Fish Consumption Survey of Anglers from the Canadian side of the Detroit River

Prepared by the Detroit River Canadian Cleanup (DRCC) for the DRCC Monitoring and Research Work Group

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Table of Contents

List of F	igures iii
List of T	ablesiii
EXECUT	IVE SUMMARYiv
1.0	INTRODUCTION1
2.0	EATING DETROIT RIVER FISH
2.1 2.2	The Guide to Eating Ontario Fish 2 Fish Consumption Advisories for the Detroit River 3
3.0	RESTRICTIONS ON FISH AND WILDLIFE CONSUMPTION (BUI #1) IN THE DETROIT RIVER
4.0	PREVIOUS DETROIT RIVER ANGLER SURVEYS
4.1 4.2	Angler/Creel Survey, 2015
5.0	DETROIT RIVER CANADIAN CLEANUP FISH CONSUMPTION SURVEY12
5.1 5.1 5.1 5.1 5.1 5.1 5.1 5.2 5.3	Methodology.131.1Survey Outreach and Advertisement.131.2Incentivizing Participation141.3Translation of Survey.141.4Call for Volunteers: Shoreline Interviewers141.5Interview Locations and Time of Day141.6Interviewing Best Practices151.7Survey Delivery15Results.16Comparison to 1996/97 Fish Consumption Survey.24
6.0	DISCUSSION
7.0 8.0 APPEND	CONCLUSION 27 REFERENCES 28 DIX A. DRCC fish consumption survey 29
APPEND	DIX B. Survey communication products
APPEND APPEND	DIX C. DRCC thank you letter to fish survey participants
APPEND	DIX E. Educational literature
APPEND	DIX F. Volunteer shoreline interviewer of Detroit River anglers
APPEND	DIX H. DRCC fish consumption timeline, 2019 to 2022

List of Figures

Figure 1: Length of time anglers reported fishing on the Detroit River	17
Figure 2: Reasons why survey participants don't eat the fish they catch from the Detroit River	17
Figure 3: How much fish from the Detroit River survey participants eat in a typical meal	18
Figure 4: Frequency survey participants eat fish from the Detroit River	18
Figure 5: Frequency of anglers reporting sharing their meals with others	19
Figure 6: Frequency of Eating Indicator Species from the Detroit River	20
Figure 7: Frequency of the amount of indicator species consumed at one time	20
Figure 8: Frequency anglers consumed freshwater drum from the Detroit River over the last year	.21
Figure 9: Methods survey respondents use to cook fish caught from the Detroit River	22
Figure 10: Response to whether survey participants know of the Guide to Eating Ontario Fish	22
Figure 11: Response to whether those who knew of the Guide to Eating Ontario Fish use it to dec	ide
which types of fish to eat	23
Figure 12: Response to whether survey participants wanted to eat more of any type of fish than the	he
Guide suggests	23
Figure 13: Gender of survey participants	23
Figure 14: Age of survey participants	23

List of Tables

Table 1: Description of contaminants associated with complete or partial fish consumption
restrictions on the Canadian side of the upper and lower Detroit River (Government of Ontario,
2024a, Government of Ontario, 2024b, Health Canada, 2016, Health Canada, 2005a, Health
Canada, 2005b, Health Canada, 2005c, Gandhi et al., 2015)2
Table 2: Detroit River (Upper Reach), From Lake St. Clair to Fighting Island (Government of Ontario,
2024a)5
Table 3. Detroit River (Lower Reach), from south of Fighting Island to Lake Erie (Government of
Ontario, 2024b)8
Table 4: Parts of fish consumed from the Detroit River 21
Table 5: Language(s) spoken by survey participants
Table 6: Top ten consumed fish according to survey and the status of restrictions in the Lower and
Upper Detroit River for the General and Sensitive Populations25

EXECUTIVE SUMMARY

With approval from the Monitoring and Research Work Group, the Detroit River Canadian Cleanup (DRCC) initiated an online and in person fish consumption survey in July 2019. The purpose of this this survey was to collect information from individuals who consume fish from the Canadian side of the Detroit River to understand Detroit River fish consumption behavior. This survey targeted both shoreline and off-shore fishers through online surveys and in-person interviews on the shore or at marinas. The survey was also designed to examine whether and how often people eat specified indicator species, as defined in the delisting criteria for the Fish Consumption beneficial use. This information provided the DRCC with insight into whether people are eating more of the indicator species than recommended and helps determine if people are eating a large amount of a certain species of fish where remedial actions can improve advisories. The data will be incorporated into the tiered assessment framework for the Restrictions on Fish and Wildlife beneficial use impairment (BUI) or BUI #1.

1.0 INTRODUCTION

The 51 km long Detroit River is a connecting channel that, along with the St. Clair River and Lake St. Clair, links Lake Huron to Lake Erie. The Detroit River has a long history of environmental issues including combined sewer overflows, degradation of habitat, and presence of toxic contaminants (e.g., mercury, polychlorinated biphenyls (PCBs), PAHs, and metals) in water and sediment. As a result of this environmental degradation, the Detroit River was listed as one of the 43 Areas of Concern (AOC) under the Great Lakes Water Quality Agreement (GLWQA) in 1987. AOCs are sites around the Great Lakes where the aquatic ecosystem has been degraded due to local sources of pollution. The Great Lakes Water Quality Agreement identified 14 beneficial use impairments (BUIs) for all AOCs and the AOC program addresses these BUIs. Beneficial Use Impairments are measures of the environmental, human health, or economic impacts of poor water quality. In each AOC, all levels of government, community, and industry partners undertake a cooperative effort to restore the environmental integrity of the AOC through the implementation of a Remedial Action Plan (RAP). The purpose of these AOC-specific RAPs is to restore beneficial uses and ultimately remove the Detroit River from the list of Great Lakes AOCs. Although the Detroit River AOC is binational, separate Canadian and American RAPs have been developed since the late 1990's.

In1998, work to implement the Remedial Action Plan for the Canadian side of the Detroit River started being directed through the Detroit River Canadian Cleanup (DRCC). The success of RAP implementation is measured through the change in status of BUIs from impaired to not impaired. In 2010, the Detroit River Canadian Remedial Action Plan Stage II Report was developed, detailing restoration goals for impaired beneficial use impairments and recommended remedial actions to address them. In this report, 9 beneficial uses were deemed impaired and 2 required further assessment for the Canadian side of the Detroit River. As of October 2024, 4 BUIs are impaired, including restrictions on fish and wildlife consumption (fish only), fish and wildlife populations, bird or animal deformities or reproductive problems, and loss of fish and wildlife habitat.

The status of a number of these beneficial uses, such as restrictions on fish and wildlife consumption, depend on the quality of the sediment in the river. Contaminants such as heavy metals, polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs), which were released from factories or entered the river via runoff, have a negative effect on wildlife, benthos, and fish living within the system (e.g., by increasing tumour prevalence) and in humans via bioaccumulation through the food web. Bioaccumulation is the process whereby pesticides and other contaminants are absorbed by fish and animals from the environment directly (i.e., from sediment and water) or indirectly through the consumption of food containing contaminants. Over the past several decades, legislation has been introduced on both sides of the border to reduce the amount of contaminants that have been found to be detrimental to fish and human health include mercury (Hg), polychlorinated biphenyls (PCBs), and dioxins and furans (and dioxin-like chemicals).

The concentration of contaminants found in wildlife is directly related to the amount found in their environment and food sources. When levels of these contaminants are high within fish, they contribute to consumption restrictions (or advisories). These restrictions identify the number of meals per month of angler caught fish from a waterbody that the public can safely consume to

minimize risks of human exposure to toxic contaminants. Since fish consumption advisories exist in the Detroit River and the Restrictions on Fish and Wildlife Consumption beneficial use is impaired for the AOC, the DRCC initiated a survey to determine what anglers are catching and eating from the river, and how often they are consuming fish from the Detroit River.

2.0 EATING DETROIT RIVER FISH

For hundreds of years, the Detroit River has been a focus for boating, fishing, and hunting. New fishing docks and observation platforms have been constructed, large scale habitat projects have been completed (i.e., sheltering islands at Peche Island), and soft-shore engineering projects have enhanced the aesthetics of the river while also improving fish habitat values and access for fishing. Through the DRCC partnership, efforts to restore, enhance, and protect fish populations and habitat have improved many fish species' health and presence in the river over time (such as the Lake Sturgeon, which was almost extirpated from the river). The river is known internationally for its Muskellunge, Walleye, White Bass and Yellow Perch fishing in addition to other sport fisheries.

