

# **2015 URBAN CANADA GOOSE CONTAMINANTS STUDY**

## **Persistent and Bioaccumulating Contaminants**

### **Executive Summary**

In several cities in Wisconsin, Canada goose populations have expanded so rapidly that they have become a nuisance. Control methods include the harvest of urban geese for donation to food pantries. This report discusses contaminant testing of tissue from geese that were harvested by USDA-Wildlife Services from 13 different urban sites in Wisconsin and evaluates the need for consumption advisories. It has been prepared by the WDNR Wildlife Health Team and reviewed by the Wisconsin Department of Health Services.

### **Introduction**

One method that is used to control the expanding goose population is the harvest of urban geese for donation to food pantries. Because geese are often concentrated in urbanized or industrialized areas, tissue samples are analyzed to ensure their safety for human consumption. This study was undertaken to assess the levels of environmental contaminants in urban geese and determine whether meat from these animals contain harmful levels of contaminants.

### **Methods**

During the summer flightless period in 2015, geese were collected from 13 sites in Wisconsin that are experiencing burgeoning populations. All of the locations were “re-tests” based on USDA/WDNR Goose Contaminant Testing Protocol (USDA 2009). Adult geese from each community were taken to a meat processor and all goose meat from a given community was ground. Samples submitted for analysis represent 10% of the adult population removed from a given site with a minimum of 5 samples submitted for organic (PCB's and 2,4-D (if warranted)) and inorganic (mercury (Hg), lead (Pb)) contaminant testing. When calculating arithmetic means, a value of ½ the detection limit was used for “non-detect” samples. Tissue was analyzed at the Wisconsin Veterinary Diagnostic Laboratory in Madison, WI.

Advisories for human consumption (Table 1) were obtained from the Protocol for a Uniform Great Lakes Fish Consumption Advisory (GLSFATF 1993), the Health Guide for People Who Eat Sport Fish from Wisconsin Waters (WDNR and WDH 1994), and Action Levels for Poisonous or Deleterious Substances in Human Food and Animal Feed (USFDA 1994).

Table 1: Human Health Consumption Advisory Critical Concentrations in Fish or Meat Products.

CONTAMINANT	ADVISORY CONCENTRATION (ppm)		
	Unlimited Consumption	No more than 1 Meal/Week	No more than 1 Meal/Month
PCB	<0.05	0.06 - 0.22	0.22 – 1.0
Mercury	<0.05*	0.06 - 0.22*	0.22 – 0.33
Lead	n/a**	n/a	n/a

\* = For children and women of childbearing years

\*\* = no universally accepted safe concentration for lead in food. An international consensus standard of 0.05 ppm is under discussion.

## Results

Based on consultation with the WDNR Wildlife Toxicologist regarding sample locations and the potential for PCB contamination at the selected sites, only 1 location was determined to need PCB analysis. PCBs were not detected in any of the geese sampled at this location (Table 2). Thus all muscle samples had concentrations below the unlimited consumption advisory concentration. Therefore no consumption advisory is recommended based on PCB results.

Mercury was detected in 2 samples of geese collected at the City of Delafield site (Table 2). The average Hg concentration in samples from the City of Delafield site is within the limited consumption advisory for children and women of child bearing age. Therefore, an advisory of no more than one meal/week is recommended.

Lead was detected in samples from all 13 of the sites tested (Table 2). There is no single standard for permissible amounts of lead in food. Furthermore, FDA regulatory standards and guidelines for Pb in food are complicated by the relatively recent recognition (ATSDR 2007, EPA 2007) of Pb as a probable human carcinogen. However, for meat and fat products, an international consensus standard of 0.05 ppm is under discussion (FDA 2000).

The mean Pb concentration at 7 of the 13 locations was above the proposed standard of 0.05 ppm. However, consultations with food distribution centers indicated these geese would be a limited quantity meat product and therefore handled in a manner similar to holiday turkeys. As such, a family/individual receiving food from a center would at most receive the equivalent of 1 goose per year. Therefore, considering the limited nature of consumption, a consumption advisory of no more than one meal/month is suitable for the locations outlined in Table 2.

## Management Implications

Based on the data from these analyses in conjunction with past sampling at some of these locations, consumption advisories of no more than one meal/month are recommended for all of

the locations sampled. These locations are identified in Table 2. The advisories are the result of lead contamination at these locations.

Ten of the 13 locations were previously tested as described in the USDA Canada goose contaminant testing protocol (2009). Concentrations of Pb at the UW Madison location in 2008, the city of Lake Mills location in 2008, Sturgeon Bay in 2011, and the Bohner's Lake location in 2012 warranted consumption advisories. Results from the 2015 testing showed lower levels of Pb in geese from these locations. Although advisories for these locations will still be in place based on the previous results, the advisories could be lifted if future testing indicates low levels of contamination.

