Library Reference 8.6.2

Dreissenid Mussel Survey (2009): Onondaga Lake and the Seneca River

DRAFT – December 2009

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Dreissenid Mussel Survey (2009): Onondaga Lake and the Seneca River

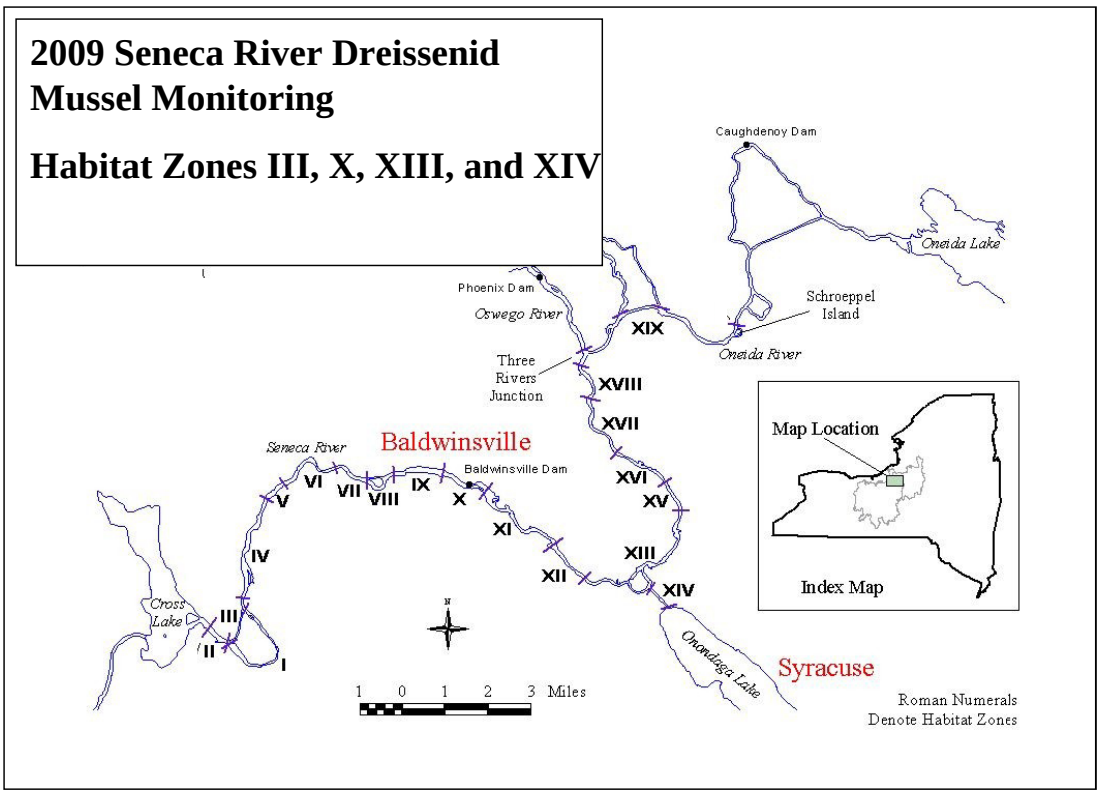
During the fall of 2009, OCDWEP staff completed the Onondaga Lake and Seneca River dreissenid mussel survey in support of the model development and/or validation needs for the Three Rivers Water Quality Model (TRWQM) and Onondaga Lake Water Quality Model (OLWQM). The survey included both zebra mussels (*Dreissena polymorpha*) and quagga mussels (*Dreissena bugensis*).

A6-1 Seneca River

The September 30, 2009, monitoring event included the collection and estimation of dreissenid mussels within habitat zones identified by Beak Consultants during the 1999 Seneca River Dreissenid Mussel Assessment Program, and key locations recommended by AnchorQEA to provide a measure of length frequency distribution and density (#/m^2 and g/m^2). The monitoring locations include the following four (4) habitat zones:

- Zone III – State Ditch Cut – 3 Transects, 3 samples per transect.
- Zone X – Near the Baldwinsville Dam – 3 Transects, 3 samples per transect.
- Zone XIII – Near Klein Island – 5 Transects, 3 samples per transect.
- Zone XIV – Onondaga Lake Outlet– 2 Transects, 3 samples per transect.

Map of General Seneca River Dreissenid Mussel Transect Locations



Three (3) samples were collected along each transect, consisting of a cross-section of the river. One (1) at approximately mid-channel (Middle), and one (1) between the channel marker buoy

and shoreline on each side of the river (Red and Green). A single grab sample was collected at each depth interval with a petit ponar dredge, which has a sample area of 35 in^2 (226 cm^2).

