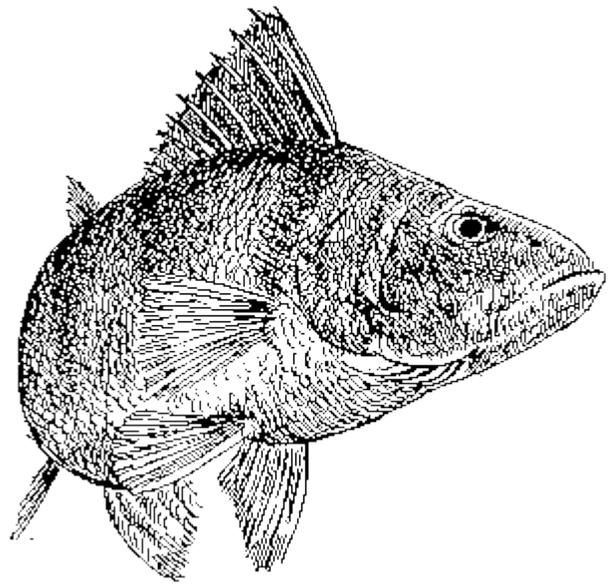


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# **Fish Consumption Advisory Interpretation by Key Audiences in the Great Lakes Region**



**May 2013**

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## HUMAN DIMENSIONS RESEARCH UNIT PUBLICATION SERIES

This publication is one of a series of reports resulting from investigations dealing with public issues in environmental and natural resources management. The Human Dimensions Research Unit (HDRU) in the Department of Natural Resources at Cornell University studies the social and economic aspects of natural resources and the environment and the application of social and economic insights in management planning and policy. A list of HDRU publications may be obtained by writing to the Human Dimensions Research Unit, Department of Natural Resources, Bruckner Hall, Cornell University, Ithaca, NY 14853, or by accessing our World Wide Web site at: <http://www.dnr.cornell.edu/hdru>.



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## EXECUTIVE SUMMARY

A consortium of the eight Great Lakes states' health and environmental departments formed in the 1980s to develop shared science-based protocols for fish consumption advice in the Great Lakes. This Consortium submitted a proposal and was funded by the U.S. Environmental Protection Agency through its Great Lakes Restoration Initiative to work together to enhance state fish consumption advisory programs by determining how to communicate information to the public more effectively. The Consortium worked with Cornell University's Human Dimensions Research Unit on a series of focus groups to determine how key audiences would interpret and respond to different fish consumption advisory materials. The audiences of interest were women of childbearing age and urban/Areas of Concern (AOC)<sup>1</sup> anglers.

Two questions were of primary interest: (a) which materials do focus group participants think would be most likely to encourage them to engage in desired fish consumption behaviors; and (b) which materials do focus group participants tend to interpret as the Consortium intended? The desired behaviors in the two target audiences were different. For women of childbearing age, we sought to identify messages that would encourage women to continue to eat fish low in contaminants, to maximize health benefits while minimizing health risks, when they were pregnant. For urban/AOC anglers, we sought to determine how to encourage anglers to follow fish consumption advisories for their states, particularly those aimed at reducing consumption of fish high in contaminants.

State health departments and fish and wildlife agencies that were members of the Consortium and nongovernmental community organizations interested in water resources recruited focus group participants. Participants were offered \$25 Visa gift cards and a light meal as incentives to participate. The number of participants in the groups ranged from 11 to 18.

In each group, we presented participants with advisory materials and asked open-ended questions to ascertain how they interpreted those materials and the factors that affected their interpretation. We explored three main topics: (1) how much and what types of information are most likely to encourage desired fish consumption behaviors in focus group participants in our two target audiences, women of childbearing age and urban/AOC anglers; (2) which formats for presenting specific fish consumption guidelines are most clear and likely to be interpreted as the Consortium intended; and (3) what general guidelines for choosing fish to consume are most clear and likely to be interpreted as intended. The complete focus group protocol is contained in Appendix A.

### **Information to Encourage Desired Behaviors**

Women of childbearing age reported that the following types of statements were most likely to encourage them to continue to eat fish:

- Women preferred succinct statements to longer ones.

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<sup>1</sup> Areas of Concern are identified under the U.S.-Canada Great Lakes Water Quality Agreement as locations that have experienced environmental degradation.

- Women viewed statements that described characteristics of fish that were not shared by many other foods as persuasive. They found statements about protein and, particularly, omega-3 fatty acids in fish to be more persuasive than general statements about vitamins and minerals.
- Women found statements about particular health benefits that could be attributed to omega-3 fatty acids most influential. These statements provided the most concrete information about why they should continue to eat fish.
- Women preferred statements that had particular relevance to them and their life circumstances. Women who were pregnant or had young children preferred statements that referred to the benefits of fish consumption for children. Those who did not expect to have any more children preferred statements that referred to the benefits to the women themselves.

Urban/AOC anglers reported that the following types of statements were most likely to encourage them to follow fish consumption advisories:

- As with the women of childbearing age, urban/AOC anglers preferred succinct statements.
- Statements that pointed out contaminants could be present in fish, bodies of water, and people who consume fish without the anglers being able to detect these contaminants captured participants' attention.
- Urban/AOC anglers found statements that pointed to negative health outcomes of eating contaminated fish persuasive. They viewed statements of widespread relevance as most persuasive. Specifically, urban/AOC anglers preferred statements that applied to a variety of contaminants and described a range of possible health outcomes to statements that were more narrowly focused.

### **Fish Consumption Guidelines Format**

We presented fish consumption guidelines in three different formats to both the women of childbearing age and the urban/AOC angler focus groups. The first format (Figure 1), modeled after materials used by Minnesota and Wisconsin, grouped fish into four categories: fish that could be eaten twice weekly, fish that could be eaten once weekly, fish that could be eaten once monthly, and fish that should not be eaten. Key characteristics of this format included:

- Multiple species were listed in most categories. The number of meals that could be eaten from each category was the total number of meals for all the species in that category, not the number of meals for each species in that category.
- An “or” was included between the “twice weekly” and “once weekly” categories. This word was intended to communicate that if an individual ate from the “twice weekly” category in a given week, he/she should not also eat from the “once weekly” category, and vice versa.
- An “and” was included between the two weekly categories (“twice weekly” and “once weekly”) and the “once monthly” category. This word was intended to communicate that individuals could eat a meal of fish from the “once monthly” category even if they were eating fish from one of the weekly categories each week.

The second format (Figure 2), modeled after materials used by Michigan, relied on a point system to communicate how much fish could safely be consumed by target audiences. Meals of fish of different species were assigned different point values, and target audiences could safely consume up to eight points each month. Species of fish were divided into five categories: 1 point/meal, 2 points/meal, 4 points/meal, 8 points/meal, and “don’t eat.”

The third format (Figure 3) presented fish consumption guidelines in a simplified layout that was designed to be suitable for use as a wallet card, which could be carried easily to grocery stores or when fishing. Species of fish were divided into four categories: “8 Meals per Month,” “4 Meals per Month,” “1 Meals per Month,” and “Don’t Eat.” Most categories listed multiple species of fish. The number of meals that could be eaten from each category was the total number of meals for all the species in that category, not the number of meals for each species in that category.

Focus group participants from both audiences almost universally considered the point system (second format) the most clear and easy to use. The other approaches had too much ambiguity and could be misinterpreted. Two participants, however, strongly disliked point systems, and several indicated that keeping track of fish consumption over the course of an entire month would be difficult.

### **Guidelines for Choosing Fish**

We presented participants in both the women of childbearing age and the urban/AOC angler focus groups with general (not species-specific) guidelines for choosing sport-caught fish to eat. Two sets of guidelines were used. One set was modeled after Wisconsin’s “Size-Species-Source” guidelines (Figure 4). The other was modeled after New York’s “Who You Are-Where You Fish-What You Catch” guidelines (Figure 5). We modified the materials to reduce extraneous differences between them. The groups discussed the clarity of each set of guidelines and their interpretation of specific terms and phrases within them. We found:

- When general statements were made about criteria to consider when choosing fish, many participants wanted those statements paired with more specific follow up information. In particular, when participants read statements about some species of fish or bodies of water being more affected by contaminants than others, they wanted specific information about *which* fish and *which* bodies of water.
- A number of phrases used in the materials were unclear to many focus group participants, although experienced anglers were more likely to understand some of these phrases than novices or non-anglers. The terms and phrases most likely to cause confusion were:
  - “Eat a variety.”
  - “Fish that eat other fish.”
  - “Smaller, younger fish” vs. “Larger, older fish”
- Terms to describe “women of childbearing age” as a target audience also either raised many questions or were misunderstood. Of all terms discussed during the groups, the one most likely to be understood as intended was “women who might become pregnant.”
- Participants were frequently confused as to who the intended target audiences were supposed to be. If a particular audience (e.g., men) were not referred to specifically, participants were unsure whether the advice was intended to apply to men. If more than

one audience was mentioned, however, some participants focused only on the first audience mentioned, assuming that the advice applied only to them.

### **Overarching Themes**

Several overarching themes emerged in the focus groups. First, the clarity of the draft materials was an important consideration to focus group participants. In general, participants preferred succinct messages to lengthier messages, but only if those messages included all the necessary information. Second, the most effective messages often provided information that target audiences were unlikely to know already. Third, people who attended our focus groups were most likely to be interested in information that was obviously relevant to them. Fourth, focus group participants had numerous questions about all of the materials presented to them. For that reason, many pointed out that it was important to tell target audiences how to get additional information if they wanted it

## **Acknowledgments**

This study was funded by the U.S. Environmental Protection Agency (EPA) under a grant to the Minnesota Department of Health, as part of the Great Lakes Consortium Fish Consumption Advisory Enhancement project.

We thank Consortium members and Ava Slotnick of Partners for Clean Streams in Perrysburg, OH, for their work arranging the focus groups that provided data for this study. Without their help and cooperation this project would not be possible.

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## BACKGROUND

A consortium of the eight Great Lakes states' health and environmental departments formed in the 1980s to develop shared science-based protocols for fish consumption advice in the Great Lakes (Anderson et al. 1993, McCann et al. 2007). This Consortium has worked together since then, as time and funding have allowed, on various communication tools, data sharing, and additions to the protocols. Most recently, the group submitted a proposal and was funded by the U.S. Environmental Protection Agency through its Great Lakes Restoration Initiative to work together to enhance state fish consumption advisory programs by determining how to communicate information to the public more effectively, thereby increasing public knowledge about the risks and benefits of fish consumption and reducing exposure of the public to toxic substances from consumption of contaminated fish. The Consortium is working with Cornell University's Human Dimensions Research Unit on several research projects to achieve their objective, including a series of focus groups with key audiences of fish consumption health advisories. For this report, these audiences are:

- Women of childbearing age. For the purposes of these focus groups, the definition of "women of childbearing age" was women who: (a) are between 18 and 50 years of age; (b) are or may become pregnant; and (c) eat at least some fish (or whose families eat at least some fish) caught by themselves, family members, or friends. This audience was of interest because women and their babies benefit from some fish consumption during pregnancy, but there is evidence that many women consume less fish in pregnancy than before they were pregnant (Connelly et al. 2013).
- Urban/Area of Concern (AOC) anglers. For the purposes of these focus groups, the definition of "urban/AOC anglers" was English-speaking anglers who live and fish in urban areas or Areas of Concern (identified under the U.S.-Canada Great Lakes Water Quality Agreement as locations that have experienced environmental degradation). This audience was of interest because fish in urban and AOC locations often have higher levels of contaminants than fish in other locations. Urban/AOC anglers of limited incomes may be restricted to nearby fishing sites and depend more on the fish they catch for food (potentially exposing them to more contaminants).

The purpose of these focus groups was to determine how these audiences would interpret and respond to different fish consumption advisory materials. Two questions were of primary interest: (a) which materials do focus group participants think would be most likely to encourage them to engage in desired fish consumption behaviors; and (b) which materials do focus group participants tend to interpret as the Consortium intended?

The desired behaviors in the two target audiences were different. For women of childbearing age, we sought to identify messages that would encourage women to continue to eat fish low in contaminants, to maximize health benefits while minimizing health risks, when they were pregnant. Connelly et al. (2013) found that although 84% of women ate at least some fish during pregnancy, the amount that they ate was well below what was recommended. Their findings were similar to previous studies of Minnesota mothers (MDH 2012) and Wisconsin mothers (Gliori et al. 2006). Consequently, identifying messages that prompt women to change their behavior and consume more low-risk fish is important.

For urban/AOC anglers, we sought to determine how to encourage anglers to follow fish consumption advisories for their states, particularly those aimed at reducing consumption of fish high in contaminants. Various studies have found evidence that some urban anglers may be less aware of advisory recommendations than other anglers, consume fish in excess of advisory recommendations, and/or hold misconceptions about how to judge whether fish are safe to eat (Burger et al. 1999, Hockett 2005, Lauber et al. 2011). Therefore, identifying messages that prompt anglers to follow these advisories may yield health benefits.

For any audience, developing advisory materials that are interpreted as intended is a challenging task. Many authors have argued for clear, simple advisory messages that describe desired behaviors in an unambiguous manner (AFS 2000, Hockett 2005, Williamson 2007, Lauber et al. 2011). Much attention has been devoted to identify and refine messages that will help target audiences choose fish that provide the most health benefits and the fewest health risks (AFS 2000, Knobeloch et al. 2005, Burger and Gochfeld 2009). These messages may include statements like:

- Eat smaller, younger fish.
- Avoid fish high on the food chain.
- Eat a variety of fish species from less contaminated waters.

Evaluating how audiences interpret such statements, and the reasons for their interpretation, can contribute to efforts to refine these messages.