At the WDNR Lakeshore State Park location, Pb was detected in 2008, but was not detected during the 2011 and 2015 testing. Although the consumption advisory will remain in place, if the next round of sampling at this location shows similar low levels of Pb, the advisory could be removed.

Concentrations of Pb at the city of Delafield site in 2011 and 2012, the city of Muskego in 2012, the Wind Lake Management District in 2011, city of Menasha in 2011 and 2012, and the village of Winneconne in 2012 warranted consumption advisories. Results from the 2015 sampling indicate that elevated levels of Pb still persist at all of the locations and therefore the consumption advisories remain in place.

Concentrations of Pb at the Palmyra and WDNR Hartman Creek State Park site are elevated and warrant consumption advisories.

Although Pb was detected in some of the samples collected at the Lake lola site, the average concentration was below the advisory level and therefore consumption advisory is not warranted.

Shotgun pellets from unsuccessful hunters have been raised as a potential concern. These steel pellets can become lodged in the muscle tissue. Consumption of meat that contains steel pellets can cause cracked or chipped teeth. Products prepared from wild geese should include a consumer warning about this risk.

### **Literature Cited**

ATSDR. 2007. *ch. 8 in Toxicological Profile for Lead*. Agency for Toxic Substances and Disease Registry, Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service. <http://www.atsdr.cdc.gov/toxprofiles/tp13.pdf>

EPA. 2007. Integrated Exposure Uptake Biokinetic Model (IEUBK) for lead in children, ver. 1.0. Internet: [www.epa.gov/superfund/lead](http://www.epa.gov/superfund/lead).

FDA. 2000. Emerging international contaminant issues: Development of Codex alimentarius standards to address the issues. Food Safety Magazine, Feb. 2000. reprinted by: U.S. Food and

Drug Administration, Center for Food Safety and Applied Nutrition. Internet:  
<http://www.cfsan.fda.gov/~cjm/codexfa2.html>

Great Lakes Sport Fish Advisory Task Force (GLSFATF). 1993. Protocol for a Uniform Great Lakes Fish Consumption Advisory.

United States Department of Agriculture Animal and Plant Health Inspection Service – Wildlife Services. 2009. Contaminant Testing of Canada Geese for Human Consumption in Wisconsin

United States Environmental Protection Agency. 1997. Integrated Risk Information System (IRIS). <http://www.epa.gov/iriswebp/iris/>

United States Food and Drug Administration (USFDA). 1994. Action Levels for Poisonous or Deleterious Substances in Human Food and Animal Feed.

Wisconsin Department of Natural Resources (WDNR) and Wisconsin Division of Health (WDH). 1994. Health Guide for People Who Eat Sport Fish from Wisconsin Waters.

Table 2: 2015 Urban goose contaminants data

Sample ID (Location)	WVDL Specimen ID	Collection Date	Lead (ppm)	Mercury (ppm)	PCB (ppm)	Advisory
<b>CITY OF DELAFIELD</b>						
Delafield #1	M15-21425-1-1	June 2015	0.58	1.10	NA	
Delafield #2	M15-21425-2-1	June 2015	0.04	0.12	NA	<b>No more than 1 meal/month</b>
Delafield #3	M15-21425-3-1	June 2015	0.02	<0.10	NA	<b>Re-test from 2011-12</b>
Delafield #4	M15-21425-4-1	June 2015	<0.01	<0.10	NA	
Delafield #5	M15-21425-5-1	June 2015	0.03	<0.10	NA	
<b>Average</b>			<b>0.13</b>	<b>0.27</b>		
<b>UW MADISON</b>						
UW Madison #1	M15-21425-6-1	June 2015	0.011	<0.10	NA	
UW Madison #2	M15-21425-7-1	June 2015	<0.01	<0.10	NA	<b>No more than 1 meal/month</b>
UW Madison #3	M15-21425-8-1	June 2015	0.094	<0.10	NA	<b>Re-test from 2008</b>
UW Madison #4	M15-21425-9-1	June 2015	0.068	<0.10	NA	
UW Madison #5	M15-21425-10-1	June 2015	0.015	<0.10	NA	
<b>Average</b>			<b>0.04</b>	<b>&lt;0.10</b>		
<b>CITY OF MUSKEGO</b>						
Muskego #1	M15-21425-11-1	June 2015	0.19	<0.10	NA	
Muskego #2	M15-21425-12-1	June 2015	0.070	<0.10	NA	
Muskego #3	M15-21425-13-1	June 2015	0.10	<0.10	NA	<b>No more than one meal/month</b>
Muskego #4	M15-21425-14-1	June 2015	1.00	<0.10	NA	<b>Re-test from 2012</b>
Muskego #5	M15-21425-15-1	June 2015	9.10	<0.10	NA	
<b>Average</b>			<b>2.09</b>	<b>&lt;0.10</b>		