Once at the surface, all substrate within the sampler was carefully placed into the wash bucket with a mesh screen. Lake water was used to rinse any remaining material into the wash bucket. Fine sediments were rinsed through the wash bucket, and all remaining material was placed in a labeled zip-lock bag. At each monitoring location technicians record the date, time, water depth (ft), general weather conditions, and GPS coordinates at the mid channel location. Following field sample collection, all samples were placed in a cooler with ice until transported to a refrigerator at the HCBF laboratory.

Thirty-nine (39) samples were collected from the Seneca River during the 2009 field effort.

A6-2 Onondaga Lake

The October 12, 2009, monitoring event on Onondaga Lake included the collection and estimation of dreissenid mussels within habitat zones identified by Stantec during the 2002 Onondaga Lake Zebra Mussel Assessment Program, and transects and water depth intervals recommended by AnchorQEA in 2005. The recent efforts provide a limited measure of length frequency distribution and density (#/m^2 and grams/m^2) in Onondaga Lake. The monitoring locations include the following eight (8) habitat zones:

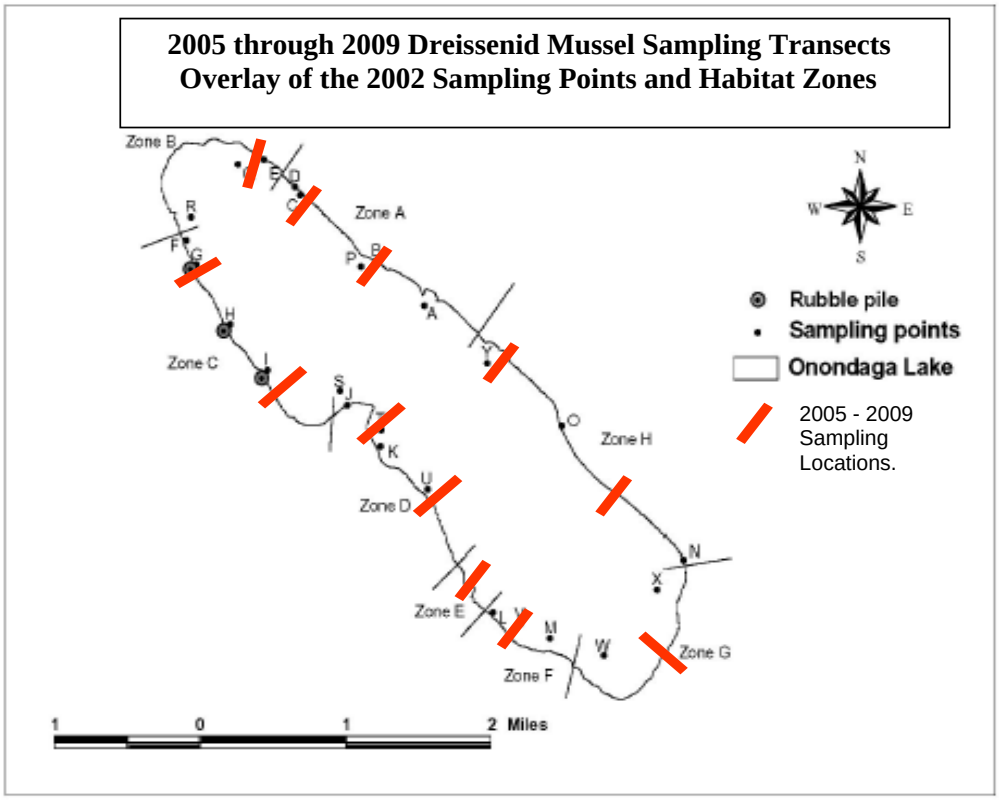
- Zone A – 2 Transects, 3 samples per transect, at 0-1.5 m, 1.5 – 3 m, and 3 – 4.5 m.
- Zone B – 1 Transect, 3 samples per transect, at 0-1.5 m, 1.5 – 3 m, and 3 – 4.5 m.
- Zone C – 2 Transects, 3 samples per transect, at 0-1.5 m, 1.5 – 3 m, and 3 – 4.5 m.
- Zone D – 2 Transects, 3 samples per transect, at 0-1.5 m, 1.5 – 3 m, and 3 – 4.5 m.
- Zone E – 1 Transect, 3 samples per transect, at 0-1.5 m, 1.5 – 3 m, and 3 – 4.5 m.
- Zone F – 1 Transect, 3 samples per transect, at 0-1.5 m, 1.5 – 3 m, and 3 – 4.5 m.
- Zone G – 1 Transect, 3 samples per transect, at 0-1.5 m, 1.5 – 3 m, and 3 – 4.5 m.
- Zone H – 2 Transects, 3 samples per transect, at 0-1.5 m, 1.5 – 3 m, and 3 – 4.5 m.