## METHODS

We chose focus groups as the approach to gather data for this study because we were not confident we could identify *a priori* all of the characteristics of advisory materials that might influence target audiences' interpretation of them. Focus groups rely on open-ended questions and encourage participants to interact with and respond to each other, and are an effective method of discovering the full set of variables that may influence a phenomenon of interest (such as interpretation of advisory materials). Focus groups are not an effective method of determining how extensive the influence is (e.g., the percentage of people in a target population whose interpretation of advisory materials is influenced by a particular factor), or for assessing impact of materials on actual behavior (e.g., the percentage of respondents who adhere to a particular type of consumption advice).

State health departments and fish and wildlife agencies that were members of the Consortium and nongovernmental community organizations interested in water resources recruited focus group participants. Participants were offered \$25 Visa gift cards and a light meal as incentives to participate. The number of participants in the groups ranged from 11 to 18.

In each group, we presented participants with advisory materials and asked open-ended questions to ascertain how they interpreted those materials and the factors that affected their interpretation. We explored three main topics: (1) how much and what types of information are most likely to encourage desired fish consumption behaviors in focus group participants in our two target audiences; (2) which formats for specific guidelines for fish consumption are most clear and

likely to be interpreted as the Consortium intended; and (3) what general guidelines for choosing fish to consume are most clear and likely to be interpreted as intended. The complete focus group protocol is contained in Appendix A, but we will describe each topic and the materials tested within that topic in the pages that follow.

### **Information to Encourage Desired Behaviors**

In the first segment of the focus groups, we explored participants' perceptions of how much and what types of information would be most likely to encourage desired fish consumption behaviors in target audiences. For the women of childbearing age groups, the desired behavior was to continue to eat fish low in contaminants, to maximize health benefits while minimizing health risks, when they were pregnant. Initially, we distributed sheets to participants with a brief set of statements communicating that fish consumption has both health risks and health benefits. These statements were:

*Fish are an important part of a healthy diet. However, fish can contain chemical contaminants at levels that may be harmful to health – especially in developing babies and children.*

*You can eat fish and get the health benefits without worrying about the risk by following your state's fish consumption guidelines.*

After the group had a chance to review and discuss these statements, we presented them with a series of additional possible statements that could be added to the first sheet. We organized these statements into three groups, which we presented sequentially. The first group consisted of general statements about eating fish being good for one's health.

- *Fish are an important part of a healthy diet.*
- *Health experts recommend that fish be included as part of a balanced diet.*
- *Eating fish is good for you and your baby!*
- *If you follow the fish consumption guidelines, you and your baby will get a lot of the health benefits and have very little risk.*

The second group consisted of statements explaining why eating fish is good for one's health.

- *Fish are generally low in unhealthy, saturated fats.*
- *Fish are high in protein.*
- *Fish contain vitamins and minerals.*
- *Including fish in your diet is the primary way to get healthy omega-3 fats.*

The third group consisted of statements about the specific health benefits of fish.

- *Omega-3 fats found in fish may be beneficial during fetal brain and eye development.*
- *Eating fish containing omega-3 fats may lower the risk of heart disease in adults.*

After each group of statements was presented, we asked participants to rank the statements according to which they thought would be most likely to encourage them to continue to eat fish. Then we discussed the reasons for their rankings.

The urban/AOC angler groups followed a similar structure to the women of childbearing age groups, but the desired behavior was different – following their state’s fish consumption advisory, particularly advice aimed at reducing consumption of fish high in contaminants. The brief set of statements presented to participants initially was similar to that presented to the women’s groups, but omitted the references to babies and children. These statements were:

*Fish are an important part of a healthy diet. However, fish can contain chemical contaminants at levels that may be harmful to health.*

*You can eat fish and get the health benefits without worrying about the risk by following your state’s fish consumption guidelines.*

After the group had a chance to review and discuss these statements, we presented them with a series of additional possible statements that could be added. We organized these statements into three groups, which we presented sequentially. The first group consisted of statements about the process of accumulation of contaminants in people.

- *Long-lasting contaminants build up in body tissue over time.*
- *Eating one meal or even several meals of contaminated fish may not make you sick right away but contaminants can build up in your body over time eventually causing health problems.*
- *Eating contaminated fish does not necessarily mean that you will get sick, but, over time, harmful levels of contaminants can build up in your body without you knowing it.*

The second group consisted of statements about detecting contaminants.

- *You can’t see, smell or taste chemical contaminants in fish.*
- *Even if water looks clean, fish caught in that water can still be contaminated.*
- *A lake can look dirty and have fish that are low in chemical contaminants. A lake can look clean and have fish with high levels of contamination.*
- *Fish in city lakes and rivers are not necessarily more contaminated than fish in waters outside of cities.*

The third group consisted of statements about the types of health effects people may experience if they consume contaminants.

- *Health problems that may result from the contaminants found in fish range from small, hard to detect changes in health - to birth defects or cancer.*
- *Too much mercury may result in loss of coordination and affect vision, hearing, and speech.*
- *Too much mercury may result in numbness and tingling, and memory loss.*

- *Some studies have found higher rates of heart disease in men who had elevated mercury levels.*
- *Young children, developing fetuses and breast-fed babies are at most risk from eating contaminated fish, because small amounts of mercury can damage a brain that is just starting to form or grow.*
- *Women who eat too much contaminated fish and become pregnant may have an increased risk of having children with lower birth weights or small head size.*
- *Women who eat too much contaminated fish and become pregnant may have an increased risk of having children who are slower to develop and learn.*

After presenting each group of statements, we asked participants to rank the statements according to which would be most likely to encourage them to eat fish. Then we discussed the reasons for their rankings.

### **Fish Consumption Guidelines Format**

For both the women of childbearing age and the urban/AOC angler focus groups, specific fish consumption guidelines were presented to participants in three different formats. It was stressed to participants that these guidelines were examples of guidelines, not the actual guidelines for their area. The first format (Figure 1), modeled after materials used by Minnesota and Wisconsin, grouped fish into four categories: fish that could be eaten twice weekly, fish that could be eaten once weekly, fish that could be eaten once monthly, and fish that should not be eaten. Key characteristics of this format included:

- Multiple species were listed in most categories. The number of meals that could be eaten from each category was the total number of meals for all the species in that category, not the number of meals for each species in that category.
- An “or” was included between the “twice weekly” and “once weekly” categories. This word was intended to communicate that if an individual ate from the “twice weekly” category in a given week, he/she should not also eat from the “once weekly” category, and vice versa.
- An “and” was included between the two weekly categories (“twice weekly” and “once weekly”) and the “once monthly” category. This word was intended to communicate that individuals could eat a meal of fish from the “once monthly” category even if they were eating fish from one of the weekly categories each week.

The second format, modeled after materials used by Michigan, relied on a point system to communicate how much fish could safely be consumed by target audiences (Figure 2). Meals of fish of different species were assigned different point values, and target audiences could safely consume up to eight points each month. Species of fish were divided into five categories: 1 point/meal, 2 points/meal, 4 points/meal, 8 points/meal, and “don’t eat.”

The third format (Figure 3) presented fish consumption guidelines in a simplified layout that was designed to be suitable for use as a wallet card, which could be carried easily to grocery stores or when fishing. Species of fish were divided into four categories: “8 Meals per Month,” “4 Meals per Month,” “1 Meals per Month,” and “Don’t Eat.” Multiple species were listed in most

**Figure 1.** First eating guidelines format, modeled after materials used by Minnesota and Wisconsin.

## Advisory for Store-bought or Restaurant Fish

### Going to the store or out to eat?

How Often Can You Eat It?	Kind of Fish
W e e k l y	2 meals per week  Catfish ( <i>farm-raised</i> ) Cod Crab Flatfish Herring Oysters  Pollock Salmon ( <i>not Great Lakes</i> ) Sardines Scallops Shrimp Tilapia
	OR  1 meal per week  Canned "Light" Tuna

AND

M o n t h l y	1 meal per month  Canned "White" Tuna Chilean Seabass Grouper Halibut  Marlin Orange Roughy Tuna Steak
---------------------------------	---

Do Not Eat	Shark Swordfish  Tile Fish King Mackerel
------------	--

**Figure 2.** Second eating guidelines format, modeled after materials used by Michigan.

## Advisory for Store-bought or Restaurant Fish

### Going to the store or out to eat?

Fish are grouped and assigned points based on the amount of mercury in one meal. Fish with more mercury get more points.

The lower the score, the better the fish is for you to eat. Eat no more than 8 points of fish meals per month...



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Grouper	Marlin												
Mackerel	Orange roughy												

**Don't eat:**  
Shark, swordfish, tile fish, king mackerel.

**Figure 3.** Third eating guidelines format, designed as a wallet card.

<b>Advisory for Store-bought or Restaurant Fish</b>			
<b>8 Meals per Month</b>	<b>4 Meals per Month</b>	<b>1 Meal per Month</b>	<b>Don't Eat</b>
Catfish (farm-raised) Cod Crab Flatfish Herring Oysters Pollock Salmon Sardines Scallops Shrimp Tilapia	Canned "light" tuna	Canned "white" tuna Chilean seabass Grouper Halibut Marlin Orange roughy Tuna steak	Shark Swordfish Tile fish King Mackerel

categories. The number of meals that could be eaten from each category was the total number of meals for all the species in that category, not the number of meals for each species in that category.

We presented these guidelines to focus groups one at a time, and the groups discussed the clarity of the guidelines and their interpretation of the recommendations after each was presented.

### **Guidelines for Choosing Fish**

For both the women of childbearing age and the urban/AOC angler focus groups, we next presented participants with general (not species-specific) guidelines for choosing sport-caught fish to eat. Two sets of guidelines were used. We modeled one set after Wisconsin's "Size-Species-Source" guidelines (Figure 4). We modeled the other after New York's "Who You Are-Where You Fish-What You Catch" guidelines (Figure 5). We modified the materials somewhat to reduce extraneous differences between them. The two sets of guidelines were presented to participants at the same time, and the groups discussed the clarity of each set and their interpretation of specific terms and phrases within them. The specific terms and phrases discussed included:

- "Eat a variety."
- "Fish that eat other fish."
- "Larger, older fish" vs. "Smaller, younger fish."
- Statements about some bodies of water being more affected by contaminants than others.
- "Women of childbearing age" (and other terms to describe women).

### **Implementation of Focus Groups**

We conducted three focus groups with women of childbearing age. These groups took place in Grand Marais, MN, Grand Portage, MN, and Muskegon, MI. We conducted four focus groups with urban/AOC anglers. These groups took place in Rochester, NY, Erie, PA, Perrysburg/Toledo, OH, and Milwaukee, WI. Each focus group lasted approximately two hours. At the conclusion of the groups, we asked participants to complete a short questionnaire to assess their demographic characteristics.

We audiorecorded and transcribed the focus group discussions. We conducted a content analysis of the transcripts using Atlas.ti (Version 7.0.88). This qualitative data analysis program allowed us to mark/code segments of interviews that described factors influencing understanding and interpretation of advisory materials. Transcript segments with the same code were grouped together, reviewed, and relevant quotes are used in subsequent sections of this report to illustrate factors influencing interpretation of advisory materials. We have labeled excerpts in this report according to the focus group from which they were drawn ("E" for "Erie," "GM" for "Grand Marais," "GP" for "Grand Portage," "MS" for Muskegon, "MW" for "Milwaukee," "R" for "Rochester," and "T" for "Perrysburg/Toledo").

**Figure 4.** Guidelines for choosing fish, modeled after Wisconsin’s “Size-Species-Source” guidelines.

## To Avoid Contaminants, Remember:

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### SIZE • SPECIES • SOURCE

- **SIZE.** Choose *smaller*, younger fish. Larger older fish are more likely to contain higher levels of contaminants.
- **SPECIES.** Eat a *variety*. Fish that eat other fish tend to build up more contaminants.
- **SOURCE.** Know *where* your fish comes from. Fish from some lakes and rivers have less contaminants than others.

You can get more information about contaminated fish and special advice about waterbodies by checking out fish advisories on the State Health Department's website.

Pregnant or nursing women, women of childbearing age and children less than 15 years old require more protective advice and should refer to the brochure, “A Family Guide to Eating Fish.”

**Figure 5.** Guidelines for choosing fish, modeled after New York’s “Who You Are-Where You Fish-What You Catch” guidelines.

## Which Fish to Eat Depends Upon:

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### WHO YOU ARE • WHERE YOU FISH • WHAT YOU CATCH

- **Who You Are.** Women of childbearing age (under 50) and children under 15 should follow special advice because contaminants have a greater effect on babies and young children. Women beyond their childbearing years and men may face fewer health risks from contaminants. For that reason, the advice for women over age 50 and men over age 15 allows them to eat more kinds of fish and more often.
- **Where You Fish.** The advice on eating fish depends on where you fish. Some lakes, rivers, and streams have been more affected by contaminants than others.
- **What You Catch.** Some species (kinds of fish) have higher levels of contaminants than others. In general, smaller fish are less contaminated than larger, older fish of the same species.

You can get more information about contaminated fish and special advice about waterbodies by checking out fish advisories on the State Health Department's website.

## RESULTS

### Participant Characteristics

The women of childbearing age focus groups included 39 participants. Thirty-nine percent of participants were in their twenties, 37% were in their thirties, and 24% were in their forties. Sixty-three percent were married, 13% lived with an unmarried partner, and 8% were divorced. Seventy-one percent had children, and the average number of children for these women was 2.2. Forty-two percent had a college or graduate degree, and an additional 47% had at least some college. Seventy-one percent were employed full-time or self-employed. Seventy-six percent were white, and 24% were North American Indian.

The urban/AOC angler focus groups included 58 participants. Thirteen percent were under forty, 20% were in their forties, 34% were in their fifties, and 34% were 60 or older. Eighty-eight percent were male. Eighty-two percent had no children under eighteen living in their homes. Twenty-seven percent had a college or graduate degree, and an additional 54% had at least some college. Fifty-five percent were employed full-time or self-employed, and 29% were retired. Ninety-one percent were white, and 7% were black or African-American.

