





Consuming Contaminated Fish

A NATIONAL PROBLEM

The problems facing the Anacostia River are shared with urban rivers across our nation. From the Hudson River to the San Francisco Bay, people are catching, consuming, and sharing fish caught in rivers that were once used as aquatic landfills. In the case of the Anacostia River, these anglers are disproportionately Latino, Asian, or African American, relying on fish for themselves, families, and friends.

While much has been done to address poor water quality, contaminants such as polychlorinated biphenyls (PCBs), dichlorodiphenyltrichloroethane (DDT), lead, and mercury linger in our waters, the sediments, and many species of fish. Health problems associated with increased exposure to these chemicals include cancer, liver disease, and developmental effects, as well as effects on the immune and endocrine systems. Children through adolescence, elderly people, and women of childbearing age are at most risk.

Our hope is that this report about one river that flows less than a mile from the U.S. Capitol will become a driver for discussion across the country on how we can safeguard our children and clean up our rivers from the legacy of our industrial pollution. Though this problem is complicated, this report shows that progress is possible.

PROJECT PURPOSE

THE ANACOSTIA RIVER

The Anacostia River flows from Maryland into the District of Columbia, where it empties into the Potomac River about one mile from the United States Capitol Building. The 8.4-mile tidal river is part of a 176-square-mile watershed that is home to roughly 860,000 people as well as 43 species of fish and more than 200 species of birds.

But like so many other urban rivers across the country, the Anacostia has suffered from environmental degradation from past and present practices, including pollution from hazardous waste sites. The Anacostia Watershed Society lists the following problems as key obstacles to restoring the River to a "fishable and swimmable" state: fecal bacteria, stormwater runoff, trash, and toxic chemicals.

One major concern is the presence of persistent toxic chemicals such as polychlorinated biphenyls (PCBs) in the water and sediment of the Anacostia. PCBs are believed to be cancer-causing agents and may also affect the mental development of children.

PCBs are still widespread in the environment and often persist in sediments of urban rivers. Fish accumulate these and other chemicals that, in turn, present a risk to human consumers. Both the District of Columbia and the State of Maryland advise the

public to avoid certain fish species and limit consumption of others to avoid long-term health effects. Both jurisdictions urge the public to completely avoid eating carp and channel catfish. [Please see the additional resources posted on www. anacostiaws.org/fishing for information about fish advisories and ways to reduce health risks when eating fish from the Anacostia.]

The District of Columbia issued its first fish consumption advisory in 1989. However, as this study indicates, fish advisories are often ignored by the public, leaving people at risk of consuming unhealthy levels of potentially contaminated fish.

OVERVIEW OF THIS STUDY

With funding from the National Oceanic and Atmospheric Administration, U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency and the Chesapeake Bay Trust, a coalition of partners and advisors has conducted this study of fishing in the Anacostia River to find out:

- 1. The extent of consumption and sharing of fish from the river,
- 2. Awareness and attitudes among anglers about the potential risks to their health, and
- 3. The most effective strategies for lessening the consumption of contaminated fish.

This study brings together the findings of an extensive set of field interviews conducted among anglers at ten sites along the riverbank to measure the characteristics, practices, and attitudes of the fishing population; deeper, qualitative testing of anglers' perceptions and attitudes in both focus group and one-on-one interviews; and a representative household survey of the neighborhoods surrounding the lower Anacostia River. All of this work was conducted in both English and Spanish, under the guidance of an independent research organization skilled in this type of inquiry.

OUTCOMES OF THE WORK

While it may not be surprising that contaminated fish are being shared in the community, the extent and ingrained culture of sharing fish are surprising. The partners to this study will use its findings to create and implement a public awareness campaign, targeted and framed as effectively as possible, to lessen the problem of contaminated fish consumption.

More challenging, this report identifies a complex, interlocking set of factors that must be addressed together to lessen the consumption of contaminated fish. As an outcome, the sponsors and advisors of this study hope to engage leaders and citizens of the broader community in a discussion that will address not just fishing, but the long-term and sometimes difficult challenges of clean water, human health, and food security, as well.

In the end, this is social marketing research. The observations made in this report are based on the perceptions and attitudes of the angler audience. This research is designed to learn how the audience makes decisions about fish consumption, and what information might move them to think and act differently. Sometimes, the needs and perceptions of the audience do not square with established science, or the expectations of advocates and experts. While this report may call into question well-established practices used to communicate health risks, it offers new approaches that will be received more readily by the audience.