Three (3) samples were collected along each transect at water depths between 0 to 1.5 meters, 1.5 to 3.0 meters, and 3.0 to 4.5 meters. A single grab sample was collected at each depth interval with a petit ponar dredge, which has a sample area of 35 in^2 (226 cm^2).

Once at the surface, all substrate within the sampler was carefully placed into the wash bucket with a mesh screen. Lake water was used to rinse any remaining material into the wash bucket. Fine sediments were rinsed through the wash bucket, and all remaining material was placed in a labeled zip-lock bag. At each monitoring location the technicians recorded the date, time, actual water depth (ft), general weather conditions, and GPS coordinates. Following field sample collection, all samples were placed in a cooler with ice until transported to refrigerator at the HCBF laboratory.

Thirty-six (36) samples were collected in Onondaga Lake during the 2009 field effort.

Map of General Onondaga Dreissenid Mussel Transect Locations



A6-3 River and Lake Biological Laboratory Processing

At the HCBF biological laboratory, all mussels in the sample were carefully removed from the substrate material. Laboratory measurements of the collected samples were completed within two (2) weeks of sample collection. The entire sample was sorted to separate the live mussels from the shell fragments. Care was taken to distinguish between zebra and quagga mussels that are similar in appearance for young-of-year mussels. The mussels were then blotted dry with paper towels.

A6-3.1 Length Frequency

Technicians randomly select 100 mussels from the sample for length measurement. Using the digital caliper, the technicians recorded the length of each mussel (nearest 1 mm) on the Log Sheet for Mussel Length. If a sample results in less than 150 mussels for any given transect (because of the lack of mussels in some individual samples), additional randomly selected mussels were then measured in those samples within the transect with more than 100 mussels (if such were available), with the goal of at least 150 measurements per transect.

A6-3.2 Weight and Density Determination (Estimate)

Upon completion of the length measurements for the sample, technicians used the 100 randomly selected mussels (or using all the mussels samples that were measured for those sample locations that did not contain 100 mussels) for a batch weigh per sub-sample.

Technicians recorded the number of mussels in the sub-sample and the weight of the sub-sample on the Log Sheet for Weight and Density Determination (weight was recorded to the nearest 0.1 grams). The technicians then combined the sub-sample mussels with the remaining mussels in the sample for a total weight for the entire sample. The calculation for the estimated total number of mussels per sample as follows:

$$\text{Total \# of Mussels per Sample} = \frac{(\text{\# mussels per sub-sample} * \text{weight per entire sample})}{\text{weight per sub-sample}}$$

A6-4 Seneca River Data

On September 30, 2009, OCDWEP technicians collected the dreissenid mussel samples at the designated locations. Samples were collected and measured in accordance with the standard procedures unless otherwise noted. In general, the locations sampled contained a significant quantity of dreissenid mussel shell fragments requiring considerable laboratory effort to distinguish between the dead and live mussels.

During 2009, the survey identified that all four (4) zones sampled contain zebra mussels, and three (3) of the four (4) zones sampled contained quagga mussels. Twenty-six (26) of the thirty-nine (39) individual samples collected contained zebra mussels, and seventeen (17) of the thirty-nine (39) individual samples collected contained quagga mussels.

Zebra mussels were identified in all transects except one (1) near Kline Island (Zone XIIID). Zebra mussels represented nearly 75% (by number) and 47% (by weight) of the Seneca River dreissenid mussels sampled, and nearly 8% (by number) and 5% (by weight) of the Lake Outlet dreissenid mussels sampled.

Quagga mussels were identified in transects near Kline Island (Zone XIIIB and XIIIE), both of the Lake outlet transects (Zone XIVA and XIVB), and the State Ditch Cut (Zone IIIA, IIIB, IIIC). The Quagga mussels represented 25% (by number) and 53% (by weight) of the Seneca River dreissenid mussels sampled, and nearly 92% (by number) and 95% (by weight) of the Lake Outlet dreissenid mussels sampled.

The Seneca River and Onondaga Lake outlet monitoring has continued to identify fluctuating dreissenid mussel densities (refer to Table A6-2), particularly in the Onondaga Lake outlet. Noteworthy during 2009, is the presence of quagga mussels in all transects from the State Ditch Cut (Zone III), the decrease in the number of zebra mussels in the State Ditch Cut, and the increase in both number and weight of *Dreissena* sp. in the Onondaga Lake outlet.