### Information to Encourage Desired Behaviors: Women of Childbearing Age

Focus group participants had different perceptions about what the main message was on the initial information sheets presented to them at the beginning of this segment of the focus group<sup>2</sup>. Some participants in each of the groups believed that women were being encouraged to eat fish, but to inform themselves about the risks and benefits associated with different types of fish:

*My get is fish are an important part of a healthy diet but there are limits to how much and how often you should eat them. (GP)*

*I think they're trying to get you to eat more fish but just let you know ... to find out more about it. (GM)*

*I would say I got out of it that fish is a healthy choice. However, you do have to educate yourself about how much you can eat, or it can become harmful. (MS)*

Others believed that pregnant women and/or children were being cautioned not to eat fish but that fish consumption was acceptable for others:

*But you can eat it as long as you're not pregnant or don't give it to your small kids or something... But not eat it if you're pregnant. (GM)*

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<sup>2</sup> Fish are an important part of a healthy diet. However, fish can contain chemical contaminants at levels that may be harmful to health – especially in developing babies and children. You can eat fish and get the health benefits without worrying about the risk by following your state's fish consumption guidelines.

*It really pinpoints babies and children... Someone researching it ... might automatically think, "Oh, especially in developing babies and children, I don't have to worry about that kind of thing." (MS)*

Some thought that the primary message was that women should seek out information about the risks and benefits of fish consumption:

*They want us to ask the state, "Why?" They want us to look for that piece of information. They want us to take the next step. (GP)*

*I would tell them they need to do research and understand what they're doing because it could harm them. (MS)*

*I think the bottom line that I get out of it is probably to find out what the fish consumption guidelines are. (GM)*

Some focus group participants wanted specific fish consumption guidelines, or directions about how to find those guidelines, included as part of the materials:

*I'm looking for a website or specific guidelines or something. You know, where do I go next to find out? (GM)*

*At least inform you where you can find the information, if it's not provided. (GP)*

A number of women in all three groups, however, would have been inclined not to eat fish at all if they received only this information from an agency:

*I wouldn't eat fish though. Like this makes me ... not want to eat fish... Because it's really like a scare tactic thing... "Eat fish? Well, it could kill your baby." (GM)*

*If I didn't know what I know about fish and I seen this, I probably wouldn't want to consume the fish. (GP)*

*I would just avoid it altogether because I'd be afraid for my children ... This would make you not buy it. (MS)*

As these different reactions to the information suggest, some focus group participants thought the message was ambiguous:

*It contradicts itself... The top one says you need to be careful what you eat, and the bottom one says don't worry about it. (GM)*

*Both statements are pretty useless I think. I mean if I read either one, I'd be like this is nothing for me. All it does is tell me, maybe there's benefits, maybe I'm hurting myself, but it tells me nothing else. (MS)*

Because of this ambiguity, this information alone would not have the effect sought by the Consortium – encouraging women to continue to eat fish low in contaminants when they were pregnant.

After discussing these initial statements, focus group participants were provided with three sets of additional statements that could be added to the initial statement. After each set of statements was distributed, they were asked which statements would be most likely to encourage them to continue to eat fish. The three sets of statements were intended to communicate:

- Fish provide health benefits.
- Reasons fish provide health benefits.
- Specific health benefits of fish.

### **Fish Provide Health Benefits**

We included four statements in the first set that was distributed to participants:

- Fish are an important part of a healthy diet.
- Health experts recommend that fish be included as part of a balanced diet.
- Eating fish is good for you and your baby!
- If you follow the fish consumption guidelines you and your baby will get a lot of the health benefits and very little risk.

No consistent preference for one of these statements emerged from the three focus groups. Positive and negative reactions to each statement were evident.

Fish are an important part of a healthy diet. Some women thought the tone of this statement was positive and encouraging:

*I like the “fish are an important part of a healthy diet” because... I’m ... focusing on a word: “healthy diet.” (GM)*

One participant argued that it appealed to people’s interest in making positive changes in their lives:

*Because it’s the beginning of the year, many people have New Year’s resolutions. You know it’s on their mind... So everyone’s thinking about it. (MS)*

A woman in one of the groups maintained that the statement needed to be more qualified:

*The statement should be more “can be” ... Instead of saying they “are” an important part... Fish “can be” and then you lead into the guidelines. (GP)*

Others, however, thought the statement did not provide much actual information:

*Just too general. There just wasn’t enough information. (GM)*

Health experts recommend that fish be included as part of a balanced diet. Several focus group participants thought that the reference to “health experts” in this statement increased its credibility:

*I like the “health experts” ... just ‘cause they’re experts. And ... I’m just going to believe that the State of Minnesota, the Department of Health... knows what they’re doing. (GM)*

*Someone has researched it. An “expert” has researched it, you know. (MS)*

One woman, however, believed that referring to “health experts” diluted the strength of the statement:

**R:** *Health experts? Well, which ones? Who? Which one? Where? Why? Republican? Democrat? I don’t know...*

**I:** *So it would be better just to have a clear statement?*

**R:** *Yeah. “Fish are an important part of a healthy diet.” Nobody’s opinion. It just is. (GP)*

Another participant argued that the statement did not provide any new information:

*Yes, I know fish are good for you. I know ... it is healthy for you to have. (MS)*

Eating fish is good for you and your baby! Some participants liked the positive tone of this statement and believed it helped to balance the warnings about fish consumption:

*The exclamation point ... I think that kind of equalizes the risk part. Like it’s kind of ultrapositive... You kind of need that to balance it out ‘cause otherwise I take away from the initial statement – I just think too much risk. (GM)*

One participant, however, argued that the tone was overly positive. Therefore, she questioned its honesty:

*The one I did not trust was “eating fish is good for you and your baby!” I was just like, “Oh no, that’s too glib.” ... The exclamation mark was what really got me. You know it was like, “You should really believe this!” Which makes me not believe it. (GM)*

If you follow the fish consumption guidelines, you and your baby will get a lot of the health benefits and have very little risk. Some participants believed that this statement covered the most important points that they needed to know:

*I even like that, not in addition to what’s on top, but almost replacing it. I feel like what’s on top ... it’s kind of ... schizophrenic. “Fish are important, but they have all these chemical contaminants.” And this is really simply... “There are guidelines, there are*

*benefits, and there are risks.” ... Instead of ... “They’re good, but they could be bad, but it’s OK.” (GM)*

One argued that it addressed her concerns about her children, which were paramount:

*I had [as my preferred statement], “If you follow the fish consumption guidelines you and your baby will get a lot of health benefits and very little risk.” Because the previous statement, my most alarming part was my children. Therefore, that ... was the most important to me. [This statement] takes that back because my kids are my number one priority. (MS)*

Others, however, thought this statement was too long and complex:

*It’s long, and I kind of get lost in it. (GM)*

*I think that’s really wordy. If you’re trying to grab somebody’s attention, I think they give up ... by the end of that ... and then just stop reading the rest... (GP)*

Some participants argued that they would not think it applied to them if they did not have a baby.

*I don’t have a baby, so that it really wouldn’t apply to me. (GM)*

**R1:** *Because they said “baby” in it, I tended to not focus on it. If it had said “children,” I might have thought more about it ...*

**R2:** *What if it was broader altogether and said “family?” “Eating fish is good for you and your family.” ...*

**R3:** *Excellent.*

**R4:** *That would be more relevant. (MS)*

### **Reasons Fish Provide Health Benefits**

Four statements were included in the second set that was distributed to participants:

- Fish are generally low in unhealthy, saturated fats.
- Fish contain vitamins and minerals.
- Fish are high in protein.
- Including fish in your diet is the primary way to get healthy omega-3 fats.

Reactions to these statements, while not entirely consistent, tended to be more similar among focus group participants. Participants viewed the third and fourth statements as more likely than the first and second to encourage women to continue to eat fish.

Fish are generally low in unhealthy, saturated fats. A number of women found this statement confusing:

*The “low” and “unhealthy” kind of seems like a double negative... Like what does that mean? (GM)*

*The one I would put on the bottom is “Fish are generally low in unhealthy saturated fats.” That’s like a double negative and it’s hard for me to sit there and go “low” and “unhealthy”... Figure that one out. (MS)*

*A lot of people are going to look at that as a negative automatically. Like what does that exactly mean, you know? (GP)*

Women in one group thought that people would focus on the words in the statement that sounded negative:

**RI:** *I saw “fish” and “unhealthy” in that sentence and that is not what promoters want people to see...*

**R2:** *It’s all like negative. (MS)*

Others simply thought it was too general:

**RI:** *Generally low in unhealthy saturated fats...*

**R2:** *Wishy-washy, mishy-nishy.*

**RI:** *Can it be a little weaker? (GP)*

*It’s so nonspecific that it would be something I would discount right away and not really read much further. (MS)*

At least one participant thought this statement would be most likely to encourage her to continue to eat fish, however:

*Actually, I had it as the first of mine. I disregarded the “unhealthy” basically because I understand the sentence. It didn’t confuse me in any way. I just thought the word “unhealthy” was unnecessary. You could have just left it at “Fish are generally low in saturated fat.” (MS)*

Fish contain vitamins and minerals. This statement was viewed as not persuasive by several focus group participants because it described a characteristic of fish that many other foods also shared:

*It’s like there’s a lot of foods that fit those requirements. (GM)*

*Fish contain vitamins and minerals. Well, pretty much everything we consume has vitamins and minerals. (GP)*

Another participant argued that this statement was too general:

*I thought the vitamins and the whole statement about it kind of odd... 'Cause it's kind of nonspecific 'cause you don't think of fish as having vitamins and minerals. You think of it as being lean, a protein and having omega-3's. So a statement that is a little bit more specific in that it contains you know vitamin E and potassium. Then I'd be like, "Oh, I didn't know that." (MS)*

Fish are high in protein. This statement was one of the two statements women were most likely to prefer. Women in each group thought that protein was widely regarded as something people needed:

*Especially if you're gearing it towards pregnant women or families with small children ... getting protein sources in every day is a really important thing. (GM)*

*The "high in proteins" ... I put at the top because I just recently found out how much protein you need a day, and I don't meet that at all ... so that was high for me. (GM)*

*Protein is such a big portion of anybody's diet ... No matter what your income is, you have some source of protein. And no matter how healthy or unhealthy you want to be, protein's big. (MS)*

This perception was not universal, however:

*I've never thought of protein ... once in my life. Like "what is protein and where do you get it?" I could care less. (MS)*

Including fish in your diet is the primary way to get healthy omega-3 fats. Like the statement about protein, this statement about omega-3 fats was one that participants thought many women would perceive as relevant:

*That's what everyone talks about now. That's what raises your good cholesterol, lowers your bad or whatever. (MS)*

*I have prior knowledge of how wonderful those are for you, the omega-3 fats. So that rated really high for me ... my number one actually. (GM)*

This statement was persuasive in part because it described a characteristic of fish that many other foods did not share:

*When it says that this is the primary way to get this really important thing that you need, that actually tells me that you should eat fish. (GM)*

**I:** *It sounds like you would be interested in something that would really make fish stand out as opposed to a general statement ... ?*

**R:** *Uh huh, yeah.*

**I:** *And do you see anything in any of these other statements that would make fish stand out?*

**R:** *Including fish ... in your diet is the primary way to eat or get healthy omega-3 fats. (GP)*

The reference to omega-3 fats made at least one participant think of fish pills, however, and that was a negative association:

*Omega-3 just makes me think of fish pills. So that's why I ... put that at the bottom (GM)*

One participant questioned the accuracy of the statement:

*We need omegas, so I think that's good, but I kind of don't like this statement ... because it says "the primary way" to get healthy omegas, which I disagree. There's a lot of things you get omegas from... So I kind of disagree with that. (GP)*

### **Specific Health Benefits of Fish**

Two statements were included in the final set that was distributed to participants:

- Omega-3 fats may be beneficial during fetal brain and eye development.
- Eating fish containing omega-3 fats may lower the risk of heart disease in adults

Of all the statements considered in all three groups, many respondents considered these statements the most likely to encourage them to eat fish:

**R1:** *Probably the most helpful for me.*

**R2:** *They're more specific.*

**R3:** *Yeah. I don't really know much about omega-3 fats so this is actually giving me information ... That's what helps, you know ...*

**R4:** *The first group is like telling you, "You should eat this." ... Why should I eat this? ... And I feel like these say, "Well, ... eating this is good for you because of this." (GM)*

One respondent, however, believed that the statements sounded too qualified because of the word "may."

*I have a question about the word "may" ... I hear it in commercials ... If you eat Cheerios it "may" lower your cholesterol. Well, what does that mean? I mean does that mean three bowls of Cheerios a day every day of the week will lower my cholesterol, or is it just a ploy to get me to buy Cheerios? ... Is there another word that could be used there because ... it just turns me away. Like there's nothing that proves there's a result in this. So you have to show me positively that there's a result, especially if I don't really like eating fish. (MS)*

Of these two statements, the one that focus group participants perceived as most persuasive varied depending on which statement they thought was most relevant to them personally:

*I'm not pregnant. So that's fantastic that it helps fetal development, [but] I'm done with that. It doesn't concern me. (MS)*

*The one I chose was that fish contain omega-3 fats [that] can lower the risk of heart disease in adults... That is specific for heart disease so that's a big concern for me and my family. (MS)*

### **Remaining Questions**

After reading all of the statements, focus group participants were still left with a number of unanswered questions. Some participants wanted more specific information about the contaminants in fish:

*Need to be specific, heavy metals or pesticides or... Be very specific about what you're talking about... And what kind of harm that it is going to cause. (GP)*

Others sought information about which fish were most and least likely to contain contaminants:

*Is there a certain type that's more beneficial than another? Should I do tilapia or salmon or whitefish or shrimp or perch or what kind? You know, which ones? Because I like them all. So if I like them all, which one is the most beneficial? Which one's the most risk? What are the most harmful? (MS)*

Participants also requested specific consumption recommendations:

*R1: I think a guide that showed ... how many portions a day or a week different age groups should eat of that higher, medium risk, low risk... That might be something good to include in the brochure or something.*

*R2: Yeah, some sort of graphic where you can easily determine ... salmon has these risks, this is often you could eat it. Whitefish, trout... (MS)*

### **Section Summary**

We can draw several generalizations about the types of statements that focus group participants thought would be most likely to encourage them to continue to eat fish:

- Women preferred succinct statements to longer ones.
- Women viewed statements that described characteristics of fish that were not shared by many other foods as persuasive. They found statements about protein and, particularly, omega-3 fatty acids in fish to be more persuasive than general statements about vitamins and minerals.
- Women found statements about particular health benefits that could be attributed to omega-3 fatty acids most influential. These statements provided the most concrete information about why they should continue to eat fish.
- Women preferred statements that had particular relevance to them and their life circumstances. Women who were pregnant or had young children preferred statements

that referred to the benefits of fish consumption for children. Those who did not expect to have any more children preferred statements that referred to the benefits to the women themselves.