ADVISORS & FUNDERS

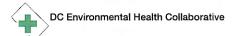


















Importantly, this effort would not have occurred without funding from the following institutions. We are very grateful for their generosity:

CHESAPEAKE BAY TRUST

NATIONAL OCEANIC AND ATMOSPHERIC

ADMINISTRATION

U.S. FISH AND WILDLIFE SERVICE

U.S. ENVIRONMENTAL PROTECTION AGENCY

All photos were donated, courtesy of Becky Harlan. (www.beckyharlan.com)



This study was designed to create an accurate picture of Anacostia River anglers through field interviews, to explore their views in-depth through qualitative interviewing, and to assess the broader community's experience through a representative survey. This work unfolded in three phases:

A Riverbank Survey consisting of 111 field interviews among anglers at 10 fishing sites along the banks of the Anacostia River between Bladensburg, MD, and the mouth of the river near Hains Point in the District of Columbia. Interviews were conducted over five weeks in August and September 2011, in English (85%), Spanish (14%), and Vietnamese (1%), on various days of the week and hours of the day from early morning until evening.

The questionnaire explored fishing practices, the extent of fish consumption and sharing, and awareness of the health risks. Based on that work, as well as a literature review and informal interviews with key experts and stakeholders, fellow consultants Ruder Finn and Communication Visual developed draft outreach messages and materials for testing.

- Qualitative Interviews with a representative sampling of Anacostia River anglers conducted between November 2011 and January 2012, including a facilitated, roundtable focus group discussion conducted in English, and one-on-one interviews conducted along the riverbank in Spanish. This phase evaluated prospective outreach tools and approaches, and explored angler attitudes in-depth among a test group screened to ensure they consumed or shared a substantial portion of their catch.
- A Community Survey in the lower Anacostia watershed, conducted by telephone and foot canvass in May 2012, to measure the extent of Anacostia River fish consumption in the broader community, beyond anglers themselves. A representative sample of 401 randomly selected households were interviewed by telephone in nine D.C. and Maryland zip codes, supplemented by 162 door-to-door interviews conducted in-person. The results were combined to reflect the demographic characteristics of this geography as measured in the 2010 U.S. Census.

This work was designed and conducted by OpinionWorks of Annapolis, Maryland, and benefited along the way from the active involvement of fellow consultants, experts, and advisors.

RECOMMENDATIONS

This research study shows poor and inconsistent knowledge among anglers and the broader community about the health risks of consuming fish from the Anacostia River. This study also uncovers widespread sharing of fish, exposing many people to unseen contaminants. The study leads us to these major recommendations:

There is little evidence in this research that organized communications about the risks of consuming Anacostia River fish are getting through to anglers, let alone getting through to the broader community. As a starting point, far more resources must be put behind the job of communicating with anglers and the public about this problem.

Those communications must come through multiple channels. Many anglers are unlicensed, and therefore will not see communications from the licensing agency. Many anglers do not look for information on the Internet. Relying primarily on consumption guidelines that accompany the fishing license or are posted online will exclude a large number of anglers.

Any outreach must be multilingual.

Not only do one-quarter of the fishing population speak a language other than English at home, but the Spanish-speaking anglers along the Anacostia are much less aware of the health risks associated with eating their catch, compared to English-speaking anglers. Furthermore, our interviewers encountered native speakers of five other languages beyond Spanish and English.

Where there is awareness of a health concern, there are strong misperceptions about the nature of the risk and the best means of avoiding it. The audience tends to expect that the contamination can be seen and avoided, and that any illness would be quickly apparent rather than chronic or long-term. Communicators must be aware of those misconceptions and address them.

Anglers want to socialize with each other and talk about fishing. An outreach campaign should take advantage of that natural tendency to socialize, delivering messages through trusted peers, friends, and experts in a comfortable setting where anglers come together to talk about fishing. The campaign should consider organizing or encouraging events such as catch-andrelease tournaments, and using these events to educate the public.

Encouraging licensing can be part of the strategy. Given the large number of unlicensed anglers that we encountered, licensing with reduced fees or at additional points of sale can open another useful channel of communication with many anglers.

This audience is primarily visually oriented. Text-heavy signs, ads, or posters will have limited impact, and this research shows that the intended meaning is sometimes completely lost. In designing communications, the greatest emphasis should be placed on the symbols and images that are chosen, as that is where the audience will tend to look first. Text that is included must be concise and direct.

Measured or equivocal messaging is ineffective. For example, based on this qualitative research a "Warning" is much stronger than an "Advisory," which anglers said enables them to rely on their own judgment in assessing the risk. Similarly, being told that small portion sizes or less-frequent consumption are acceptable allowed the anglers in this study to rationalize that their own consumption falls within acceptable bounds, even if it falls outside the stated limits. Based on this research, definitive no-consumption guidelines may be more effective in bringing about change in many anglers' behavior.

