Supporting Information

Assessing Fish Consumption Beneficial Use Impairment (BUI) at Great Lakes Areas of Concern: Toronto Case Study

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Running title: Toronto AOC Fish BUI Assessment

# meals/ month	Sensitive I	Population	General F	opulation
$Years \rightarrow$	1977-1994	2015-2016	1977-1994	2015-2016
Mercury (ppm)			
0	>0.5	>0.5	>1.5	>1.8
2			1.0-1.5	1.2-1.8
4		0.25-0.5	0.5-1.0	0.6-1.2
8	0-0.5	0.16-0.25	0-0.5	0.4-0.6
12		0.12-0.16		0.3-0.4
16		0.06-0.12		0.15-0.3
32		<0.06		<0.15
PCB (ppb))		·	
0	>2000	>844		>844
1		422-844	0000	422-844
2		211-422	>2000	211-422
4		105-211		105-211
8	0-2000	70-105	0-2000	70-105
12		53-70		53-70
16		26-53		26-53
32		<26		<26

Table S1. Changes in advisory benchmarks of mercury and PCB between the 1980s and 2015-16 (OMOECC, unpublished data).

Table S2. Published (2017-18) fish consumption advisories for the Toronto waterfront Area (OMOECC, 2017). Values are in meals/month, separate for the general and sensitive populations. Species with red arrow can be considered mostly non-migratory. Red boxes highlight restrictive advisories for the nonmigratory species. Superscripts 1, 2, 3 and 13 are for advisories caused by mercury, PCB, dioxin-like PCB and mirex, respectively.

	Length • Longueur	15 6"	20 8"	25 10"	30 12"	35 14"	40 16"	45 18"	50 20"	55 22"	60 24"	65 26"	70 28"	75 ⁺ cm 30 ⁺ "
	Lake Ontario 4a – Toro Secteur riverain de Tor	onto	o Wa	nter	fro	nt A	rea	۱۰L	ac C)nt	ario	4a	-	
	nearshore area from the west side	of Hu	imber lumbe	Bay Pr Bay	Park t	to the	east	side (of Ash narc A	nbrid Ashbr	ges B	ay Pa Bay	rk•z	one
→	Bluegill ^{1,2} Crapet arleguin ^{1,2}	16	6			Jeen								
->	Brown Bullhead ²	32	16	12	8	4								\square
	Brown Trout ^{2,3}	32	10	8	0	4		2			1			0
	Coho Salmon ²		12	8		4				0	0	Г		
	Common Carp ^{2,3}					2				0	0	_		
	Freshwater Drum ^{1,2} Malachigan ^{1,2}									1	F	İ	İ	
	Gizzard Shad ² Alose à gésier ²					(<u>)</u> ו	<u> </u>			F			\square
	Lake Trout ^{2,13} Truite de lac ^{2,13}				1				0	I	0	<u> </u>	1	<u> </u>
	Lake Whitefish ² Grand corégone ²			1		0)				Γ	Γ		
→	Largemouth Bass ^{1,2} Achigan à grande bouche ^{1,2}	32	6	16	2	8	8	4						
÷	Northern Pike ^{1,2} Brochet ^{1,2}				_	16	6	Ť	-		12	12	8	4
→	Pumpkinseed ¹ Crapet-soleil ¹	16 12											Ī	
	Rainbow Smelt ² Éperlan arc-en-ciel ²	1	0)										
	Rainbow Trout ²			2		1		0						
	Redhorse Sucker ²							2	1					
\rightarrow	Rock Bass ^{1,2} Crapet de roche ^{1,2}	16 16	12											
	Round Whitefish ² Ménomini rond ²	10			2	1	0	0						
	Walleye ^{1,2} Doré ^{1,2}									12	8	0	4	
	White Bass ^{1,2} Bar blanc ^{1,2}				0								Τ	
	White Perch ² Bar-perche ²	4	1									1		\square
→	White Sucker ² Meunier noir ²	16	12	8		4			2			t		\square
→	Yellow Perch ^{1,2} Perchaude ^{1,2}	32	16	6	12 4								\square	

Table S3. <u>Simulated fish consumption advisories</u> for the Toronto waterfront Area. Values are in meals/month, separate for the general and sensitive populations. <u>Only 2009 onwards collected PCB and mercury</u> measurements were considered. Non-migratory species have been highlighted in bold.

					_		Fish le	ength (cm)					
Fish type	Population	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+
Plugaill	General	16	12											
biuegiii	Sensitive	12	4											
Brown Bullhood	General	32	32	16	12	8								
biowii builleau	Sensitive	32	32	16	12	8								
Prown Trout	General		12	8	4	4	2	2	1	1	1	1		
BIOWITHOUL	Sensitive		12	8	4	4	0	0	0	0	0	0		
Common Corn	General						0	0	0	0	0	0	0	0
common carp	Sensitive						0	0	0	0	0	0	0	0
Frachwatar Drum	General								1	1				
Fleshwater Dium	Sensitive								0	0				
Largementh Rocc	General	16	16	12	12	12	8	8						
Largemouth bass	Sensitive	16	16	12	8	4	4	0						
Northorn Biko	General		16	16	16	16	12	12	8	8	8	8	8	4
Northern Pike	Sensitive		16	16	16	16	12	12	8	8	8	8	8	4
Padharsa Suckar	General							2	1					
Reunoise Sucker	Sensitive							0	0					
Pock Bass	General	16	12											
NUCK Dass	Sensitive	16	12											
White Sucker	General	16	12	8	4	4	4	2	2	2				
white Sucker	Sensitive	16	12	8	4	4	4	0	0	0				
Vellow Perch	General	32	16	16										
I EIIUW FEICH	Sensitive	16	16	16										

Table S4. Comparison of <u>simulated PCB related advisories</u> for the <u>sensitive population</u>. Toronto AOC advisories: Green, "unrestricted"; yellow, similar to ref sites; red, more restrictive than ref sites