The fluctuation in dreissenid mussel density may be a function of annual variability in the mussel populations (mortality vs. distribution of year classes), a change in water quality conditions, a function of comparing results from different sampling methodologies (SCUBA diver collected vs. petit ponar dredge), or a combination of each.

Note: The 2004 data utilized scuba divers for sample collection, and the 2005 through 2009 data utilized the petit ponar dredge for sample collection.

A6-5 Onondaga Lake Data

On October 12, 2009, OCDWEP technicians collected the dreissenid mussel samples at the designated locations. Samples were collected and measured in accordance with the procedures unless otherwise noted. In general, most locations sampled contained a significant quantity of dreissenid mussel shell fragments requiring considerable laboratory effort to distinguish between the dead and live mussels.

During 2009, the survey identified that all eight (8) zones sampled contain zebra mussels, and seven (7) of the eight (8) zones sampled contained quagga mussels. Thirty (30) of the thirty-six (36) individual samples collected contained zebra mussels, and twenty-nine (29) of the thirty-six (36) individual samples collected contained quagga mussels.

Zebra mussels were identified in all transects, and represented nearly 28% (by number) and 13% (by weight) of the Onondaga Lake dreissenid mussels sampled. Quagga mussels were identified in all transects except one (1), which encompassed the southern most portion of Onondaga Lake (Zone G). The Quagga mussels represented 72% (by number) and 87% (by weight) of the Onondaga Lake dreissenid mussels sampled.

The Onondaga Lake monitoring has continued to identify fluctuating dreissenid mussel densities (refer to Table A6-5a and Table A6-5b), and a shift from zebra mussels as the most abundant *Dreissena* sp. to quagga mussels. Noteworthy during 2009, is that the number of Dreissenid mussels remained relatively stable (0.5% increase from 2008), however, the weight increased significantly (150% increase from 2008). This is supported by both an increase in mean quagga mussel length, and shift in length frequency distribution (Figure A6.4).

The fluctuation in dreissenid mussel density may be a function of annual variability in mussel populations (mortality vs. distribution of year classes), a change in water quality conditions, a function of comparing results from different sampling methodologies (SCUBA diver collected vs. petit ponar dredge), or a combination of each.

Note: The 2002 data utilized scuba divers for sample collection, and the 2005 through 2009 data utilized the petit ponar dredge for sample collection.

Table A6-1. Seneca River Dreissenid Mussel Survey Fall 2009 - Length and Weight Data Summary