In a related idea, anglers insist that the health message must be stark and arresting to break through to them. The effect of showing the word "CANCER" to anglers who doubted the seriousness of the health risk was dramatic. Future outreach that wants to make an impact on this topic must be willing to assert the health consequences in the strongest possible terms that can be supported by medical evidence. Adding conditional language so as not to overstep the established evidence - such as "may cause Cancer" - does not seem to detract from the impact of the basic message among the anglers we interviewed.

Ultimately, this is a large and complex problem.

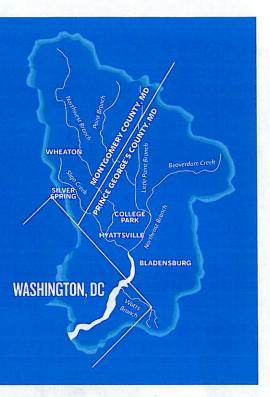
The wide extent of sharing and consumption we discovered in this study is driven by a number of interlocking factors. Not the least among these is a lack of food security in the surrounding community, driving people to eat free, locally caught fish. There is also strong evidence of an emotional benefit to anglers who share their fish to help others eat. What are needed most are:

- Viable protein alternatives to help address the immediate food crisis,
- An engaged network of health professionals and local community leaders to help communicate these messages, and
- A long-term commitment to clean up the waters so contaminated fish are no longer a problem.

We encourage widespread sharing of these research findings, and convening a broadbased community conversation to help address the broader set of problems.

THE ANACOSTIA WATERSHED

The Anacostia River watershed is a demographically diverse region that spans Montgomery County and Prince George's County in Maryland, and funnels into Washington, DC, eventually meeting up with the Potomac River. It includes several legacy toxic waste sites and experiences combined sewer overflows during heavy rains.

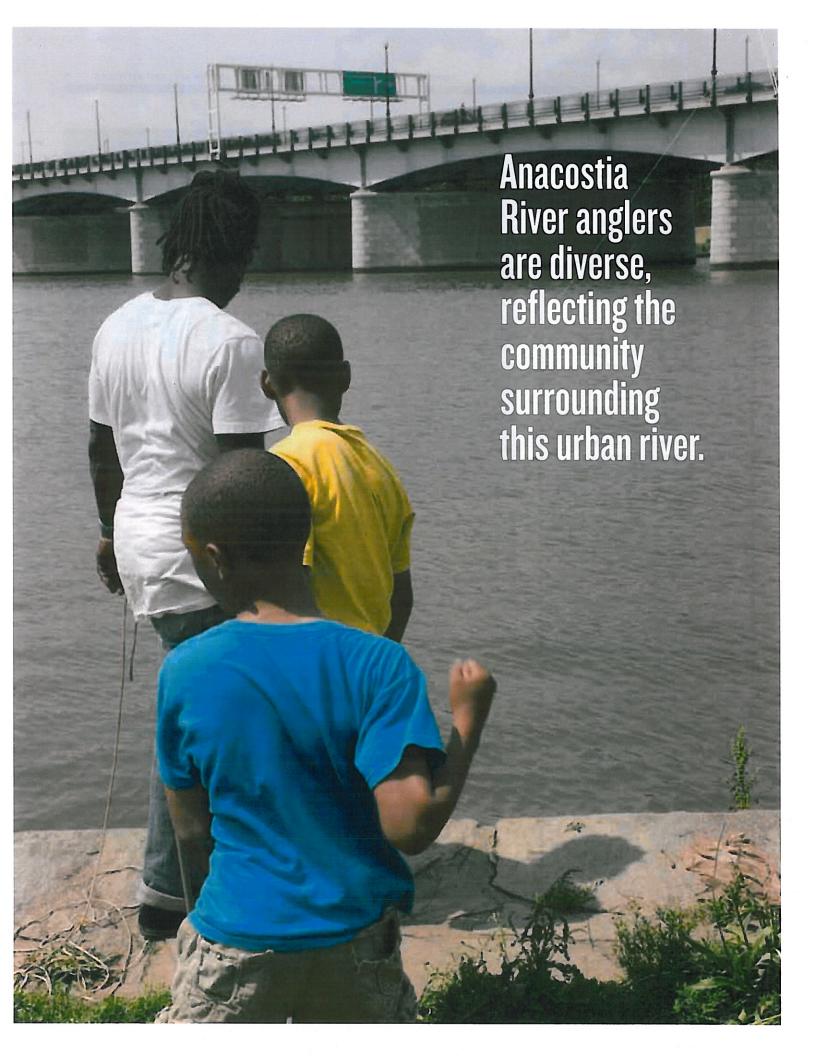


CONSUMING FISH SAFELY

Fish are an important part of a healthy diet, and recreational fishing provides health and social benefits. Fish and shellfish contain high-quality protein and other essential nutrients, are low in saturated fat, and contain omega-3 fatty acids. A well-balanced diet that includes a variety of fish and shellfish can contribute to heart health and children's proper growth and development. Women and young children in particular should include fish or shellfish in their diets due to the many nutritional benefits.