### **Information to Encourage Desired Behaviors: Urban/AOC Anglers**

Many focus group participants believed that the main message that an agency was trying to communicate through the initial statements presented to them<sup>3</sup> was to be cautious when consuming fish:

*You've got to be careful how many fish you eat. (R)*

*Watch the amount of fish that you eat. (E)*

*Eat in moderation. (T)*

Many also recognized that the statements articulated the health benefits of fish consumption:

*It's also beneficial. (R)*

*Fish are healthy, but they could be harmful. (T)*

*It seems like an encouraging statement to consume fish initially. (MW)*

A number of participants believed the statements were encouraging consumers to educate themselves about fish consumption:

*Know ahead of time ... the quantity that you should be able to safely consume. (E)*

*Well you can eat fish, but you've just got to be careful which ones. Find out. (MW)*

More specifically, participants believed they were being encouraged to follow the guidelines:

*If you read the guidelines, you would know what not to eat. (R)*

*Observe and follow the guidelines prepared by professional people ... It's based on scientific research ... That is the bottom line. (E)*

*Check out what fish you could or could not eat... Their website or the fishing regulations. (MW)*

Some participants, however, were confused as to what the primary message was:

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<sup>3</sup> Fish are an important part of a healthy diet. However, fish can contain chemical contaminants at levels that may be harmful to health. You can eat fish and get the health benefits without worrying about the risk by following your state's fish consumption guidelines.

**R1:** *It's working both ways... Fish is good for you. Forget about all the warnings that you get...*

**I:** *Okay, so you're finding there's a contrast in the message?*

**R1:** *Definitely. There's a conflict, isn't there? It kind of downplays the message you're trying to get across.*

**R2:** *It cuts the first one right off at the knees.*

**R3:** *It's very incomplete.*

**R1:** *Eat all the fish that you want even though it contains contaminants. But you can eat all the fish and get the health benefits without worrying about it. That's wrong. (T)*

After reading these statements, some participants said they would be cautious about eating fish, perhaps even consuming less fish than the guidelines allow:

*Because the state don't know my levels ... so I would probably eat less ... in caution... The state doesn't have a guideline for eating fish for 50 years. I mean it does say you can eat a half a pound of fish a month... They're not going to say you can eat a half a pound of fish a month for 45 years, you know what I'm saying?... We know what happens to those chemicals when they get in your body. They accumulate in areas of your body that you're not going to notice until it's too late. (R)*

*I kind of like cut that in half. So say it was once a month you could eat say walleye or whatever, I would probably eat it every other month just to feel a little bit more safe myself. (E)*

Some might avoid fish entirely:

*I'd second guess wanting to eat it after reading this... I mean it sounds it's good for your diet. Then you start reading through it. Then you're like ... maybe I should just go buy the pills and have the benefits. (R)*

Others, however, thought many people would simply ignore fish consumption guidelines:

**R1:** *There's a whole lot of people that go and catch fish and they don't pay any attention to fish advisory, consumption advisory.*

**R2:** *They'll read the first part of the first sentence.*

**R1:** *There's a lot of people you go on, you see people fishing off the shore, they don't pay a bit of attention ...*

**R2:** *They don't read through. (T)*

By themselves, these initial statements seemed unlikely to communicate a consistent message to urban/AOC anglers.

After focus group participants discussed these initial statements, we provided them with three sets of additional statements that could be added to the initial statements. After each set of statements was distributed, we asked participants which statements would be most likely to

encourage them to continue to eat fish. The three sets of statements were intended to communicate:

- Eating fish can cause health problems.
- The detectability of contaminants.
- Health problems associated with eating contaminated fish.

### **Eating Fish Can Cause Health Problems**

Three statements were included in the first set of statements that was distributed to participants:

- Long-lasting contaminants build up in body tissue over time.
- Eating one meal or even several meals of contaminated fish may not make you sick right away but contaminants can build up in your body over time eventually causing health problems.
- Eating contaminated fish does not necessarily mean that you will get sick, but, over time, harmful levels of contaminants can build up in your body without you knowing it.

All three statements referred to consequences that could occur “over time,” and this phrase raised questions in the mind of one participant:

*R: The “over time” concerns me... If I eat one meal a week, how does that compare to one meal every three weeks or fish every four days because there is a flushing effect... How often can I eat a meal of fish and not have the effects?...*

*I: Okay so “over time” is what gets your attention and makes you want ... more information?...*

*R: Well, I don’t know what “over time” means. Is it a week frame? Is it a two-year frame? (MW)*

Participants expressed specific reactions to each individual statement, too, and these reactions differed.

Long-lasting contaminants build up in body tissue over time. Some participants in some of the focus groups thought this statement would influence them the most because it was short and clear:

*I just thought the short one, the short and sweet. (T)*

*The simplest one to me was clear and concise... I just thought it kind of followed from the first statement... You’re explaining it a little bit more and then that made me feel like I wanted to go ... looking up more on a chart or a table or some information and try to figure this out. The others seemed to be more nebulous. (MW)*

Others, however, found this statement too general:

*The one-liner seems to me to be vague, and for me personally I would want to know more. (MW)*

Eating one meal or even several meals of contaminated fish may not make you sick right away but contaminants can build up in your body over time eventually causing health problems. Some focus group participants thought this statement was most likely to encourage them to follow the advisories. Participants liked the greater specificity of this statement:

*The one with “eating one meal or even several meals,” that grabs the reader’s attention whenever you start throwing a number out there... Whenever the writer puts in a figure of eating one or even several, that narrows it down to the reader to say “Okay, now they’re trying to say that you know there is a limit.” ... Whenever they throw a number in there, it grabs your attention a little bit more. (E)*

*These first two lines about “eating one meal or ... several meals.” That would fulfill my quest for more information ... more detail. (MW)*

The fact that this statement has a clear description of outcomes (health problems) was important:

**R1:** *That last statement, you know, “eventually causing health problems” ... it gives you an outcome, an expected outcome.*

**R2:** *It has a number so you can put it in relation. Eating one meal could give you contaminants. So it’s “one or several.” So it’s putting a figure in front of you that people can understand. (T)*

Anglers would be more likely to be alarmed by this reference to health problems, and that might encourage them to follow the advisories:

*I think the [statement] scares me more into following the guidelines than the other two. (T)*

*It does state, “Eventually it causes health problems.” I think that’s an eye catcher right there. (E)*

Some would be so alarmed by these statements that they might stop eating fish altogether:

*I said, “causing health problems” ... When somebody reads it they pretty well know right up front, “I’m not eating these fish. I don’t care how good they are. I’m going to go somewhere else. I’m not going to eat these fish.” (T)*

**R:** *Well, why should I even go out and fish? Why should I even go out and buy a license?*

...

**I:** *So what in particular would make you stop [eating fish] based on these statements?*

**R:** *Oh probably the “eating one meal ... going to be causing you health problems.” (MW)*

A number of participants thought the statement was too wordy, however:

*If you can abbreviate the first one and still get the point across, do it. Make it as short as you can but still get the point across. Whatever it takes to get it across. (T)*

*Yeah, number one is the best, but I think it wouldn't have to be that wordy. (MW)*

Eating contaminated fish does not necessarily mean that you will get sick, but, over time, harmful levels of contaminants can build up in your body without you knowing it. Like the last statement, some participants liked its specificity. One participant argued, however, that it was easier to understand than the previous statement:

*It's easier for them to read. It's easier for them to get it through their head. You know, it can build up in your body without you knowing it. That's something that they can understand... The majority of the people buy a fishing license nowadays aren't college level. They're high school grads, if you're lucky. (T)*

Some participants suggested that they would be influenced by the statement telling them something that they would not be able to know on their own:

*What stuck out on it for me was "without you knowing it." And then that's important and it would make me read further. (R)*

**R:** *I think it gave you the most information in a quick statement on what's going on and would get my attention better than the other two.*

**I:** *Okay, so what particular information gets your attention in there?*

**R:** *Well, that eating contaminated fish can over time leave the contaminants in your body without you know it. And that would be something I'd want to know. (MW)*

However, one participant argued that the statement did not identify a clear consequence of eating fish and would, therefore, be less influential:

*I was going to say on the one that you're referencing, the "without you even knowing it," that just leaves it open. It doesn't put a face on what that means, but when [the previous statement] says "eventually causing health problems." "Oh, that's what could happen as an outcome." ... But if we just say without you knowing it ... you can take more of a kind of, "Eh, whatever." But, you know, "causing health problems." "Oohhh, I wonder what kind of health problems? What does that mean?" You know, that to me makes me want to learn more about it. (T)*

### **Detectability of Contaminants**

Four statements were included in the second set of statements that was distributed to participants:

- A lake can look dirty and have fish that are low in chemical contaminants. A lake can look clean and have fish with high levels of contamination.

- Fish in city lakes and rivers are not necessarily more contaminated than fish in waters outside of cities.
- You can't see, smell or taste chemical contaminants in fish.
- Even if water looks clean, fish caught in that water can still be contaminated.

The third and fourth statements tended to be viewed as both straightforward and comprehensive.

A lake can look dirty and have fish that are low in chemical contaminants. A lake can look clean and have fish with high levels of contamination; and Fish in city lakes and rivers are not necessarily more contaminated than fish in waters outside of cities. Some participants commented that the third and fourth statements were of value because they challenged preexisting beliefs about areas that were safe for fishing:

*The one that stood out to me was, "the lake can look dirty but the fish are low," because you don't really know as a consumer what you're getting. (R)*

*This statement that had the most impact on me was "the fish in city's lakes and rivers..." It kind of challenges the heuristic I have... So that one kind of just stood out from the other ones... That challenges my view of what's safe or not. (MW)*

You can't see, smell or taste chemical contaminants in fish. As with the previous two statements, many focus group participants thought this statement would influence them because it communicates information about something they cannot detect on their own:

*I think the one that strikes me the most is, "You can't see, smell or taste chemical contaminants in fish." And for myself when you can't see something, but they say it's there ... that's kind of almost like a wake-up call to me. (R)*

Several participants perceived this statement as concise and clear:

*The other ones ... got more wordy... But I'm thinking just saying this, "You can't see, smell or taste chemical contaminants." It doesn't matter where you catch the fish. It's just that you can't see that. (T)*

*Clear, concise... It wants me to read on. It doesn't give me options like, "Well, if it's clean, if it's dirty." (MW)*

Even if water looks clean, fish caught in that water can still be contaminated. Like the previous statement, many participants believed that this statement would challenge their preexisting assumptions about clean water:

*That would stick in my mind... Because if you're fishing up in the Adirondacks or something ... you think that's pristine water up there. (R)*

*Of course you're not going to go to fish in a pond that has all this crap in the water and it just looks unhealthy. But you're going to fish in the ones that look clean and you can see*

*through to the bottom. But even those ones could still be contaminated and the fish could be unhealthy in that. (T)*

*It's very direct... Because we have the assumption that water that's crystal clear is non-contaminated, and I just believe that that would be less confusion than the others. (MW)*

Several participants argued that this statement about water combined with the previous statement about fish provided more comprehensive information:

*By looking at the lake you can't tell. By looking at the fish you can't tell... I think there's a lot of information right there in those two. (E)*

*If you kind of combine it..."You can't see, smell or taste" ... combine it with the second statement about the water looking clean... I think that's a more holistic message maybe then because it's not just the fish, it's the water, too. (T)*

*I figured you combine them and therefore you wouldn't have just one. One to me doesn't stand alone by itself. I think you need it together. (MW)*

### **Types of Health Problems**

Seven statements were included in the last set of statements:

- Too much mercury may result in loss of coordination and affect vision, hearing, and speech.
- Too much mercury may result in numbness and tingling, and memory loss.
- Some studies have found higher rates of heart disease in men who had elevated mercury levels.
- Young children, developing fetuses and breast-fed babies are at most risk from eating contaminated fish, because small amounts of mercury can damage a brain that is just starting to form or grow.
- Women who eat too much contaminated fish and become pregnant may have an increased risk of having children with lower birth weights or small head size.
- Women who eat too much contaminated fish and become pregnant may have an increased risk of having children who are slower to develop and learn.
- Health problems that may result from the contaminants found in fish range from small, hard to detect changes in health - to birth defects or cancer.

The first three statements addressed specific health problems that could be caused by mercury. The next three statements spoke to health problems that could be experienced by developing fetuses, babies, and children. The final statement was most broad, addressing a range of health problems that could be caused by contaminants. This broadest statement was generally viewed as the most likely to encourage participants to follow the advisory.