Sp	Location \downarrow Length (cm) \rightarrow	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+
gill	02a - Jordan Harbour	16												
Blue	04a - Toronto Waterfront Area	16	12											
	01a - Upper Niagara River			16										
	02a - Jordan Harbour	16	12	8	8									
	02z - Martindale Pond			8	8									
ad	04 - Toronto Offshore Area		12	12	12									
lhe	04a - Toronto Waterfront Area			16	12	8								
Bul	06 - Northwestern Lake Ontario		0											
Ň	06a - Frenchman Bay		12	12	8	8								
Bro	06v - Lynde Creek Marsh	8	4											
	06w - Oshawa Harbour		8	8	8									
	06y - Westside Marsh		12	12	12									
	10 - Middle B of Q	16	16	12	8									
	01a - Upper Niagara River							4	4	4	4	4	4	4
	02a - Jordan Harbour				16	12	12	8	8	4	4	4		
_	02z - Martindale Pond							4	4	0	0	0	0	0
arp	04 - Toronto Offshore Area					12	8	4	4	0	0	0	0	0
u U	04a - Toronto Waterfront Area						0	0	0	0	0	0	0	0
ũ	05z - Rattray Marsh						16	8	4	4	4	0		
L D	06a - Frenchman Bay							0	0	0	0	0	0	0
0	06v - Lynde Creek Marsh									0	0	0	0	0
	06w - Oshawa Harbour			16	12	8	4	4	4	0	0	0	0	
	06x - McLaughlin Bay							4	4	4	4	4	4	4
ţ	01a - Upper Niagara River				16	16	8	4						
nou	02a - Jordan Harbour		16	16	16	16	16							
gen	04a - Toronto Waterfront Area	16	16	12	12	12	12	8						
Lan	06a - Frenchman Bay	16	16	16	16	16								
	02z - Martindale Pond								8	4	4	4		
ike	04 - Toronto Offshore Area			8	8	8	8	8	8	8	8	8	8	8
L L	04a - Toronto Waterfront Area		16	16	16	16	12	12	8	8	8	8	8	4
the	06x - McLaughlin Bay								8	8	8	8	8	8
- P	06z - Bowmanville Creek Marsh							16	12	8	8	4	4	
_	11 - L B of Q/ELO								16	16	16	16	16	16
SS	01a - Upper Niagara River	16	16											
Ba	04 - Toronto Offshore Area	16												
Š	04a - Toronto Waterfront Area	16	12											
R	08 - Northeastern Lake Ontario	16	16											
	01a - Upper Niagara River		16	16	12	8	8	4						
er	02z - Martindale Pond					12								
nck	04 - Toronto Offshore Area	16	12	12	8	8	4	4	4	4				
e S	04a - Toronto Waterfront Area	16	12	8	4	4	4	0	0	0				
/hit	06 - Northwestern Lake Ontario		16	16	16	12	12	12						
<	06a - Frenchman Bay		16	16	12	8	4	4						
	06z - Bowmanville Creek Marsh						4							
	01a - Upper Niagara River		16	16	16									
ъ	04a - Toronto Waterfront Area	32	16	16										
Pen	06a - Frenchman Bay	16	16	16										
Ň	06v - Lynde Creek Marsh	16												
ellc	06z - Bowmanville Creek Marsh	16	16											
∽	08 - Northeastern Lake Ontario	16	16											
	10 - Middle B of Q	16	16	16										

Table S5. Comparison of <u>simulated mercury related advisories</u> for the <u>general population</u>. Toronto AOC advisories: Green, "unrestricted"; yellow, similar to ref sites; red, more restrictive than ref sites.