<b>WIND LAKE MGMNT DIST</b>						
Wind Lake #1	M15-21425-16-1	June 2015	0.044	<0.10	NA	
Wind Lake #2	M15-21425-17-1	June 2015	0.37	<0.10	NA	<b>No more than one meal/month</b>
Wind Lake #3	M15-21425-18-1	June 2015	1.50	<0.10	NA	<b>Re-test from 2011</b>
Wind Lake #4	M15-21425-19-1	June 2015	2.90	<0.10	NA	
Wind Lake #5	M15-21425-20-1	June 2015	0.049	<0.10	NA	
<b>Average</b>			<b>0.970</b>	<b>&lt;0.10</b>		
<b>PALMYRA LOWER SPRING LAKE DIST</b>						
Palmyra #1	M15-21425-21-1	June 2015	0.130	<0.10	NA	
Palmyra #2	M15-21425-22-1	June 2015	0.023	<0.10	NA	<b>No more than one meal/month</b>
Palmyra #3	M15-21425-23-1	June 2015	0.076	<0.10	NA	
Palmyra #4	M15-21425-24-1	June 2015	0.190	<0.10	NA	
Palmyra #5	M15-21425-25-1	June 2015	0.025	<0.10	NA	
<b>Average</b>			<b>0.089</b>	<b>&lt;0.10</b>		
<b>CITY OF MENASHA</b>						
Menasha #1	M15-21425-26-1	June 2015	0.63	0.10	NA	
Menasha #2	M15-21425-27-1	June 2015	0.19	<0.10	NA	<b>No more than one meal/month</b>
Menasha #3	M15-21425-28-1	June 2015	0.12	<0.10	NA	<b>Re-test from 2011-12</b>
Menasha #4	M15-21425-29-1	June 2015	0.066	<0.10	NA	
Menasha #5	M15-21425-30-1	June 2015	0.099	<0.10	NA	
<b>Average</b>			<b>0.220</b>	<b>&lt;0.10</b>		
<b>VILLAGE OF WINNECONNE</b>						
Winneconne #1	M15-21425-31-1	June 2015	<0.01	<0.10	NA	
Winneconne #2	M15-21425-32-1	June 2015	<0.01	<0.10	NA	<b>No more than one meal/month</b>
Winneconne #3	M15-21425-33-1	June 2015	1.10	<0.10	NA	<b>Re-test from 2012</b>
Winneconne #4	M15-21425-34-1	June 2015	0.040	<0.10	NA	
Winneconne #5	M15-21425-35-1	June 2015	0.150	<0.10	NA	
<b>Average</b>			<b>0.260</b>	<b>&lt;0.10</b>		

<b>CITY OF LAKE MILLS</b>						
Lake Mills #1	M15-21425-36-1	June 2015	0.150	<0.10	NA	
Lake Mills #2	M15-21425-37-1	June 2015	<0.01	<0.10	NA	<b>No more than one meal/month</b>
Lake Mills #3	M15-21425-38-1	June 2015	0.020	<0.10	NA	<b>Re-test from 2008</b>
Lake Mills #4	M15-21425-39-1	June 2015	0.013	<0.10	NA	
Lake Mills #5	M15-21425-40-1	June 2015	0.030	<0.10	NA	
<b>Average</b>			<b>0.044</b>	<b>&lt;0.10</b>		
<b>HARTMAN CREEK STATE PARK</b>						
Hartman Creek State Park #1	M15-21425-41-1	June 2015	0.046	<0.10	NA	
Hartman Creek State Park #2	M15-21425-42-1	June 2015	0.029	<0.10	NA	<b>No more than one meal/month</b>
Hartman Creek State Park #3	M15-21425-43-1	June 2015	1.10	<0.10	NA	
Hartman Creek State Park #4	M15-21425-44-1	June 2015	0.096	<0.10	NA	
Hartman Creek State Park #5	M15-21425-45-1	June 2015	0.016	<0.10	NA	
<b>Average</b>			<b>0.257</b>	<b>&lt;0.10</b>		
<b>LAKE IOLA LAKE DISTRICT</b>						
Lake Iola #1	M15-21425-46-1	June 2015	0.012	<0.10	NA	
Lake Iola #2	M15-21425-47-1	June 2015	0.016	<0.10	NA	<b>Unlimited/No advisory</b>
Lake Iola #3	M15-21425-48-1	June 2015	<0.01	<0.10	NA	
Lake Iola #4	M15-21425-49-1	June 2015	<0.01	<0.10	NA	
Lake Iola #5	M15-21425-50-1	June 2015	0.027	<0.10	NA	
<b>Average</b>			<b>0.013</b>	<b>&lt;0.10</b>		
<b>BOHNERS LAKE SANITARY DISTRICT</b>						
Bohners Lake #1	M15-21425-51-1	June 2015	0.064	<0.10	NA	
Bohners Lake #2	M15-21425-52-1	June 2015	<0.01	<0.10	NA	<b>No more than one meal/month</b>
Bohners Lake #3	M15-21425-53-1	June 2015	<0.01	<0.10	NA	<b>Re-test from 2012</b>
Bohners Lake #4	M15-21425-54-1	June 2015	<0.01	<0.10	NA	
Bohners Lake #5	M15-21425-55-1	June 2015	<0.01	<0.10	NA	
<b>Average</b>			<b>0.017</b>	<b>&lt;0.10</b>		