Too much mercury may result in loss of coordination and affect vision, hearing, and speech;  
Too much mercury may result in numbness and tingling, and memory loss; and Some studies

have found higher rates of heart disease in men who had elevated mercury levels. The three statements about mercury were perceived as too narrow:

*The mercury ones were limited... I'm assuming there's more things than mercury out there. (MW)*

Furthermore, the statement linking mercury to numbness, tingling, and memory loss described effects that were perceived to be common in an aging population:

**R1:** *The one where you've got too much mercury may result in numbness and tingling and memory loss, well, that's quite common as you get older.*

**R2:** *Oh my God, I got mercury poisoning. (E)*

The statement linking mercury to heart disease piqued the interest of some participants because it seemed to conflict with conventional wisdom about eating fish:

*"Some studies have found higher rates of heart disease in men who had elevated mercury levels." This is a pretty eye opener because a lot of people want to eat the fish for ... good heart situation. (E)*

However, this statement would be of less interest to younger anglers:

*"Some studies have found higher rates of heart disease in men." I wouldn't pay attention to that either. (R)*

It also raised questions as to why it did not apply to women:

*Well, this says "men." You know, it specifically says "men." I mean it doesn't say that it won't hurt a female... If there's a risk that it could affect a man's heart, why wouldn't it affect a female's heart, too? (E)*

Young children, developing fetuses and breast-fed babies are at most risk from eating contaminated fish, because small amounts of mercury can damage a brain that is just starting to form or grow; Women who eat too much contaminated fish and become pregnant may have an increased risk of having children with lower birth weights or small head size; and Women who eat too much contaminated fish and become pregnant may have an increased risk of having children who are slower to develop and learn. The three statements about health effects on fetuses, babies, and young children struck some participants as very influential because they referred to a vulnerable population:

**R1:** *I am going to go with the "young children, developing fetuses, etc." Just the fact you have young children, fetuses, breastfed babies, that attracts people's attention more.*

**R2:** *What's worse than that? (T)*

**R1:** *I think the young children one stands out.*

**R2:** *The ones that are specific to young children, I had the highest too. (R)*

However, participants also pointed out that these statements would not influence the behavior of people who did not have young children:

*Well, all the ones that are gender specific or target young kids, I mean personally I would look at them and be like “Oh, I don’t have to worry about that.” (R)*

*And I think if you’re not one of those groups, then you’ll just X it out. Because I’m not one of those people so it doesn’t apply to me. I think it would be real easy for people to do that. (T)*

*And I don’t know about the rest of you but historically when I look at warnings, the bulk of them in my eyes have dealt with women and children. And I don’t remember a lot of warnings for men, so I’ve just kind of disregarded them... And that I think that is very true with the two women statements and you’ve got a young children statement. (MW)*

Health problems that may result from the contaminants found in fish range from small, hard to detect changes in health - to birth defects or cancer. Many participants believed that the final statement would be influential because it would be relevant to a wide range of people:

*That kind of encompasses everybody. (R)*

*That includes the whole public. The other ones are more specific to women and children... The first one I think that would be the main one that would be the most eye-catching for the entire public. (E)*

*[The statement] categorizes all of that, with the kids and everything ... birth defects... cancer. So it gives people kind of a range. (T)*

**R1:** *There were several others that were specific to mercury and to me contaminants are more than mercury and so this one covers the gamut of possibilities.*

**R2:** *That one covers all the others actually as far as I was concerned. That one stood out to me as the one that would get your attention where everything else is just another sentence. (MW)*

This statement also pointed to concrete consequences of eating contaminated fish that would be influential:

*The [statement] really sticks out. And cancer, that’s just a scary thing in general... the “C” word. (T)*

### **Remaining Questions**

Several additional questions or comments about the fish consumption advisories arose in the focus groups as participants reviewed these statements. Many participants assumed that

statements about fish consumption were specific to particular species and, consequently, wanted species-specific information:

*In my opinion it should be species divisions. You know what I mean? You know, because everybody doesn't eat all kinds of fish... The kinds of fish that I like – I would like that information on those particular ones, not as fish in general. (E)*

*I would want to know which fish would fall into the consumption guidelines. Are they going to be specific? Is a walleye different than a bluegill and a northern different than a ... lake trout or whatever?... Also size. Is there a difference between size of a particular fish? I mean, you call a 16-17" walleye an "eater." Well, what if I caught a 28" walleye? ... Does that fish hold more contaminants than the smaller one? (MW)*

In two of the groups, participants said they would want factual information to support the statements being made:

*If they say something like, "we tested ... 100 men and showed that men are high in mercury," then I would look at that... I'm a person you've got to prove it to me... I got to see that you did a study over here to see how it affected people. (R)*

*Substantiate the facts... Because we see these ... being real abstract... How many people that we know of have heart disease contributed to [by] that? I mean, is there a percentage? ... We say there's 50,000 traffic fatalities every year... That kind of hits home... Is there something ... we can ... put out you know where it kind of hits home that, "Hey, males at 58 years old are dying off because of they ate too much salmon." (MW)*

The information also made some participants want to know their own contaminant levels:

*If I had a way of checking my mercury level in my system ... if I went for that kind of testing, I could say that I was at a higher risk of heart disease if my mercury level was higher than say the next person next to me. But I have no idea of knowing that because I don't know exactly where to go to get checked if I wanted to. So that statement right there ... leaves me standing in a situation where I don't know what to do next. (R)*

*One thing that I hear a lot of is the mercury levels. I mean, how do we know when the mercury is high or how do we know when the mercury is low? (E)*

### **Section Summary**

We drew several conclusions about the types of statements that focus group participants thought would be most likely to encourage them to follow fish consumption advisories:

- As with the women of childbearing age, urban/AOC anglers preferred succinct statements.

- Statements that pointed out contaminants could be present in fish, bodies of water, and people who consume fish without the anglers being able to detect these contaminants captured participants' attention.
- Urban/AOC anglers found statements that pointed to negative health outcomes of eating contaminated fish persuasive. They viewed statements of widespread relevance as most persuasive. Specifically, urban/AOC anglers preferred statements that applied to a variety of contaminants and described a range of possible health outcomes to statements that were more narrowly focused.

## **Fish Consumption Guidelines Format**

### **Format 1**

The first format (Figure 1) presented to the focus groups<sup>4</sup> was initially perceived by many participants as straightforward to interpret:

*It's pretty straightforward. (R)*

*I think I understand it. (MS)*

*I: So if you looked at this and picked out a couple of kinds of fish, do you think that you could figure out what the agency who put this out thinks you could safely eat of that fish?*

*R1: Yeah.*

*R2: Yes. Yes.*

*R3: Without a doubt. (T)*

However, as the format was discussed in more depth, questions began to surface. Some participants were unsure whether the meal limits specified for each eating category of fish was the total number of meals consumed of *all* species in that category or the number of meals consumed of *each* species in that category:

*I guess I'm confused because does it mean that I can have two meals of cod and two meals of crab and two meals of herring? Is that what it means? Or does it mean ... the total you get is two meals? (MS)*

*I'm thinking that you can only have these types of fish two meals per week total, but I could see where people could think that, "Oh, I could have cod twice, and I can also have herring twice, and I can have scallops twice." ... You could end up having fish every day of the week. (GM)*

*Am I allowed to eat two meals of oysters here and flatfish, crab, and everything on this? ... Or just one of those species? ... What can I eat? (T)*

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<sup>4</sup> The analysis of the interpretation of the different eating guidelines formats combined data from both the women of childbearing age focus groups and the urban/AOC anglers focus groups.

Although the guidelines included the word “or” between the “twice weekly” and the “once weekly” categories, some participants were unsure whether they could eat fish from both categories in a given week:

**R1:** *My impression was you could have one of those type [two meals per week] or the canned light tuna once a week, not both.*

**R2:** *Totally three meals...*

**R1:** *I don't know if that's the right answer, but that was my impression...*

**R2:** *That's what my question is – was that you're only supposed to eat fish three meals a week.*

**R1:** *No. It's only, if you do the tuna, that's it. You don't get anything else.*

**R1:** *Per week?*

**R2:** *Per week. So it's not three. It's either two or one. (MS)*

Similarly, many participants did not notice the “and” initially between the two weekly categories and the monthly category. Consequently, they did not know whether they could eat fish from the weekly categories if they ate fish from the monthly category:

**R1:** *That kind of tells me if you eat one meal of halibut that you probably shouldn't be eating any of the other stuff from the top then...*

**R2:** *Right. You're done for the month. If you want to eat fish weekly...*

**R3:** *You better stick with cod or something like that. (MW)*

*I basically took it as – if I was going go for the one meal per month out of one of those, I wouldn't do the two meals per week. Like that week I would only do that one but then I might still do the two meals per week the next week you know in that same month. It's isn't really clear. (GM)*

**R1:** *Can I have two meals of salmon, then can I have a meal of halibut? I mean can I have that all in 1 week? Can I have that all in one week?...*

**R2:** *I would kind of say, no. That's just how I would interpret it...*

**R3:** *Yeah I'd say, no, too... (R)*

In one group, participants wondered if they could “trade” fish between categories. That is, if they chose not to eat a meal from the “once monthly” category, they wondered if they could eat more fish from the weekly categories:

*Now why couldn't I eat four herring? You know what I mean? If I can eat one nasty meal [out of the yellow box], why couldn't I eat two more green? (GP)*

After some discussion within the groups, most participants' interpretation of the eating guidelines was the intended interpretation, but there were exceptions.

## Format 2

The second format relied on a point system to communicate how much fish could safely be consumed by target audiences (Figure 2). Almost universally, participants in the focus groups found this format easier to interpret than the previous format:

*This one is just right to the point. This is what you can eat how many times. And it's, "Hey that's really easy. I don't have to guess." (GM)*

**R1:** *I like it better.*

**R2:** *It's much more specific... You just add up the points... You don't have to either/or, or look at the boxes. (GP)*

*This one's much better... much easier. (R)*

**R1:** *I think this is a lot better.*

**R2:** *Yeah, it's easier. (E)*

*That one's pretty straightforward. I like that one. (T)*

*I think this is a more effective way of getting across the same message as the previous one. (MS)*

*It's definitely easier than the first one I think. (MW)*

Two participants in one focus group, however, had strong negative reactions to the use of a point system.

**R1:** *Okay. Okay. I've already stopped because I have to add and subtract because it's a point system ...*

**R2:** *I absolutely hate point systems...*

**R1:** *I hate point systems...*

**R2:** *It turned me off instantly. (MS)*

A similar concern was expressed less intensely by a participant in another group, too:

*I don't want to count. I just want to look at it and, "Okay. Once a week I can have this." That's it. (GM)*

Some participants also raised concerns about having to keep track of what they ate over the course of an entire month:

*You need a scorecard ... because I can't remember what I ate two weeks ago. (T)*

**R1:** *I think about meal planning in terms of a week, like this week, next week, not over a course of a month...*

**R2:** *For a busy mom ... you don't think out that far into the future... You pretty much go week by week. (GM)*

People found the categories with higher point values particularly alarming:

*This just makes me more scared of the 8-point one... If it's in red, I can technically eat it, but I don't want to. (GM)*

*Somebody looks at the points, they automatically say, "Oh geez, that one's got 8 points per meal. I better not eat that." (R)*

Many thought they would eat only from the species with lower point values both because they were safer, and they would have to pay less attention to how frequently they were eating fish:

*I'd pretty much stay in the first two boxes [the 1-point and 2-point categories] anyway just to make sure. Just in case I forgot what I had three weeks ago, if I stay in the 1-[point] and the 2-[point] I should be fine. (GP)*

*I would use it, but I would probably do like most people in here. I would probably remember the 1- and 2-point system, and I would disregard the rest of it and not even purchase it because that would be too complicated. And I know 1 or 2 points – I can get away with planning that in my meals once or twice a week and be okay for the month for the family. But if it's anything over that it's just too much work, too much to deal with. (MS)*

### **Format 3**

The third format presented fish consumption guidelines in a simplified layout that was designed to be suitable for use as a wallet card, which could be carried easily to grocery stores or when fishing. A number of participants liked the idea of presenting fish consumption guidelines in a shorter, more portable format.

*This would be a nice handy thing to just keep in your purse. (MS)*

*[Print it] on a harder piece of paper that they could move, put in the tackle box or... (R)*

*Something like this would be nice. You know, you could hang it on your refrigerator or whatever. (T)*

*I think it's important because people, at least in my family, they take things like this and they'll tape it on the inside of a cabinet someplace and they're not so likely to tape something large. (MW)*

Two participants doubted that people would actually use it.

*Are you willing to carry a card in your wallet? I'm not putting another card in my wallet just to look at. (E)*

*I'm not going to carry around something just about fish. (T)*

With regard to the clarity of the information presented in this format, a few participants believed this format was clear and preferred it to the other formats they had seen:

*R1: I like this one better.*

*R2: I mean this one's pretty straightforward and understandable. (R)*

*R1: I kind of like the card.*

*R2: Yeah.*

*R1: Can't say particularly why... (E)*

Many other participants found the guidelines ambiguous. Because they had already seen the previous two formats, they assumed that they should not eat eight meals from the "8 Meals per Month" column AND four meals from the "4 Meals per Month" column AND one meal from the "1 Meal per Month" column. If they had not seen the other formats, however, they would have assumed that they could indeed eat the maximum number of fish from each column.

*I think if we wouldn't have the previous handout that let us know that, I would look at this and be like, "Okay ... I can eat 13 meals." (GM)*

*I would assume that I could have eight meals from the green, four meals from yellow, one from the orange, and none from the red all in the same month. (GP)*

*Well, I can have catfish twice a week, and I can have a Chilean sea bass once a month, and I can have four tunas a month. Well, that may not be what the intent of this is ... but ... I could interpret it that way. (MW)*

A number of participants suggested retaining the wallet card format, but modifying the presentation of information to incorporate some of the features they liked about the point system:

*The card would be really useful, but it seems to me that the second handout you gave us would work much better as a card ... if this information were in card format. (GM)*

*You could use the points on the wallet card. (GP)*

*[Use the] point system on a small format. (R)*

### **Other Considerations**

Discussions in the focus groups also focused on several topics that had relevance to all the formats. In every group, participants wondered how big a meal was:

*But how many ounces is a meal? That's where I get stuck because ... I could eat a giant plate of herring and that's probably the equivalent ... of like four meals a week. (GM)*

*And does size make a difference in any of these? I mean what is a serving? How many meals per week? What is the serving? (GP)*

*I think the biggest thing lacking here is the size of the portion. (E)*

*In addition to that, what we're missing is the size. What do we mean by two meals? I mean shouldn't it be four ounces? Or three ounces? (MW)*

In addition, participants were confused when they did not find species listed that they expected to see:

*I'm left with a lot of questions with this list because ... I wonder where's trout? Where is whitefish? (GM)*

**R1:** *Salmon. It says "not Great Lakes [salmon]" so where does the salmon that is from the Great Lakes come into play?*

**R2:** *That's the same question I had. I was looking at it and I said, "Okay, salmon not Great Lakes," expecting to see Great Lakes salmon somewhere lower, and then it's not there. (MS)*

Although it was not a planned part of the variation between the three formats, a number of participants liked the fact that the second format included information about the contaminant of concern (mercury) on which the guidelines were based.

