heard about eating seafood from the LDW and where they have seen or heard this information. Participants are also asked what sources of information they trust for information about eating LDW seafood and their preferred language.

In Section E, participants are asked if they have anything else they would like to add or if there is anything they would like more information about. Participants are also asked for their zip code or neighborhood and their ethnicity/race. In order to better understand the fishing behavior of people who take the survey more than once, participants will be asked for their first initial and the last four digits of their telephone number. This information will be used to determine how many times an individual participant has taken the survey but not provide information that could be used to identify the participant.

Section F includes five questions related to risk perception, including the benefits and risks of eating seafood. These questions are asked only if participants are willing to talk longer. The surveyor determines on a case-by-case basis if a participant seems willing to address the five questions in Section F.

After the survey is completed, the surveyor records their own name, the language used for the survey, and the date, time, and location of the survey in Section G.

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<sup>6</sup> Per the fishers study objectives, the focus of the survey is on LDW resident seafood and not on salmon. Salmon is the healthiest choice of seafood caught from the LDW. Salmon do not spend the majority of their lives in the LDW, and therefore, salmon caught in the LDW have similar contaminant body burdens to salmon caught in other parts of Puget Sound.

Section G also has space for additional surveyor notes (i.e., fisher comprehension of and comfort with the survey, cultural context notes that could help with survey interpretation, notes related to key informant interviews, and other observations). Other information about general conditions and observations at each survey location are to be collected on a separate field form as discussed in Section 6.2. Survey participants will be asked to sign their initials on a separate form for receipt of the \$10 card (participant's name is not required to receive the \$10 card and will not be requested) (Appendix B). The initials are required so that King County<sup>7</sup> can document that \$10 cards were received by the participant.

## **5 Pilot Test**

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A pilot test of the survey questions was performed in July 2014 to ensure that the questions were understood, elicited responses as intended, and were culturally appropriate. Pilot test participants and surveyors also provided feedback on the selection of options provided for multiple-choice questions, the visual aids for the survey (i.e., pictures of fish, crab, and clams and maps), and the overall survey structure (e.g., the organization of the questions and the length of the survey). This section presents information on the pilot test design, survey translation, cognitive testing, and pilot test training. The results of the pilot test and the resulting revisions to the survey are summarized in Section 5.4. The pilot training, pilot testing, and discussion of pilot test results provided opportunities for co-learning (i.e., collaborative learning that capitalizes on the resources and skills of all parties involved as opposed to the one-way dissemination of information) and capacity building (e.g., increase ability to perform new activities, understand and address community issues) for those working on the survey, as well as for community members.

### **5.1 PILOT TEST DESIGN**

This section describes the selection of pilot test participants and the administration of the pilot test. The pilot test was conducted with a variety of participants (languages, ages, ethnicities) and involved both versions of the survey that will be used in the year-long survey (i.e., verbally administered and self-administered).

#### **5.1.1 Selection of pilot test participants**

The pilot test was administered to 10 participants. The priorities for recruiting people to participate in the pilot were as follows (starting with the highest priority):

- ◆ Represent the 10 priority languages
- ◆ Represent fishers

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<sup>7</sup> King County will be purchasing the \$10 cards for use in this study, and documentation of their use is required for expense tracking purposes.

- ◆ Represent different age groups and genders

The primary goal was to include one participant from each of the 10 priority language groups (i.e., Vietnamese, Mienh, Hmong, Lao, Khmer, Spanish, simplified Chinese, Korean, Tagalog, and English) anticipated in the survey. The process for identifying and selecting languages for use in the survey is described in Section 6.1.3. A secondary goal was to include as many fishers as possible (at least half of the participants) because the actual survey will take place in the field with fishers. Some LDW fishers who participated in the ECOSS interviews<sup>8</sup> were recruited to take the pilot test. A tertiary goal was to also represent, to the extent possible, different age groups (i.e., under 30 years, 30 to 50 years, older than 50 years) and both genders. For example, one participant might speak Vietnamese and be a fisher who is female and under 30 years old. Another participant might speak Mienh and be a fisher who is male and older than 50.

The pilot test was completed in July 2014. Table 5-1 presents the demographics of the pilot test participants and identifies the survey type (i.e., whether it was verbal or self-administered). Most participation goals were met. The pilot test was performed with one woman and nine men, including eight people who were fishers. Two participants were under 30, five were between 30 and 50, and three were over 50. Eight surveys were performed verbally, and two were self-administered (in English and Tagalog). The survey was completed in all the target languages, with the exception of Hmong; a Hmong community member participated in the pilot test but the survey was conducted verbally in English.

**Table 5-1. Participation in the pilot test**

Pilot No.	Survey Language	Survey Type	Fisher? (yes/no)	Participant Age	Participant Gender	Other Notes
1	English	self-administered	yes	30 – 50	male	Samoan community member; survey conducted in English
2	English	verbal	yes	≤ 30	male	Hmong community member; survey conducted in English
3	Khmer	verbal	yes	30 – 50	male	
4	Lao	verbal	yes	50 +	male	
5	Mienh	verbal	yes	30 – 50	male	
6	Korean	verbal	yes	30 – 50	male	
7	Chinese	verbal	no	≤ 30	male	
8	Spanish	verbal	no	50+	female	

<sup>8</sup> During the ECOSS interviews, 33 people, who represented a diverse group in terms of language, age, and gender, said they would be willing to help with a pilot test (see Section 3.2.9). Ten of these people were fishers; although those 10 included speakers of only 4 of the 10 priority languages that were targeted for the pilot.

Pilot No.	Survey Language	Survey Type	Fisher? (yes/no)	Participant Age	Participant Gender	Other Notes
9	Tagalog	self-administered	yes	50+	male	
10	Vietnamese	verbal	yes	30 – 50	male	

### 5.1.2 Conducting the pilot test

The pilot test, which consisted of scheduled trials of the survey with identified participants, covered both the verbal and self-administered versions. Two of the pilot tests were performed as self-administered tests with the surveyor providing some initial instruction on the survey and the participants reading and filling out the survey themselves. The remaining pilot tests were verbally administered. Pilot test participants were asked all of the survey questions, including those in Section F.

For the verbally administered pilot tests, the questions in each section were asked as they will be asked during the year-long survey. However, after completing each section of the pilot test, surveyors asked the participants for feedback on that section before moving on to the next section. After completing the survey, participants were asked for feedback on the survey as a whole. The survey was modified for use in the pilot test to facilitate the collection of this feedback (see Section 5.3.2).

For self-administered pilot tests, the surveyor allowed the participant to complete the entire survey by himself/herself. Then the surveyor asked the participant to provide feedback on each section of the survey and on the survey as a whole. The surveyor recorded the participant’s comments as well as his/her own observations.

As with the surveys conducted at locations along the LDW, participants in the pilot test received a \$10 card for their participation, which was tracked on the \$10 card tracking form (Appendix D). Participants were informed of the opportunity to discuss the preliminary results of the pilot test at a meeting and provide their thoughts on the interpretation of the results. For participants who expressed an interest, ECOSS staff asked for their contact information so they could be informed about the meeting.

## 5.2 SURVEY TRANSLATION AND COGNITIVE TESTING

This section describes the translation (and back-translation) and cognitive testing of the survey.

### 5.2.1 Initial survey translation and interpretation

The draft survey was translated into five languages (i.e., Vietnamese, Spanish, simplified Chinese, Korean, and Tagalog) by Northwest Interpreters Inc. To ensure that the translations were understandable and accurate, native speakers of each language then “back translated” the questions into English or conducted translation

checks of the survey.<sup>9</sup> These back translations were then compared with the original English version of the survey, with adjustments made to the translated versions as needed. After the completion of the pilot test, revisions were made to the survey. This will require additional translation and “back translation” efforts to ensure that changes to the survey are applied to all written versions.

For some language groups (i.e., Khmer, Lao, Hmong, and Mienh), the survey will not be translated in written form. Instead the surveyor will interpret the survey as it is administered verbally to the participant (for both the pilot test and the survey). A discussion of why some languages were selected for written translation and others were not is provided in Section 6.1.3.