Zone	Transect	Transect Coordinates	Channel Location	Water Depth (m)	Number of Mussels Per Sub-Sample	Weight Per Sub-Sample (g)	Weight Per Entire Sample (g)	Total Weight (g/m^2)	Mean Weight (g/m^2) per Transect	Median Mussel Length (mm)	Mean Mussel Length (mm)	Total Number of Mussels Per Sample	Estimated Total Number of Mussels per m^2	Mean Estimated Number of Mussels per m^2 by Transect
III	A	N 43 06.478, W 76 26.461	Green	2.5	7 (1)	1.1 (0.2)	1.1 (0.2)	48.7 (8.8)	421.8 (54.6)	4 (12)	7.2 (11.5)	7 (1)	309.7 (44.3)	2891 (325)
			Middle	4.1	116 (18)	19.3 (3.2)	27.0 (3.2)	1194.7 (141.6)		8 (11)	8.2 (10.5)	162 (18)	7168.1 (796.5)	
			Red	2.1	27 (3)	0.5 (0.3)	0.5 (0.3)	22.1 (13.3)		4 (7)	4.4 (8.2)	27 (3)	1194.7 (132.7)	
III	B	N 43 06.606, W 76 26.435	Green	2.2	48 (1)	1.7 (0.1)	1.7 (0.1)	75.2 (4.4)	38.3 (2.9)	4 (11)	5.1 (10.7)	48 (1)	2123.9 (44.3)	2684 (30)
			Middle	4.2	35 (1)	0.3 (0.1)	0.3 (0.1)	13.3 (4.4)		3 (6)	3.7 (5.9)	35 (1)	1548.7 (44.3)	
			Red	1.2	99 (0)	0.6 (0.0)	0.6 (0)	26.5 (0)		3 (0)	3 (0)	99 (0)	4380.5 (0)	
III	C	N 43 06.786, W 76 26.383	Green	2.9	60 (1)	3.9 (0.1)	3.9 (0.1)	172.6 (4.4)	97.4 (7.4)	4 (8)	4.8 (7.7)	60 (1)	2654.9 (44.3)	3569 (59)
			Middle	4.3	100 (1)	1.7 (0.3)	1.8 (0.3)	79.6 (13.3)		3 (13)	3.7 (12.6)	106 (1)	4690.3 (44.3)	
			Red	2.8	76 (2)	0.7 (0.1)	0.7 (0.1)	40.0 (4.4)		4 (3)	3.8 (3)	76 (2)	3362.8 (88.5)	
X	A	N 43 09.691, W 76 20.684	Green	2.5	0 (0)	0 (0)	0 (0)	0 (0)	119.5 (0)	0 (0)	0 (0)	0 (0)	0 (0)	575 (0)
			Middle	4.2	8 (0)	4.9 (0)	4.9 (0)	216.8 (0)		3 (0)	7.2 (0)	8 (0)	354.0 (0)	
			Red	2.2	31 (0)	0.5 (0)	0.5 (0)	22.1 (0)		4 (0)	3.8 (0)	31 (0)	1371.7 (0)	
X	B	N 43 09.575, W 76 20.374	Green	3.8	0 (0)	0 (0)	0 (0)	0 (0)	2.9 (0)	0 (0)	0 (0)	0 (0)	0 (0)	74 (0)
			Middle	4.1	4 (0)	0.1 (0)	0.1 (0)	4.4 (0)		4 (0)	4.4 (0)	4 (0)	177.0 (0)	
			Red	2.4	1 (0)	0.1 (0)	0.1 (0)	4.4 (0)		6 (0)	5.5 (0)	1 (0)	44.3 (0)	
X	C	N 43 09.357, W 76 19.765	Green	3.8	0 (0)	0 (0)	0 (0)	0 (0)	1.5 (0)	0 (0)	0 (0)	0 (0)	0 (0)	74 (0)
			Middle	4.0	0 (0)	0 (0)	0 (0)	0 (0)		0 (0)	0 (0)	0 (0)	0 (0)	
			Red	2.8	5 (0)	0.1 (0)	0.1 (0)	4.4 (0)		2 (0)	2.6 (0)	5 (0)	221.2 (0)	
XIII	A	N 43 09.472, W 76 16.723	Green	4.6	1 (0)	0.1 (0)	0.1 (0)	4.4 (0)	1.5 (0)	5 (0)	4.8 (0)	1 (0)	44.3 (0)	15 (0)
			Middle	7.0	0 (0)	0 (0)	0 (0)	0 (0)		0 (0)	0 (0)	0 (0)	0 (0)	
			Red	3.3	0 (0)	0 (0)	0 (0)	0 (0)		0 (0)	0 (0)	0 (0)	0 (0)	
XIII	B	N 43 07.489, W 76 16.125	Green	0.9	4 (0)	0.1 (0)	0.1 (0)	4.4 (0)	929.2 (324.5)	2 (0)	2.7 (0)	4 (0)	177.0 (0)	1903 (369)
			Middle	6.5	17 (1)	5.5 (1.1)	5.5 (1.1)	243.4 (48.7)		12 (22)	12.3 (22.0)	17 (1)	752.2 (44.3)	
			Red	2.1	108 (24)	57.4 (20.9)	57.4 (20.9)	2539.8 (924.8)		14 (17)	13.6 (17.8)	108 (24)	4778.8 (1061.9)	
XIII	C	N 43 07.590, W 76 15.505	Green	4.9	1 (0)	0.1 (0)	0.1 (0)	4.4 (0)	1.5 (0)	9 (0)	9.4 (0)	1 (0)	44.3 (0)	15 (0)
			Middle	4.8	0 (0)	0 (0)	0 (0)	0 (0)		0 (0)	0 (0)	0 (0)	0 (0)	
			Red	1.8	0 (0)	0 (0)	0 (0)	0 (0)		0 (0)	0 (0)	0 (0)	0 (0)	
XIII	D	N 43 07.302, W 76 15.518	Green	3.2	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
			Middle	5.4	0 (0)	0 (0)	0 (0)	0 (0)		0 (0)	0 (0)	0 (0)	0 (0)	
			Red	0.9	0 (0)	0 (0)	0 (0)	0 (0)		0 (0)	0 (0)	0 (0)	0 (0)	
XIII	E	N 43 07.476, W 76 15.115	Green	4.6	6 (150)	2.2 (70.6)	2.2 (101.8)	97.3 (4504.4)	32.4 (1501.5)	7 (16)	9.6 (15.9)	6 (216)	265.5 (9557.5)	89 (3186)
			Middle	5.1	0 (0)	0 (0)	0 (0)	0 (0)		0 (0)	0 (0)	0 (0)	0 (0)	
			Red	2.7	0 (0)	0 (0)	0 (0)	0 (0)		0 (0)	0 (0)	0 (0)	0 (0)	
XIV	A	N 43 07.256, W 76 14.985	Green	2.9	16 (88)	1.8 (16.2)	1.8 (16.2)	79.6 (716.8)	148.9 (2004.4)	9 (10)	9.2 (10.6)	16 (88)	708.0 (3893.8)	723 (6032)
			Middle	5.0	19 (100)	4.5 (27.6	4.5 (38.7)	199.1 (1712.4)		12 (13)	11.4 (13.0)	19 (140)	840.7 (6194.7)	
			Red	2.6	14 (100)	3.8 (44.7)	3.8 (81.0)	168.1 (3584.1)		13 (16)	13.3 (15.3)	14 (181)	619.5 (8008.8)	
XIV	B	N 43 07.031, W 76 14.718	Green	2.1	2 (57)	0.5 (9.5)	0.5 (9.5)	22.1 (420.4)	203.5 (4199.1)	13 (11)	13.1 (11.5)	2 (57)	88.5 (2522.1)	1091 (16121)
			Middle	5.1	67 (100)	10.7 (21.9)	10.7 (178.7)	473.5 (7907.1)		9 (7)	9.4 (9.4)	67 (816)	2964.6 (36106.2)	
			Red	1.4	5 (100)	2.6 (43.8)	2.6 (96.5)	115.0 (4269.9)		13 (14)	16.3 (14.4)	5 (220)	221.2 (9734.5)	