Sp	Location \downarrow Length (cm) \rightarrow	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+
Ι	02a - Jordan Harbour	12												
egi	02z - Martindale Pond	32												
3Iu	04a - Toronto Waterfront Area	32	12											
	10 - Middle B of Q	32												
	01a - Upper Niagara River		32	32										
	02a - Jordan Harbour	32	32	32	16									
	02z - Martindale Pond			32	32									
ad	04 - Toronto Offshore Area		32	32	32									
he	04a - Toronto Waterfront Area	32	32	32	32	32								
Ing.	06 - Northwestern Lake Ontario		16											
n B	06a - Frenchman Bay		32	32	16	16								
Š	06v - Lynde Creek Marsh	32	32											
ä	06w - Oshawa Harbour	32	32	32	16									
	06x - McLaughlin Bay		16											
	06y - Westside Marsh	32	32	32	32									
	10 - Middle B of Q	32	32	32	16									
	01a - Upper Niagara River							32	32	32	32	32	16	16
	02a - Jordan Harbour				32	32	32	32	32	16	16	16		
	02z - Martindale Pond							32	32	16	16	16	12	4
đ	04 - Toronto Offshore Area					32	32	32	32	32	32	32	16	8
ő	04a - Toronto Waterfront Area						32	32	32	32	32	32	32	16
۶,	05z - Rattray Marsh						32	32	32	32	32	16		
Ē	06a - Frenchman Bay							32	32	32	32	32	32	16
ō	06v - Lynde Creek Marsh									16	16	16	16	16
	06w - Oshawa Harbour	32	32	32	32	32	32	32	32	16	16	16	16	
	06x - McLaughlin Bay							32	32	32	32	16	16	4
	06y - Westside Marsh	32	32	32	32	32	32	32	32	32				
	01a - Upper Niagara River				16	16	8	4						
SS	02a - Jordan Harbour		32	32	16	16	12							
Ba	02z - Martindale Pond			32	16	12	4							
f	04a - Toronto Waterfront Area	32	32	32	16	12	8	8						
0 u	06a - Frenchman Bay	32	32	32	32	16								
ger	06x - McLaughlin Bay	32	32	32	32	32	16							
Lan	06v - Westside Marsh	32	32	32	16	16								
-	10 - Middle B of Q	52	32	16	16	8								
	02z - Martindale Pond		52	10	10	32	32	32	16	16	16	12		
	04 - Toronto Offshore Area			32	32	32	32	32	32	16	16	16	16	12
	04a - Toronto Waterfront Area		32	32	22	22	22	22	22	10	22	10	10	12
ω.								- 37	- 37	- 32	- 37	16	10	
I≚	06a - Frenchman Bay		52	32	32	32	32	32	32	32	32	16	16	12
'n Pik	06a - Frenchman Bay 06w - Oshawa Harbour		32	32	32	32	32	32 32 16	32 32 16	32 32 16	32 32 16	16	16	12
hern Pik	06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay		32	32	32	32	32 16	32 32 16	32 32 16 32	32 32 16 32	32 32 16 32	16 16 32	16 16 32	12
orthern Pik	06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06v - Westside Marsh		32	32	32	32	32 32 16	32 32 16	32 32 16 32	32 32 16 32 16	32 32 16 32 16	16 16 32	16 16 32	12 32
Northern Pik	06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Marsh		32	32	32	32	32 16	32 32 16	32 32 16 32	32 32 16 32 16 16	32 16 32 16 16	16 16 32	16 16 32	12 32
Northern Pik	06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Marsh 10 - Middle B of O		32	32	32	32	32 16	32 32 16 16 16	32 32 16 32 16 16	32 32 16 32 16 16 16	32 16 32 16 16 16	16 32 16 16	16 16 32 12 16	12 32 8
Northern Pik	06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Marsh 10 - Middle B of Q 11 - L B of Q/ELO		32	32	32	32	32	32 16 16 16	32 32 16 32 16 16 16 16	32 32 16 32 16 16 16 16	32 16 32 16 16 16 16 16	16 16 32 16 16 16	16 16 32 12 16 8	12 32 8 4
Northern Pik	06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Marsh 10 - Middle B of Q 11 - L B of Q/ELO 01a - Unger Niagara River	32	32	32	32	32	32 16	32 16 16 16	32 32 16 32 16 16 16 16	32 32 16 32 16 16 16 16 16	32 16 32 16 16 16 16 12	16 32 16 16 16 12	16 16 32 12 16 8	12 32 8 4
Northern Pik	06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Marsh 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond	32	32 32 16 4	32	32	32	32 16	32 32 16 16 16	32 32 16 32 16 16 16	32 32 16 32 16 16 16 16	32 32 16 32 16 16 16 16 12	16 16 32 16 16 12	16 32 12 16 8	12 32 8 4
ass Northern Pik	06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Marsh 10 - Middle B of Q 111 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area	32 16 32	32 32 16 4	32	32	32	32 32 16	32 32 16 16 16	32 32 16 32 16 16 16	32 32 16 32 16 16 16 16	32 32 16 32 16 16 16 12	16 16 32 16 16 12	16 16 32 12 16 8	12 32 8 4
k Bass Northern Pik	06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Marsh 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04a - Toronto Offshore Area 04a - Toronto Waterfront Area	32 16 32 32	32 32 16 4	32	32	32	32 16	32 32 16 16 16	32 32 16 32 16 16 16	32 32 16 32 16 16 16 16	32 32 16 32 16 16 16 12	16 16 32 16 16 12	10 16 32 12 16 8	12 32 8 4
ock Bass Northern Pik	06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Marsh 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Waterfront Area 08 - Northeastern Lake Ontario	32 16 32 32	32 32 16 4 32	32	32	32	32 32 16	32 32 16 16 16	32 32 16 32 16 16 16 16	32 32 16 32 16 16 16 16	32 32 16 32 16 16 16 16 12	16 16 32 16 16 12	10 16 32 12 16 8	12 32 8 4
Rock Bass Northern Pik	06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Marsh 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Waterfront Area 08 - Northeastern Lake Ontario 10 - Middle B of Q	32 16 32 32 32 32	32 32 16 4 16 12	32	32	32	32 32 16	32 32 16 16 16	32 32 16 32 16 16 16 16	32 32 16 32 16 16 16 16	32 32 16 32 16 16 16 16 12	16 16 16 16 16 12	16 32 12 16 8	12 32 8 4
Rock Bass Northern Pik	06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Marsh 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Waterfront Area 08 - Northeastern Lake Ontario 10 - Middle B of Q 11 - L B of Q/ELO	32 16 32 32 32 16 32	32 32 16 4 16 12 16	32	32	32	32 32 16	32 32 16 16 16	32 32 16 32 16 16 16	32 32 16 32 16 16 16 16	32 32 16 32 16 16 16 16 12	16 16 32 16 16 12	16 32 12 16 8	12 32 8 4
Rock Bass Northern Pik	06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Marsh 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Waterfront Area 08 - Northeastern Lake Ontario 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River	32 16 32 32 32 16 32	32 32 16 4 16 12 16 32	32	32	32	32 16	32 32 16 16 16 16	32 32 16 32 16 16 16	32 32 16 32 16 16 16 16	32 32 16 32 16 16 16 12	16 16 32 16 16 12	16 16 32 12 16 8	12 32 8 4
Rock Bass Northern Pik	06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Marsh 10 - Middle B of Q 111 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04a - Toronto Offshore Area 04a - Toronto Waterfront Area 08 - Northeastern Lake Ontario 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond	32 16 32 32 16 32 32 16 32	32 32 16 4 16 12 16 32	32	32	32	32 16 	32 32 16 16 16 16 32	32 32 16 32 16 16 16 16	32 32 16 32 16 16 16 16	32 32 16 32 16 16 16 12	16 16 32 16 16 12	16 32 12 16 8	12 32 8 4
ker Rock Bass Northern Pik	06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Marsh 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Waterfront Area 08 - Northeastern Lake Ontario 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area	32 16 32 32 32 16 32	32 32 16 4 16 12 16 32 32	32	32	32 32 32 32 16 32	32 16 32 32 32 32	32 32 16 16 16 16 16 16 32 32	32 32 16 32 16 16 16 16	32 32 16 32 16 16 16 16	32 32 16 32 16 16 16 16 12	16 16 32 16 16 12	16 16 32 12 16 8	12 32 8 4
ucker Rock Bass Northern Pik	06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Marsh 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Waterfront Area 01a - Upper Niagara River 02 - Martindale Pond 01 - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Offshore Area 04a - Toronto Offshore Area	32 16 32 32 32 16 32	32 32 16 4 16 12 16 32 32 32 32	32	32	32 32 32 32 32 16 32 32	32 16 32 16 32 32 32	32 32 16 16 16 16 16 16 32 32 32 32	32 32 16 32 16 16 16 16 16	32 32 16 32 16 16 16 16 16	32 32 16 32 16 16 16 16 12	16 32 16 16 16 12	16 16 32 12 16 8	12 32 8 4