### **5.2.2 Cognitive testing of survey**

Cognitive testing is a research method for pre-testing surveys through the collection of information regarding survey questions and responses to ensure that the questions are constructed to meet the needs of the study and are understandable to participants. This testing is performed before the survey is used with the full sample (in this case, the year-long survey). In the fishers study, there were three opportunities for cognitive testing:

- ◆ ECOSS trials of the draft survey
- ◆ Pilot test training
- ◆ Pilot testing

The initial cognitive testing (i.e., trials of the draft survey) was performed by ECOSS staff who administered a draft version of the survey to two other ECOSS staff members in early May 2014. One of the participants was not familiar with the fishers study, and one of the participants did not speak English as his/her first language. ECOSS provided feedback on the survey, including suggestions for questions that survey participants in these trials found to be unclear or made them uncomfortable. The draft survey was revised accordingly.

A second element of cognitive testing occurred as part of the pilot test training. As described in Section 5.4.1, training for ECOSS staff included overview information about the fishers study (goals/objectives) and a detailed review of the survey questions. This included discussions about their understanding of the questions and any recommendations they had to improve the questions (e.g., to improve clarity or make them more culturally appropriate). These observations and recommendations

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<sup>9</sup> Back translations of the Chinese, Spanish, and Vietnamese versions of the survey were performed by native speakers on ECOSS staff. Simpler translation checks (rather than a full back translation) of the Tagalog and Korean versions of the survey were conducted by a native speaker at King County and ECOSS, respectively.



from the pilot test training were recorded by Windward staff and used, in conjunction with findings from the pilot test, to adjust the survey questions.

The pilot test (Section 5.3.3.) also provided an opportunity to receive feedback on the draft survey from both the pilot test participants and the surveyors. Specifically, the pilot test participants were asked to provide feedback on each section of the survey and at the end of the survey. Feedback regarding their understanding of the questions and any recommendations to improve the questions was requested. Surveyors recorded their thoughts on the questions, as well as any observations of participant behavior or responses to questions during the pilot test.

The information gathered through the cognitive testing described here was used to revise the survey to ensure that the questions address study needs and are understandable and acceptable to survey participants.

### **5.3 PILOT TEST TRAINING**

The pilot test was administered by trained ECOSS staff, who will also administer the year-long survey (referred to collectively as surveyors). Because ECOSS staff are active members of many of the communities being surveyed, they were able to provide valuable insight regarding cultural considerations for conducting the pilot test. Training for the ECOSS staff who will administer the pilot test was conducted by ECOSS managers, Windward staff, and a social science professional. Pilot test training included orientation to the fishers study and survey, survey materials, qualitative survey techniques, and survey administration. The training for ECOSS staff to administer the survey helped build new skills for ECOSS, and the collaborative approach for the training (with two-way information exchange between trainers and ECOSS staff) provided an opportunity for co-learning. The administration of the pilot test also provided an opportunity for relationship building between LDWG, ECOSS staff, and community members.

#### **5.3.1 Orientation to fishers study and survey**

One goal of the training was to ensure that each surveyor had an understanding of the overall study goals and tasks and was able to convey that information (if asked) to pilot test participants. Thus, the training for the pilot test included the following components to achieve these goals:

- ◆ General background information regarding the LDW
- ◆ Goals/objectives of the fishers study
- ◆ Survey organization and questions (including response options)

It is critical that ECOSS surveyors understand the questions and the various response options. As discussed above, this portion of the training provided an additional opportunity for cognitive testing of the survey questions.

### 5.3.2 Pilot test administration

This portion of the pilot training involved teaching the surveyors how the pilot test should be administered. The topics related to survey administration that were critical for the pilot test training included the following:

- ◆ Items that must be covered before starting the survey (i.e., confidentiality language)
- ◆ How to record participant responses (For a given multiple choice question, the surveyor should select the multiple choice option[s]) that correspond with the participant's response. If the response does not match one of the options, then the response should be marked as "other," and details of the specific response should be recorded.)
- ◆ When to skip questions or sections based on participant responses
- ◆ What to do if the participant does not understand a particular question
- ◆ How to verbally administer the survey vs. initiate the self-administered survey (including training on how to provide instruction to participants who self-administer the pilot test)

### 5.3.3 Pilot test materials

During the pilot test, surveyors were instructed to make health information available if it was requested by pilot test participants. A fact sheet on LDW seafood health information was available to hand out at the end of the pilot test if requested (Appendix C). For questions about the environmental status of the LDW or its cleanup, surveyors were instructed to provide participants with contact information for EPA's outreach officer for the site. To avoid biasing any of the responses to the survey, the fact sheet was handed out to participants only after the survey was completed.

In addition, training for the pilot test included a review of the survey form that includes space for feedback from the surveyor (i.e., ECOSS staff member) and prompts to ask the participant for feedback during the pilot test (Appendix C). Specifically, space is provided next to each question for the surveyor to write notes about the clarity of the questions, the options provided for multiple-choice questions, and the helpfulness of the visual aids. In addition, at the end of each section, the surveyor asked the participant questions about his/her thoughts on the questions in that section:

- ◆ Were there any questions in this section that were difficult to answer? Which one(s) and why?
- ◆ Do you have any recommendations to improve the questions in this section?



Space was also provided for the surveyor to write any general notes or comments about each section. The pilot test was intended to facilitate the collection of feedback on the draft survey questions. At the end of the pilot test, participants were asked for any additional feedback on the overall survey structure (e.g., the organization of the questions, length of the survey) and ideas on how to improve the survey and promote participation. Participants were also asked if they were interested in learning about or discussing the pilot test results, and, if so, how this could best be accomplished (e.g., through a call from ECOSS staff, by attending a meeting [if so, what location and timing would work best for them], or by receiving an email summary).

#### **5.3.4 Qualitative survey techniques**

The pilot test survey (i.e., the draft survey) included five open-ended questions for participants who were willing to talk longer (these questions were optional). The pilot test training included instruction by a social science professional who has experience in administering and training others to administer qualitative surveys. Specifically, surveyors learned how to start an open-ended series of questions, how to allow the respondent to talk freely and make his/her intentions known, how to create a rapport, how to probe for additional information, and how to avoid interviewer bias.

Through the training, the surveyors gained an understanding of what kind of information is being sought within the broad goals of the study and how qualitative interviewing differs from conducting a standardized survey or a semi-structured interview. They also gained skills in establishing rapport and gathering additional information. The training also included methods for rapid note taking in the field.

The training also discussed how experience asking open-ended questions developed during the pilot test and the year-long survey can serve as practice for asking qualitative questions during the key informant interviews that will begin mid-way through the year-long survey.

#### **5.3.5 Survey practice**

In the last portion of the pilot test training, surveyors were asked to practice administering the survey. This practice allowed surveyors to gain additional familiarity with the survey (and associated materials) and ensured that they were correctly administering the survey. Trainers (from ECOSS, Windward, and the social science professional) acted as survey participants and provided feedback during and after these practices.

### **5.4 PILOT TEST RESULTS**

#### **5.4.1 Method for the incorporation of results and community feedback**

The results from the pilot test were compiled by Windward with assistance from ECOSS. ECOSS recorded the answers to survey questions as well as comments on the

survey from pilot test participants and ECOSS surveyors. Pilot test participant responses about their perceptions of and recommendations for survey questions and format were considered in making revisions to the survey. Participant responses to actual survey questions were reviewed only to help evaluate whether the survey questions are understandable. Results from the pilot test will not be included with results of the year-long survey. Findings from the pilot test related to participants' comprehension of the questions, their feedback on the questions, and feedback from ECOSS staff on the pilot were used to inform changes to the survey.

A meeting was held on July 30, 2014, at South Seattle Community College in Georgetown to discuss the results with EPA, Ecology, DRCC/TAG, ECOSS, LDWG, and public health advisors. In addition, community members identified through the ECOSS interviews or re-contact efforts (see Section 3.5) and ECOSS surveyors who expressed an interest in learning about or discussing the pilot test results were invited to attend.<sup>10</sup> The meeting provided an opportunity to learn about the results of the pilot test, as well as proposed changes to the survey based on the pilot test. In addition, this meeting provided an opportunity for pilot test surveyors to voice their thoughts on the survey and the interpretation of the pilot test results. The meeting also served as an opportunity for those working on the study and the community to further build relationships.