*It specifically talks about the amount of mercury in one meal whereas the other handout has nothing about mercury and so that's educating me more (GM)*

*This tells you why... It's saying fish with more mercury get more points, so it's telling you more than the other one did. (R)*

*It identifies the contaminant. I mean it spells it out as mercury, so that's what you're looking at. (T)*

They argued that this information had relevance for how they interpreted the eating advice:

*If you got real serious about this and decided, "Okay ... I can eat two meals of cod a week and two meals of crab and two meals of herring." Well, maybe the cod is contaminated with something different than the other two are. So you could figure out for yourself then ... if I can eat two meals of cod that have mercury, if I can eat two meals of herring that have something different, it's not going to hurt me. Where if I eat two meals of cod and two meals of this and two meals of that and they're all contaminated with the same thing, then you're in big trouble. (E)*

*Tilapia could be on the list for mercury and herring could be on the list for arsenic and so he could eat two meals of the oysters a week and two meals of scallops a week and ...* (T)

## **Section Summary**

Focus group participants from both audiences almost universally considered the point system the most clear and easy to use. The other approaches had too much ambiguity and could be misinterpreted. Two participants, however, strongly disliked point systems, and several indicated that keeping track of fish consumption over the course of an entire month would be difficult.

## **Guidelines for Choosing Fish**

In the final segment of the focus groups with both audiences, we explored participants' understanding of and reaction to alternative presentations of general (not species-specific) guidelines for choosing sport-caught fish to eat (Figures 4 and 5). Although opinions were mixed, most participants in the focus groups expressed a preference for the "Size-Species-Source" guidelines. These guidelines were viewed as simpler and clearer:

*But this one to me is a lot easier to remember than all the stuff on the other one. You've got them three S's at the top ... I think this is much more eye-catching and much easier to remember than the other one by far.* (E)

*This one is quick, to the point: size, species, and source.* (GM)

*What I have to remember when I'm thinking about fish is size, species, source. It makes it very simple at the top, and it says for more [information], here's where you go.* (GP)

*It's more concise than the other one.* (R)

As these comments imply, the relative length and complexity of the "Who you are-Where you fish-What you catch" guidelines interfered with the ability of people to understand the main message.

*I think the one that says who you are, where you fish, what you catch is ... longer so I got bored reading the first part... I was lost ... reading it.* (GM)

*By the time I figure out, "Okay, I'm this, or my kids are this," then I'm done with the sentence and I don't really realize what I just read. So I had to go back and read that section actually two more times just because it was just way too much.* (MS)

*I was part way through "who are you" and I'm already blanking out... It's way too much, the wording.* (MW)

On the other hand, the “Size-Species-Source” handout did not give as much information about target audiences. Focus group participants thought it was important to have clear statements of the target audiences (both age and gender) to which the advice applied:

*I like the “size, species, source” also, but in the other one, “who you are,” it’s the only place that says anything about men... Why is a man not involved in it?... It would almost mean to me that I can eat anything I want, any size I want, it’s not going to affect me. Is that true? Is that not true? (MW)*

*I did like the specific ages [on the who you are-where you fish-what you catch]. That was interesting to me. (GP)*

*You could put ... in bold “women and children under 15.” ... If you are a woman and you see the women and children, you’ll stop and read that part, too. I mean that’s what I do when I’m in the supermarket. If I have the time, I’ll stop and say, “Oh, what’s that thing?” And within the first couple sentences if it doesn’t apply to me, I just keep going. (GP)*

Even though the “Who you are-Where you fish-What you catch” guidelines were viewed as having more information about the target audiences, this information was often misinterpreted. In particular, because the first sentence of these guidelines begins “women of childbearing age...,” some participants assumed that the advice applied *only* to women of childbearing age and not to men or older women:

**R1:** *Well, I kind of get that when I turn 50 I can eat as much fish as I want.*

**R2:** *Woo-hoo!*

**R1:** *After menopause!*

**R2:** *Yeah, as long as you don’t have to worry about having any more kids. (GP)*

**I:** *With the [who you are-where you fish-what you catch] sheet, what is your impression of who that one applies to?*

**R1:** *Women and children... if I was a man I’d be like ...*

**R2:** *Walk on by. (GP)*

**R1:** *Women of childbearing age. I’m reading the whole thing and think it’s all about women you know.*

**R2:** *You’re right. That’s what I was looking at...*

**R1:** *And you’re going to put it down then.*

**R2:** *Yeah, I’m going to put it down. (E)*

### **Eat a Variety**

The guidance for choosing species of fish to eat in the “Size-Species-Source” sheet recommended that people “eat a variety” of fish. Some participants considered this recommendation clear and straightforward and interpreted it as it was intended:

**R1:** *Not eating the same fish from the same source all the time.*

**R2:** *I think it's pretty self-explanatory. (E)*

**R1:** *Different species.*

**R2:** *Yeah, it's under the species part so that would mean you know don't just eat all walleyes or something like that. Vary what you're having. You know, have some salmon, have different things like that. That's what I would figure. (MW)*

They also understood the rationale for it:

*Some fish contain, could contain, less powerful chemicals than others, too, you know. There is fish that have more than others and different types, too, but we keep on eating the same kind of one fish... If you're eating something that contains a lot of that specific [contaminant], you're going to get a lot of that. But if you eat a variety, you know this week I'll eat this type and it has ... less contaminants. (E)*

*Certain things like to eat certain things in the food chain, so they tend to get certain build-ups. So if you're eating varieties, you're not eating all of the same thing all the time over and over and over again to build up that same contaminant in your body over time. (MS)*

Many others found the phrase confusing, however, when they stopped to think about it. In part, they were confused because of the juxtaposition of the phrase “eat a variety” with the sentence about “fish that eat other fish”

*Why a variety? You know, “fish that eat other fish build up more contaminants.” So you're saying eat fish that don't eat other fish? ... Or does it mean ... you could have five different types of fish that still eat other fish? That's still a variety. (GM)*

*This variety thing kind of gets me because it says “fish that eat other fish tend to build up more contaminants,” and it's like I just don't know if that's a good place to put that. (GP)*

*I don't kind of like ... how “eat a variety” and “fish that eat other fish tend to build up more contaminants” correlate... I would not have been like, “Oh, that makes me understand why I need to eat a variety.” Like, I'm not sure if my brain is just not functioning or something, but putting those two sentences together means nothing to me. (MS)*

They wondered how they would use this information together with the eating guidelines for specific species, which indicated that some species could be eaten more frequently than others:

*I think it's a little contradictory, too... Because the green, like the first column, is kind of telling me “anything should be okay.” So am I supposed to eat a variety out of this column, a variety of all of them?... I thought all these [listed in the first column] were good, so it just kind of gets a little murky. (MS)*

*It's pretty much telling you that you should eat a variety, whereas ... personally I like to eat herring only because I know it's ... smaller, it doesn't eat other fish. Well, should I be eating a variety ...? Like, is there something wrong with just eating the one point fish? (GM)*

*It might be safer to eat the one species too ... if you're eating one that has low contaminants. (E)*

Some individuals were also uncertain whether “eat a variety” meant that eating only one or two species could cause health problems:

***R1:** I'd be concerned because I do eat a lot of tuna and tilapia and like, “Oh, now I've got to add more in there.”*

***R2:** Why do I have to eat a variety? ...*

***R3:** Yeah eating a variety, that would alarm me if I ate two [species]... Two is not a variety. (MS)*

***I:** Okay. So if you were in a situation like [NAME] is describing here where you have one kind of fish that you catch the most of, and that's what you're eating when you're eating fish that you catch, is that okay according to this guideline?*

***R:** No. (E)*

Others, however, believed that the advice to “eat a variety” would not be relevant if they were not eating fish frequently:

*But I would look at it as, “Well, I don't catch a lot of perch so I'm only eating a little bit maybe compared to someone else...” So I'm not eating a mass consumption of perch all the time... So I probably would just ignore “eat a variety” because I'm not eating it that often. (E)*

*It all depends on how often we ate them. If we ate them like once a month maybe I'd stick with just perch, but if I ate it twice a week, I think I'd go with the more, different varieties. (T)*

### **Fish that Eat Other Fish**

The justification for the recommendation to “eat a variety” was that, “fish that eat other fish tend to build up more contaminants.” Some participants in the urban/AOC angler focus groups understood what was meant by “fish that eat other fish.”

*I think what they're shooting for is ... you're better off eating the panfish... I think what they're shooting for is the separation between like the pike and the bass and the trout and salmon vs. sunfish and perch. (R)*

*Muskies and pike would probably be the worst and then maybe salmon or bass, perch and bluegills. (T)*

*I think it's a very simple way of trying to convey the idea of a contaminant pyramid ... without getting too wordy about it. You know, even a crappie or a bluegill that might be eating a fish, those are pretty young ... and the contaminant levels of those would be minimal ... As opposed to a northern, a 30" northern out there eating other fish that's been around for quite a while, and the fish it's eating have been around for a while. (MW)*

However, many other focus group participants, particularly in the women of child-bearing age focus groups (which contained fewer anglers), found this phrase confusing and would not be able to identify “fish that eat other fish.”

*How do you know which fish eat other types of fish, you know? (GM)*

*We don't know what fish eat. (GP)*

**I:** *What do you think “fish that eat other fish” means? What kind of fish?*

**R:** *Predatory fish.*

**I:** *So [what are] examples of predatory fish?*

**R:** *I'm clueless. I have no idea. Shark. (MS)*

One participant in one of the urban/AOC anglers focus groups argued that the phrase “fish that eat other fish” would only be meaningful to more knowledgeable anglers.

*Well, I think it might depend on just your knowledge level... Listening to you guys, you know what eats what and all that stuff. And new girl here, I don't know any of that stuff... I don't know ... that food chain kind of stuff you guys were talking about. (T)*

Even many experienced anglers found the phrase confusing, however, because they maintained that almost all fish eat other fish to some degree.

**R1:** *I mean ... all varieties eat other fish...*

**R2:** *Yeah, there's not a whole lot of fish that you would eat out of Lake Ontario that don't eat fish. (R)*

**R:** *Most of the fish that we eat, eat other fish.*

**I:** *So what does that mean to you when you read “fish that eat other fish?” Which kind of fish do you think they're talking about?*

**R:** *Perch, walleye, crappie, bluegill, everything we catch. (T)*

**R1:** *What fish don't eat other fish?...*

**R2:** *How many people are even aware of which fish eat predominantly other fish?*

**R3:** *Don't they all?*

*R2: Well, they all at some point, but predominantly I would say bluegills for example predominantly do not eat little minnows. (MW)*

### **Larger Older Fish vs. Smaller Younger Fish**

Both information sheets offered consumption advice based on the size and/or age of fish. One sheet stated, “Smaller fish are less contaminated than larger, older fish of the same species.” The other stated, “Choose smaller, younger fish. Larger, older fish are more likely to contain higher level of contaminants.” Some participants, particularly in the urban/AOC angler focus groups, interpreted this advice as it was intended. They understood that, all else being equal, it was safer to eat smaller fish of a given species because larger fish were likely to be older and, therefore, would have had more time to build up contaminants in their systems:

*I mean a beautiful [walleye]. Wow, I'm happy I caught such a big fish. Versus the one that's 20" or 18", just legal, a little more. That's the better fish to eat. (E)*

*Well, it's how long they've lived... They concentrate the stuff in their system. (T)*

*What it's telling me is that the longer that fish is in the water, even if it doesn't grow to a huge size, the longer the fish is in the water, the more contaminants are going to build up in its body. So it probably would be better to eat an 18" northern than a 30" northern. (MW)*

A number of people pointed out that they were inclined to eat smaller fish anyway, both because of taste and concerns about contaminants:

*R1: Keep the smaller ones. They taste better...*

*R2: If they're too big, then we throw them back... My grandma won't keep a fish that's past a certain size because she doesn't want to eat that mercury and whatever...*

*R3: I think the bigger ones taste crappy, too. (GP)*

*I think that's how it's always been. That's how the state's always warned it, you know. The smaller fish are better... Bigger ones, if you eat them, cut out the bottoms. (R)*

*R1: Eat smaller fish. But you hear that from a lot of the people, that they do that.*

*R2: I do that. I prefer the smaller walleye to the larger ones. (T)*

Some people were confused, however, as to whether the comparison of smaller, younger fish to larger, older fish was intended to apply across species or within species (despite the fact that one of the information sheets stated that the advice applied within species):

*The [Who you are-Where you fish-What you catch] is more specific in that it says “of the same species.” So if you're thinking about larger, older fish, well, those great big, hunking tuna as opposed to a smaller trout. Well, “of the same species” is still the important part because some of those fish at a younger age are a whole lot bigger than*

*other ones of a different species... A really big walleye is still smaller than a really small ... tuna. (GP)*

*An 8 or 9" bluegill it's still considered, perceived as a small fish, but an 8 or 9" bluegill is a large fish for its species. So where do you draw the distinction? (MW)*

A number of participants also argued that size and age were not criteria they could consider for store-bought or restaurant fish.