e Sucker Rock Bass Northern Pik	06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Marsh 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Waterfront Area 08 - Northeastern Lake Ontario 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Offshore Area 04a - Toronto Offshore Area 04a - Toronto Waterfront Area 06a - Northwestern Lake Ontario	32 16 32 32 32 16 32 32	32 32 16 4 16 12 16 32 32 32 32 32	32 32 32 32 32 32 32 32	32 32 32 32 32 32 32 32	32 32 32 32 32 16 32 32 32	32 16 32 16 32 32 32 32 32 32	32 32 16 16 16 16 32 32 32 32 32	32 32 16 32 16 16 16 16 16 16 16 16	32 32 16 16 16 16 16 16 16 16 16 16	32 32 16 16 16 16 12	16 32 16 16 16 12	16 32 12 16 8	12 32 8 4
hite Sucker Rock Bass Northern Pik	06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Marsh 10 - Middle B of Q 111 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Waterfront Area 08 - Northeastern Lake Ontario 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Offshore Area 04a - Toronto Materfront Area 06a - Frenchman Bay	32 16 32 32 32 16 32 32	32 32 16 12 16 32 32 32 32 32 32	32 32 32 32 32 32 32 32 32 32	32 32 32 32 32 32 32 32 32 32	32 32 32 32 32 32 16 32 32 32 32 32	32 16 32 16 32 32 32 32 32 32 32 32	32 32 16 16 16 16 16 32 32 32 32 32 32 32 32	32 32 16 16 16 16 16 16 16 16	32 32 16 32 16 16 16 16 16 16 16	32 32 16 32 16 16 16 12	16 16 16 16 16 12 	10 16 32 12 16 8	12 32 8 4
White Sucker Rock Bass Northern Pik	06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Marsh 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Ufshore Area 04a - Toronto Waterfront Area 08 - Northeastern Lake Ontario 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Offshore Area 04a - Toronto Utaterfront Area 06a - Northwestern Lake Ontario 06a - Frenchman Bay 06w - Oshawa Harbour	32 16 32 32 32 16 32 32 16 32 32 32	32 32 16 12 16 32 32 32 32 32 32	32 32 32 32 32 32 32 32 32 32 32 16	32 32 32 32 32 32 32 32 32	32 32 32 32 32 16 32 32 32 32	32 32 16 32 32 32 32 32 32 32	32 32 16 16 16 16 16 32 32 32 32 32 32	32 32 16 32 16 16 16 16 16 16 16	32 32 16 32 16 16 16 16 16 16 16	32 32 16 32 16 16 16 16 12	16 16 32 16 16 16 12	10 16 32 12 16 8	12 32 8 4
White Sucker Rock Bass Northern Pik	06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Marsh 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Waterfront Area 08 - Northeastern Lake Ontario 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Offshore Area 06a - Frenchman Bay 06w - Oshawa Harbour 067 - Bowmanville Creek Marsh	32 16 32 32 32 16 32 32 16 32	32 32 16 4 32 16 12 16 32 32 32 32 32 32	32 32 32 32 32 32 32 32 32 32 16	32 32 32 32 32 32 32 32 32	32 32 32 32 32 32 32 32 32	32 32 16 	32 32 16 16 16 16 16 32 32 32 32 16 32	32 32 16 32 16 16 16 16 16	32 32 16 32 16 16 16 16 16 16 16	32 16 32 16 16 16 16 12	16 16 32 16 16 16 12	10 16 32 12 16 8	12 32 8 4
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White Sucker Rock Bass Northern Pik	06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06g - Bowmanville Creek Marsh 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Waterfront Area 08 - Northeastern Lake Ontario 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Waterfront Area 06a - Northwestern Lake Ontario 06a - Frenchman Bay 06w - Oshawa Harbour 06z - Bowmanville Creek Marsh 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area	32 16 32 32 32 32 32 32 32 32 32 32	32 32 16 4 32 16 32 32 32 32 32 32 32 32 16	32 32 32 32 32 32 32 32 32 16 16 16	32 32 32 32 32 32 32 32 32 16	32 32 32 32 32 16 32 32 32 32	32 32 16 32 32 32 32 32 32 32 32 8	32 32 16 16 16 16 32 32 32 32 32 16 32	32 16 32 16 16 16 16 16	32 32 16 32 16 16 16 16 16 16 16	32 16 32 16 16 16 16 12	16 16 32 16 16 12	16 16 32 12 16 8	12 32 8 4
White Sucker Rock Bass Northern Pik	06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Marsh 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Uffshore Area 04a - Toronto Waterfront Area 08 - Northeastern Lake Ontario 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Uffshore Area 06a - Frenchman Bay 06w - Oshawa Harbour 06a - Frenchman Bay 06w - Oshawa Harbour 06a - Sowmanville Creek Marsh 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 06z - Bowmanville Creek Marsh 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area	32 16 32 32 32 32 32 32 32 32 32 32 32	32 32 32 32 32 16 32 32 32 32 32 32 32 32 32 32 32 32 32	32 32 32 32 32 32 32 32 32 32 16 16 16	32 32 32 32 32 32 32 32 32 32 16	32 32 32 32 32 32 32 32 32	32 16 32 16 32 32 32 32 32 32 32 32 32 8	32 16 16 16 16 32 32 32 32 32 16 32	32 16 32 16 16 16 16 16 16 16	32 32 16 32 16 16 16 16 16 16	32 16 32 16 16 16 16 16 12		10 16 32 12 16 8	12 32 8 4
White Sucker Rock Bass Northern Pik	06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Marsh 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Waterfront Area 08 - Northeastern Lake Ontario 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 06a - Northwestern Lake Ontario 06a - Frenchman Bay 06w - Oshawa Harbour 06z - Bowmanville Creek Marsh 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 06a - Toronto Offshore Area 06a - Toronto Offshore Area 06a - Toronto Offshore Area 06a - Toronto Offshore Area 06a - Toronto Offshore Area 06a - Toronto Offshore Area 06a - Toronto Waterfront Area 06a - Northwestern Lake Ontario	32 16 32 32 32 32 32 32 32 32 32 32 32 32 32	32 32 16 4 32 16 32 32 32 32 32 32 32 32 32 32 32 32 32	32 32 32 32 32 32 32 32 32 16 16 16 16 32	32 32 32 32 32 32 32 32 32 16	32 32 32 32 16 32 32 32 32	32 16 32 16 32 32 32 32 32 32 32 32 32	32 32 16 16 16 16 16 16 16 32 32 32 32 32 32 32 32	32 16 32 16 16 16 16 16 16	32 32 16 32 16 16 16 16 16 16 16	32 32 16 32 16 16 16 16 12		16 16 32 12 16 8 	
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Yellow Perch White Sucker Rock Bass Northern Pik	06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Marsh 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Waterfront Area 08 - Northeastern Lake Ontario 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Offshore Area 04a - Toronto Offshore Area 04a - Toronto Waterfront Area 06a - Northwestern Lake Ontario 06a - Frenchman Bay 06w - Oshawa Harbour 06z - Bowmanville Creek Marsh 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Offshore Area 04a - Toronto Offshore Area 04a - Toronto Offshore Area 04a - Toronto Offshore Area 04a - Toronto Waterfront Area 06 - Northwestern Lake Ontario 06a - Frenchman Bay 06w - Uphe Creek Marsh 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06y - Westside Marsh	32 16 32 32 32 32 32 32 32 32 32 32 32 32 32	32 32 16 4 32 16 12 16 32 32 32 32 32 32 32 32 32 32	32 32 32 32 32 32 32 32 32 32 16 16 16 16 16 32 32	32 32 32 32 32 32 32 32 32 32 32	32 32 32 32 16 32 32 32 32 32	32 32 16 32 32 32 32 32 32 32 32 32 32 32 32	32 32 16 16 16 16 16 32 32 32 32 32 32 16 32	32 16 32 16 16 16 16 16	32 32 16 32 16 16 16 16 16 16 16 16 16 16	32 16 32 16 16 16 16 12			
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Table S6. Comparison of simulated mercury related advisories for the <u>sensitive population</u>. Toronto AOC advisories: Green, "unrestricted"; yellow, similar to ref sites; red, more restrictive than ref sites