Below are government guidelines for how to lower your potential exposure to risks.

- Eating only certain kinds and sizes of fish may be safer. Younger, smaller fish contain fewer pollutants than older, larger fish. For instance, one-half pound per month of largemouth bass or one-half pound of sunfishes and other fish may be eaten. Avoid eating catfishes, carp, eel, or other fish that feed on the bottoms of rivers and streams. These fish are more likely to contain higher levels of chemical pollutants.
- Cleaning and cooking fish properly can reduce health risks. Proper cleaning and cooking techniques may reduce the levels of some chemical pollutants in the fish. Trim away the skin and fatty tissue before cooking to eat. Remove the head, skin, fat, and internal organs before cooking the fish. Avoid or reduce the amount of fish drippings or broth used to flavor the meal. Eat less fried or deep fat-fried fish. Fillet the fish and remove the skin before the fish is smoked.
- Consume healthy, non-contaminated fish. Eat two meals per week of a variety of fish lower in mercury, such as canned light tuna, farm-raised catfish, pollock, salmon, and shrimp.



FINDINGS

CHARACTERISTICS OF THE FISHING POPULATION

Two-thirds (67%) of the 111 anglers interviewed along the riverbank were African-American, 18% Hispanic, 8% Asian, and 6% white. One-quarter (27%) of anglers were born outside the United States, and 26% speak a language other than English at home. Though Spanish predominated, we also encountered native speakers of five other languages, most notably Chinese and Vietnamese.

Anacostia anglers skew much lower than the general population on educational attainment, with 62% having no more than a high school education or GED, and one-quarter (25%) never having completed high school.

Many Anacostia River anglers are unlicensed. One-quarter (24%) of the anglers interviewed along the riverbank admitted that they did not have a fishing license. Another 16% said they had a license but were not able or willing to show it to the

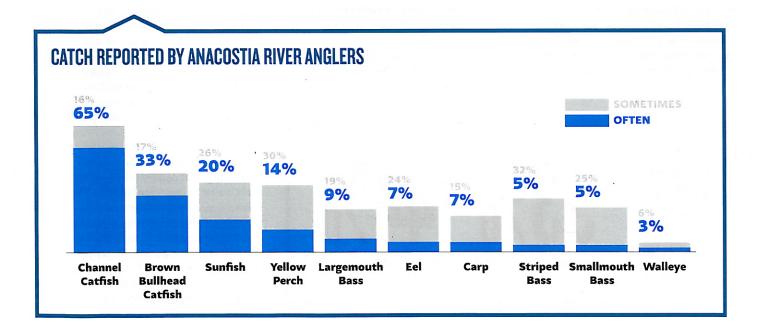
interviewer. Only 59% of anglers showed a fishing license to our interviewers. Thus, relying heavily on the licensing process to distribute health information – as is the case today – will miss a significant share of anglers.

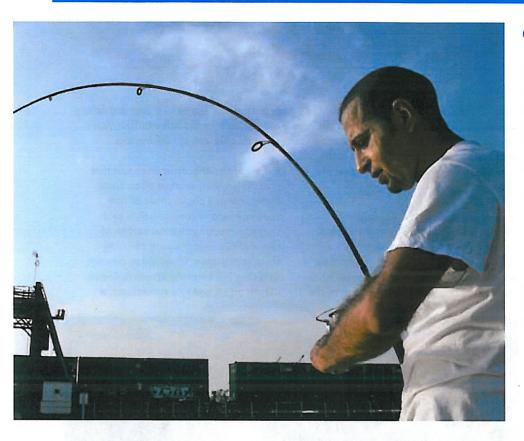
Anglers fish the Anacostia frequently.

Nearly two-thirds of anglers (63%) said they fish the Anacostia at least once a week during the warm-weather months, and nearly one-fifth (18%) said they fish there every day. In part a reflection of the economy, half (53%) said they are fishing more than they did three or four years ago, and only 21% are fishing less.

Fishers of the Anacostia River said they are catching catfish most often. Upon being shown a photo sheet of fish species found in the river, 65% said they are catching channel catfish often, and 16% said they are catching them sometimes. Thirty-three percent said they are catching brown bullhead catfish often, and 17% sometimes.