*It's easier for us to know because we do the fishing. But if you're going to a store and buying something, and you don't fish, how do you know what's a larger or older fish or anything like that? You don't know. You're just sitting there looking at a fillet in the counter. We can kind of look at it and get an idea of what it is, but if you're not a fisherman, somebody that fishes, they have no clue. (MW)*

*You'll never know the size and age of the fish unless you specifically went like, say, into Meijer, to the fresh food [counter], you're like, "Okay, I can see the head to the tail." (MS)*

Anglers in one group also pointed out that the advice to eat smaller, younger fish conflicted to some degree with fishing regulations, which restricted anglers to keeping only the larger, older fish:

**R1:** *Why can't you eat a 12" one? Because it's illegal... They put [the size limit] up so high that it's an old fish that you're going to be getting. It's not a young fish.*

**R2:** *That's true. (MW)*

### **Some Waters More Affected by Contaminants**

Both information sheets pointed out that some bodies of water were more likely to be affected by contaminants than others. The "Who you are-Where you fish-What you catch" sheet stated, "Some lakes, rivers, and streams have been more affected by contaminants than others." The "Size-Species-Source" sheet stated, "Fish from some lakes and rivers have less contaminants than others."

Focus group participants generally wanted more information after reading these statements. They wanted specific guidance about which bodies of waters were more affected by contaminants:

*It's not giving us any idea of like what rivers and what streams and what lakes. I mean I'm figuring that the big lake is probably going to be more contaminated than the lakes around the region here just because it's used so much more ... a lot more boats and different things going on it and ships. So that makes me think it would be more contaminated. But it's not really... giving me any idea of what I should look for. (GP)*

*I think the information should just be there... I'm not going to take the time and go look up a website. I'm really not. I want to pick it up and see what I need to know. Get the details, enough details to make an educated decision ... I mean these really don't have anything. You're forced to go home and go to a website. (MS)*

**I:** *One of the sheets... makes the statement, "Some lakes, rivers and streams have been more affected by contaminants than others..." The other sheet says "Fish from some lakes and rivers have less contaminants than others..." What do these mean to you and would you use this information in making decisions?*

**R:** *If you had the rivers and lakes on there, the name of them... It'd have to tell me... I would have to guess, "Can I fish out here in Port Bay? Can I fish in Canandaigua?" You're guessing as you go. You want to know – is this water out in Canandaigua worse than Port Bay? ... I want to know that. (R)*

### **Women of Childbearing Age Terms**

Both information sheets identified "women of childbearing age" as a sensitive subpopulation. The "Who you are-Where you fish-What you catch" sheet also referred to this group by age (under 50). Without the age specified, many focus group participants believed the term "women of childbearing age" would be unclear because there is no agreed upon age range during which women bear children.

**I:** *If it doesn't say "under 50," if you just saw the "childbearing age," would you interpret that differently?*

**R1:** *Yeah.*

**R2:** *Yeah. Yeah, I guess I would think of it as younger. (GM)*

**R1:** *All women... Like 9th grade, 8th grade and up.*

**R2:** *Women 38 and under.*

**I:** *38 and under?*

**R2:** *Now there's a lot of older women having babies nowadays. The percentage has risen drastically. (R)*

**R1:** *Women under 40.*

**R2:** *I'm thinking under 30...*

**R3:** *I don't think the natural imagery of childbearing age for women goes all the way up to 50. (T)*

Women were also uncertain about why women of a particular age needed to be more careful with fish consumption. In particular, they did not know whether it was because they might have children and, if so, how long they had to be careful before they had children.

**R1:** *Another question arises in my mind, "women of childbearing," is that because it's worse for women, or is it because they might become pregnant? So I kind of want to know that part of it, too.*

**R2:** *Yeah, like if I wasn't planning on having kids for a couple years, could I eat just as much fish as a man? (GM)*

**R1:** *I thought ... pregnant women and children and lactating women were in the high risk and then everyone else was in another group...*

**R2:** *So there's no difference between a man and a woman as long as the woman's not breastfeeding? (GP)*

**R1:** *Is it actually bad for you because you're of childbearing age or is it because you might become pregnant?...*

**R2:** *You're never going to have a baby. Is it still bad for you until you get to 50?...*

**R3:** *That's true. Good point...*

**R4:** *I don't understand the wording of it either because it does make it sound like whether or not you're having babies, you could be at risk. (MS)*

One participant wondered why it was not important for men to be cautious about fish consumption, too, if the advisory was intended to protect children:

*Why wouldn't it like affect the sperm as well? If we're having to protect our bodies ... aren't they getting affected as well? So am I going to get a retarded baby because he eats fish all the time? (GP)*

Age. Specifying a specific age range for women made it more difficult for women to understand why they needed to be cautious about fish consumption.

*Why would an age difference have anything really to do about it?... If it's contaminated, if you're going to eat something's that contaminated, it's going to affect you whether you're this age or that age right? (E)*

Most believed that the message was intended to target women who might have children, but specifying an age range for women made them less certain of that:

*I have some friends that have their tubes tied, and they're my age or younger, but they're not over 50. So ... why can't they have the fish? I mean if I was them in the supermarket, and I saw "women of childbearing age (under 50)," well, where the heck do I stand? I'm not over 50 but I no longer can have children. (GP)*

**R1:** *Is that focused on reproduction? What about non-reproducing females?...*

**R2:** *They just put an age limit on it rather than qualified it as childbearing and non-childbearing...*

**R1:** *Exactly. So that's what makes me think is it the women are still at risk? Or is it actually the women producing the children that are at risk? I'm not quite sure.*

**R2:** *That's what I've been trying to get out of it. (T)*

Some pointed out that if childbearing was the concern, women over age 50 could have children:

*Nowadays there's women having babies over 50... Because I just had one over 50, so I know. (R)*

**I:** *When you read something that says ... “women of childbearing age (under 50),” is that a good way of describing to you?*

**R:** *Not when we have women having children that are over age 50 these days. (MS)*

For that reason, some women preferred the term “women of childbearing age” without a specified age range:

*I would just say “women of childbearing age,” and you know if you're one or not. (MS)*

**RI:** *I think the term “women of childbearing age” says it all... You don't have to put an age there.*

**R2:** *Yeah, you don't have to put an age, just bearing, childbearing.(R)*

Women Planning to Become Pregnant. When other terms were introduced, however, some of these terms were preferred to “women of childbearing age.” “Women planning to become pregnant” was considered less ambiguous than “women of childbearing age.”

*That'd be easier. It's easy to understand. It's more specific... If I'm not planning on having kids, I can eat what I want. (GP)*

*That's better because ... then you can X yourself out or you can opt in or opt out of that group based on the intent that you're going to utilize your body systems. (T)*

Some also correctly understood its intent.

*Like I'm out of that stage, so I think I'm okay no matter what my age is. If it said that if I was not planning on having children at any point in the future, then that health advisory or whatever would not be applicable to me... Because we've learned that contaminants build up over time so ... you wouldn't want to ingest things that are harmful if at some point that would produce a negative effect – birth defects or what have you. (T)*

However, many women thought the term applied only to women who are actively planning to become pregnant:

**RI:** *She just got married.*

**R2:** *Late 20's, early 30's are planners.*

**RI:** *Most people who just got married want a baby within a year or two after they get married. (R)*

**RI:** *Two pregnancies, I did not plan.*

**R2:** *Yeah, you've got to leave the plan out ...*

**R3:** *If ... you could become pregnant, you might not be planning to, but you know you kind of know if that's a possibility. (MS)*

Some focus group participants wondered about women who were not originally intending to become pregnant and later changed their minds:

*Well, it can build up over time... So if I'm not planning on becoming pregnant, and then all of a sudden ... I feel more stable ... and in 6 months I do plan on becoming pregnant... How far in advance do they want women to really be thinking? If it's three years out I should be taking precautions, then how can I make that judgment? (GM)*

*She's eaten all this fish up until she's 35. She wasn't planning on bearing any children, so now that I'm going to have a child, "Uh oh, I ate all this fish." What's going to happen? (E)*

Women Who Might Become Pregnant. The term "women who might become pregnant" was seen as more inclusive than "women planning to become pregnant."

*It's like, "Well I'm not planning on it, but yeah I might..." It just makes it more like, "Okay, I'm still going to be cautious." If you can't [become pregnant] or aren't ever for sure going to become pregnant, then you could just switch yourself out of that right away then. (GM)*

People generally found this term more clear than the others, too:

**R1:** *If you had the "women who could become pregnant," it lets you know that pregnancy is the concern vs. just because of your age...*

**R2:** *That would let you know, it's not because of your age. There are a lot of women that today prove that can't get pregnant, so you don't have that worry. (MS)*

*I would go with the "might" vs. "planning" because "planning" could be perceived as, "Well, me and my husband just got married. I'm going to plan to have a child in three years." However if you put "may" in there, that could pertain to anybody who is capable of becoming pregnant. (T)*

This term was even suggested by one participant before the moderator suggested it to the group:

*"Women who may become pregnant" might be a better term. (MS)*

## **Section Summary**

The generalizations that emerged from the focus groups were as follows:

- When general statements were made about criteria to consider when choosing fish, many participants wanted those statements paired with more specific follow up information. In particular, when participants read statements about some species of fish or bodies of water being more affected by contaminants than others, they wanted specific information about *which* fish and *which* bodies of water.

- A number of phrases used in the materials were unclear to many focus group participants, although experienced anglers were more likely to understand some of these phrases than novices or non-anglers. The terms and phrases most likely to cause confusion were:
  - “Eat a variety.”
  - “Fish that eat other fish.”
  - “Smaller, younger fish” vs. “Larger, older fish”
- Terms to describe “women of childbearing age” as a target audience also either raised many questions or were misunderstood. Of all terms discussed during the groups, the one most likely to be understood as intended was “women who might become pregnant.”
- Participants were frequently confused as to who the intended target audiences were supposed to be. If a particular audience (e.g., men) were not referred to specifically, participants were unsure whether the advice was intended to apply to men. If more than one audience was mentioned, however, some participants focused only on the first audience mentioned, assuming that the advice applied only to them.

## CONCLUSIONS

Several overarching themes emerged in the focus groups. First, the clarity of the draft materials was an important consideration to focus group participants. In general, participants preferred succinct messages to lengthier messages, and this finding is consistent with recommendations made by a number of other authors (AFS 2000, Hockett 2005, Williamson 2007, Lauber et al. 2011). An important caveat, however, is that participants preferred succinct messages only if they included all the necessary information. Some participants were confused by aspects of the draft materials we presented to the focus groups. Even in situations in which the focus group participants broadly preferred one approach to communicating advisory information (such as the preference for the point system for communicating specific consumption guidelines), a few individuals disagreed, suggesting that testing and refining approaches to communication will be necessary on an ongoing basis to determine the most effective approaches for various groups while recognizing the heterogeneity of preferences that may exist even within specific groups.

Second, certain types of messages were more likely to catch focus group participants’ attention than others. The most effective messages often provided information that target audiences were less likely to know. Participants preferred specific statements to general ones. They preferred statements about unique characteristics of fish to statements about characteristics that fish shared with many other types of food. Participants were interested in information about things that they could not observe directly on their own or that were counterintuitive. Previous work has indicated certain misconceptions about contaminated fish are common (Lauber et al. 2011, Connelly et al. 2012) demonstrating the opportunity to provide information that target audiences do not already have.

Third, people who attended our focus groups were most likely to be interested in information that was obviously relevant to them. Sometimes they were confused by materials that did not clearly indicate the intended target audience because they were not sure whether these messages applied to them. They preferred statements about risks and benefits that applied to them either because they applied to almost everyone (e.g., statements about the risks of cancer) or because they

applied to a subgroup of which they were a part (e.g., statements about fetal brain development targeting pregnant women).

Fourth, focus group participants had numerous questions about all of the materials presented to them. They wanted to understand the messages and, quite often, the reasoning behind those messages. For that reason, many pointed out that it was important to tell target audiences how to get additional information if they wanted it. Past work has also concluded that providing audiences with ways to find more in-depth information is important (Connelly et al. 2012).

Although this work provided valuable insights into how members of key target audiences interpret advisory materials, more research is needed. In particular, this research was conducted in the context of focus groups in which participants are exposed to advisory materials for only a short period of time and have the benefit of hearing how other focus group participants interpret these materials. Additional evidence is needed to determine whether an increase in desired behaviors in target audiences would result if Consortium members incorporated advisory materials with certain messages and eating guidelines formats into their advisory programs. The type of evidence that would be worthwhile to collect falls into two general areas:

- Interpretation and use of advisory materials. If individuals in a target audience received advisory materials (e.g., a brochure) with specific messages and with eating guidelines presented in a particular format, would they understand those materials correctly (without the benefit of a focus group) and adopt the behaviors the Consortium is advocating?
- Delivery of advisory materials. Could the Consortium states deliver these materials to enough members of a target audience to influence the behavior of that audience?

The methods involved in this additional research might be varied and include additional focus groups, standardized surveys, “diary studies” of fish consumption habits and how they change as communication programs are implemented, and randomized field experiments to gauge performance of different types of advisory materials in shifting fish consumption decisions in applied and natural settings. Taken together, this set of studies could provide a firmer foundation for refining fish consumption advisory programs.

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## **APPENDIX A: FOCUS GROUP PROTOCOL**

## **Great Lakes Restoration Initiative Fish Consumption Health Advisory Consortium**

### Focus Groups to Test Alternative Forms of Advisory Information Protocol

Cornell is conducting this study in cooperation with a consortium of state agencies working to improve fish consumption health advisories in the Great Lakes states. Although Cornell will be responsible for this research, members of this consortium will contribute to many aspects of this work. An 8-member contact team of consortium members will work most closely with Cornell in the development and implementation of the focus groups

#### **Purposes**

The purpose of these focus groups is to determine how key audiences of concern in Great Lakes states respond to different type of fish consumption advisory materials.