	Location ↓ 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+
=	02a - Jordan Harbour	4												
Bi	02z - Martindale Pond	16												
2 n	04a - Toronto Waterfront Area	12	4											
-	10 - Middle B of Q	16												
	01a - Upper Niagara River		16	16										
	02a - Jordan Harbour	32	16	12	8									
	02z - Martindale Pond			16	16									
σ	04 - Toronto Offshore Area		32	32	16									
lea	04a - Toronto Waterfront Area	32	32	16	16	12								
Ę	06 - Northwestern Lake Ontari	0	8	10										
B	06a - Frenchman Bay		16	16	12	0								
Ň	06y - Lynde Creek Marsh	16	16	10	12	0								
5 E	06w Oshawa Harbour	22	22	16	0									
		32	32	10	ð									
	Obx - Michaela Marsh		8		40									
	Uby - Westside Marsh	32	16	16	12									
	10 - Middle B of Q	32	16	12	8									
	01a - Upper Niagara River							16	16	12	12	12	8	8
	02a - Jordan Harbour				32	32	16	16	12	8	8	4		
_	02z - Martindale Pond							16	12	8	8	4	4	0
arp	04 - Toronto Offshore Area					32	32	32	16	16	16	12	8	4
ű	04a - Toronto Waterfront Area						32	32	16	16	16	16	12	8
ğ	05z - Rattray Marsh						32	16	16	16	12	12		
١	06a - Frenchman Bay							16	16	16	16	16	12	12
ð	06v - Lynde Creek Marsh									8	8	8	8	8
1	06w - Oshawa Harbour	22	37	16	16	16	16	12	12	8	8	8	8	_
	06x - McLaughlin Bay	52	52	10	10	10	10	22	16	16	12	8	8	0
	06v - Westside Marsh	27	37	27	27	27	16	16	16	16	14	0	0	5
-	01a - Unner Niagara Piyor	32	52	52	<u>۲</u>	52	10	10	10	10		-		-
s		_	45	42	8	4	4	U						
3as	U2a - Jordan Harbour	_	16	12	8	4	4							
Ч	02z - Martindale Pond			16	8	4	0							
d l	04a - Toronto Waterfront Area	32	16	12	8	4	4	0						
Ĕ	06a - Frenchman Bay	32	16	16	12	8								
Be Be	06x - McLaughlin Bay	32	32	32	16	16	12							
Lai	06y - Westside Marsh	32	16	12	8	4								
	10 - Middle B of Q		16	8	4	4								
	02z - Martindale Pond					16	16	12	8	8	4	4		
	04 - Toronto Offshore Area													
				32	16	16	16	16	12	12	8	8	8	4
	04a - Toronto Waterfront Area	_	32	32	16	16	16	16	12	12	8	8	8	4
ike	04 - Toronto Waterfront Area		32	32 32	16 32	16 16	16 16	16 16	12 16	12 12	8 12	8 8 8	8 8 8	4 4
n Pike	04a - Toronto Waterfront Area 06a - Frenchman Bay		32	32 32	16 32	16 16	16 16 16	16 16 16	12 16 16	12 12 12	8 12 12	8 8 8	8 8 8	4 4 4
ern Pike	04 - Toronto Waterfront Area 06a - Frenchman Bay 06w - Oshawa Harbour		32 16	32 32 16	16 32 16	16 16 12	16 16 16 12	16 16 8	12 16 16 8	12 12 12 8	8 12 12 4	8 8 8	8 8 8	4 4 4
rthern Pike	04a - Toronto Waterfront Area 06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay		32 16	32 32 16	16 32 16	16 16 12	16 16 16 12	16 16 8	12 16 16 8 32	12 12 12 8 32	8 12 12 4 32	8 8 32	8 8 32	4 4 32
Northern Pike	04a - Toronto Waterfront Area 06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh		32 16	32 32 16	16 32 16	16 16 12	16 16 12	16 16 8	12 16 16 8 32	12 12 12 8 32 8	8 12 4 32 4	8 8 32	8 8 32	4 4 32
Northern Pike	04a - Toronto Waterfront Area 06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Mars	1	32 16	32 32 16	16 32 16	16 16 12	16 16 16 12	16 16 8 8	12 16 8 32 8	12 12 8 32 8 8 8	8 12 4 32 4 4	8 8 32 4	8 8 32 4	4 4 32
Northern Pike	04a - Toronto Waterfront Area 06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Mars 10 - Middle B of Q	1 1	32 16	32 32 16	16 32 16	16 16 12	16 16 16 12	16 16 8 8 8 8	12 16 8 32 8 8 8	12 12 8 32 8 8 8 8 8	8 12 4 32 4 4 4 8	8 8 32 4 4	8 8 32 4 4	4 4 32 4
Northern Pike	04a - Toronto Waterfront Area 06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Mars 10 - Middle B of Q 11 - L B of Q/ELO	1 1	32	32 32 16	16 32 16	16 16 12	16 16 12	16 16 8 8 8 8 8	12 16 8 32 8 8 8 8	12 12 12 8 32 8 8 8 8 8 8 8 4	8 12 4 32 4 4 4 8 8 4	8 8 32 4 4 4	8 8 32 4 4 4	4 4 32 4 0
Northern Pike	04a - Toronto Waterfront Area 06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Mars 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River	1 1 12	32 16	32 32 16	16 32 16	16 16 12	16 16 16 12	16 16 8 8 8 8	12 16 8 32 8 8 8 8	12 12 12 8 32 8 8 8 8 8 8 8 4	8 12 4 32 4 4 8 8 4	8 8 32 4 4 4	8 8 32 4 4 4	4 4 32 4 0
s Northern Pike	04a - Toronto Waterfront Area 06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Mars 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond	12 4	32 16 8 0	32 32 16	16 32 16	16 16 12	16 16 16 12	16 16 8 8 8 8	12 16 8 32 8 8 8 8 8	12 12 8 32 8 8 8 8 8 8 4	8 12 4 32 4 4 8 4	8 8 32 4 4 4	8 8 32 4 4 4	4 4 32 4 0
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k Bass Northern Pike	04a - Toronto Waterfront Area 06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Mars 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Waterfront Area	12 4 16 16	32 16 8 0	32 32 16	16 32 16	16 16 12	16 16 12	16 16 8 8 8 8	12 16 8 32 8 8 8 8	12 12 8 32 8 8 8 8 8 4	8 12 4 32 4 4 8 4	8 8 32 4 4 4	8 8 32 4 4 4	4 4 32 4 0
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Rock Bass Northern Pike	04a - Toronto Waterfront Area 06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Mars 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Materfront Area 08 - Northeastern Lake Ontario 10 - Middle B of Q	12 4 16 16 12 8	32 16 8 0 16 8 4	32 32 16	16 32 16	16 16 12	16 16 16 12	16 16 8 8 8	12 16 8 32 8 8 8 8 10 10 10 10 10 10 10 10 10 10	12 12 8 32 8 8 8 8 4	8 12 4 32 4 4 8 4	8 8 32 4 4 4	8 8 32 4 4 4	4 4 32 4 0
Rock Bass Northern Pike	04a - Toronto Waterfront Area 06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Mars 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Waterfront Area 08 - Northeastern Lake Ontario 10 - Middle B of Q 11 - L B of Q/ELO	12 4 16 16 16 12 8 8 12	32 16 8 0 16 8 4 8	32 32 16	16 32 16	16 16 12	16 16 12	16 16 8 8 8	12 16 8 32 8 8 8 8 10 10 10 10 10 10 10 10 10 10	12 12 8 32 8 8 8 8 4	8 12 4 32 4 4 8 4	8 8 32 4 4 4	8 8 32 4 4 4	4 4 32 4 0