2.1 The Guide to Eating Ontario Fish

Fish can provide high-quality protein to maintain a balanced diet and offer a great source of omega-3 fats and other nutrients. However, fish caught from Ontario lakes and rivers can present a risk of exposure to harmful contaminants, based on their size, type, and location caught. Since the 1970s, the Ontario Ministry of Environment, Conservation and Parks (MECP) has monitored specific chemicals in fish flesh as part of the province-wide Fish Contaminant Monitoring Program. Fish consumption advisories are produced from the information collected in the program and published in the *Guide to Eating Ontario Fish*. The guide provides information to the public that can be used to guide consumption of fish caught from Ontario lakes and rivers to minimize exposure to toxins.

The consumption advice in the guide is based on guidelines provided by Health Canada (Government of Ontario, 2024a). The consumption advice provided in the Ontario guidelines is based on an average meal of 227 grams of a skinless, boneless dorsal fillet for an average size adult weighing 154 pounds. According to current benchmarks that are recognized by the MECP, there are three sub-categories of restrictions: (1) **Unrestricted** is defined as being able to eat 8 or more meals per month of the desired fish; (2) **Partially restricted** means that a fish consumer should use caution and limit their consumption of the desired fish per month following a range of 1, 2 or 4 meals per month; and (3) **Restricted consumption** refers to when a consumer is advised to not eat any meals of a particular size of fish (Gandhi et al., 2015). Table **1** below describes contaminants that are associated with complete or partial fish consumption restrictions in the Canadian upper and lower Detroit River (Government of Ontario, 2024a, 2024b).

Table 1: Description of contaminants associated with complete or partial fish consumption restrictions on the Canadian side of the upper and lower Detroit River (Government of Ontario, 2024a, Government of Ontario, 2024b, Health Canada, 2016, Health Canada, 2005a, Health Canada, 2005b, Health Canada, 2005c, Gandhi et al., 2015)

Contaminant	Description
Mercury	Mercury is a naturally occurring metal in soil, rocks, and water bodies. It can also be released into the environment because of anthropomorphic combustion processes such as coal-fired power generation, metal mining
	and waste inclueration. Mercury is converted to methytmercury which iish

Contaminant	Description							
	absorb by water passing over their gills or ingested through their diet. Fish							
	metabolize mercury at a very slow rate, which means concentrations of							
	mercury gradually increase, or bioaccumulate in the food web. Walleye,							
	Pike, and other fish at the top of the food web typically have the highest							
	mercury levels in their bodies.							
Polychlorinated	PCBs are a group of chlorinated organic compounds first commercially							
biphenyls (PCBs)	developed in the late 1920s and banned for their manufacture in North							
and dioxin-like	America in 1977. However, the ban did not include PCBs already in use,							
PCBs	which are currently being phased out. PCBs persist for decades in the							
	natural environment and readily accumulate in the aquatic ecosystem. Low							
	levels of PCBs are unlikely to cause adverse health effects in humans except							
	for individuals who consume large amounts of fish or other wildlife. Dioxin-							
	like PCBs are a select group of PCBs with harmful properties similar to							
	dioxins.							
Perfluoroalkyl	PFAS are a family of chemicals that make materials water, stain and oil							
and	repellent and have been in a wide array of consumer products since the							
Polyfluoroalkyl	1950s. PFAS do not break down easily.							
Substances								
(PFAS)								

There are several ways people can reduce their risk of consuming contaminants from fish. The following recommendations and practices can help individuals make the safest choice when deciding which fish to target, consume, and prepare:

- Follow the advice of the MECP *Guide to Eating Ontario Fish* and continue to observe updates every few years (most recent update occurred in 2024);
- Choose smaller and or leaner fish species for consumption. Avoid consuming large, predatory fish and bottom feeders;
- When preparing fish for consumption, remove all visible fat and skin from the fish;
- Cook fish on a grill, rack, or broiler pan to allow fat to drip away from the fillet; and
- Do not consume fish organs.

Some contaminants, such as mercury, can be found throughout the fish flesh and are not removable by trimming skin or fat. Therefore, it is always best to follow fish consumption guidelines.

This fish consumption survey report focuses only on the Canadian side of the Detroit River. As the Detroit River is a bi-national river connecting the United States and Canada, there are different consumption restrictions, advisories, and guidelines issued by the State of Michigan's Department of Health and Human Services (MDHHS). For information on the MDHHS safe fish guidelines for the American side of the Detroit River, visit https://www.michigan.gov/mdhhs/safety-injury-prev/environmental-health/topics/eatsafefish/find-your-area/detroit-area.

2.2 Fish Consumption Advisories for the Detroit River

For reporting out on consumption advisories for the Detroit River the Guide to Eating Ontario Fish has divided the river into two sections, the upper and lower Detroit River. The following two tables

highlight consumption advisories for these two areas. Upper Detroit River includes from Lake St. Clair to Fighting Island. Lower Detroit River includes Fighting Island to Lake Erie (Government of Ontario, 2024a, 2024b). Consumption advisories in the tables below represent the maximum number of meals per month recommended for each species/size range indicated, as well as the contaminant(s) driving the advisories. These tables are from the 2024 Guide to Eating Ontario Fish. Note that the sensitive population refers to children under 15 years of age and people who are pregnant or may become pregnant.

Length (cm)	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75
Length (in)	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	>30
Bluegill ¹													
General	32	32											
Population													
Sensitive	16	16											
Population													
Brown Bullhea	d ^{1,2}												
General			16	8									
Population													
Sensitive			8	0									
Population													
Channel Catfis	sh²												
General			2	2	2	2	1	0	0				
Population													
Sensitive			0	0	0	0	0	0	0				
Population													
Common Carp	2,6												
General				12	8	4	2	2	2	2	2	2	
Population													
Sensitive				12	8	4	0	0	0	0	0	0	
Population													
Freshwater Dr	um ^{1,2,6}												
General		16	16	16	8	4	4	4	4				
Population													
Sensitive		8	8	4	4	0	0	0	0				
Population													
Gizzard Shad ²													
General					1	1	1						
Population													
Sensitive					0	0	0						
Population													

Table 2: Detroit River (Upper Reach), From Lake St. Clair to Fighting Island (Government of Ontario, 2024a)

Length (cm)	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75
Length (in)	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	>30
Goldfish ^{1,2}													
General			16	16									
Population													
Sensitive			8	4									
Population													
Largemouth Ba	ass ^{1,6}												
General		4	4	4	4	4							
Population													
Sensitive		4	4	4	4	0							
Population													
Northern Pike ¹	,6												
General						8	8	8	8	8	8	8	8
Population													
Sensitive						8	8	8	8	4	4	4	4
Population													
Pumpkinseed ¹													
General	16												
Population													
Sensitive	8												
Population													
Rock Bass ^{1,2,6}													
General	16	12	4										
Population													
Sensitive	4	4	0										
Population													
Walleye ^{1,6}													
General			8	8	8	8	8	8	8	4	4	4	
Population													
Sensitive			8	8	8	4	4	4	4	0	0	0	
Population													
White Bass ^{1,2,6}													
General		4	4	4	2	1							
Population													
Sensitive		4	4	4	0	0							
Population													

Length (cm)	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75
Length (in)	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	>30
White Perch ^{2,6}													
General	4	4	2	1									
Population													
Sensitive	4	4	0	0									
Population													
Yellow Perch ^{1,}	Yellow Perch ^{1,2}												
General	4	4	4										
Population													
Sensitive	4	4	4										
Population													
*Sensitive Popul	ation: Chi	ldren unde	er 15 years o	f age and pe	ople who ar	e pregnant	or may becc	ome pregnar	nt.				
Superscripts: the	Superscripts: the number identifies the contaminant or group of contaminants which are causing consumption restrictions. [1] Mercury; [2] Polychlorinated												
biphenvls (PCBs)):[6] PerFli	JoroAlkvl	and PolvFluc	oroAlkvl Sub	stances (PF	AS)							

Table 3. Detroit River (Lower Reach), from south of Fighting Island to Lake Erie (Government of Ontario, 2024b)

Length (cm)	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75
Length (in)	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	>30
Bluegill ¹													
General	32												
Population													
Sensitive	12												
Population													
Common Carp	2												
General						2	2	2	2	2	2	2	2
Population													
Sensitive						0	0	0	0	0	0	0	0
Population													
Freshwater Dr	um ^{1,2}												
General		16	16	16	16	12	4	4	2				
Population													
Sensitive		12	8	8	8	4	0	0	0				
Population													
Largemouth Ba	ass ^{1,2,6}												
General	16	16	16	16	12	8	8						
Population													
Sensitive	16	12	8	4	4	4	0						
Population													
Rock Bass ^{1,2}	1												
General	12	8	8										
Population													
Sensitive	8	8	4										
Population													
Smallmouth B	ass ^{1,2}												
General				4	4	4	4						
Population													
Sensitive				4	4	0	0						
Population													
Walleye ^{1,2}													
General			12	12	12	12	12	12	8	4			
Population													