Note: Petit Ponar Dredge Sample Area is 226 cm^2.
Results expressed as Zebra mussel (Quagga mussel).

Samples were collected on September 30, 2009.

Table A6.2. Seneca River Dreissenid Mussel Survey - Fall 2004 through Fall 2009 Comparison of Mean Weight (g/m^2) and Mean Density ($\#/m^2$)

Zone	Transect	Mean Weight (g/m^2) per Transect[1]						Mean Estimated Number of Mussels per m^2 by Transect[2]					
		2004	2005	2006	2007	2008	2009	2004	2005	2006	2007	2008	2009
III	A	4025.8	140.7	808.0	8.8	435.1 (0)	421.8 (54.6)	11987	15433	5760	1608 (0)	11001 (0)	2891 (325)
III	B	2569.0	327.1	789.1	61.9	179.9 (0)	38.3 (2.9)	9691	5525	6638	4241 (74)	5663 (0)	2684 (30)
III	C	1392.2	66.2	413.0	10.3	131.3 (0)	97.4 (7.4)	17860	12133	6449	1740 (0)	4017 (0)	3569 (59)
X	A	549.0	284.4	236.0	1.5	5.9 (0)	119.5 (0)	1500	1796	546	15 (0)	74 (0)	575 (0)
X	B	444.9	176.5	311.2	8.8	22.1 (0)	2.9 (0)	1692	546	619	88.5 (15)	88 (0)	74 (0)
X	C	0.0	1.8	0.0	0	0 (0)	1.5 (0)	0	88	0	0 (0)	0 (0)	74 (0)
XIII	A	477.2	0.0	19.2	308.3	29.0 (0.3)	1.5 (0)	1909	0	44	959 (251)	221 (15)	15 (0)
XIII	B	563.3	151.9	272.9	1.5	10.3 (41.3)	929.2 (324.5)	2012	826	560	29 (0)	89 (74)	1903 (369)
XIII	C	0.0	14.4	35.4	19.2	4.4 (0)	1.5 (0)	0	162	2581	118 (0)	0 (0)	15 (0)
XIII	D	308.6	0.3	2.9	1.5	5.9 (0)	0 (0)	1815	59	162	29 (0)	310 (0)	0 (0)
XIII	E	958.0	1272.8	986.7	427.7	1274.3 (0)	32.4 (1501.5)	5042	3290	4869	2271 (413)	3586 (0)	89 (3186)
XIV	A	1532.1	0.0	23.6	2166.7	67.8 (23.6)	148.9 (2004.4)	8157	0	3053	21211 (811)	2168 (177)	723 (6032)
XIV	B	3042.7	146.2	1991.2	4246.3	NA (NA)	203.5 (4199.1)	15445	796	10041	24676 (929)	4199 (7242)	1091 (16121)

[1)] The 2007 mean weights represent total *Dreissena* sp., the 2008 through 2009 results are expressed as Zebra mussel (Quagga mussel).