Rock Bass Northern Pike	04a - Toronto Waterfront Area 06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Mars 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Waterfront Area 08a - Northeastern Lake Ontario 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River	12 4 16 16 12 8 12	32 16 8 0 16 8 4 8 4 8 32	32 32 16	16 32 16	16 16 12	16 16 12	16 16 8 8 8 8	12 16 8 32 8 8 8 8 10 10 10 10 10 10 10 10 10 10	12 12 8 32 8 8 8 8 4	8 12 4 32 4 4 8 4	8 8 32 4 4 4	8 8 32 4 4 4	4 4 32 4 0
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ker Rock Bass Northern Pike	04a - Toronto Waterfront Area 06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Mars 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 08 - Northeastern Lake Ontario 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04 - Toronto Offshore Area	12 4 16 16 12 8 12	32 16 8 0 16 8 4 32 32	32 32 16 16	16 32 16 16	16 16 12 12	16 16 12 12	16 16 8 8 8 8 16 12	12 16 8 32 8 8 8 8 	12 12 8 32 8 8 8 8 4	8 12 4 32 4 8 4 4	8 8 32 4 4 4 4	8 8 32 4 4 4	4 4 32 4 0
ucker Rock Bass Northern Pike	04a - Toronto Waterfront Area 06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Mars 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Waterfront Area 08 - Northeastern Lake Ontario 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Offshore Area 04a - Toronto Offshore Area	12 4 16 16 12 8 12 8 12	32 16 8 0 16 8 4 8 32 32 32	32 32 16 16 32	16 32 16 16 16 16	16 16 12 12	16 16 12 12 16 16	16 16 8 8 8 8 16 12 12	12 16 8 32 8 8 8 8 8 8 8 12 12 9	12 12 8 32 8 8 8 4 4 	8 12 4 32 4 4 8 4 4 8 4	8 8 32 4 4 4 4	8 8 32 4 4 4 4	4 4 32 4 0
e Sucker Rock Bass Northern Pike	04a - Toronto Waterfront Area 06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Mars 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Waterfront Area 08 - Northeastern Lake Ontario 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Offshore Area 04a - Toronto Offshore Area 04a - Toronto Offshore Area 04a - Toronto Materfront Area 04a - Toronto Waterfront Area	12 4 16 16 16 12 8 12 8 12 8	32 16 8 0 16 8 4 4 8 32 32 32 32	32 32 16 16 32 16 32	16 32 16 16 16 16 16 16	16 16 12 12	16 16 16 12 12 10 16 16 16 12	16 16 16 8 8 8 8 8 16 16 12 12 12	12 16 8 32 8 8 8 8 8 8 8 12 12 8	12 12 8 32 8 8 8 4 	8 12 4 32 4 4 8 4 4 8 4	8 8 32 4 4 4 4 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	8 8 32 4 4 4 4 4 9 9 9 9 9 9 9 9 9 9 9 9 9 9	4 4 32 4 0
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White Sucker Rock Bass Northern Pike	04a - Toronto Waterfront Area 06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Mars 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Waterfront Area 08 - Northeastern Lake Ontario 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Offshore Area 04a - Toronto Waterfront Area 06a - Frenchman Bay 06w Ochawa Undergen	12 4 16 16 12 8 12 12 8 12 12 8 0 12	32 16 8 0 16 8 4 4 8 32 32 32 32 32 32	32 32 16 	16 32 16 16 16 16 16 32	16 16 12 12 12 12 16 8 16 16 16 16	16 16 16 12 10 10 16 12 16 12 16	16 16 16 8 8 8 8 8 10 12 12 12 12	12 16 16 8 32 8 8 8 8 8 8 1 1 12 8 12 8	12 12 12 8 32 8 8 8 8 4 	8 12 12 4 32 4 4 8 4	8 8 32 4 4 4 4 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	8 8 8 32 4 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	4 4 32 4 0
White Sucker Rock Bass Northern Pike	04a - Toronto Waterfront Area 06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Mars 10 - Middle B of Q 11 - L B of Q/ELO 01a - Toronto Waterfront Area 04a - Toronto Offshore Area 04a - Toronto Waterfront Area 04a - Toronto Offshore Area 04a - Toronto Offshore Area 04a - Toronto Offshore Area 04a - Toronto Offshore Area 05a - Northeastern Lake Ontaric 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 06a - Toronto Waterfront Area 06a - Frenchman Bay 06w - Oshawa Harbour 06a - Frenchman Bay 06w - Oshawa Harbour	12 4 16 16 12 8 12 8 12 32	32 16 8 0 16 8 4 4 8 32 32 32 32 32	32 32 16 16 30 16 32 32 32 32 8	16 32 16 16 16 16 16 32	16 16 12 12 12 12 16 8 16 16 16 16	16 16 12 12 10 16 16 12 12 16	16 16 16 8 8 8 8 8 8 16 12 12 12 12 12	12 16 16 8 32 8 8 8 8 8 8 8 8 8 8 8 8 8	12 12 12 8 32 8 8 8 8 4 4	8 12 4 32 4 4 8 4 4 8 4	8 8 32 4 4 4 4 4 9 9 9 9 9 9 9 9 9 9 9 9 9 9	8 8 8 32 4 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	4 4 32 4 0
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White Sucker Rock Bass Northern Pike	04a - Toronto Waterfront Area 06a - Frenchman Bay 06w - Oshawa Harbour 06x - McLaughlin Bay 06y - Westside Marsh 06z - Bowmanville Creek Mars 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Waterfront Area 08 - Northeastern Lake Ontaric 10 - Middle B of Q 11 - L B of Q/ELO 01a - Upper Niagara River 02z - Martindale Pond 04 - Toronto Offshore Area 04a - Toronto Waterfront Area 05 - Northwatern Lake Ontaric 01 - Upper Niagara River 02z - Martindale Pond 04 - Toronto Waterfront Area 06 - Northwestern Lake Ontari 06 - Northwestern Lake Ontari 06 - Sowmanville Creek Mars 06w - Oshawa Harbour 06z - Bowmanville Creek Mars 01a - Upper Niagara River	12 4 16 16 12 8 8 12 8 12 8 12 9 12 8 8 12 12 12 12 12 12 12 12 12 12 12 12 12	32 16 8 0 16 8 4 4 8 32 32 32 32 32 32 32 12	32 32 16 16 32 16 32 32 32 32 32 8 8	16 32 16 16 16 16 16 32 8	16 16 12 12 12 12 16 8 16 16 16 16	16 16 12 12 16 16 16 12 16 16 12 12 16 4	16 16 16 8 8 8 8 8 8 16 12 12 12 12 12	12 16 16 8 32 8 8 8 8 8 8 8 8 8 8 8 8 8	12 12 12 8 32 8 8 8 8 8 4 	8 12 12 4 32 4 4 8 4 4 8 4 4	8 8 8 32 4 4 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	8 8 8 32 4 4 4 4	4 4 32 4 0
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Figure S1. Temporal trends of PCB in fish from the Toronto waterfront (LO4a) between 1972 and 2012 for (a) Brown Trout, (b) Common Carp, (c) Northern Pike, and (e) White Sucker. Sen's Slope estimates are indicated by a solid regression line when the trend is significant (p<0.05) and indicated by a dashed line when trend is not significant (p<0.1). Any Sen's Slope estimates with p>0.1 are not indicated in the Figure. The Ontario PCB consumption advisory benchmarks are indicated with horizontal dashed lines. Majority of the results taken from Robinson et al. (2015).