Two other options to stay involved were offered during the ECOSS interviews and the pilot test: to receive a phone call from ECOSS and/or to receive summaries via email. ECOSS followed up in August with phone calls to the two pilot test participants who requested phone calls, and email summaries of findings from the pilot test were sent to the three pilot participants who requested these summaries. Individuals who requested continued involvement via phone calls or email as a result of the re-contact efforts (Section 3.5) were contacted as well (any feedback obtained as a result of these communications will be documented in the community involvement log; Appendix D).

#### **5.4.2 Findings from the pre-pilot training and the pilot test**

Significant feedback on the survey was collected from ECOSS staff during the pilot test training and administration. A summary of this feedback is provided in Appendix C (Table C-1), which is organized by section and survey question. Overall feedback is also provided in Table C-1.

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<sup>10</sup> ECOSS called two community members and emailed two community members to invite them to the meeting. None chose to attend. An invitation was also extended to DRCC/TAG, its staff, and any community members they wished to include. All pilot test participants were asked whether they would like to attend a meeting to discuss the results. No pilot test participants expressed an interest in attending the meeting. Two ECOSS staff members who administered the pilot test attended the meeting.

Various concerns regarding the survey were raised during the pre-pilot training and/or the pilot test. These included:

- ◆ The skip pattern of the survey was difficult to follow.
- ◆ The large tables that addressed the fishing habits of individuals and whether they eat and share their catch (Questions B3 through B6) and that asked for preferred information sources (Questions D2 and D3) were difficult to use and time consuming.
- ◆ The questions that addressed where else people fish were time consuming, and many people were confused by the maps.
- ◆ Several questions were repetitive, confusing, or irritating (specifically, questions about why people fish/eat their catch, the benefits of eating fish, and whether people trust their information sources).
- ◆ Several participants asked questions for which ECOSS staff would have appreciated standard answers (e.g., Why do you need to know my race? or What is the EPA?).
- ◆ The end of the survey is awkward (i.e., people were thanked for their participation and given a \$10 card and then asked if they want to answer more questions).
- ◆ Most pilot test participants were confused by the questions in Section F, and many ECOSS staff felt uncomfortable asking these questions.

The feedback provided from the training and pilot was used to develop recommendations for survey revisions and changes in survey administration.

## **5.5 REVISIONS TO SURVEY BASED ON PILOT TEST**

The survey was revised in response to feedback from the pre-pilot training and pilot test (see Table C-1 in Appendix C for recommended changes to the survey based on the results of the pilot). In addition, feedback from the July 30, 2014, meeting was incorporated. The revised survey is provided in Appendix D.

Key revisions made to the survey included:

- ◆ The format of the survey was changed to make the skip pattern easier to follow (i.e., section headers were removed, and a shorter version was included at the end for fishers who have taken the survey previously).
- ◆ The length of the survey was reduced through the elimination of some redundant questions.
- ◆ The introduction was adjusted to state that the surveyor is not a game warden.
- ◆ The participation check box now clarifies that all questions related to the taking the survey have been answered (general questions about the health risks related

to eating fish from the Duwamish or general information about the river cleanup will be answered after the survey is completed).

- ◆ The questions regarding the eating and sharing of catch were simplified (and are no longer repeated for each species caught from the LDW).
- ◆ The questions regarding other specific locations where people fish were simplified (revised to ask if people fish in other places).
- ◆ The question about whether people trust their information sources was removed.
- ◆ The optional qualitative questions at the end of the survey were re-ordered and refined.
- ◆ The end of the survey was revised so that the \$10 card is given after the conclusion of the survey (including the final qualitative questions if the participant is willing to answer these questions).
- ◆ A frequently asked question (FAQ) sheet will be developed so that ECOSS staff can more easily answer questions such as why participants are being asked their race/ethnicity.

## 6 Survey Design

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This section presents information regarding survey guidelines (Section 6.1), surveyor training (Section 6.2), the approach for contacting fishers at businesses along the LDW (Section 6.3), and information regarding the approach for the qualitative key informant interviews (Section 6.4). Details of previous studies and surveys that were used to help design the LDW fishers study survey are provided in Appendix E.

### 6.1 SURVEY GUIDELINES

This section presents the survey guidelines and an overview of how these guidelines were developed. Guidelines were developed for survey locations and seasonality, survey timing and structure of survey days (e.g., days of the week, times of day), survey languages, and other physical/environmental considerations. The primary concepts for the survey design include the following:

- ◆ **Tiered approach to survey locations** - Based on the available information regarding the fishing frequency at locations on the LDW, a tiered approach was developed to address the fact that fishing is most frequent at a subset of the locations.
- ◆ **Seasonality** - Due to the higher frequency of fishing reported during warmer months (which overlaps with salmon runs in the LDW), a higher level of effort will be made during summer months (i.e., June to September) than during the non-summer months (i.e., October to May). This allocation of resources will

help ensure that more effort is expended during the times of the year when more fishers are likely to be present.

- ◆ **Staffing** – Each survey day will be staffed by two people for safety reasons and to provide more language capabilities on a given survey day (typically English and at least one other language).
- ◆ **Flexibility** – The survey guidelines are intended to be flexible to allow for information obtained during the survey and other key factors (e.g., tides, weather) to be considered when scheduling the survey days. Any substantive changes to the survey design would require EPA/Ecology approval.

### 6.1.1 Survey locations and seasonality

Based on the available information regarding fishing frequency at various locations along the LDW (see Appendix E), a tiered approach was developed to prioritize survey locations. Locations where available information indicates that fishing is most frequent (i.e., at the Spokane Street Bridge and the T-105 fishing pier)<sup>11</sup> were identified as Tier 1 locations (Table 6-1, Map 6-1). Tier 2 locations include other locations where fish advisory signs are posted, locations noted by a WDFW game warden as being popular fishing locations, and locations where past studies have reported that fishing occurs (Appendix E). For the purpose of visiting these locations during the fishers study, the Tier 2 locations (which will be visited less frequently than the Tier 1 locations) are divided into three groups based on their geographic locations, as presented in Table 6-1 and shown on Map 6-1.

**Table 6-1. Survey locations**

Tier and Group	Area Covered	No. of Locations	Locations
Tier 1	most popular fishing locations (located on Harbor Island and at RM 0.1 on the west side)	2	<ul style="list-style-type: none"> <li>• Spokane Street Bridge</li> <li>• T-105 public fishing pier</li> </ul>
Tier 2, Group 1	fishing locations on Harbor Island or between RM 0 and RM 3.2 on the west side	6	<ul style="list-style-type: none"> <li>• T-18 public access park</li> <li>• Herring House Park</li> <li>• T-107 public access</li> <li>• Peninsula and SW Michigan (street end)</li> <li>• Gateway Park South</li> <li>• Duwamish Waterway Park</li> </ul>