Length (cm)	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75
Length (in)	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	>30
Sensitive			12	12	8	8	4	4	4	0			
Population													
White Bass ^{1,2}													
General		8	8	4	4	2							
Population													
Sensitive		8	8	4	4	0							
Population													
White Perch ^{1,2}	,6												
General	4	4	4	4									
Population													
Sensitive	4	4	4	4									
Population													
Yellow Perch ^{1,}	6												
General	12	12	12	4	4								
Population													
Sensitive	12	12	8	0	0								
Population													
*Sensitive Popula	ation: Chi	ldren unde	er 15 years o	f age and pe	ople who ar	e pregnant (or may becc	ome pregnar	nt.				
Superscripts: the	e number i	dentifies	the contamir	nant or grou	p of contam	inants whic	h are causir	ng consumpt	tion restricti	ons. [1] Mer	cury; [2] Pol	ychlorinated	k
biphenyls (PCBs)); [6] PerFl	uoroAlkyl	and PolyFlu	oroAlkyl Sub	ostances (PF	AS)							

3.0 RESTRICTIONS ON FISH AND WILDLIFE CONSUMPTION (BUI #1) IN THE DETROIT RIVER

In many AOCs, legacy contaminants such as mercury are the main driver of restrictions on fish consumption as they persist in the environment and accumulate in fish tissue. Elevated levels of contaminants have been found in sediments on both the Canadian and U.S. sides of the Detroit River. In 1993, the Ontario Ministry of the Environment established Provincial Sediment Quality Guidelines (Fletcher et al., 2008), which determined the thresholds above which adverse effects are likely to be experienced by various sediment-dwelling organisms. The Lowest Effect Level (LEL) of contaminants of potential concern (COPCs) is the threshold of contaminants above which the most sensitive species may experience adverse effects, and the Severe Effect Level (SEL) is the threshold above which ecological detriment to the majority species will begin to be observed. Sediment samples were analyzed from the Detroit River AOC in 1999, 2001, 2009, and 2013 to determine whether contaminant levels exceeded SELs (Drouillard et al., 2010; 2014; 2015). These analyses showed that there has been a general decline in SEL exceedances on both sides of the river and since 1999, with only one SEL exceedance has been recorded in 2013 on the Canadian side of the river (Drouillard et al., 2014; McDougall, 2019). Hot spots of contaminant accumulation were located along the American shoreline upstream of Belle Isle and downstream in the Trenton Channel, which is consistent with previous studies (i.e., Thornley and Hamady, 1984). The one Canadian site that had SEL exceedances in 2013 for chromium, lead, and copper was located near the Ambassador Bridge, just inside of the Canadian border (Drouillard et al., 2014; 2015). This research indicates that sediment contamination on the Canadian side is localized, with the vast majority of sites sampled having concentrations below provincial SELs. As a result, no sediment remediation activities have been conducted in the Canadian waters of the Detroit River or are planned in the future, but continued monitoring of sediment contamination levels is recommended. While there are no further sediment remediation actions that need to be undertaken, restrictions on fish consumption remain in effect in the Canadian upper and lower Detroit River.

In both the 1996 RAP Update Report (Michigan Department of Environmental Quality, 1996) and the 2006 BUI Assessment Report (Leney and Haffner, 2006), the status of the Restrictions on Fish and Wildlife Consumption BUI for the Detroit River was identified as impaired. In the 2010 Stage II RAP report, the status of the BUI remained impaired for fish as fish consumption advisories existed in the river for seven out of the ten most popular species of fish consumed from the river (Green, et al., 2010), but wildlife consumption was considered not impaired. In the 2010 Detroit River Canadian RAP Stage II report the delisting criteria stated that this BUI will be considered not impaired "When consumption advisories for indicator fish species (e.g. walleye, brown bullhead, and smallmouth bass) given for the sensitive population in the AOC are similar to upstream and downstream non-AOC Great Lakes reference areas." This delisting criteria was developed to focus on contaminants that were driving fish consumption restrictions within the AOC and indicator species that represent different trophic levels (i.e., bottom feeders, intolerant of pollution species, and local species). Wildlife was once again considered not impaired based on a Health Canada study in the AOC that found consumption of game birds did not pose a human consumption concern (Green, et al., 2010). Additionally, waterfowl are migratory, spending only a short time within the AOC, so are unlikely to be a good indicator of local conditions. In 2016, the Ontario

Ministry of Environment, Conservation, and Parks (MECP) and Environment and Climate Change Canada (ECCC) reviewed the *Restrictions on Fish and Wildlife Consumption* delisting criteria across Canadian AOCs and recommended a generic delisting criteria statement "*When consumption advisories for fish of interest in the AOC are unrestricted or no more restrictive than the advisories for suitable reference site(s) due to contaminants from locally-controllable sources.*" The 2010 delisting criteria adopts an indicator species approach and retains the AOC/reference comparison, which is consistent with the 2016 generic delisting criteria. However, *the 2010 delisting criteria did not specify a 'locally-controllable source' element and is restricted to advisories for the sensitive population.*

The DRCC's committees decided to combine the two delisting criteria and use an updated Detroit River delisting criteria, "When consumption advisories for indicator fish species (e.g. walleye, brown bullhead, and largemouth bass) given for the sensitive population in the AOC are similar to upstream and downstream non-AOC Great Lakes reference areas due to contaminants from locally-controllable sources" to evaluate the Restrictions on Fish and Wildlife Consumption BUI. Largemouth bass were used as an indicator species instead of the originally proposed smallmouth bass as there are no fish consumption advisories in place for smallmouth bass in the Detroit River and both species are considered to occupy similar trophic status. Further, multiple upstream and downstream non-AOC Great Lakes reference areas were used for comparison as using just two reference sites in isolation that have abnormally high or low contaminant levels would bias the comparison i.e., using only Lake St. Clair (upstream non-AOC) and western Lake Erie (downstream non-AOC) as reference sites. The DRCC is in the process of assessing the restrictions on fish consumption BUI in the Detroit River based on this delisting criteria. In doing this assessment, it was suggested by the DRCC Research and Monitoring Work Group that information regarding how often indicator species are consumed from the river and if anglers are consuming more of these species than restrictions allow would better inform the assessment of this beneficial use. The DRCC executed a fish consumption survey to collect this information.

4.0 PREVIOUS DETROIT RIVER ANGLER SURVEYS

In advance of launching the 2019-22 DRCC fish consumption survey, a literature review of previously completed surveys in the Detroit River focusing on angler activity, fish preferences, and consumption behaviour was conducted. The two previously completed surveys are highlighted below.

4.1 Angler/Creel Survey, 2015

In 2015, a partnership between the Michigan Department of Natural Resources, the U.S. Geological Survey and the Ontario Ministry of Natural Resources and Forestry was developed to conduct a full creel survey of the Detroit River. A creel, or angler survey, is a tool fisheries managers use to gather information on fish populations. Individual anglers are interviewed to gather information about the number of hours they fished, what species they're targeting, the size of the fish they caught, and whether they released or harvested the fish. This creel survey provides a snapshot of the recreational fishery measuring the effort, catch, and harvest of fish from the Detroit River.

Anglers put in over 600,000 hours on the river with most recreational fisheries catch and effort at 54% and occurred during April and May in 2015. Anglers caught and harvested over 500,000 White Bass (more than any other species). Walleye is the preferred fish sought out of the Detroit River with 73% targeted and 87% harvested (around 150,000 fish). There were 192,000 Yellow Perch caught, mostly in September (68% at a rate of 4.13 perch per angler hour). Over 100,000 Smallmouth Bass were caught in 2015. Either in May (22%) during the Michigan catch and release season or in September (30%). Of all the Smallmouth Bass caught, 97% were released. Anglers in the Detroit River caught over 4,000 Muskellunge. Most muskies were caught in the spring (April to June); however, it does appear that catches do occur throughout the year. Like the Lake St Clair Muskie fishery, 99-100% of all Muskie caught were released.

4.2 Health Canada Angler Survey for Detroit River, 2000

Health Canada conducted a survey on the Detroit River AOC to gather information on the amounts and species of fish consumed, perceptions of health risk and benefit of consuming fish, awareness and use of fish consumption advisories, and perceptions on environmental and natural resource management issues of the Detroit River (Health Canada, 2000).