Figure S2. Temporal trends of mercury in fish from the Toronto Waterfront (LO4a) between 1972 and 2012 for (a) Brown Bullhead, (b) Common Carp, (c) Northern Pike, (d) Rainbow Smelt, (e) White Sucker, and (f) Yellow Perch. Sen's Slope estimates are indicated by a solid regression line when the trend is significant (p<0.05) and indicated by a dashed line when trend is not significant (p<0.1). Any Sen's Slope estimates with p>0.1 are not indicated in the Figure. The Ontario consumption advisory benchmarks for mercury are indicated with horizontal dashed lines. The figure taken from Robinson et al. (2015).





Figure S3. Map of Lake Ontario tributaries in the GTA monitored for fish contaminant levels: Etobicoke Creek, Mimico Creek, Humber River, Don River and Rouge River. Yellow points indicate sites where forage fish have been collected and analyzed at least once since the 1970s.



Figure S4. Temporal trends in PCB in forage ¬fish from five Lake Ontario tributaries in the GTA. Split panels were used for the Humber and Don Rivers due to large variance in PCB concentrations among some sites.



Figure S5: PCB concentrations in forage fish from the Lake Ontario tributaries in the GTA. The left panel shows the full scale of PCB values; the right panel is on a truncated scale to better illustrate differences among the sites. The measurements were collected by Ontario Ministry of the Environment and Climate Change between 2000 and 2012.



An example of fish consumption survey (drafted for the Spanish Harbour Area of Concern)

Notes on this draft survey (shall be removed once the survey is finalized):

The goal of this survey is to collect the information necessary from the Spanish Harbour Area of Concern in Recovery in order to help inform the fish consumption beneficial use impairment assessment for this AOC. In addition, the survey should:

- Provide defensible results
- Engage a target audience
- Be easily understood by the target audience
- Be replicable for other AOCs
- Provide information to tailor outreach and guidance for fish consumption

The following survey has been drafted to answer a number of broad questions which include:

- Is fish consumption, or are fish consumption habits, compromised because of the AOC?
 - Do people eat fish from the AOC or not?
 - If not, is it because of the impairment or is it unrelated?
- Are there stricter fish consumption advisories on the fish species people eat from the AOC compared to other Lake Huron locations as a result of contaminants of concern?
 - What fish species do people normally eat from the AOC?
- What are people's fish eating habits and is this an issue?
 - How often do people eat fish caught within the AOC?
 - How do people prepare and cook the fish they catch within the AOC?

Spanish Harbour Area of Concern in Recovery

Draft Fish Consumption Survey – 2018

Introduction

Do you fish in the Spanish Harbour Area of Concern (AOC), which includes Spanish River between the towns of Espanola and Spanish, and Spanish Harbour itself out to the western end of Kirke and Green Islands (as shown by the orange shaded area in the map below)? If so, the Spanish Harbour Remedial Action Plan Team (Ontario Ministry of the Environment and Climate Change and Environment and Climate Change Canada) is interested in finding out more about your fish consumption habits.