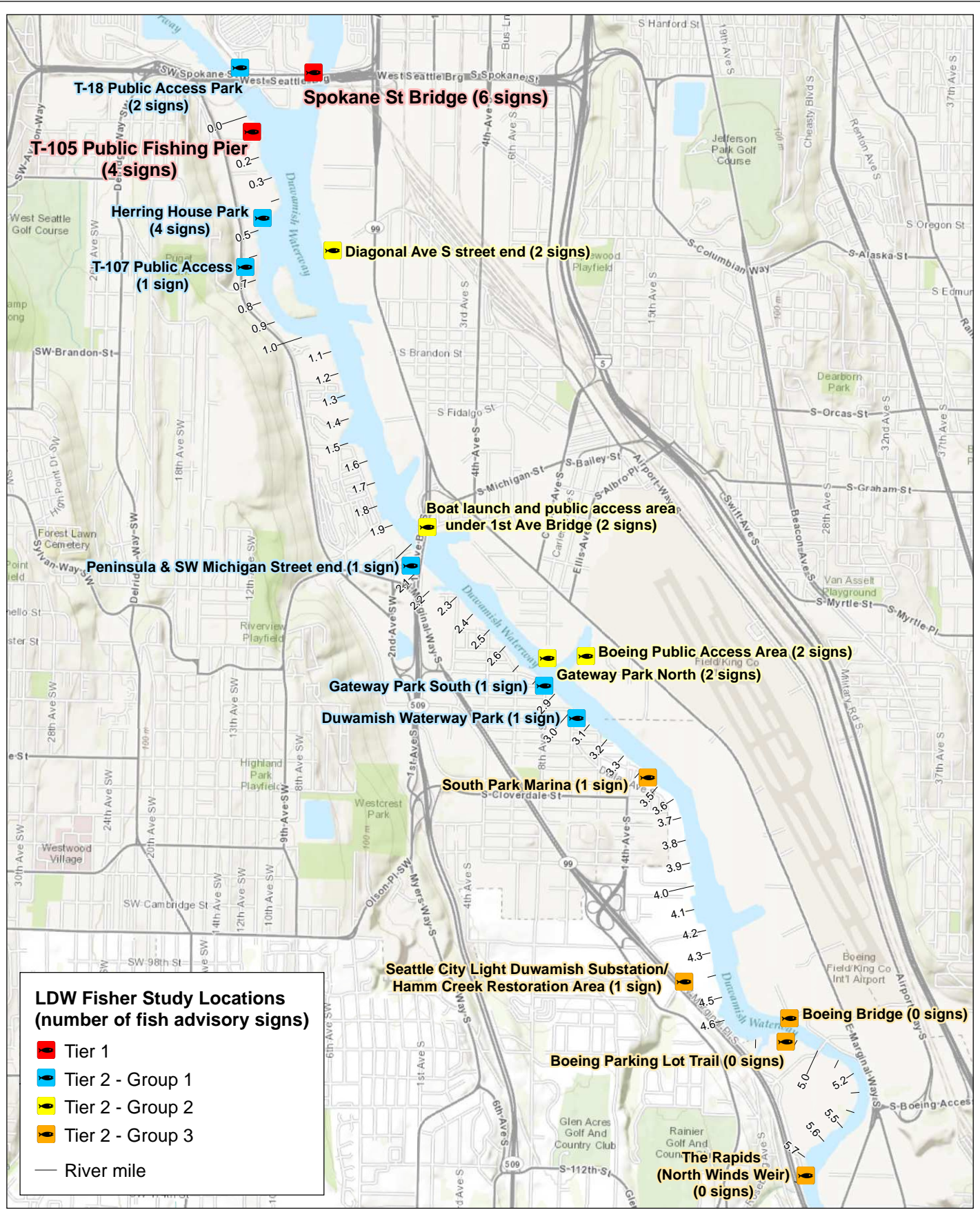
<sup>11</sup> A Washington State Department of Fish and Wildlife (WDFW) game warden familiar with the fishing enforcement activities in this area noted that these two Tier 1 locations are the only places where game wardens commonly see individuals with resident fish (Chandler 2014).

Tier and Group	Area Covered	No. of Locations	Locations
Tier 2, Group 2	fishing locations between RM 0.5 and RM 3.0 on the east side	4	<ul style="list-style-type: none"> <li>• Diagonal Ave South (street end)</li> <li>• Boat launch and public access area under the 1<sup>st</sup> Avenue Bridge</li> <li>• Gateway Park North</li> <li>• Boeing public access area</li> </ul>
Tier 2, Group 3	fishing locations between RM 3.2 and RM 6.0 on the west side	5	<ul style="list-style-type: none"> <li>• South Park Marina</li> <li>• SCL Duwamish Substation/Hamm Creek restoration area</li> <li>• Boeing Bridge</li> <li>• Boeing parking lot area</li> <li>• The Rapids (North Winds Weir)</li> </ul>

LDW – Lower Duwamish Waterway  
RM – river mile  
SCL – Seattle City Light

T-18 – Terminal 18  
T-105 – Terminal 105  
T-107 – Terminal 107





**LDW Fisher Study Locations  
(number of fish advisory signs)**

- Tier 1
- Tier 2 - Group 1
- Tier 2 - Group 2
- Tier 2 - Group 3
- River mile



**Map 6-1. Fisher Study survey locations**

During the course of the survey, new fishing locations may be identified, which could result in the need to add additional Tier 2 locations or groups to allow surveyors sufficient time to visit the locations in each of these Tier 2 groups. In addition, it is possible that after a number of visits to these locations, no anglers will have been observed at some of these locations. If this is the case, the frequency of visits to these locations may be reduced over the year-long survey period.

Based on the frequency of fishing reported by past surveys and anglers, the Spokane Street Bridge will be visited on two of every three survey days, and T-105 will be visited on one of every three survey days. Each group of Tier 2 locations will be visited by surveyors every third or fourth survey day.

Based on the available information (primarily information from the 1997 King County Study (King County 1999); Table 4 of Appendix E), the fishing frequency during the warmer (i.e., summer) months is expected to be higher than that during the non-summer months. For the purpose of the year-long fishers study, there will be approximately twice the number of survey days scheduled during summer months (defined as June to September) as compared with the non-summer months (defined as October to May). The summer period also overlaps with some popular salmon runs (July/September through the end of January, depending on the species and location within the LDW)<sup>12</sup> and crabbing season (which typically falls during summer months; the specific dates for the 2014 season are July 3 to September 1) although the timing of the salmon runs was not a factor in designing the survey because the focus of the year-long survey is on fishers targeting resident seafood. Throughout the year, the goal of the survey is to interview all fishers willing to participate at a location when visited regardless of what they are fishing for. The survey is designed to understand what fishers are targeting, recognizing it could change from one season to the next.

Table 6-2 presents a summary of the number of visits per month that will be conducted during the summer and non-summer months, along with the total survey visits at each location that are expected based on this paradigm. These guidelines will result in approximately 96 survey days over the duration of the fishers study.

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<sup>12</sup> Information regarding salmon fishing seasons for Marine Area 10 are provided in WDFW's sport fishing rules pamphlet (2013). It should be noted that the fishers study will overlap with a pink salmon year (which occurs only during odd-numbered years).



**Table 6-2. Guidelines for approximate frequency and total number of visits to survey locations**

Location	Summer Months (June to September)		Non-Summer Months (October to May)		Total No. of Survey Days
	Average No. of Visits per Month	Total No. of Visits (4 months)	Average No. of Visits per Month	Total No. of Visits (8 months)	
<b>Total number of visits</b>	<b>12</b>	<b>48</b>	<b>6</b>	<b>48</b>	<b>96</b>
<b>Tier 1 Locations</b>					
Spokane Street Bridge	8 (1 tent <sup>a</sup> )	32 (4 tents <sup>b</sup> )	4 (0.5 tent <sup>c</sup> )	32 (4 tents <sup>b</sup> )	<b>64 (8 tents)</b>
T-105	4 (1 tent <sup>a</sup> )	16 (4 tents <sup>b</sup> )	2 (0.5 tent <sup>c</sup> )	16 (4 tents <sup>b</sup> )	<b>32 (8 tents)</b>
<b>Tier 2 Locations</b>					
Group 1	3 – 4	13 – 14	1 – 2	13 – 14	<b>26 – 28</b>
Group 2	3 – 4	13 – 14	1 – 2	13 – 14	<b>26 – 28</b>
Group 3	3 – 4	13 – 14	1 – 2	13 – 14	<b>26 – 28</b>

- <sup>a</sup> One visit per month will be a Tier 1 tent day at this location (the tent will be staffed for 4 hours per tent day).
  - <sup>b</sup> Four visits over the course of the summer months and four visits over the course of the non-summer months will be Tier 1 tent days at this location.
  - <sup>c</sup> A Tier 1 tent day will be conducted once every other month at this location.
- T-105 – Terminal 105

**6.1.2 Survey timing and structure of survey days**

Only a limited amount of information (all of it qualitative) is available regarding the preferred days of the week and times of day for fishing along the LDW; the available information (summarized in Appendix E) was used to develop guidelines for when during the week the survey will be conducted. These guidelines assume that approximately 50% of the survey days will be scheduled on weekends and 50% on weekdays. Table 6-3 presents a summary of the guidelines, including the times of day (i.e., morning, mid-day, and evenings) when the surveys should be conducted. The intent of these guidelines is to ensure that survey days are scheduled over the range of possible days of the week and times of the day to maximize, to the extent practicable, the number of fishers encountered during the survey. A rotation of the times of day will ensure that all locations are visited at various target times over the course of the survey.