Between 1996 and 1997, 999 individuals were surveyed. Sixteen percent were American residents who reported to enjoy the scenic Canadian side of the river, and felt the fish were 'healthier'. Fortyeight percent had not consumed fish from the river in the last 12 months prior to their interview, with 42% sharing that the water was polluted and dirty as the main reason for not consuming fish. Other reasons for not consuming fish include that catch and release was preferable, as fishing is recreational and that 22% indicated they simply did not eat fish (Health Canada, 2000).

Fifty-two percent of the individuals surveyed who had consumed fish in the last twelve months had eaten 1 to 11 meals, 22% consumed 12 to 25 meals, 20% had eaten 26 to 95 meals and 5% consumed 96 or more meals. Over 75% of the responders said the fish taste good, it was fresh, and 5% identified it was a cheaper alternative or free meal for protein. The top ten species of Detroit River fish consumed were yellow perch, walleye, white (or silver) bass, rock bass, small mouth bass, white perch, channel catfish, bluegill, largemouth bass, and crappie (Health Canada, 2000).

5.0 DETROIT RIVER CANADIAN CLEANUP FISH CONSUMPTION SURVEY

The Detroit River Canadian Cleanup (DRCC) initiated a fish consumption survey that was launched online and in person in July 2019. The rationale for this survey was to collect information from individuals who consume fish from the Detroit River on the Canadian side to understand local consumption behavior. This survey targeted both shoreline and off-shore fishers through in-person interviews on the shore or at marinas and others via an online survey. The survey was designed to answer whether people eat the indicator species, and if so, how often they eat it and how much they eat at each meal. This information will help determine the types of fish people are eating and the frequency they are eating certain species of fish. The data will be incorporated into the tiered assessment framework for BUI #1.

5.1 Methodology

The DRCC fish consumption survey was delivered in person and also provided online for completion. A version of the survey was also conducted by the Métis Nation of Ontario (MNO). The survey was launched in July 2019, with the online survey closed for responses on March 31, 2022. The public in-person survey interviews ended in Fall 2021. Appendix A includes the survey questionnaire that was used to conduct in-person interviews and reflects the questions asked in the online survey.

5.1.1 Survey Outreach and Advertisement

A variety of tools and communications products were created to increase awareness about the survey and encourage individuals to fill out the online survey. Posters, small business cards, a media release, a project page on the DRCC website <u>www.detroitriver.ca</u>, social media (Facebook, Twitter, Instagram), newsletters (DRCC and partner organizations) and signage in local fishing areas were created. Appendix B has a sample of these materials.

Partners, businesses and organizations who supported the DRCC in sharing the online survey with their networks included Just Fishin' Friends, the Ontario Federation of Anglers and Hunters (OFAH), Essex County Field Naturalists' Club (ECFNC), Great Lakes Institute for Environmental Research (GLIER) at the University of Windsor, Wally's Bait and Tackle, Strictly Fishing, D & D Lures, the Windsor Sportsmens' Club, Riverside Public Library, Windsor Public Library Central Branch, Leddy Library at the University of Windsor, the Ojibway Nature Centre and the Windsor Public Library John Muir Branch. Mass email requests were sent out to Riverside Marina, LaSalle Marina, Ranta Marina, Holiday Harbour Marina, Westport Marina, Islandview Marine Store and Marina, Beatties Sunset Marina, Belle River Marina, Fish LSC Charters and Big Mike's Fishing Charters to share the survey details with their members and customers. Lastly, the DRCC posted on a variety of online fishing forums such as the Fishing Ontario one via Reddit.com, Ontario fishing discussion and reports via OntarioFishingForums.com and various Detroit River fishing groups on Facebook including Detroit River Fishing, Detroit River/Lake St. Clair Fishing and Detroit River Jigging.

The DRCC created educational literature for both the in person and online survey, including fish identification flashcards as well as a fish size infographic to visually show the difference between 4 oz and 8 oz fillet (Appendix E). Further, a printout of the map of the Detroit River AOC was included to highlight that the survey questions are focused within the channel, and not tributaries and sub-watersheds including River Canard, Little River and Turkey Creek.

Where possible, the DRCC would include information about the fish consumption survey when delivering virtual presentations to the public and at various in person events including Windsor Sportsmens' Club 2020/21 fishing derby, ElderCollege Detroit River environmental history presentations, St. Clair College Community Studies capstone course, University of Windsor GLIER career presentation, ECFNC monthly member meeting, annual Detroit River Evening, and others.

5.1.2 Incentivizing Participation

The DRCC provided a \$5 Tim Horton's gift card, a thank you letter (included in Appendix C) and a fish consumption awareness package for individuals who filled out the survey. The awareness package included a printed copy of *The Guide to Eating Ontario Fish*, DRCC branded giveaway items (pens, carabiners, measuring tape to measure length of fish) and a double-sided fish consumption brochure that provided a quick reference guide for Detroit River anglers about the survey (included in Appendix D).

5.1.3 Translation of Survey

To outreach to anglers who did not speak English, and/or those who spoke English as a second language, the DRCC made efforts to engage with various multicultural centers to share the survey information with their families and networks. The DRCC was able for a fee, pay for translation services by the Multicultural Council of Windsor and Essex County to translate the survey. The survey was translated in Vietnamese, as during our interviews we noted that a large number of those who did not speak English who were fishing on the river spoke Vietnamese. The survey was provided as a print only resource.

5.1.4 Call for Volunteers: Shoreline Interviewers

As the Detroit Riverfront is a vast area to cover, the DRCC created a call for volunteers to help with deploying the survey early winter 2020. Volunteers were to supplement the times that DRCC staff are unable to be on the river asking the questions. The DRCC initiated a Fish Consumption Survey internship for third year Faculty of Science Undergraduate students at the University of Windsor that ran from January to April 2020.

Between April -June 2021, a post-secondary summer student was employed by the DRCC to conduct in person interviews. In this role, they assisted with interviewing anglers on the Detroit River about what they catch and eat from the river. Further, they input all in-person data collected into the DRCC fish survey database and created a collection of anecdotal notes highlighting anything worthwhile reporting as part of the fish consumption survey was deployed. Appendix F includes the position description.

5.1.5 Interview Locations and Time of Day

A variety of shoreline fishing locations were inventoried by the DRCC to map out in person interview spots where anglers are known to frequent in the upper and lower shorelines of the river. These locations included:

• **City of Windsor:** Shanfield Shores Park, Lakeview Park Marina, Kiwanis Park, Bridges Bay Park, St. Rose Beach, Coventry Gardens, Resume Park, Goose Bay Park, Alexander Park, Joan and Cliff Hatch Wildflower Garden, Bert Weeks Memorial Gardens, Aylmer Riverfront Park, Windsor Riverfront promenade, Dieppe Memorial, Steamboat Wharf, Caron Avenue Pumping Station Park, Riverfront Trail fishing pier, Gateway Park, Centennial Park, Windsor

Sculpture Park, Assumption Park pier, McKee Park, Queen's Dock Park, privately owned green spaces along Russell Street in Sandwich, Brock Park.

- **Town of LaSalle:** mouth of Turkey Creek, LaSalle Marina, Gil Maure Park, Riverdance Park.
- Town of Amherstburg: King's Navy Yard.

As the survey was to be deployed over a long period of time, the DRCC scheduled staff and volunteers to conduct in person surveys randomly across locations and time of day. Sampling was targeted to run from 6am to 8pm across 4-hour time slots. The volunteers took whichever shifts they were available for and the DRCC staff conducted the early morning or late evening shifts, when necessary.

5.1.6 Interviewing Best Practices

The DRCC initiated some interviewing best practices which were followed by all interviewers. They included:

- All interviewers will be trained in advance of collecting in person responses at the river.
- All interviewers will be clearly identified with nametags with the DRCC logo on them indicating that they are volunteers.
- Interviewers will go in pairs.
- Interviewers will be trained in survey protocol and delivery.
- An attempt will be made for interviewers to be fluent in languages they are likely to encounter on the river.
- A brief introduction will be provided to the interviewers about fishing and fishing related languages.
- Photos of fish will be put on the back of clipboards to make it easier for interviewers to communicate species visually when conducting interviews.
- During the assigned time slot, interviewers will approach all fishers fishing at the location on the Detroit River, including on-shore and off-shore fishers returning from boat trips.

5.1.7 Survey Delivery

During the fall of 2019, the DRCC received positive support at the outset launch of the survey from the public. While on the river, the DRCC RAP Coordinator and Assistant learned about local fishing practices and preferences for locations while conducting the interviews. For example, no shore fishing was observed from Great Western Park, Bert Weeks Memorial Gardens to Joan and Cliff Hatch Wildflower Garden section as fish habitat rocks in the water may be the reason anglers avoid this location. It was noted that while shoreline anglers were observed at the Riverfront Festival Plaza shoreline section, in 2019 and 2020 this location was blocked off by the City of Windsor for construction. Throughout the duration of the 2020 survey periods, there were only people recreating and not fishing at Kiwanis Park, Bridges Bay Park, Reaume Park, Coventry Gardens, Goose Bay Park, Alexander Park, Steamboat Wharf and Centennial Park.