Spanish Harbour was identified as an AOC in 1987 because of impacts to water quality due to historic local industrial activities. Since 1999, all actions that were recommended to restore water quality and the environmental health of this area have been completed. Ongoing monitoring shows that the environmental conditions of the area continue to improve. Fish consumption advisories due to local contaminants have become less restrictive overtime and, overall, advisories for the North Channel and Spanish Harbour AOC are similar to other locations in Lake Huron.

The information collected in this survey will remain confidential and will be used to help guide decisions on the status of the Spanish Harbour AOC as well as to improve the Guide to Eating Ontario Fish. Survey participants can choose to enter into a draw for a chance to win [to be determined, e.g. one of five \$100 Canadian Tire gift certificates].

Thank you for your participation.



Please answer the questions below to the best of your abilities.

Section 1: About you (to understand demographics and safe contaminant intakes)

 Age ______ years

 Sex O Male
 O Female
 O Prefer not to say

 Weight ______ kgs OR _____ lbs

Section 2: Eating Fish from the Spanish Harbour AOC

- 1. Do you eat fish from Spanish Harbour AOC?
 - O Yes
 - O No
- 2. Prior to taking this survey, were you aware of the AOC designation of Spanish Harbour?
 - O Yes
 - \circ No \rightarrow Skip to the next section
- 3. Do fish contaminant levels in Spanish Harbour AOC affect your fish consumption habits?
 - O Yes
 - \circ No \rightarrow Skip to the next section

If yes, how do your concerns about fish contaminant levels in Spanish Harbour AOC affect your fish consumption habits? (check all that apply)

- □ I avoid eating fish from the area
- □ I eat less fish caught from the area
- □ I don't eat certain fish caught from the area
- Other



Section 3: Preferences in Eating Fish

4. Please identify how often you eat fish caught from the Spanish Harbour AOC on average over the course of a year. Please consult the picture guide provided at the end of this questionnaire to help in identifying fish species.

	Rarely	Once a month	2-3 times a month	Once a week	Twice a week	3-5 times a week	Daily
Brown Bullhead							
Channel Catfish							
Chinook Salmon							
Cisco (Lake Herring)							
Coho Salmon							
Northern Pike							
Pink Salmon							
Rainbow Trout							
Rock Bass							
Smallmouth Bass							
Walleye							
White Sucker							
Yellow Perch							
Other							

- 5. Would the eating habits you identified in the above question change if contaminant levels in the Spanish Harbour were not a concern?
 - O Yes
 - \circ No \rightarrow Skip to the next question

If yes, how often would you eat the fish on average over the course of a year if you had no concerns about contaminant levels?

	Rarely	Once a month	2-3 times a month	Once a week	Twice a week	3-5 times a week	Daily
Brown Bullhead							
Channel Catfish							
Chinook Salmon							
Cisco (Lake Herring)							
Coho Salmon							
Northern Pike							
Pink Salmon							
Rainbow Trout							
Rock Bass							
Smallmouth Bass							
Walleye							
White Sucker							
Yellow Perch							
Other							

Section 4: Fish Eating Habits

6.	On average, about how much fish do you eat in a single meal? (for example, a fillet that is the
	size of a dinner plate or the width of two adult hands is approximately 8 oz or 230 g)

- Less than 4 oz / 115 g
- O 4 oz / 115 g
- O 6 oz / 170g
- O 8 oz / 230 g
- 12 oz / 340 g
- More _____
- 7. What parts of the fish do you eat? (check all that apply)
 - □ Fillet without skin
 - □ Fillet with skin
 - \Box Steak with fat
 - □ Steak with fat trimmed/removed
 - □ Whole fish
 - □ Eggs/Organs
 - Other_

8. Which method do you use to cook or prepare fish? (check all that apply)

- □ None (raw fish)
- □ Baking/broiling
- □ Frying
- □ Grilling
- □ Steaming
- □ Smoking
- □ Other _____







Section 5: Advisories

9. Do you have access to a copy of the 2017-2018 *Guide to Eating Ontario Fish*?

- O Yes
- O No, but I use an old version of the Guide
 - No, I don't have access to the 2017-2018 Guide
 - No, I don't know how to access
- $\,\circ\,$ I am unaware of the Guide $\,\rightarrow\,$ Skip to the next question

10. Where did you obtain the copy of the Guide you use?

- O Internet O Trade Show
- O Friend/relative O Provincial Park
- O Government office O Walmart
- O Tourism office O Canadian Tire
- Liquor store O Beer Store
- O Other ____

11. Do you check the consumption advice in the Guide prior to eating the fish you catch in the Spanish Harbour?

- O Yes
- \circ No \rightarrow Skip to the next question

12. Do you follow the consumption advice in the Guide?

- Always
- Usually
- O Sometimes
- Never

If not always, why not? (check all that apply)

- □ I don't always have access to the Guide when I am fishing
- □ I don't understand how to use the Guide
- □ I choose not to follow the consumption advice in the Guide
- □ I think the consumption advice in the Guide unnecessarily restricts eating fish
- □ I think the consumption advice in the Guide should recommend eating less fish
- □ I don't think the consumption advice in the Guide is relevant to me
- □ I don't catch enough fish
- □ I don't eat enough fish
- Other ______





13. Has the information in the Guide led to a change in your fish eating habits?

- O Yes
- O No

If yes, in what way(s)? (check all that apply)

- \Box I am more selective on what type of fish I eat from certain areas
- \Box I reduced the number of fish I eat from certain areas
- \Box I changed the method of cooking fish
- □ I follow advice in the Guide
- Other

Section 6: Additional Comments

Section 7: Personal Information (optional; to enter into a draw)

Name	
Address	
Phone	
Email	

Thank you for your participation!

Picture guide (example) to help in identifying type of fish

Brown Bullhead	Channel Catfish	Chinook Salmon

References

- OMOECC. 2017-2018 Guide to Eating Ontario Fish. Toronto, Ontario, Canada: Ontario Ministry of the Environment and Climate Change, 2017.
- Robinson JM, Neff MR, Bhavsar SP. Assessment of contaminant levels in fish from the Toronto waterfront area. Journal of Great Lakes Research 2015; 41: 228-237.