**Table 6-3. Guidelines for survey timing**

Day of the Week	Visit Frequency	No. of Visits per Month	Total No. of Visits Over Time Period	Time of Day <sup>a</sup>		
				Morning (e.g., 6 a.m. to 11 a.m.)	Mid-Day (e.g., 11 a.m. to 4 p.m.)	Evening (e.g., 4 p.m. to 9 p.m.)
<b>Summer Months (June to September)</b>						
Monday – Thursday	33%	4	16 (over 4 months)	X	X	X
Friday	17%	2	8 (over 4 months)			X
Saturday and Sunday	50%	6	24 (over 4 months)	X	X	X

Day of the Week	Visit Frequency	No. of Visits per Month	Total No. of Visits Over Time Period	Time of Day <sup>a</sup>		
				Morning (e.g., 6 a.m. to 11 a.m.)	Mid-Day (e.g., 11 a.m. to 4 p.m.)	Evening (e.g., 4 p.m. to 9 p.m.)
<b>Non-Summer Months (October to May)</b>						
Monday – Thursday	33%	2	16 (over 8 months)	X	X	X
Friday	17%	1	8 (over 8 months)			X
Saturday and Sunday	50%	3	24 (over 8 months)	X	X	X

<sup>a</sup> Priority will likely be given to mornings and evenings on weekdays based on the available information regarding when fishers are present on these days, although mid-day surveys on weekdays will also be conducted. Surveys will generally be scheduled for daylight hours, except during the winter when daylight hours are shorter (e.g., surveys conducted in the morning or evening during the winter may be conducted when it is dark).

Each survey day will consist of an approximately 4-to-5-hour shift to be completed by at least two people. Survey days will follow one of two structures, which are listed here, and described in more detail below.

- ◆ **Tier 1 and Tier 2 day** – These survey days will consist of spending approximately 2 hours at the selected Tier 1 location and visiting the locations in one of the Tier 2 groups (see Section 6.1.1 and Map 6-1 for the Tier 1 and Tier 2 locations).
- ◆ **Tier 1 tent day** – These survey days will consist of setting up a tent at the selected Tier 1 location for the duration of the survey day. Tent days will be scheduled for weekends.

Tier 1 and Tier 2 days are intended to allow surveyors to split their time between one of the Tier 1 locations (i.e., approximately 2 hours at either Spokane Street Bridge or T-105) and the locations in one of the Tier 2 groups (see Table 6-3). The total length of these survey days will be variable because it will be determined to a great extent by the presence or absence of fishers at the locations.

Surveyors will visit each Tier 1 and Tier 2 location in a given group, check for fishers, and then move on if no fishers are present. If fishers are present, the surveyor will approach them about taking the survey and then depart the location once they have finished talking with any fishers they encounter (i.e., additional time will not be spent waiting at the Tier 2 locations to see if additional fishers arrive). Surveyors may alternate the order in which they execute these survey days to vary the time of day that they are at each of these locations (i.e., on some days, surveyors might visit the Tier 1 location first and then go to the Tier 2 locations; on other days, surveyors might go to the Tier 2 locations first and then visit the Tier 1 location). A typical Tier 1 and Tier 2 day will involve surveyors visiting the selected Tier 1 location and approaching any fishers who are present about taking the survey. If there are no fishers present (or if it takes significantly less than the allotted 2 hours to interview the fishers who are present), surveyors will depart the Tier 1 location with the intent of returning (e.g., after they have visited the Tier 2 locations) to see if any new fishers have arrived.

Tier 1 tent days will consist of surveyors setting up a tent at the selected Tier 1 location (i.e., either Spokane Street Bridge or T-105) for approximately 4 hours. An additional surveyor (i.e., three surveyors instead of two) may be scheduled for these days to expand the language capabilities of the surveyors during these days. The tent will allow surveyors to establish a greater presence at the location, which will hopefully make fishers feel more comfortable taking the survey.

Example survey schedules (as calendars) for both a summer and non-summer month based on the above guidelines are presented in Figure 6-1. These calendars are intended to serve as an example of how the survey days in a given month could be scheduled. Some flexibility in the schedule will be necessary to accommodate the weather, tides, daylight hours, information regarding target species, and surveyor availability. Physical/environmental considerations are discussed further in Appendix E.

### Example summer month calendar

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		
<b>Week 1</b>		Spokane St. Bridge + G1 (evening)			T-105 + G2 (evening)	Spokane St. Bridge tent (morning)	Spokane St. Bridge + G2 (evening)		
<b>Week 2</b>				Spokane St. Bridge + G3 (morning)		T-105 + G1 (morning)	Spokane St. Bridge + G3 (mid-day)		
<b>Week 3</b>	Spokane St. Bridge + G2 (mid-day)				Spokane St. Bridge + G3 (evening)		T-105 tent (mid-day)		
<b>Week 4</b>			T-105 + G1 (morning)			Spokane St. Bridge + G3 (evening)			
<b>Month Summary Statistics</b>									
	Survey Days	Spokane Street Bridge	T-105	G1	G2	G3	Morning	Mid-Day	Evening
<b>Weekdays</b>	4	3	1	2	1	1	2	1	1
<b>Fridays</b>	2	1	1	0	1	1	0	0	2
<b>Weekends</b>	6	4 (1 tent)	2 (1 tent)	1	1	2	2	2	2
<b>Total</b>	12	8	4	3	3	4	4	3	5

### Example non-summer month calendar

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		
<b>Week 1</b>									
<b>Week 2</b>			Spokane St. Bridge + G1 (morning)		T-105 + G3 (evening)		Spokane St. Bridge + G2 (mid-day)		
<b>Week 3</b>									
<b>Week 4</b>		Spokane St. Bridge + G2 (evening)				Spokane St. Bridge + G1 (evening)	T-105 tent (morning)		
<b>Month Summary Statistics</b>									
	Survey Days	Spokane Street Bridge	T-105	G1	G2	G3	Morning	Mid-Day	Evening
<b>Weekdays</b>	2	2	0	1	1	0	1	0	1
<b>Fridays</b>	1	0	1	0	0	1	0	0	1
<b>Weekends</b>	3	2 (0 tents)	1 (1 tent)	1	1	0	1	1	1
<b>Total</b>	6	4	2	2	2	1	2	1	3

G1 – Group 1 of the Tier 2 locations  
 G2 – Group 2 of the Tier 2 locations  
 G3 – Group 3 of the Tier 2 locations

Figure 6-1. Example survey month calendars

In Figure 6-1, color is used to distinguish the Tier 1 and Tier 2 survey days (orange) from the Tier 1 tent survey days (blue). These example calendars also provide a summary of the number of monthly visits to each of the Tier 1 and Tier 2 locations. In practice, the schedule for each survey month will be different to ensure that over the course of the survey duration (i.e., the 4 summer months and 8 non-summer months), the survey days reflect the range of possible date, time, and location combinations. For example, over the course of the summer, it is expected that Tier 2 Group 1 locations will be visited on a variety of days of the week and at a variety of times of day. The goal is to achieve the range on a seasonal basis, even though the visits during a single month may not fully capture the range. The survey design may be updated based on observations and information obtained as the survey progresses (e.g., to target times of day when fishing is more popular).

It should be noted that the language capabilities of the surveyors are not captured in Figure 6-1. As indicated in Section 6.1.3, it is expected that decisions regarding the use of individual surveyors will be made in order to rotate through the high-priority languages. The guidelines for this rotation are intended to be flexible, and the selected language capabilities will be adjusted, as needed, by ECOSS and Windward based on information obtained as the survey period progresses.

### **6.1.3 Survey languages**

Available information from past studies indicates that the population of fishers along the LDW represents a variety of ethnicities (Appendix E). Although many of these fishers speak English, other fishers may either not speak English or may prefer and feel more comfortable doing the survey in their first language. A list of the top 10 preferred languages was developed based primarily on input from ECOSS. ECOSS developed these recommendations based on three main sources of information: 1) their on-the-ground knowledge and experience from past work, 2) information from past fishing-related surveys/studies, and 3) information from the ECOSS interviews (see Appendix E for details). As part of these recommendations for each of the 10 languages, a priority level was determined by ECOSS for survey interpretation (i.e., the ability of the ECOSS staff to verbally translate the survey and responses in real time) and the translation of any written surveys. These priority levels and the languages in each level are presented in Table 6-4.