While there was much interest, especially from high-school and post-secondary students wishing to gain experience with a local conservation organization to support the survey, the COVID-19 pandemic halted in-person work in 2020. Early that year, DRCC staff were directed to work from

home, temporary staffing changes impacted the work plan, the Province of Ontario was experiencing multiple declarations of emergencies and issued Stay at Home Orders in 2020 and early 2021 and initiated multiple gathering restrictions for indoor and outdoor settings. Further, following the March 30th, 2022, Provincial stay at home order, the City of Windsor, Town of LaSalle and Town of Amherstburg closed access to public amenities including boat ramp access. Many shoreline and boat anglers were not able to access the early spring walleye run into the Detroit River, limiting the opportunity to catch for sustenance and for the DRCC to interview during that time. Overall, the DRCC focused on collecting online survey responses primarily during the COVID pandemic, and visited the river on August 11, August 18, August 20, August 25, August 27 and September 10, 2020 following enhanced safety protocols (Appendix G).

After bringing the summer student to the DRCC team, many in person surveys were conducted during April, May, and June 2021. This provided high engagement and interest as gathering restrictions were lifted and boat ramps were available to the public again. Many anglers, shoreline and on the river participated and provided meaningful responses to the survey. Online survey communications and recruitment continued into 2021.

In 2022, the DRCC closed in person surveys and closed the online survey by March 31, 2022. During 2022, DRCC began preliminary analysis of the survey responses and shared with the Monitoring and Research Work Group.

5.2 Results

A total of 355 in person/online survey results were obtained. The Métis Nation of Ontario conducted their own community fish consumption survey, however, data from the Métis Nation of Ontario Fish Consumption Survey was not included in the report as site specific AOC data was not available. The majority of respondents have been fishing on the Detroit River for greater than 5 years (218 people, 61%; Figure 1). Of the 355 surveyed, 49 or 79% responded positively to the question "Do you eat the fish you catch from the Detroit River?". The practice of catch and release is the most popular reason why some anglers choose not to eat their Detroit River catch (Figure 2).



Figure 1: Length of time anglers reported fishing on the Detroit River



Figure 2: Reasons why survey participants don't eat the fish they catch from the Detroit River

Those that do consume their Detroit River catch were then asked how much fish they eat in a typical meal (Figure 3) and how often (Figure 4). The majority of respondents consume approximately 8 ounces (or about the size of two palms) in a typical meal and consume Detroit River fish 1 to 4 times per month (once a week or less).



Figure 4: Frequency survey participants eat fish from the Detroit River

Survey participants often share their catch with others. They most often share with their immediate family (spouse/partner and children) as well as other family members and neighbours and friends (Figure 5).



Figure 5: Frequency of anglers reporting sharing their meals with others

Of specific interest in this study was the frequency in which the indicator species that are included in the delisting criteria (brown bullhead, largemouth bass, and walleye) are consumed (Figure 6). Brown bullhead was the least consumed of the three indicator species with only 14.26% (43 survey participants) identifying they have consumed brown bullhead over the past year. Sixty-two survey participants (26.8%) identified that they have consumed largemouth bass over the past year and the majority of survey participants (193 or 83.5%) identified that they have eaten walleye over the past year.



Figure 6: Frequency of Eating Indicator Species from the Detroit River

Similarly, the BUI#1 indicator species breakdown was characterized by portion size (Figure 7).



Figure 7: Frequency of the amount of indicator species consumed at one time

The Great Lakes Institute for Environmental Research (GLIER) conducted modeling exploring the implications of removing legacy contaminants in the Detroit River Area of Concern. The results of this modeling indicated that freshwater drum is the only fish species where a complete removal of PCBs in Canadian sediments would reduce the fish consumption advisory. Therefore, determining how often survey participants consumed freshwater drum was of interest. Only 29/231 respondents (12.5%) have eaten freshwater drum over the past year, with most of these people identifying that they only eat it occasionally and when they did (Figure 8), all respondents portion sizes were 8 oz or less.



Figure 8: Frequency anglers consumed freshwater drum from the Detroit River over the last year

The survey also posed questions to those that ate their Detroit River catch about what parts of the fish they ate and how it was prepared. Most respondents follow Ontario guidelines, eating the fillet without skin, followed by the fillet with skin (Table 4).

Part of fish	Number of respondents
Fillet without skin	208
Fillet with skin	39
Steak with fat trimmed away	8
Steak with fat included	8
Head	8
Skin	8
Tail	11
Fins	7
Bones	2
Fish organs (liver, heart)	3
Fish eggs	5
None of the above	1

Table 4: Parts of fish consumed from the Detroit	River
--------------------------------------------------	-------

When it comes to how fish caught from the Detroit River are typically cooked, most survey participants fry the fish in a pan (Figure 9), followed by grilling or baking in the oven.



Figure 9: Methods survey respondents use to cook fish caught from the Detroit River

The 2024 Guide to Eating Ontario Fish provides information on the types and amounts of fish that are safe to eat in Ontario. The Guide is available online at: https://www.ontario.ca/page/guide-eating-ontario-fish. The survey asked anglers whether or not they had knowledge of the Guide's existence. Respondents were almost equally split between having and not having knowledge of the Guide, with 53% of survey participants not having heard of the Guide (Figure 10).



Figure 10: Response to whether survey participants know of the Guide to Eating Ontario Fish

For those who had heard of the Guide, more questions were asked to determine how they use the Guide. Just over half (53%) of the survey participants reported that they do not use the Guide to decide which types of fish to eat (Figure 11). Further, of those who have heard of the Guide only 30% reported that they wanted to eat more of any type of fish than the Guide suggests (Figure 12).





Figure 11: Response to whether those who knew of the Guide to Eating Ontario Fish use it to decide which types of fish to eat Figure 12: Response to whether survey participants wanted to eat more of any type of fish than the Guide suggests

Demographics of survey participants



The majority of survey respondents identified as male (81%; Figure 13), aged between 31 and 65 (70%; Figure 14).

Figure 13: Gender of survey participants



Most survey participants identified English (328 people) as the most common language spoken at home, with the remaining 27 people identifying other languages being primarily spoken at home (Table 5).

Language	Number of respondents
English	328
Other	11
Arabic	6
Chinese	4
Vietnamese	3
Lebanese	1
Serbian	1
Czech	1

Table 5: Language(s) spoken by survey participants

5.3 Comparison to 1996/97 Fish Consumption Survey

We then compared the 1996/97 fish survey conducted by Health Canada in the Detroit River AOC to see how trends in fish consumption may have changed over time. Our survey showed an increase in respondents identifying that they had eaten Detroit River fish over the past year. Our results suggest that a similar number of people ate parts of the fish other than the fillet. The most popular fish consumed from the river were similar between the two studies, with the top two most popular switching between the two surveys (walleye and perch).

A comparison of results can be found below:

1996-97 Survey

- 52% of respondents had eaten Detroit River fish in the last 12 months
- 17% ate parts of the fish other than the fillet
- 27% stated they used the Guide to Eating Ontario fish

2019-22 Survey

- 65% of respondents had eaten Detroit River fish in the last 12 months
- 20% ate parts of the fish other than the fillet
- 22% stated they knew of the Guide to Eating Ontario Fish, with only 47% of those who knew of the Guide using it to decide how much or which type of fish to eat.

Top 10 most consumed fish in Detroit River (in order) according to 1996-97 survey

- 1. Yellow perch
- 2. Walleye
- 3. White bass
- 4. Rock bass
- 5. Smallmouth bass
- 6. White perch
- 7. Channel catfish
- 8. Bluegill

Top 10 most consumed fish in Detroit River (in order) according to 2019-22 survey

- 1. Walleye
- 2. Yellow perch
- 3. White perch
- 4. White/Silver bass
- 5. Smallmouth bass
- 6. Crappie
- 7. Largemouth bass
- 8. Rock bass

- 9. Largemouth bass
- 10. Crappie

9. Northern Pike 10. Channel Catfish

6.0 **DISCUSSION**

In the Guide to Eating Ontario Fish, three sub-categories of restrictions exist: (1) Unrestricted is defined as being able to eat 8 or more meals per month of the desired fish; (2) Partially restricted means that a fish consumer should use caution and limit their consumption of the desired fish per month following a range of 1, 2, or 4 meals per month; and (3) Restricted consumption refers to when a consumer is advised to not eat any meals of a particular size of fish. According to our survey, the large majority of survey participants (211/231 or 91.3%) eat 8 or less meals per month of fish from the Detroit River, with most of these participants identifying eating less than 4 meals per month (185/231 or 80.1%). Most survey participants identify eating less meals than the 8 or more meals per month threshold established in the unrestricted category.