[2)] The 2007 through 2009 results are expressed as Zebra mussel (Quagga mussel).

Note: The 2004 data utilized scuba divers for sample collection, and the 2005 through 2009 data utilized the petit ponar dredge for sample collection.

Table A6-3a. Seneca River Dreissenid Mussel Survey Fall 2009 - Zebra Mussel Raw Length (mm) Data

Zone	Zone III			Zone III			Zone III			Zone X			Zone X			Zone X			Zone XIII		
Transect	Transect A			Transect B			Transect C			Transect A			Transect B			Transect C			Transect A		
Location	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red
Median Length	**4**	**8**	**4**	**4**	**3**	**3**	**4**	**3**	**4**	**0**	**3**	**4**	**0**	**4**	**6**	**0**	**0**	**2**	**5**	**0**	**0**
Mean Length	**7.2**	**8.2**	**4.4**	**5.1**	**3.7**	**3.0**	**4.8**	**3.7**	**3.8**	**0.0**	**7.2**	**3.8**	**0.0**	**4.4**	**5.5**	**0.0**	**0.0**	**2.6**	**4.8**	**0.0**	**0.0**
1	14.2	18.3	7.6	5.8	7.9	8.6	7.0	8.8	4.8		31.7	12.9		4.4	5.5			3.4	4.8		
2	15.2	20.3	9.2	3.3	4.3	6.5	7.1	14.8	4.6		9.3	2.6		6.6				2.3			
3	7.0	18.8	5.4	11.5	3.1	5.4	2.7	1.7	3.2		2.5	5.6		3.8				2.4			
4	4.4	13.9	6.3	10.8	5.9	5.0	4.5	2.0	2.8		2.0	5.4		2.8				2.5			
5	3.8	11.4	4.0	9.9	4.9	4.4	12.8	2.4	3.3		3.2	2.0						2.2			
6	3.3	13.6	9.3	12.3	3.7	5.1	20.0	6.8	2.4		4.1	4.1									
7	2.8	11.6	8.0	8.2	4.6	4.9	8.0	11.4	4.7		1.9	4.9									
8		10.3	7.0	5.0	4.1	6.8	6.3	7.7	8.5		2.7	6.2									
9		5.5	4.1	6.5	3.7	4.8	7.5	5.9	2.8			1.8									
10		10.8	3.5	8.3	2.4	4.1	9.8	2.0	2.5			3.7									
11		10.3	4.0	9.4	5.0	3.2	4.8	3.6	4.1			4.0									
12		2.6	4.1	5.7	7.6	5.1	4.5	8.5	5.7			3.4									
13		8.6	4.3	8.8	5.8	3.5	4.9	7.7	2.6			2.6									
14		6.5	3.5	7.1	4.4	3.3	4.1	5.6	4.1			4.1									
15		4.2	3.8	11.3	4.6	2.6	3.5	1.5	10.2			5.2									
16		9.6	3.6	6.5	3.1	2.9	3.7	7.3	4.3			3.9									
17		7.6	3.1	8.2	3.4	4.9	2.7	5.0	5.1			3.9									
18		4.0	3.6	9.3	3.2	4.2	3.8	7.0	7.4			4.6									
19		9.6	2.9	5.1	1.8	4.9	2.7	1.5	6.0			1.8									
20		3.5	3.5	5.5	2.9	3.8	3.7	6.1	6.5			2.4									
21		7.0	2.7	5.1	2.5	2.4	5.6	3.9	4.3			3.5									
22		9.1	2.5	6.3	2.2	2.5	4.1	1.8	7.1			2.1									
23		8.9	2.1	3.6	2.2	2.7	5.5	3.9	4.5			2.0									
24		2.5	3.7	3.5	2.3	3.7	11.1	4.4	4.2			3.6									
25		2.8	2.4	2.8	2.1	3.0	2.9	5.3	6.0			4.4									
26		2.9	2.3	2.9	2.4	2.9	3.0	6.0	2.6			2.1									
27		7.5	1.5	3.8	2.5	2.9	2.6	1.0	6.5			4.1									
28		11.5		3.0	1.6	3.1	2.9	3.0	4.1			1.9									
29		18.8		3.0	1.4	3.5	5.1	4.3	6.8			3.2									
30		13.5		4.7	1.7	3.8	4.3	4.9	4.8			3.6									
31		8.1		3.7	1.3	4.9	2.8	3.9	4.6			2.4									
32		11.6		1.3	6.0	4.3	4.7	4.1	3.0												
33		14.6		2.7	5.2	4.8	4.0	1.3	4.5												
34		10.9		3.3	3.3	3.3	17.5	2.0	5.2												
35		2.8		5.3	4.7	3.0	3.6	1.5	3.8												
36		8.6		2.2		2.8	3.1	4.4	4.3												
37		6.3		3.3		3.3	3.6	3.4	3.7												
38		4.8		2.7		3.9	3.4	1.4	5.1												
39		3.0		3.1		4.4	2.4	2.6	4.1												
40		4.3		2.5		4.3	5.8	3.1	3.7												
41		1.5		2.7		3.3	3.3	1.6	3.2												
42		1.3		2.3		3.2	4.2	2.2	3.1												
43		11.0		1.8		2.8	3.2	0.9	3.2												
44		11.6		2.2		3.5	3.8	5.8	4.2												
45		9.1		2.8		2.5	10.6	1.6	4.0												
46		8.4		1.9		2.3	5.2	3.6	2.3												
47		3.3		2.6		3.6	2.1	2.8	1.8												
48		4.8		1.5		2.0	1.9	4.8	5.1												
49		14.0				2.7	2.1	4.2	2.6												
50		12.7				2.1	3.4	2.0	2.7												
51		6.2				2.2	2.6	4.7	5.7												