**Table 6-4. Guidelines for survey language capabilities**

Survey Type	Languages	Notes
Verbal survey	<p><b>high priority:</b> English, Hmong, Khmer, Lao, and Mienh</p> <p><b>moderate priority:</b> Korean, Tagalog, and Vietnamese</p> <p><b>low priority:</b> simplified Mandarin and Spanish<sup>a</sup></p>	English language capabilities will be available for all survey attempts. The selection of surveyors will be done to rotate through the other high-priority languages (i.e., Hmong, Khmer, Lao, and Mienh). In addition, surveyors who speak the moderate priority languages (Korean, Tagalog, and Vietnamese) may be available for some survey days (e.g., during Tier 1 tent days). The inclusion of surveyors who speak the low priority languages is not anticipated, although information obtained as the survey period progresses indicating that this would be helpful could influence the availability of this language capability.
Written survey (can be self-administered)	English, Korean, simplified Chinese, Spanish, Tagalog, and Vietnamese	Written surveys will be available in these languages during all survey attempts.

<sup>a</sup> Priority level indicates the priority for having surveyors who speak this language available for the survey.

Surveyors who speak Hmong, Khmer, Lao, or Mienh (in addition to English) will be used with a higher frequency to conduct the verbal surveys based on the higher numbers of fishers who are anticipated to speak these languages and their preference to take the survey verbally. Thus, on any one survey day, the two surveyors will have the capability to communicate in two or three of these languages (e.g., English and at least one other high-priority language). Written surveys for self administration will be available in Korean, simplified Chinese, Spanish, Tagalog, and Vietnamese (as well as English). This means that fishers who are literate in one of these languages could potentially self-administer the survey, although taking the survey verbally is preferred when the language needs of the participant are met by ECOSS staff in the field. The selection of the language capabilities of surveyors will be modified as needed as the survey progresses based on the information obtained during the survey.

#### 6.1.4 Survey record-keeping

During the survey, surveyors will record information from the surveys and other appropriate information regarding the day’s activities. The forms to be used for record-keeping during the survey are detailed below and provided in Appendix D.

- ◆ **Survey form** – This form will be used to document the responses to the survey questions for fishers who agree to take the survey.
- ◆ **Survey decline form** – This form will be used to document information about fishers who decline to take the survey. Information to be recorded on this form will include the reason given for not participating in the survey, information that can be observed by the surveyor (e.g., the gender and estimated age of the fisher and fishing method being used), and any other information obtained by the surveyor through the interaction.
- ◆ **Daily field log and location data form** – These forms will be used to record information regarding the surveyor crew, day of the week, weather, tides, and



the locations visited on the survey day (e.g., advisory sign condition, number of fishers observed, location arrival/departure times). In addition, this form will provide a place for surveyors to record any other useful information or observations from the day.

- ◆ **\$10 card tracking form** – This form will be used by ECOSS to record the distribution of the \$10 cards, as required by King County. Survey participants will be asked to sign their initials on this form to document that they received the \$10 card. The participant’s name is not required to receive the \$10 card and will not be requested.

With the exception of the \$10 Card tracking form, information captured on the above forms will be entered into the project database (see Section 7), and will be retained as part of the records for the fishers study. The \$10 card tracking form will be returned to King County for documentation purposes.

### **6.1.5 Guideline flexibility and process for revision**

The guidelines presented in this section are intended to serve as a starting point for the fishers study design. Over the course of the survey, it is expected that new information will become available regarding the locations, times, days of the week, and languages needs. There will be frequent communication between ECOSS and Windward throughout the survey (weekly and possibly daily at the beginning), to ensure that the survey sampling plan is working as intended. This information will be used to adjust the survey guidelines to ensure that the maximum number of fishers (to the extent practicable) is surveyed over the course of the study. The revision process is as follows:

1. **Obtain new information** – Information obtained by ECOSS during the surveys will be reviewed by Windward as it is received and discussed with ECOSS to determine if any revisions should be proposed.
2. **Submit proposed guideline revisions** – Proposed revisions will be discussed with LDWG and submitted to Ecology/EPA and public health advisors for review (a conference call/meeting will be scheduled if needed).
3. **Guideline revisions approved** – If the proposed revisions are agreed upon, EPA/Ecology will issue a written approval and ECOSS will implement the change in the planning/scheduling of future survey days.

The flexible format of the guidelines, as detailed in this section, allows for the scheduling of the survey days and selection of language capabilities to be adjusted without EPA/Ecology approval. Thus, this formal review process will only be conducted for more substantial revisions to these guidelines. However, EPA/Ecology will be kept informed of general survey progress.

## 6.2 SURVEYOR TRAINING

The training for surveyors will include pilot testers and additional ECOSS staff who will also administer the surveys. The training will be similar to training for pilot testers, as discussed in Section 5.3, with the addition of instruction on how to administer the survey in the field and how to document field observations.

If questions about LDW cleanup, health issues associated with eating seafood from the LDW, or the fisher's study arise during the survey, surveyors will be instructed to provide information after completion of the survey to avoid biasing responses to survey questions. The information provided would include a copy of the fact sheet from the health departments (Appendix C) and/or EPA's factsheet on the fisher's study.<sup>13</sup> A survey training guide that provides guidance on how to conduct the survey is provided in Appendix D. This will be provided to ECOSS staff during the training for the year-long survey.

As with the pilot test, training will also involve reviewing the survey (survey orientation) with ECOSS surveyors to ensure that they understand the questions and how the survey should be administered. For example, for a given multiple-choice question, the surveyor should select the multiple-choice option(s) that corresponds with the participant's response to the question if that option is available. If not, the response should be recorded as "other." It will also be important for surveyors to understand when to skip questions or sections based on participant responses. ECOSS staff who participated in the pilot test will be able to provide insight based on their experiences to other surveyors who did not assist with the pilot test.

Training for the year-long survey will also include training in qualitative research methods by a social science professional to ensure that surveyors are prepared to administer the optional questions at the end of the survey. The decision to ask the fisher these additional questions at the end of the survey will be made at the discretion of the surveyor at the time of the survey. It will depend on the fisher's apparent willingness to talk longer and on whether surveyors have time to ask these questions given the number of other fishers present at the site. Priority will be given to surveying a greater number of fishers, rather than talking longer with a fewer number of fishers.

Surveyors will be trained in providing instruction to fishers who self-administer the survey (rather than complete the survey verbally). Surveyors will also be given a process for reviewing survey forms and translating survey responses into English if the survey is completed in another language.

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<sup>13</sup> EPA has created a fact sheet regarding the fisher's study that was not available for use during the pilot test. The EPA fact sheet (see Appendix D) includes contact information for those interested in finding out more about the status of the LDW cleanup as well as the fisher's study.

As part of the training, surveyors will be asked to practice administering the survey. During the training, surveyors will also practice recording responses and taking notes on the survey as they would in the field. These practice surveys will include practicing how to approach the fishers as they are engaged in fishing. As discussed in Section 3, community members indicated a strong preference for surveyors to communicate in the participant's preferred language (Sections 3.2.2 and 3.2.3) and to not look like a game warden or other official (Sections 3.2.2 and 3.2.5). Fishing props (e.g., fishing poles and buckets) may be used to facilitate the role play, and the practice surveys may take place outside. Practice surveys will also include training on how to respond when surveyors are not able to communicate in a fisher's preferred language or if a fisher declines to participate (see survey decline form in Appendix B). The practice survey will also address situations in which surveyors may feel uncomfortable (e.g., if it is dark in the early morning or late afternoon in winter). The emphasis will be on how surveyors should respond in these situations as well as how to ensure that surveyors remain safe. Trainers (from ECOSS, Windward, and Public Health) will observe the practice surveys and provide feedback.

Survey training will also include instruction on when and how often the different survey locations (i.e., the location groups discussed in Section 6.1.2) should be visited and how to fill out the daily field log (Appendix B) to document visiting each location. This training will include how to record observations, such as the location of any fishing and crabbing activity, observations of game wardens, etc. The rotation schedule for survey locations and daily field logs will be jointly managed by the ECOSS field manager and Windward. Surveyors will also receive training regarding procedures for the Tier 1 Tent days (see Section 6.1.7).

Information collected during the surveys (by ECOSS staff or from survey participants) about the survey and/or the overall study may be collected on the survey form, survey decline form, and/or location data form. The training will include instruction on how to record information on all of the field forms (Appendix D). This information will be summarized in quarterly reports (see Section 8) and in the final data report.