Modeling results from GLIER indicate that the only species that would benefit from the complete removal of PCBs from sediment on the Canadian side of the river is freshwater drum. The results of our survey indicate that freshwater drum is not highly consumed in the Detroit River, so removing all PCBs in the sediment in the Detroit River would not substantially reduce contaminant consumption for those who eat Detroit River fish.

The majority of the top ten consumed fish according to our survey have some sort of fish consumption advisory associated with them, depending on where they were caught in the river (upper vs. lower Detroit River) and whether or not the person consuming them is part of the general population or the sensitive population (Table 6). With just over half of survey respondents not being aware of the Guide and just over half of those who were aware of the Guide not using the guide to inform consumption decisions, it is important to continue to do outreach and communication in communities to ensure that fish are being consumed in a manner that reduces exposure to contaminants in fish.

Species	General Population		Sensitive Population*		
	Detroit River	Detroit River	Detroit River	Detroit River	
	(upper reach)	(lower reach)	(upper reach)	(lower reach)	
Walleye	Partially restricted	Unrestricted,	Partially	Unrestricted,	
		partially restricted	restricted,	partially	
		for some larger	restricted for	restricted, and	
		size classes	some larger size	restricted,	
			classes	depending on	
				size class	
Yellow Perch	Partially restricted	Unrestricted,	Partially restricted	Unrestricted,	
		partially restricted		partially	
				restricted, and	

Table 6: Top ten consumed fish according to survey and the status of restrictions inthe Lower and Upper Detroit River for the General and Sensitive Populations

Species	General Population		Sensitive Population*		
	Detroit River	Detroit River	Detroit River	Detroit River	
	(upper reach)	(lower reach)	(upper reach)	(lower reach)	
		for some larger		restricted,	
		size classes		depending on	
				size class	
White Perch	Partially restricted	Partially restricted	Partially	Partially	
			restricted,	restricted	
			restricted for		
			some larger size		
			classes		
White/Silver	Partially restricted	Unrestricted,	Partially	Unrestricted,	
bass		partially restricted	restricted,	partially	
		for some larger	restricted for	restricted, and	
		size classes	some larger size	restricted,	
			classes	depending on	
				size class	
Smallmouth	Not included in	Partially restricted	Not included in	Partially	
bass	guidelines		guidelines	restricted, and	
				restricted in	
				some larger	
	-		–	size classes	
Largemouth	Partially restricted	Unrestricted	Partially	Unrestricted,	
bass			restricted,	partially	
			restricted for	restricted, and	
			some larger size	restricted,	
			classes	depending on	
Dealtheas	l la rootrioto d	Linxoatriated	Dertielly	SIZE Class	
ROCK Dass	Unrestricted,	Unrestricted	Partially	Partially	
	for one size close		restricted,		
	for one size class		restricted for		
			classes	SIZE Classes	
Northern pike	Unrestricted	Not included in	Unrestricted.	Not included	
		restrictions	partially restricted	in restrictions	
			for some larger		
			size classes		
Channel	Partially restricted,	Not included in	Restricted	Not included	
catfish	restricted for some	restrictions		in restrictions	
	larger size classes				
*Sensitive Populat	ion: Children under 15 years	s of age and people who ar	e pregnant or may become	e pregnant.	

7.0 CONCLUSION

Through the DRCC partnership, efforts to restore, enhance and protect fish populations and habitat have improved many fish species' health and presence in the river over time. The River is known internationally for its Muskellunge, Walleye, White Bass and Yellow Perch in addition to other sport fisheries. Sediment contaminant levels have improved over time with cleanup and restoration actions being implemented on the Detroit River, as well as efforts to reduce point source inputs of contaminants to the river (i.e., infrastructure upgrades, etc.). The reduction in contaminants have improved fish consumption advisories over time. Fish caught from the Detroit River are safe to eat, so long as consumption is done in accordance with the Guide to Eating Ontario Fish, so that exposure to contaminants is reduced. Many anglers consume fish from the Detroit River, although a small number do enjoy catch and release fishing. Popular species that are consumed from the river include walleye, yellow and white perch, and white/silver bass. The majority of survey respondents reported eating 8 meals or less of Detroit River fish per month, with 8 oz of fish being consumed each meal. Fish fillets without skin are most consumed and fish are often fried in a pan, grilled, or baked in the oven. However, about half of the anglers who consume Detroit River fish have not heard of the Guide to Eating Ontario Fish and out of those who have, over half do not use the Guide to inform decisions regarding fish consumption. The knowledge gained from this survey will help inform the assessment for BUI #1 and ensure that fish consumption restrictions are viewed within the context of fish consumption patterns in the Detroit River AOC.

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APPENDIX A. DRCC fish consumption survey

Introduction

Interviewer: please fill this out for each survey. You do not need to ask these questions.

- Date: _____
- Time: _____

Good morning/ afternoon,

We are talking to people who are fishing today to learn more about the type of fish people are eating from the Detroit River, how much they are eating, and how often. The information is being gathered by the Detroit River Remedial Action Plan Team – a group that is working on improving the health of the Detroit River for people, fish and wildlife.

We're not interested in knowing if you have a fishing license and will not be asking any questions related to any laws. Survey responses will be summarized in a final report and will not be linked to an individual.

Participants will receive a thank you gift of a \$5 Tim Horton's gift card (while supplies last). The thank you gift is restricted to residents of Ontario and will be mailed in Ontario. You will be asked for your name and contact information at the end of the survey. Your information will only be used for the gift and will not be linked to your responses. You may opt out of receiving a gift. Questions? Please contact,

Jackie at 519-776-5209 extension 356 or via e-mail postmaster@detroitriver.ca

PART A: Eligibility and Fishing Practices

- **1.** Have you already answered a survey this year about the fish you eat from the Detroit River either online or in-person?
 - □ Yes end survey and thank respondent
 - \Box No continue to Q2
- 2. How long have you fished in the Detroit River?
 - Less than a year
 - □ Between one and five years
 - Over five years

3. Do you eat any of the fish you catch from the Detroit River?

- □ Yes continue to Part B
- □ No go to Q4

4. Why don't you eat any of the fish you catch from the Detroit River?

- □ I like to practice catch and release / want to protect fish populations
- □ I don't like the taste
- I don't like fish
- $\hfill\square$ I think the water is polluted

- □ I think the fish are diseased/unhealthy
- □ I prefer to purchase fish at the market or store
- Other: ______

If they do not eat fish from the Detroit River, go to Part C.

Part B: Fish Consumption

- **5.** What locations along the upper Detroit River do you like to catch fish that you keep to eat? (Show map of upper DR)
- 6. What locations along the lower Detroit River do you like to catch fish that you keep to eat? (Show map of lower DR)

7. How much fish do you eat in a typical meal? (show size estimates)

- □ Less than 4 ounces
- □ About 4 ounces (fillet about size of palm)
- □ About 8 ounces (fillet about size of two palms)
- Other ______

8. How many meals of fish caught from the Detroit River do you eat in a typical month?

- □ 1 to 3 meals per year
- \Box 1 to 4 (one per week or less)
- □ 5 to 8 (one to two per week)
- □ 9-12 (two to three per week)
- □ 13 to 16 (three to four per week)
- □ 17 to 20 (four to five per week)
- □ 21 to 32 (more than five meals per week)
- Other ______

9. Who else eats the fish you catch from the Detroit River?

- □ Your spouse/partner
- □ Your children under the age of 15
- □ Your children aged 15 or older
- Pregnant family members
- Other family members
- □ Your neighbours or friends
- Just me

Other:_____

10. Please identify how often you ate the fish you caught from the Detroit River over the last year (choose one per row)

	Rarely	1x per	1x per	2-5x per	Daily	l don't eat
		month	week	week		
Brown bullhead						
Channel Catfish						
Common Carp						
Crappie						
Freshwater Drum						
Largemouth Bass						
Northern Pike						
Rock Bass						
Smallmouth Bass						
Walleye						
White Perch						
White/Silver Bass						
Yellow Perch						

Please specify other fish that you eat from the Detroit River, if not listed above. Also indicate how often you eat these fish.

11.Which parts of the fish do you eat? Select all that apply.