POOR KNOWLEDGE OF THE HEALTH RISKS OF CONSUMING ANACOSTIA RIVER FISH

Nearly one-quarter (22%) of anglers have never heard about possible health consequences connected with eating fish from the Anacostia. But the number who are unaware of any health risks reached a

majority (53%) among anglers who speak Spanish at home, underlining the importance of communicating in multiple languages and through multiple channels.

Based on the community survey of residents who live in the lower Anacostia watershed, 44% of residents said they have "never heard that eating fish out of the Anacostia could make you sick."

Further, based on the riverbank survey, the anglers who said they have heard

"I usually catch 10 or 12 of them...they look perfectly good to eat and I'll eat one, and I'll give the rest of them away. I've never gotten sick."

about health concerns are most likely to have learned about those risks through informal means, rather than through any organized communications effort. Most anglers credited word of mouth (55%) or news reports (33%) as their source of information. Only small numbers had seen a sign or poster (11%), material accompanying a fishing license (10%), or online information (7%). There is little evidence that any current health warnings and consumption advisories are reaching the fishing community.

In the qualitative interviews, despite emphatically saying they know the fish may be unsafe, anglers vividly described their careful and idiosyncratic methods of determining if each fish is safe to eat. Overwhelmingly, these anglers said they rely on visual or tactile inspection. Beyond looking for obvious lesions, anglers described that they may look for cloudiness in the eyes, examine the color of the blood, or feel the texture of the skin to assess the health of the fish, throwing back only the ones that appear unhealthy to them. Fish that pass these sensory tests are often eaten or shared.

Even if the fish does not pass visual inspection, most anglers believe contaminants are on the outside of the fish. They believe they can minimize the risk by washing the fish to remove contaminants, or taking off the skin. Though the most recent fish consumption advisory published by the District of Columbia explains how to prepare and cook fish to lessen exposure to contamination, this research

HAVE NOT
HEARD THAT
EATING FISH
OUT OF THE
ANACOSTIA
COULD MAKE
YOU SICK

53%

44%

OF COMMUNITY RESIDENTS

makes clear that such a message is not penetrating the audience.

Further, many anglers believe that an illness would be immediate – similar to food poisoning – rather than long-term. The anglers we interviewed do not recall people being sickened by their fish, further convincing them that there is no danger.

Naturally, these imperfect methods and understandings ignore the risks they cannot see. As a practical matter, the focus group demonstrated how difficult it is to break through to this audience with a message about unseen contaminants.

Seeing a picture of a clean, healthy-looking fish and the headline "Just because it

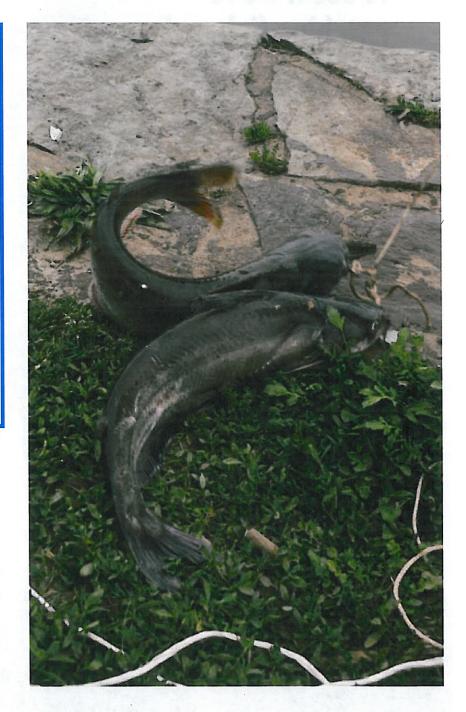
looks clean on the outside doesn't mean it's clean on the inside," a respondent announced, "This (ad) makes you just want to grill it!" A lengthy discussion ensued, but in the end respondents heartily agreed that if the fish looks good, they are going to eat it.