### **6.3 REACHING OUT TO BUSINESSES ON THE DUWAMISH**

In addition to the public access areas identified in Appendix E, individuals may also fish from private property, such as from their workplace. These locations are not accessible to the general public, and would not be accessible to the surveyors. In an effort to survey fishers who may fish or crab from their places of work or from marinas, ECOSS staff will reach out to their contacts (made through previous community efforts) at marinas and businesses on the LDW waterfront and LDWG will contact their tenants and businesses located on the LDW and inquire about fishing activity on their property. A log of the businesses that have been contacted (or contact has been attempted) and the results of the inquiries will be maintained. If, through these inquiries, it is determined that individuals are fishing or crabbing from these

locations, the contacts at these businesses or marinas will be asked to facilitate meetings between the surveyors and the fishers or provide written surveys, either at the business or marina or at another agreed-upon location, so that these fishers can participate in the survey.

In addition, if surveyors observe fishing or crabbing from businesses or marinas or receive reports of such activity during the course of the survey, that information will be recorded on the daily field log (as will information about fishing and crabbing at any locations on the LDW). ECOSS (or LDWG members, if appropriate) will then attempt to follow up with those businesses or marinas to gather information on the fishing or crabbing activity and, if possible, arrange for a surveyor to administer the survey or provide written surveys to those fishers.

## 6.4 KEY INFORMANT INTERVIEWS

Approximately six months after the year-long survey has begun, an estimated 15 key informant interviews, maximum, will be conducted. The estimated number of interviews is based on an earlier recommendation from the public health agencies. However, as the study is an iterative process refined as data are collected and information needs are re-assessed, the number and/or format of the interviews may be changed accordingly. During these interviews, specific issues, such as risk perception, will be discussed in greater detail than was done during the survey. Key informant interviews will be conducted by ECOSS staff (with assistance from public health advisors, if needed). The goal of these key informant interviews is to have more in-depth discussions with both people who fish on the LDW and people who are preparers or consumers of LDW seafood but do not fish or collect shellfish themselves.

A plan for the key informant interviews will be discussed at a meeting with EPA/Ecology, the stakeholders,<sup>14</sup> public health advisors, LDWG, and ECOSS after the second quarter of the survey. If community representatives who would like to review and provide feedback on this plan are identified, they will also be included. Following this meeting, a plan for the key informant interviews will be summarized in a memorandum, which will be submitted to EPA for review and approval before these interviews are conducted. This memorandum will include the following components:

- ◆ **Interview questions** – A list of questions (i.e., a standard interview tool), as well guidelines to be followed during the interviews
- ◆ **Recruitment of key informants** – A plan for who will be recruited as key informants and how this will be done
- ◆ **Training plan** – Details regarding the plan for training ECOSS staff in qualitative research methods (e.g., how to record data, how to ask probing questions, and how to prompt participants for more information)

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<sup>14</sup> EPA will coordinate with the tribes and the DRCC/TAG.

- ◆ **Methods for group interviews** – Recommendations from ECOSS staff and community members on the best format for group interviews, should they be conducted
- ◆ **Interviewer qualifications** – The importance of having the interviewer be a trusted community member and someone with training in qualitative research methods
- ◆ **Recording of information** – The desire to have a second individual present to record notes from the interview so that the interviewer can focus on the questions (thus allowing for a more effective interview)

The interviews will focus on topics related to the survey questions that could not be fully addressed during the on-river survey, such as those around risk perception (e.g., “How do you decide whether or not to eat fish or crab from the Duwamish?”) and how they prepare and cook seafood. Key informants may be asked about risk perceptions following the cleanup activities. Some interview questions may apply only to people who are preparers or consumers of LDW seafood, and some may apply only to fishers. The interview tool is intended to be somewhat flexible to accommodate respondents who are willing to spend more time talking on some topics than others.

Some of the interview questions might be derived from the early findings of the survey. For example, if responses to survey questions about why people fish are different than expected based on findings from other studies (see review of risk perception studies discussed in Section 4.1), additional questions on this topic might be asked in the key informant interviews. ECOSS staff will be consulted for their thoughts on how to facilitate an open dialogue in the key informant interviews (e.g., format, venue, language).

Potential key informants may be identified through the course of the survey using a “snowball” technique. During the survey, surveyors may develop relationships with some of the fishers that they see on a regular basis. It is anticipated that before or after each survey there may be some casual conversation because fishers will be asked to take the survey each time they are encountered by surveyors. Fishers may provide contact information for people with whom they share their fish or for others who fish regularly but have not been surveyed. Surveyors will ask if the fisher feels comfortable with surveyor reaching out to this individual and identifying by first name the fisher who provided the referral. The surveyor will also inform the fisher that the individual may or may not be contacted and, if so, it may be several months before the individual is contacted. If fishers offer contact information (first name only and phone number, email, or business location<sup>15</sup>) for other individuals who are either consumers or preparers of seafood or fishers, surveyors will record this information (along with the

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<sup>15</sup> For example, a bait or tackle shop.



first name of the fisher who provided the referral) separately from the survey forms in a small field notebook maintained by each surveyor.

Key informant interviews will be arranged by ECOSS staff, who will reach out directly (via telephone or email) to contacts provided by LDW fishers. Interviews will occur in a mutually agreeable location or may be conducted over the telephone. As with the surveys, key informants will be notified of their right to stop the interview at any time and to decline answering any questions. They will also be notified of the intention to keep their responses anonymous and the steps taken to maintain confidentiality. EPA Region 10 will continue to serve as the liaison with the EPA's Human Subjects Research Review group, and all necessary steps will be taken in the administration of the interviews, management of the response data, and reporting of results to maintain compliance with EPA's human subjects policies.

The plan to conduct up to 15 key informant interviews was discussed in the Work Plan (Windward 2013). The interviews may be with individuals or small groups, depending on the preference of the key informants. To ensure that the key informant interview administration is consistent, orientation to the interview guide (i.e., the interview questions) and instruction on conducting the interviews, recording responses, providing additional information to key informants who request information, and privacy policies will be provided to all surveyors. The data from these interviews will be summarized in the final study report and used to provide broader context for the survey data.

## **7 Data Management**

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The data collected in this study (from the pilot test, the survey, and the key informant interviews) will be managed by Windward. The focus of data management activities will be to provide an accurate recording of the information collected, create an organized structure for analyzing and interpreting the results, and provide a secure data storage (both hard copy and electronic) and management system that maintains the confidentiality of study participants.

### **7.1 HANDLING SURVEY FORMS, INTERVIEW FORMS AND CARDS**

Pilot test and survey forms will be collected by surveyors after they are completed and temporarily retained at the ECOSS office in a locked cabinet. Periodically during the survey (approximately monthly), completed, interpreted, and translated survey forms will be moved to Windward's office. Completed survey forms may be collected even more frequently at the beginning of the field effort, to ensure that forms are being filled out appropriately. Windward will also be in regular (weekly) communication with ECOSS, to ensure that the survey tool is working well for ECOSS staff administering the survey and the survey participants. Windward will review the survey forms, following up with ECOSS staff about any incomplete, illegible, or erratic



responses (e.g., checking all responses to all questions). The survey decline forms, daily field log, and location data forms will also be collected by ECOSS and shared with Windward.

If the data in some completed or partially completed survey forms are identified as suspect (e.g., the responses do not correspond with the questions such that it seems as though the participant is being deliberately mischievous), the survey(s) in question will be carefully examined by ECOSS and Windward. If a determination is made to exclude a survey from the dataset, the survey form will be retained in a separate file, and the rationale for exclusion will be provided in the final report. Because the preferred survey approach will be verbal administration by trained ECOSS staff, it is anticipated that few surveys will have quality issues of this nature.

The key informant interviews will be translated and summarized by ECOSS staff, as was done with the ECOSS interviews. After all the key informant interviews have been completed and summarized, the interview forms will be moved to Windward's office. Windward's provisions for the storage of survey and interview forms are discussed in Section 7.2. Initial findings from the study (including both the survey and the key informant interviews) will be discussed with ECOSS and community representatives during a meeting (as discussed in Section 9) prior to the finalization of data in order to ensure that the findings accurately reflect the data.

King County will receive and retain ECOSS records regarding the distribution of \$10 cards to pilot test participants, survey participants, and key informants. ECOSS will track the distribution of each card; all fishers and other participants will be obliged to initial a tracking sheet to indicate that they received the card.