•		
🗆 Fillet without skin	🗆 Fillet with skin	□ Steak with fat trimmed away
\Box Steak with fat included	🗆 Head	🗆 Skin
🗆 Tail	🗆 Fins	🗆 Bones
\Box Fish organs (liver, heart)	🗆 Fish eggs	\Box None of the above

12. How much of each type of fish do you eat in a typical meal?

	Less	4 ounces	8 ounces	Greater than 8	l do not	l do not eat
	than 4			ounces	know	
	ounces					
Brown bullhead						
Channel Catfish						
Common Carp						
Crappie						
Freshwater						
Drum						
Largemouth						
Bass						
Northern Pike						
Rock Bass						

Smallmouth			
Bass			
Walleye			
White Perch			
White/Silver			
Bass			
Yellow Perch			

13. How do you typically cook the fish you catch from the Detroit River?

- 🗆 Grill
- Fry in pan
- Bake in oven
- Braise in a pan
- Steam
- On BBQ
- □ In a soup or stew
- Dry for jerky/smoked
- □ None (raw fish)
- Other _____ (may vary by species)

14. Have you heard of the Government of Ontario's 2017-2018 Guide to Eating Ontario Fish?

- Yes
- \Box No skip to Part C

15. Do you use the guide to decide what type of fish to eat or how much to eat?

- Yes
- □ No skip to Part C

16. Would you like to eat more of any type of fish than the guide suggests?

- Yes
- \Box No skip to Part C

Part C Participant Information

17. Gender of person interviewed: _____

18.Approximate age of person interviewed

- □ Under 18 years old
- □ 18-30
- 31-45
- 46-65
- Over 65 years old
- □ I prefer not to say

19.What is your weight? (to estimate exposure to contaminants)

- Less than 126 lbs
- □ 126-150 lbs

- □ 151-175 lbs
- □ 176-200 lbs
- □ More than 200 lbs
- □ I prefer not to say

20. What are the first three letters/numbers of your postal or zip code?

21. What is the most common language spoken in your home?

- English
- □ French
- Other_____

The final results of the survey will be compiled into a brief summary in the Fall 2019. Would you like a copy of the preliminary results or to participate in any other future surveys? If so, please write your email below.

We'd like to thank you for your time to complete our survey. For participating in the survey, you will receive a \$5 Tim Horton's gift card. The delivery of the gift is restricted to Ontario residents only. If you would like the gift card to be mailed to you, please provide your first and last name as well as your full mailing address.

Do you have anything else to add?

APPENDIX B. Survey communication products

A sample of the language used on the DRCC website, newsletters and social media:



Do you fish the Detroit River? If so, fill out our fish consumption survey!

We're interested in knowing what fish people catch and eat from the Detroit River. Your input will provide valuable information to Detroit River Canadian Cleanup (DRCC) staff to help guide future research, education and outreach, monitoring and remediation efforts in the Detroit River and its watershed.

Participants will receive a \$5 Tim Horton's gift card (while supplies last) for their time. <u>Take the survey</u> <u>now!</u>



An example of a digital promotional image of the fish consumption survey:

A poster the DRCC created to put up at various locations such as marinas, bait and tackle shops, libraries etc.



APPENDIX C. DRCC thank you letter to fish survey participants

Hello,

Thank you for completing the Detroit River Fish Survey. Your participation is important in helping us understand which fish people are eating from the Detroit River. By knowing which fish people prefer to eat, we can better focus our efforts on monitoring, research, and education related to fish consumption.

To thank you, we have enclosed a \$5 Tim Horton's gift card and some material outlining how to eat safe fish.

Since 1987, community partners involved in the Detroit River Remedial Action Plan (RAP) initiative have worked together to improve water quality and ecosystem health in the Detroit River. If you have any further questions, wish to learn more, or want to get involved, please do not hesitate to contact me or visit our website. You can also sign up for our e-newsletter or follow us on social media.

Wishing you all the best and thanks again,

Jacqueline Serran, M.Sc. Remedial Action Plan Coordinator Detroit River Canadian Cleanup (DRCC) 360 Fairview Avenue West, Suite 311 Essex, Ontario, N8M 1Y6 519-776-5209 x 356 serran@detroitriver.ca Www.detroitriver.ca Facebook: Detroit River Canadian Cleanup Twitter: @DetroitRiverRAP Instagram: detroitrivercanadiancleanup

APPENDIX D. Fish consumption survey brochure

OUR FISH Consumption Survey

We are currently interviewing anglers to determine which types of fish are being eaten from the Detroit River, how much Detroit River fish people eat, and who the fish is being shared with. Your input will provide valuable information to the Detroit River Canadian Cleanup (DRCC) staff to help guide future research, education and outreach, monitoring, and remediation efforts in the Detroit River watershed.

For more information, or to take the survey online visit: www.detroitriver.ca/fishsurvey



REDUCING CONTAMINANTS IN FISH

Toxins such as polychlorinated biphenyls and pesticides concentrate to the highest levels in fish with fatty flesh such as catfish. Before cooking, remove the skin, trim off the fatty areas, and discard the flesh around the belly area. You can further reduce contaminants by allowing fat to drip away during cooking (e.g., grilling, broiling or baking). If you deep fry fish, do not re-use the oil.

HOW TO TRIM AND COOK FISH TO REDUCE CONTAMINANTS



1. Remove fillet

2. Remove skin and fat along the side and belly



3. Cook on a rack or grill to let fat drip away

CONTACT US

- postmaster@detroitriver.ca
- www.detroitriver.ca



@DetroitRiverRAP







www.detroitriver.ca



WHAT IS THE DETROIT RIVER CANADIAN CLEANUP (DRCC)

The Detroit River was listed as one of 43 Areas of Concern (AOC) under the Great Lakes Water Quality Agreement in 1987. AOCs are sites around the Great Lakes where the aquatic ecosystem has been degraded due to human factors.

The DRCC is a partnership that is responsible for implementing the Detroit River Remedial Action Plan (RAP; or clean up plan) to protect, restore, and enhance the Detroit River ecosystem. The DRCC formed in 1998 to implement the RAP in collaboration with its many partners to improve the health of the Detroit River and remove it from the list of Great Lakes Area of Concern.

EATING SAFE FISH

Consult the Guide to Eating Ontario Fish to determine what kind of fish, the size of fish and the number of servings that are safe to eat.

DETROIT RIVER CONSUMPTION ADVISORIES

A consumption advisory is a recommendation to limit or even avoid eating certain fish. There is an advisory for the Detroit River due to elevated PCB and mercury levels in certain fish species.

HIGHEST QUALITY FISH (8 MEALS PER MONTH SSP)

Species	Length (cm)	Length (Inches)
Upper Detroit River	r	
Common Carp	Under 40 cm	16″
Walleye	Under 35 cm	14"
Largemouth Bass	Under 35 cm	14"
Yellow Perch	Under 25 cm	10″
Rock Bass	Under 25 cm	10"
Freshwater Drum	Under 50 cm	20"
Lower Detroit Rive	r	
Common Carp	Under 50 cm	20"
Walleye	Under 35 cm	14″
Largemouth Bass	Under 30 cm	12"
Yellow Perch	Under 30 cm	12"
Rock Bass	Under 30 cm	12"

*1 meal = 227 g (8 oz) skinless dorsal muscle **SSP= Sensitive Sub-population (Children under 15 and individuals of child bearing age)

Note: these charts were prepared for information purposes only and has not been endorsed by the Ontario Government or its staff. The information is synthesized from the Guide to Eating Ontario Sport Fish (2017/18) for the Detroit River

AVOID EATING (O MEALS PER MONTH SSP)

Species	Length (cm)	Length (Inches)
Upper Detroit River		
Walleye	Over55 cm	22"
Largemouth Bass	Over 40 cm	16"
White Perch	Over 20 cm	8"
White Bass	Over 20 cm	8"
Rock Bass	Over20 cm	8″
Carp	Over 45 cm	18″
Channel Catfish	Over 25 cm	10"
Freshwater Drum	Over 45 cm	18"
Lower Detroit River		
Walleye	Over 55 cm	22"
Yellow Perch	Over 30 cm	12"
White Perch	Over 20 cm	8"
Freshwater Drum	Over 35 cm	14″
Carp	Over 60 cm	24"

FISHING RELATED LINKS

Guide to Eating Ontario Fish: https://tinyurl.com/guideforfish

Ontario Fishing Limits and

https://tinyurl.com/ontfishregs The Detroit River is in Fisheries Management Zone 19.

TWEPI fishing guide: https://tinyurl.com/TWEPIfish

Ontario Invasive Species Angler Action Plan: https://tinyurl.com/angleractionplan

APPENDIX E. Educational literature

Infographic highlighting a visual comparison of a 4oz and 8oz fish fillet using one and two hands.