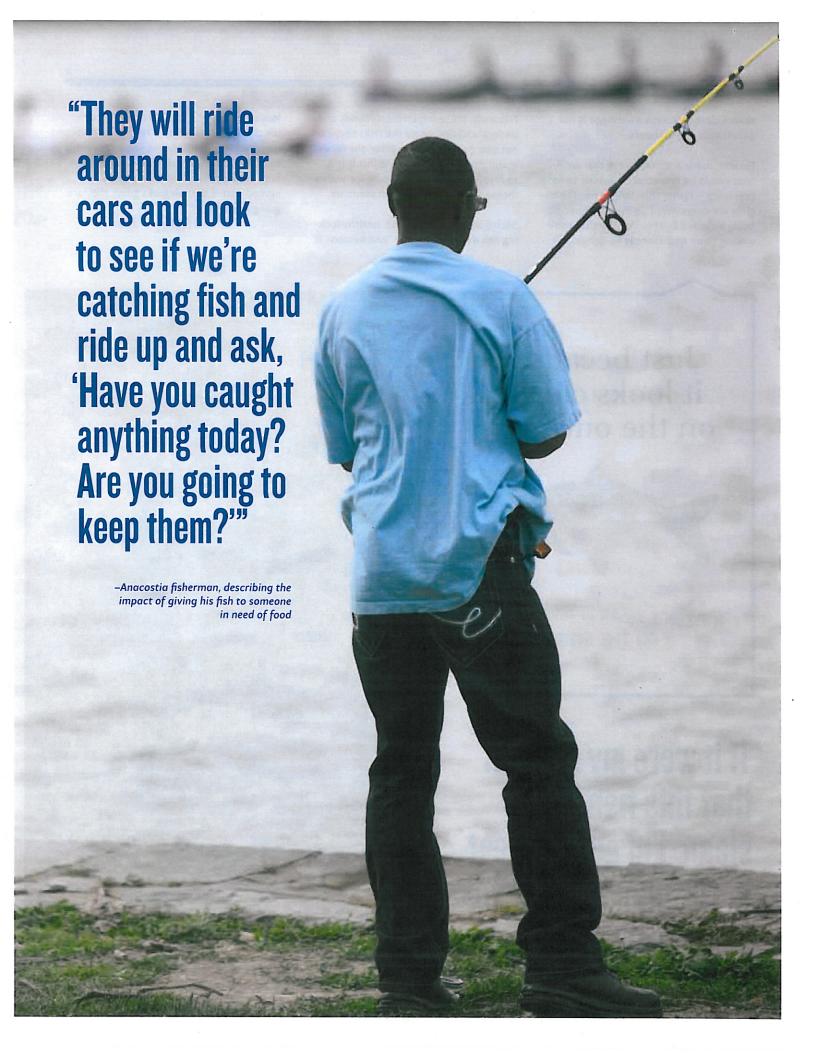
Just because it looks clean on the outside,



DOESN'T MEAN IT'S CLEAN ON THE INSIDE

"If it were my opinion that this fish looks clean, I'm going to eat it. Nothing is going to change my mind."





EVIDENCE OF WIDESPREAD SHARING OF FISH

Based on the riverbank survey, threequarters of Anacostia River anglers are eating or sharing some or all of the fish they catch.

One in five (21%) anglers eat or share everything they catch. That number rises to two in five (39%) when including those who eat or share "most" of what they catch. Another 35% are eating or sharing "some" of their catch, leaving only one angler in four who is not eating or sharing anything that they catch from the Anacostia.

One-third (35%) of the anglers who eat or share their fish are doing so at least once a week. Seven percent are eating the fish "every day."

Further, there is evidence of sharing with high-risk groups: 12% of Anacostia River anglers said that children are eating their catch, and 11% are sharing with wives or girlfriends (some of whom may be or become pregnant).

To give a sense of the reach of the problem, nearly half (46%) of all anglers interviewed in the riverbank survey said they are sharing their catch with people beyond their families. Anecdotally, our field interviewers were told by several anglers that they are selling Anacostia River fish at the Maine Avenue fish market. Some frequent, experienced anglers were seen to be catching large enough quantities of fish to suggest broad sharing. All of this suggests that the ultimate disposition and consumption of these fish is well beyond anglers and their own families, and may reach beyond the local community.



To better quantify the extent of sharing and eating Anacostia River fish, a representative household survey was conducted in the lower watershed. That survey shows:

77%

of community residents have eaten fish in the last month outside of a restaurant.

28%

have been given locally caught fish to eat, but do not know in what local waters it was caught.

8%

know they eat fish "that is caught in local rivers like the Potomac or the Anacostia."

6%

of households know for sure that they have eaten Anacostia River fish during the past year.

Five percent of residents in the lower watershed identify the Anacostia as the source of fish they have eaten—but the number may range significantly higher given how many households are uncertain about the source of their locally caught fresh fish. Using the most conservative assessment, based on 5.7% consumption of Anacostia River fish, a minimum of 17,200 community residents may be consuming contaminated fish. This is based on 2010 Census data showing a lower watershed population of approximately 303,000.

QUESTION:

"How much of the fish that you catch out of the Anacostia do you end up eating or sharing with someone else who eats it, as opposed to throwing it back?"