#### **Procedures**

- We will conduct seven focus groups, each including approximately 10 individuals. Each focus group will include participants from a specific audience of concern. In all cases, focus group participants will be adults (18 years of age or older) who eat at least some fish.
- Three focus groups will target women of child-bearing age.
  - The definition of “women of child-bearing age” that will guide participant selection is women who: (a) self-define as being of child-bearing age (b) are or may become pregnant; and (c) eat at least some fish (or whose families eat at least some fish) caught by themselves, family members, or friends. In particular, the Consortium is interested in knowing what types of advisory messages are needed if the objective is to encourage women to continue to eat fish, but within safe limits, especially during pregnancy. These focus groups will likely be conducted in Grand Marais and Grand Portage, Minnesota and Muskegon, Michigan.
  - Cornell’s partner organizations will recruit participants and distribute the recruiting information. Strategies for recruiting focus group participants may vary from state to state. The state agencies belonging to the consortium may work with local organizations to recruit focus group participants. Local organizations may include anglers’ organizations, community groups local health departments, WIC clinics, early childhood centers, and child care researchers. Participants may also be recruited through newspaper ads or other forms of advertising.
  - Child care will be offered during these focus groups.
  - Participants will be offered a \$25 Visa gift card as an incentive.
  - Cornell developed a 1-page explanation of the focus groups to be distributed to participants at the beginning of the focus groups (included in this document).
- Four focus groups will target urban anglers.

- The definition of this audience that will guide participant selection is English-speaking anglers who: (a) live and fish in urban areas or Areas of Concern; and (b) eat at least some fish (or whose families eat at least some fish) caught by themselves, family members, or friends. Anglers from urban areas or Areas of Concern who eat a lot of fish may be at high risk of contaminant exposure. The Consortium is interested in knowing what types of advisory messages are needed to encourage these anglers to eat fish within safe limits. These focus groups will likely be conducted in Toledo, Ohio, Green Bay, Wisconsin, Rochester, New York, and Erie, Pennsylvania.
- Cornell’s partner organizations will recruit participants and distribute the recruiting information. Strategies for recruiting focus group participants may vary from state to state. The state agencies belonging to the consortium may work with local organizations to recruit focus group participants. These local organizations may include anglers’ organizations and community groups in urban communities with populations of “urban anglers.” Participants may also be recruited through newspaper ads or other forms of advertising.
- Participants will be offered a \$25 Visa gift card as an incentive.
- Cornell developed a 1-page explanation of the focus groups to be distributed to participants at the beginning of the focus groups (included in this document).
- At the beginning of each focus group, we will describe what we are asking of participants using the script on page 3. We may not read this script word for word, but we will address all points included in the script and answer any questions.
- We will conduct the focus group in person using one of the attached sets of questions and materials. Because the questions are open-ended, we will not necessarily cover the questions in the exact order listed nor will we necessarily read the questions verbatim. These questions describe the content we will cover during the focus groups. It is possible that participant responses will lead us to follow up with additional questions not listed in the initial script.
- Each session will last approximately 2 hours.
- The focus groups will be audio recorded and transcribed.

**Great Lakes Restoration Initiative  
Fish Consumption Health Advisory Consortium**

Focus Groups to Test Alternative Forms of Advisory Information  
Introductory Script

**Introduction**

At the beginning of each focus group, we will discuss several points:

- The purpose of the focus group is to help us learn more about how people understand advisory messages about eating fish. Government agencies and other groups often communicate to the public messages about eating fish, but they're not always sure how people understand these messages.
- We're going to present you with information in different forms about eating fish. This information is similar to actual advice about eating fish, but it is NOT the actual advice for your area.
- We will then ask a series of questions about these messages for discussion, with no right or wrong answers. For most of these questions, we'd like you to answer in an open discussion. We may follow up with additional questions in response to particular points people raise. All perspectives are important. There are no right or wrong answers. We simply want to find out how easy people find it to understand different types of information about eating fish. We may check in with different people to find out if they agree or disagree with points that have been made.
- Participation in this focus group is voluntary. You do not have to participate if you don't want to. You may also refuse to answer specific questions. There is no penalty to you if you decide you do not want to complete the focus group, although you will receive a \$25 Visa gift card if you complete the focus group.
- Your identity will remain completely confidential. No one but the researchers in this study will be able to associate your responses with your name. We will not report results in a way that would allow other people to determine who made particular comments to us. We may use direct quotations from some people in reports or publications, but we will delete any information that could be used to identify specific people before we do.
- The session will be audio-recorded and the recording will be transcribed.

**Questions?** Are there any questions before we get started?

## Focus Groups to Test Alternative Forms of Advisory Information Questions

**Introductory Questions** [NOTE: These first questions are to get the group “warmed up” before presenting advisory materials to them. We may choose to reduce these questions if the other sections become too long.]

- Let’s start by going around the table and have everyone introduce themselves and tell me how you came to take part in this focus group.
- First, I’d like to get a sense of how much fish you eat. How often do you eat fish? In what types of situations do you usually eat fish? At home? In a restaurant? At friends’ or relatives’ homes? On vacation?
- Is the fish you eat: Fish you catch yourself? Fish caught by someone in your family? Fish caught by one of your friends? Fish you buy in the supermarket? Fish you buy elsewhere? Which of these do you eat most frequently?

For the rest of our time, I’m going to be sharing a number of different information sheets about eating fish with you. I’m going to give you a chance to look over these sheets, and then ask you some questions about them. These are similar to information sheets that many states actually use, but the advice in them may not apply in your region.

### Amount of Information – Explanation Questions

Now I’m going to give you a sheet with some brief information about eating fish to read over. After you read it, I’m going to ask you some questions about it. [Distribute sheet.]

- If you were going to explain the main message on the information sheet to a friend or spouse or partner, what would you tell them?
- What do you think the agencies that wrote the information sheet would like you to do?
  - What parts of the sheet tell you that the agencies would like you to do this?
- How useful is the information on the sheet?
- What questions do you have about the information on the sheet?
- Do you think it would make you change how you think about fish consumption the next time you caught some fish or were thinking about buying some fish? Do you think you would be inclined to eat more fish, less fish, about the same amount of fish, or different types of fish? What is it about the information sheet that would make you change how much fish or the type of fish you would be likely to eat?

Now I’m going to provide you with a series of statements about eating fish. These are statements that could be added to the information sheet you just read. As you read them over, think about whether the statements would be more likely to [eat fish/follow the advisory<sup>5</sup>] in the future. Arrange the slips of paper from those that would be most likely to make you to [continue to eat fish/follow the advisory] to those that would be least likely to [continue to eat fish/follow

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<sup>5</sup> For the “women of child-bearing age” focus groups, the behavior of interest will be continuing to eat fish. For the “urban/AOC angler” focus groups, the behavior of interest will be following the fish consumption advisory.

the advisory]. [First of three sets of additional statements is presented to participants. After distributing the slips and giving participants a chance to arrange them, ask the following questions.

- Which statements would make it most likely for you to [continue to eat fish/follow the advisory]? What is it about the statements that would make it more likely for you to [continue to eat fish/follow the advisory]?
- Which statements would make it least likely for you to [continue to eat fish/follow the advisory]? What is it about the statements that would make it less likely for you to [continue to eat fish/follow the advisory]?

Now I'm going to provide you with a second set of statements about eating fish. Again, think about whether the statements would be more likely to [eat fish/follow the advisory] in the future. Arrange the slips of paper from those that would be most likely to make you to [continue to eat fish/follow the advisory] to those that would be least likely to [continue to eat fish/follow the advisory]. [Second of three sets of additional statements is presented to participants. After distributing the slips and giving participants a chance to arrange them, ask the following questions.

- Which statements would make it most likely for you to [continue to eat fish/follow the advisory]? What is it about the statements that would make it more likely for you to [continue to eat fish/follow the advisory]?
- Which statements would make it least likely for you to [continue to eat fish/follow the advisory]? What is it about the statements that would make it less likely for you to [continue to eat fish/follow the advisory]?

Now I'm going to provide you with a final set of statements about eating fish. Again, think about whether the statements would be more likely to [eat fish/follow the advisory] in the future. Arrange the slips of paper from those that would be most likely to make you to [continue to eat fish/follow the advisory] to those that would be least likely to [continue to eat fish/follow the advisory]. [Third of three sets of additional statements is presented to participants. After distributing the slips and giving participants a chance to arrange them, ask the following questions.

- Which statements would make it most likely for you to [continue to eat fish/follow the advisory]? What is it about the statements that would make it more likely for you to [continue to eat fish/follow the advisory]?
- Which statements would make it least likely for you to [continue to eat fish/follow the advisory]? What is it about the statements that would make it less likely for you to [continue to eat fish/follow the advisory]?

Now think about all the statements together. Each set of statements focuses on a different topic.

- Which statements would make it most likely for you to [continue to eat fish/follow the advisory]? What is it about the statements that would make it more likely for you to [continue to eat fish/follow the advisory]?

- Which statements would make it least likely for you to [continue to eat fish/follow the advisory]? What is it about the statements that would make it more likely for you to [continue to eat fish/follow the advisory]?
- What other kinds of information might make it more likely for you to [continue to eat fish/follow the advisory]?

### **Eating Guidelines Format Questions**

Now I'll let you read over an information sheet with specific advice on how much fish you can safely eat. Keep in mind that this advice is only an example of the type of advice that government agencies provide – this specific advice doesn't necessarily apply in your area. We're trying to get a better sense of how people interpret advice about how much of what types of fish they can safely eat. When reading over this sheet, think about the information you shared early on this evening about how much and what types of fish you eat. Imagine that this example of an information sheet provides the actual advice about eating fish for your area, and think about how you would use it to decide how much fish you could safely eat. After you have a chance to read over the advice, I'm going to ask you a few questions. [NOTE: Initially, only the first format will be presented to participants.]

- Again, think about how much and what types of fish you eat. If this information sheet provided the actual advice about eating your favorite types of fish, how easily do you think you could use it to determine how much fish you could safely eat?
- What are some examples of how you might use this sheet to determine how much fish you could safely eat?
- Could you give me some examples of how much fish you might be able to eat safely in a week? Two weeks? A month?
- What, if anything, is unclear about this sheet?
- What additional information do you need?
- What questions do you have about the information on the sheet?
- What could be done to make the information more clear?

Now I'm going to show you a second sheet that gives similar types of information – but the information is not exactly the same and it's in a different format. After you read it, I'm going to ask you about what you think of it.

- Again, think about how much and what types of fish you eat. If this information sheet provided the actual advice about eating fish for your area, how easily do you think you could use it to determine how much fish you could safely eat?
- What are some examples of how you might use this sheet to determine how much fish you could safely eat?
- Could you give me some examples of how much fish you might be able to eat safely in a week? Two weeks? A month?
- What, if anything, is unclear about this sheet? How clear is it compared to the first sheet?
- What additional information do you need?
- What questions do you have about the information on the sheet?
- What could be done to make the information more clear?

Now I'm going to show you a third sheet that gives similar types of information – but in a format designed so that you can carry around easily. After you read it, I'm going to ask you about what you think of it.

- Again, think about how much and what types of fish you eat. If this information sheet provided the actual advice about eating fish for your area, how easily do you think you could use it to determine how much fish you could safely eat?
- What are some examples of how you might use this sheet to determine how much fish you could safely eat?
- Could you give me some examples of how much fish you might be able to eat safely in a week? Two weeks? A month?
- What, if anything, is unclear about this sheet? How clear is it compared to the other sheets?
- What additional information do you need?
- What questions do you have about the information on the sheet?
- What could be done to make the information more clear?

### **Language for Choosing Fish Questions**

Now I'm going to give you a different set of sheets to read over. After you read them, I'm going to ask you some questions about them.

- If you were going to explain the main message on each information sheet to a friend or spouse or partner, what would you tell them? How do they differ?
- What do you think the agencies that wrote the information sheets would like you to do?
  - What parts of the sheets tell you that the agencies would like you to do this?
  - How do the two sheets differ?
  - In the first sheet, what grabbed your attention? What did you look at first? What part of the sheet did you find the most useful? The second sheet?
  - Who does the advice apply to on each sheet?
  - How do you understand “eat a variety of fish?”
- What is clear or unclear about each?
- What questions do you have about the information on the sheets?
- I'm going to ask you some questions about specific statements on the two sheets, and what they mean to you. [Only ask about statements that haven't been discussed already. If the statements are ambiguous, explore why.]
  - The first sheet says that women over age 50 and men over age 15 can “eat more kinds of fish and more often.” What do you understand this to mean? In the same section, what do you understand the term “women of childbearing age (under 50)” to mean? How would you understand this section if a different term was used such as...?
  - The second sheet says to “eat a variety.” What do you understand this to mean? If you only had one or two species that you liked to eat, how would you understand it?
  - Both sheets refer to “larger, older fish.” What does this term mean to you?

- The second sheet says that “fish that eat other fish” tend to be more contaminated. What does this term mean to you?
- The first sheet says: “Some species (kinds of fish) have higher levels of contaminants than others.” How do you understand this statement?
- The first sheet says: “Some lakes, rivers, and streams have been more affected by contaminants than others.” The second sheet says: “Fish from some lakes and rivers have less contaminants than others.” What do these statements mean to you? How would you use this information in making decisions about what kinds of fish to eat?
- Does the information on these sheets tell you anything that you wouldn’t have known already? Does it tell you anything that you don’t think is true? How is it different from what you believe? What do you think about this new information? How useful would it be? Do you think it would make you change how you think about fish consumption the next time you caught some fish? How (or why not)?

### **Wrap Up**

Those are all of the questions I have. Is there anything we haven’t talked about that you think is important for me to know?

I’d like you to respond to a short set of written questions so that we have some basic information about the types of people who participated in our focus groups. [HAND OUT DEMOGRAPHIC QUESTIONNAIRES WITH QUESTIONS ON AGE, GENDER, RACE/ETHNICITY, EDUCATION, MARITAL STATUS, AND EMPLOYMENT STATUS.]

If you’re interested in receiving a copy of the report we prepare based on this study, provide me with your address or email address. (*Provide them with my business cards.*)

**THANK YOU!**