Image taken from Niagara River Remedial Action Plan, created by Paul Santos http://www.ourniagarariver.ca/fish

Fish identification flashcards created by the DRCC to support communications during in person surveys.









APPENDIX F. Volunteer shoreline interviewer of Detroit River anglers

Purpose

The Detroit River Canadian Cleanup (DRCC) is seeking volunteers to interview Detroit River shoreline anglers to obtain information about what types of fish are being caught and consumed. The information collected is required for assessing the status of the Fish and Wildlife Consumption Detroit River beneficial use, as part of the Canadian Remedial Action Plan.

Responsibilities

In pairs, volunteers will be required to walk along the Windsor riverfront to interview shoreline anglers about their fishing habits and the taste/odour of Detroit River fish. The survey is approximately 10 minutes in length. Volunteers will be responsible for returning surveys to the DRCC monthly. A brief training session will be provided.

Qualifications

- Interest in the environment and/or fishing;
- Strong interpersonal skills (outgoing, positive attitude, comfortable approaching strangers);
- Effective communication skills;
- Ability to walk long distances in all weather conditions (along the riverfront);
- Fluency in other languages (e.g., Italian, Cantonese, Mandarin, etc.) is an asset.

To Apply

To apply for this volunteer position, please contact Jackie Serran by email at postmaster@detroitriver.ca.

Time Commitment

Volunteers will be asked to interview shoreline anglers along the Windsor riverfront at least 1 day a month from July until November 2019 preferably between 8 am-12 noon and 4 pm-8 pm. Weekday and weekend volunteers are needed.

Reward/Benefit

This is an excellent opportunity to meet new people, develop communication/interpersonal skills, and add volunteer experience to your resume.

About us

The Detroit River Canadian Cleanup (DRCC) is a community-based partnership between government, industry, municipalities, environmental organizations, and citizens working together to improve the Detroit River Area of Concern (AOC) identified in the Canada-U.S. Great Lakes Water Quality Agreement. The DRCC's ultimate goal is to restore, enhance and protect the Detroit River in order to remove it from the list of Great Lakes' AOCs. For more information, please visit www.detroitriver.ca.

APPENDIX G. Fish Consumption Survey Guidelines for COVID-19

INTRODUCTION

These guidelines apply to ERCA staff that, as a key component of their job duties, need to interact with members of the public. This task involves driving to public outdoor locations along the Detroit River and interviewing individuals fishing, to see what fish they are eating.

This document is prepared utilizing guidance and best practices from various public health agencies, heath and safety associations and industry documentation. As new information emerges, this document will be updated to reflect any change in process or amended procedures and redistributed to staff as required.

This guideline provides general safety measures and therefore is not an inclusive list of all work activities. For work activities that are not covered in this guide, please review the list of guidelines available. If you have questions or concerns, please contact your Director to ensure you have the appropriate safety measures in place.

The most recent version of this document will be circulated to all staff via email and stored in S:\General Information - All Staff\Health and Safety\Covid-19 Guidelines. You can also request a copy from your Director, Human Resources or your JHSC member.

HAZARDS & SAFETY CONSIDERATION

Hazard: Biohazard

Exposure Risks:

- Close contact with another person/people
- Droplets from coughing/sneezing
- Touching potentially contaminated surfaces with your hands
- Touching your face with your hands
- Large gatherings (more than 5 people present)
- Sharing equipment/tools/desks
- People who are showing Covid-19 (flu-like) symptoms

GENERAL PRECAUTIONS:

REFER TO THE "PREVENTING EXPOSURE: GENERAL WORKPLACE GUIDANCE"

- Maintain the 2 meter/6 feet radius between each person recommendation for physical distancing
- Wash your hands often with soap and water or alcohol-based hand sanitizer. See Appendix A on how properly hand rub and hand wash.
- Avoid touching your eyes, nose or mouth.
- Avoid contact with people who are sick.

- Sneeze and cough into your sleeve.
- Avoid high-touch areas, where possible, or ensure you wash/clean your hands afterwards.
- Stay home if you are sick.

CONDUCTING FISH SURVEYS

The following procedures are developed to help protect the health and well-being of staff and members of the public during the Covid-19 pandemic, and to help maintain operations for as long as possible. Ultimately, the completion of the survey will be at the discretion of the employee, taking into consideration the Occupational Health and Safety Act.

COMMUNICATIONS WITH OTHER STAFF

There is no need for in-person communications other than training. While being trained, staff will maintain a 2 metres (6 feet) distance, be provided with a face mask, gloves, hand sanitizer and access to a sink with antibacterial soap.

Once training is complete, communications with co-workers, HR and immediate supervisors can be conduced by email, virtual meetings, texting and phone calls.

PUBLIC SURVEY MEASURES

- Prior to attending various survey sites staff are to use an ERCA vehicle, unless alternate vehicle usage is previously authorized. Please see ERCA Vehicle Guidelines for additional information. In addition, ERCA staff are to follow the schedule outlined by their immediate supervisor.
- ERCA staff will ensure the they have available the following and will wear/utilize these items prior to exiting their vehicle to conduct public surveys:
- ERCA uniform items (t-shirt, hat) to identify them as ERCA staff
- A cloth face mask and eye protection at the discretion of the employee to alleviate any personal concerns
- Hand sanitizer
- Be aware of any high-touch areas on the property (parking payment machines, railings, seating)
- Under no circumstance will the ERCA staff member initiate personal physical contact with any person or persons while conducting a survey.
- Do not shake hands; do practice safe physical distancing maintain a minimum separation distance of at least two (2) metres while interacting with others.
- If you encounter members of the public with pets, staff should not pet any animals during this time.
- If persons do not maintain a safe physical distance with the ERCA staff member, remind them to please respect physical distancing requirements and remind them that the survey is to be a contactless physically distant discussion. If a member of the public is non-compliant, the ERCA staff member will discontinue the survey and leave the area.

POST SURVEY MEASURES

- Return to vehicle and before entering vehicle, the ERCA staff member is to remove any gloves and dispose of properly to avoid touching the vehicle exterior and interior surfaces with potentially contaminated gloves. Upon vehicle re-entry, apply hand sanitizer.
- Hand sanitizer, disinfectant wipes, disposable gloves, or any other PPE are to remain stocked in each ERCA vehicle. Requests are to be made to their Director for additional stock. No masks will be stocked in the vehicles as each person will be provided with their own and should have it available to them for use at any time.
- At the earliest, the staff member should immediately wash their hands.

REFERENCES

- <u>https://ipac-canada.org/coronavirus-resources.php</u>
- <u>https://www.ontario.ca/page/resources-prevent-covid-19-workplace#section-2</u>
- <u>https://www.ihsa.ca/Urgent-Notices/COVID-19-Main.aspx</u>
- <u>https://www.pshsa.ca/covid-19</u>
- <u>https://www.ottawapublichealth.ca/en/professionals-and-</u>
 <u>partners/resources/Documents/IPAC-Templates/PPE_Procedure_ACCES.pdf</u>

APPENDIX H. DRCC fish consumption timeline, 2019 to 2022

Year	Work Plan
2019	-Researched and reviewed relevant fish consumption surveys undertaken for the Detroit
	River and other AOCs.
	-Developed draft survey questionnaire, approved by Monitoring and Research Work
	Group.
	-Inquired about translation services from the Multicultural Council of Windsor.
	-Created survey work plan.
	-Developed communications products such as digital postcards, media release,
	Created the online our ov through ESPI's Survey 122
	-Created the online survey through ESRI's Survey 123.
	survey with their networks.
	-Recruited volunteer interviewers.
	-DRCC RAP Coordinator and Assistant conducted interviews along the river in person in
	fall.
2020	-Pivoted delivery of survey to online deployment only from January to September.
	-Translated survey in Vietnamese through translation services provided by the
	Multicultural Council of Windsor and Essex County.
	-Posted survey through various community advertising channels including AM 800, CBC
	Afternoon Drive, Windsor Morning and News at 6, BizX Magazine, River Town Times,
	Essex Free Press, and the City of Windsor Fall 2020 Activity Guide.
	-Conducted in person surveys from September to December, when possible, on the
	Detroit River in accordance with public health guidelines.
	-Provide updates on results periodically to Monitoring and Research Work Group.
2021	-Continued to deploy online survey.
	-Hire the DRCC Outreach Assistant to conduct in person interviews April, May, and June
	2021
	-Input all data from in person interviews to the online survey database.
	-DRCC staff continue to collect in person survey responses at public events and along
	the river when possible.
0000	-Environment and Climate Change Canada engage with MNO to collect responses.
2022	-Closed online survey March 31, 2022
	-Compile results.
	- Write inal report.
	-Share results with the public and DRCC work groups.