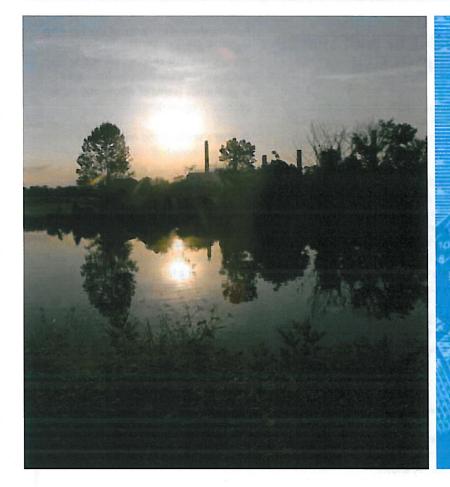
AN ALMOST IRRESISTIBLE DESIRE TO SHARE FISH BASED ON NEED

More profoundly, and a challenging finding of this research, is the motivation anglers described in the qualitative interviews for their extensive sharing of fish. Anglers are approached and begged for fish they would otherwise throw back, they are cajoled into fishing when they otherwise would not by people who may go hungry, and they have standing arrangements to fish for people in their neighborhoods who are in economic distress.

These anglers, even the ones who know some of the health risks, find the urge to share the fish irresistible. In fact, they feel good to be helping someone in need, and that motivation overcomes concerns they may have about possible contamination.

The focus group discussion was energetic and extensive on this topic, and all participants were in agreement and emphatic about the phenomenon. Here are just a few of the comments:

- "We've got a guy that calls us every day or comes past our fishing spot every day to see what we caught and get our fish because he's not working, he doesn't have any, and that's basically all him and his wife eat."
- "There's a lot of people out here that basically look for us because if we don't eat the fish, that lights up somebody's life."



- "You feel bad if you throw all of them back and then they ask you if you've caught anything; then the next thing you know they may not have anything to eat."
- "I feel good because you helped somebody have something to eat. They didn't have anything to eat."

OUR FINDINGS MAKE CLEAR that many anglers cannot resist sharing their catch with people who are in need. Therefore, encouraging catch and release conflicts with the priority of lessening the consumption of contaminated fish. Sponsors and stakeholders of this work need to grapple with those competing priorities before an outreach campaign moves ahead.

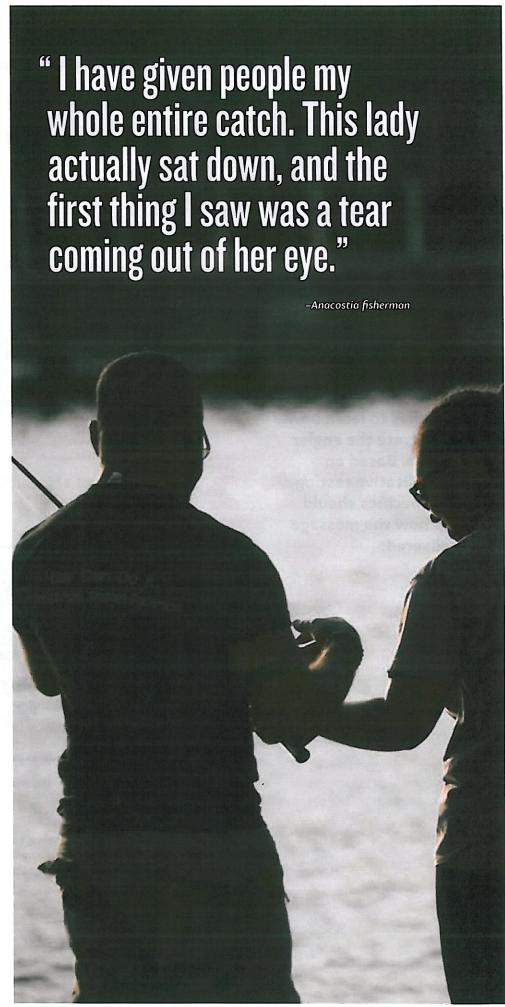
HOW TO DELIVER MESSAGES THAT MOVE ANGLERS

Despite any existing perceptions of the health risks of consuming the river's fish, one objective of this study is to determine what messages and techniques would cause anglers to think differently about consuming contaminated fish.



This is a tough audience to move. In the riverbank survey, 51% of anglers said that "knowing about such a health advisory" – in other words that "eating fish out of the Anacostia could make you sick" – would make no difference in their fishing or consumption practices. The largest number believe they do not eat enough fish to cause a problem, while others said they have never heard of anyone getting sick from eating fish, that they are careful about how they prepare the fish, or that they just don't worry about it.