## **7.2. DATA STORAGE AND PROVISIONS TO PROTECT PRIVACY**

The hard copies of the pilot tests, surveys, and key informant interviews will be maintained in a locked cabinet at Windward's office. Names will not be recorded on the pilot test, survey, or key informant interview forms. For the survey, it is anticipated that there will no mechanism to associate participants with names or other identifiers because fishers will be approached in a public area and such information will not be collected as part of the survey. Any identifying information, such as that used by ECOSS staff to arrange the pilot tests and key informant interviews, will be maintained in a file that is separate from the pilot test and key informant interview results. Numeric keys will be created to associate any identifiers with the pilot and key informant interview results. The table that is used to link pilot test or interview results and identifying numbers from the numeric key will be stored in a password protected electronic file.

As discussed in Sections 5, 6.2, and 6.4, the pilot test, survey, and interviews will include language intended to assure participants that their responses will be anonymous and cannot be linked to them. Names of participants will not be collected on the pilot test or survey forms; the names of survey participants may never be

known. In addition, as previously discussed, ECOSS staff who administer the pilot test (Section 5.2), survey (Section 6.2), and key informant interviews (Section 6.4) will receive instruction on communicating information about privacy protection.

### **7.3 ELECTRONIC DATA MANAGEMENT**

Windward will develop a data management system to store the survey and interview results. All of the pilot test, survey, and key informant interview results will be entered into Microsoft Excel® spreadsheets. A full review of each recorded entry (i.e., 100% quality control) will be performed by someone other than the individual who originally entered the data. Data from the survey will be uploaded from customized spreadsheets (created in Microsoft Excel®) in Microsoft Access® to facilitate directed sorting and data queries. Key informant interview data will not be moved from Microsoft Excel® into Microsoft Access®, inasmuch as the information from the key informant interviews does not lend itself as well to sorting and queries.<sup>16</sup> Public Health resources or input from project social scientist for developing spreadsheets of data from the key informant interviews may be used.

## **8 Community Representative Participation**

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As part of the LDW fishers study, community representatives have the opportunity to provide input on the development of the study and the interpretation of the results and/or stay informed about the progress of the fishers study. As discussed in Section 3.5, many of the participants in the ECOSS interviews indicated a willingness/interest to remain involved in the study at some level. In addition to the opportunities discussed earlier in this plan (i.e., the ECOSS interviews [Section 3], the pilot test [Section 5], and the meeting regarding the pilot test findings [Section 5.4]), the following options are available for individuals to continue to participate and/or receive information on the study:

- ◆ Participate in the key informant interviews or survey (consistent with study design goals)
- ◆ Join an email list to receive notifications when documents are posted on the web<sup>17</sup> or when meetings that community representative may attend will be held
- ◆ Review and comment on study documents (posted on the web) including:
  - ◆ Implementation plan (including ECOSS interview summary)
  - ◆ Quarterly updates (see Section 8.3 for details)

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<sup>16</sup> If after collection and assembly of the data from the key informant interviews, it appears that the ability to query the information would be useful, the data may be moved into Microsoft Access®.

<sup>17</sup> Various websites will also announce the availability of these documents for those not wishing to be on an email list.

- ◆ Data report
- ◆ Fact sheet presenting the study results
- ◆ Attend a project meeting or receive a phone call<sup>18</sup> to discuss:
  - ◆ Any of the posted documents listed above
  - ◆ Preliminary results of the study (including the survey and key informant interviews) (see Section 9 for details)

The options above were offered to ECOSS interview participants through re-contact efforts as described in Section 3.5. Questions that arise from community members about the fishers study, the LDW cleanup, and eating seafood from the LDW will be addressed as discussed in Section 5.3.3.

## 8.1 COMMUNITY INPUT OPPORTUNITIES

As discussed above, input collected through the ECOSS interviews and the pilot test (as described in Sections 3 and 5) was used to develop and revise the survey and study design. Community input will continue to be collected through the activities described above.

In addition, in order to document community input that may occur outside of data gathering efforts (i.e., the survey and the key informant interviews), a community involvement log will be used to record this information (Appendix D). Input gathered through less formal communication, such as in-person discussions, phone conversations, or emails with ECOSS staff, will also be captured in this log. This information will be reviewed as part of development of the quarterly updates. The quarterly updates will be made available on the web and emailed to individuals who have expressed an interest in the project (during the ECOSS interviews, re-contact efforts, pilot test, survey, key informant interviews, or other direct contact with ECOSS staff). In addition, ECOSS may follow up by phone to share information from the quarterly updates with those individuals who have requested to be informed via phone call. Any feedback received during this ECOSS outreach will be recorded as well on the community involvement log.

## 8.2 ROLE OF ECOSS AS COMMUNITY REPRESENTATIVES

The fishers study has and will continue to rely on the expertise of the ECOSS staff as members of the affected community when developing opportunities for community representative involvement in the study. This includes following up on input from the

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<sup>18</sup> For community representatives (as identified through the ECOSS interviews, the pilot test, or other means) who would like to stay involved but would prefer not to attend a project meeting, ECOSS staff have offered to call or meet with them directly. This option may be particularly helpful for people whose preferred language is not English. <sup>19</sup> EPA will coordinate with the tribes and the DRCC/TAG and provide documents and invitations to meetings.

community about how they would like to be involved (Section 3.5) and consulting with ECOSS staff on the quarterly updates (Section 8.3) and the development of key informant interviews (Section 6.4). As study partners, ECOSS has and will continue to provide input on the survey tool, study design, and interpretation of results.

### **8.3 QUARTERLY UPDATES**

Quarterly updates will be issued to keep EPA/Ecology, the public health advisors, LDW stakeholders,<sup>19</sup> and interested community members informed during the survey. The first of these updates will include a written update (for distribution) and a meeting to discuss progress to date. Subsequent updates may include only written updates, unless there is interest in additional quarterly update meetings. Feedback from ECOSS or community members during the survey or through the mechanisms described above will also be summarized in quarterly updates (and in the final data report).

The quarterly updates will include the following:

- ◆ Locations visited (including dates and times)
- ◆ The number of fishers observed, the number of fishers who have taken the survey, the number of fishers who are repeat participants, and the number of fishers who have declined to take the survey
- ◆ Information regarding the ability of the surveyors to meet the language needs of the fishers
- ◆ Participant feedback on the survey tool and approach
- ◆ Feedback on the study or survey from community members as provided through the options listed above (this information will be recorded as part of the community involvement log, see Appendix D)
- ◆ Any relevant observations, such as the presence of game wardens or fishers observed in locations not currently identified in this implementation plan
- ◆ Feedback from the ECOSS team on any issues with the approach used for conducting the surveys or survey tool
- ◆ Any recommended or implemented changes to the survey or field schedule

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<sup>19</sup> EPA will coordinate with the tribes and the DRCC/TAG and provide documents and invitations to meetings.

## 9 Next Steps

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This implementation plan summarizes the activities included in Tasks 4 and 5 of the LDW fishers study (see Section 2). As part of Task 5, a detailed plan for conducting the key informant interviews will be developed and submitted to EPA as a memorandum (see Section 6.4). Key informant interviews will be conducted upon EPA approval of the key informant interview memorandum.

The next steps after the survey is complete include the Task 6 activities, as discussed in the Work Plan. Task 6 will include the following activities:

- ◆ **Meeting to discuss preliminary findings** – LDWG, EPA/Ecology, public health advisors, ECOSS, DRCC/TAG, and interested community representatives will meet to discuss the preliminary findings. The discussion will include data use, potential negative impacts, and ways to ensure that there is a correct understanding of the responses.
- ◆ **Data report** – A data report will be prepared and made available for review by the parties listed above.
- ◆ **Presentation of final results and community involvement discussion** – A meeting will be held with the above parties to present the final results of the study and to discuss feedback regarding how the community involvement process went for the study.
- ◆ **Fact sheet** – A fact sheet summarizing the key results of the study will be developed and made available for review by the parties listed above before it is finalized.

As indicated in this list of items, LDWG, EPA/Ecology, public health advisors, ECOSS, DRCC/TAG, and interested community representatives will be involved throughout the Task 6 activities.

## 10 References

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