<b>CITY OF STURGEON BAY</b>						
Sturgeon Bay #1	M15-21425-56-1	June 2015	0.200	<0.10	NA	
Sturgeon Bay #2	M15-21425-57-1	June 2015	0.011	<0.10	NA	
Sturgeon Bay #3	M15-21425-58-1	June 2015	0.028	<0.10	NA	
Sturgeon Bay #4	M15-21425-59-1	June 2015	<0.01	<0.10	NA	
Sturgeon Bay #5	M15-21425-60-1	June 2015	0.013	<0.10	NA	
Sturgeon Bay #6	M15-21425-61-1	June 2015	<0.01	<0.10	NA	
Sturgeon Bay #7	M15-21425-62-1	June 2015	0.53	<0.10	NA	
Sturgeon Bay #8	M15-21425-63-1	June 2015	0.012	<0.10	NA	
Sturgeon Bay #9	M15-21425-64-1	June 2015	0.023	<0.10	NA	
Sturgeon Bay #10	M15-21425-65-1	June 2015	<0.01	<0.10	NA	
Sturgeon Bay #11	M15-21425-66-1	June 2015	<0.01	<0.10	NA	
Sturgeon Bay #12	M15-21425-67-1	June 2015	<0.01	<0.10	NA	<b>No more than one meal/month</b>
Sturgeon Bay #13	M15-21425-68-1	June 2015	0.033	<0.10	NA	<b>Re-test from 2011</b>
Sturgeon Bay #14	M15-21425-69-1	June 2015	0.045	<0.10	NA	
Sturgeon Bay #15	M15-21425-70-1	June 2015	<0.01	<0.10	NA	
Sturgeon Bay #16	M15-21425-71-1	June 2015	<0.01	<0.10	NA	
Sturgeon Bay #17	M15-21425-72-1	June 2015	<0.01	<0.10	NA	
Sturgeon Bay #18	M15-21425-73-1	June 2015	<0.01	<0.10	NA	
Sturgeon Bay #19	M15-21425-74-1	June 2015	<0.01	<0.10	NA	
Sturgeon Bay #20	M15-21425-75-1	June 2015	<0.01	<0.10	NA	
Sturgeon Bay #21	M15-21425-76-1	June 2015	<0.01	<0.10	NA	
Sturgeon Bay #22	M15-21425-77-1	June 2015	<0.01	<0.10	NA	
Sturgeon Bay #23	M15-21425-78-1	June 2015	<0.01	<0.10	NA	
Sturgeon Bay #24	M15-21425-79-1	June 2015	0.037	<0.10	NA	
<b>Average</b>			<b>0.042</b>	<b>&lt;0.10</b>		

<b>WDNR LAKESHORE STATE PARK</b>						
Lakeshore State Park #1	M15-21425-80-1	June 2015	<0.01	<0.10	ND	
Lakeshore State Park #2	M15-21425-81-1	June 2015	0.010	<0.10	ND	<b>No more than one meal/month</b>
Lakeshore State Park #3	M15-21425-82-1	June 2015	0.056	<0.10	ND	<b>Re-test from 2008 and 2011</b>
Lakeshore State Park #4	M15-21425-83-1	June 2015	0.024	<0.10	ND	
Lakeshore State Park #5	M15-21425-84-1	June 2015	0.056	<0.10	ND	
<b>Average</b>			<b>0.03</b>	<b>&lt;0.10</b>		