As a bottom-line finding, anglers demonstrated in the qualitative interviews that to reach them, the health concerns must be stated starkly and clearly. If lower consumption is the goal, that central message must be conveyed unequivocally, they indicated.



RECOMMENDATIONS FOR OUTREACH

The recommendations that follow may be challenging and not in keeping with current practice, but the goal of this audience-driven research is to learn how to penetrate the angler audience. Based on this qualitative testing, these specifics should guide how the message is delivered:

The audience is impatient with written text.

There were some literacy barriers with both English- and Spanish-speaking anglers, with our interviewers having to read text to them. But more generally, the angler audience demonstrated in reviewing mock-ups that they often will not read headlines, but instead go straight to the symbols and imagery. Therefore, striking and meaningful visual images and symbols are very important, while the meaning of a well-written headline can be lost.

A large share of this audience thinks literally and concretely.

Therefore, messaging that deals in abstractions can fail to penetrate. For example, an abstract image of a discolored and damaged fish used strictly for visual impact prevented the focus group from imagining that the message applied as well to fish that appear clean. Similarly, a fish-shaped outline surrounded by muck and oil caused the audience to think the message was only about "dirty fish" or bottom feeders, losing the larger point.



This image was too abstract for the audience.

All respondents said that tying the message directly to the concept of eating is important. Knowing whether the fish is clean or unclean – contaminated or uncontaminated – is not helpful, one respondent explained, but "is it clean enough to eat; is it edible?" That direct connection must be made.

Using strong and direct language is important with this audience.

- An "advisory" says to anglers that they can use their own judgment (and are therefore likely ignore the advisory), while a "warning" injects a severely cautionary note and will be taken more seriously.
- Testing an adaptation of the current fish consumption advisory that indicates that some species of fish can be consumed in moderation, respondents found the message to be confusing. It seemed to give the green light to consuming fish, undermining rather than introducing the intended cautionary note:

"I don't like it at all. I think it's not effective. What that says to me is that as long as you do this or that it's OK. I think if you did anything, you could put a big circle with an X on it or something like that (to discourage eating fish)."

Testing the word "Cancer" visually gets anglers' attention unlike other concepts. It clarifies their misperception that food poisoning is the only health risk. "Cancer" alerts the audience that there are real and serious longterm health risks. If necessary, inserting conditional language - such as "may cause cancer" - does not significantly weaken the message.



This stark message got their attention.

"Healthy" and "unhealthy" are strong words to use, and convey clear meaning.

"To me, when you say 'healthy' that is related to all parts of your body, when you say 'unhealthy,' I'm thinking, if you eat it you get sick."

Testing the impact of symbols, focus group respondents were motivated by the starkest, clearest representations of danger, such as a familiar biohazard symbol, and wanted to see those included in communications to convey the health dangers of eating fish. While the biohazard symbol itself may not be appropriate to use, another similarly evocative symbol could be found or created for this outreach campaign. Less-dramatic symbols and images that were tested in this study had little to no motivational impact on the angler audience.



Both visually and in terms of the words used, the audience wants an arresting presentation, stating the risk clearly and without nuance. Bright colors, large words, striking images, and familiar symbols are all necessary elements of a successful ad, they said.

In terms of outreach, there is a strong desire among local anglers to get together in clubs and tournaments, and those gatherings would provide good opportunities for education.

These anglers find fishing to be a social activity, and they enjoy talking about fishing with their peers. They bemoan the fact that there is so little organized activity around local fishing, and crave it. Such get-togethers could provide great opportunities for educating them on the topic of fish consumption.

A small number of serious anglers are participating in online fishing forums to exchange information about their experience. Such forums are another good avenue to reach some anglers.

Finally, our focus group respondents think of themselves as "fishermen," not "anglers."

In their estimation, a fisherman is someone with "a floppy hat and a pole," while an angler "is more like a professional fisherman that makes money off of it." While only a sample of one, the one woman in our focus group also said she preferred the term "fisherman" over "angler" and is used to being called a fisherman because because that is the language she hears at bait shops and sporting goods stores.

We are grateful to the following individuals who helped make this report a reality

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ABOUT THE RESEARCHER

Founded in 2001 and based in Maryland, OpinionWorks conducts frequent opinion studies nationally on public policy and behavior change. They undertake voter polls for the news media, and frequently conduct studies for public agencies and non-profit organizations on public service delivery and social marketing. Measuring attitudes and behavior related to environmental stewardship and public health is OpinionWorks' core expertise. They are experts in measuring behavior change through pre- and post-surveys, and testing messages that will bring about change through qualitative research such as focus groups.

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