Table A6-3a. Seneca River Dreissenid Mussel Survey Fall 2009 - Zebra Mussel Raw Length (mm) Data

Zone	Zone III			Zone III			Zone III			Zone X			Zone X			Zone X			Zone XIII		
Transect	Transect A			Transect B			Transect C			Transect A			Transect B			Transect C			Transect A		
Location	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red
52		3.2				1.7	3.5	4.8	3.2												
53		1.8				3.1	3.3	3.3	3.0												
54		5.4				3.4	3.3	4.9	2.6												
55		10.6				1.4	2.9	4.2	1.1												
56		9.7				1.1	1.9	2.6	2.2												
57		13.2				1.6	1.8	2.8	1.7												
58		14.2				1.9	1.6	4.1	2.0												
59		7.5				3.0	2.6	3.3	1.7												
60		5.8				3.5	1.5	2.8	2.5												
61		5.2				2.2		1.4	5.8												
62		4.0				3.3		2.4	2.2												
63		2.9				2.8		1.1	5.0												
64		1.9				2.1		1.8	3.3												
65		9.4				3.5		1.3	2.6												
66		13.2				2.2		5.1	1.8												
67		9.3				3.2		3.4	4.2												
68		9.6				1.4		3.4	3.0												
69		6.1				1.9		3.8	3.6												
70		9.7				1.6		3.9	3.9												
71		5.6				2.1		3.9	1.9												
72		5.3				1.2		2.6	1.7												
73		6.3				2.2		2.7	1.9												
74		6.7				1.9		3.9	1.9												
75		7.4				1.5		4.7	1.1												
76		6.1				1.3		3.8	1.2												
77		5.2				1.6		3.8													
78		3.4				1.2		4.9													
79		3.7				3.3		1.3													
80		3.3				2.9		4.5													
81		2.9				2.4		1.2													
82		8.1				2.9		3.4													
83		17.5				2.7		2.1													
84		10.1				3.1		3.3													
85		13.0				3.4		3.4													
86		12.8				1.9		3.3													
87		7.9				2.6		2.1													
88		5.1				2.6		2.2													
89		3.4				2.1		1.2													
90		2.8				1.5		3.4													
91		10.7				2.2		4.2													
92		11.5				1.4		2.3													
93		7.6				1.4		1.4													
94		6.7				1.3		0.9													
95		11.2				1.4		2.3													
96		9.3				1.2		4.8													
97		7.4				1.2		3.1													
98		11.2				1.0		2.8													
99		22.9				1.2		3.7													
100		9.5						2.7													
101		4.7																			
102		4.5																			
103		6.8																			
104		14.7																			

Table A6-3a. Seneca River Dreissenid Mussel Survey Fall 2009 - Zebra Mussel Raw Length (mm) Data

Zone	Zone III			Zone III			Zone III			Zone X			Zone X			Zone X			Zone XIII		
Transect	Transect A			Transect B			Transect C			Transect A			Transect B			Transect C			Transect A		
Location	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red
105		9.2																			
106		6.1																			
107		7.5																			
108		9.5																			
109		10.8																			
110		4.6																			
111		6.0																			
112		7.7																			
113		9.3																			
114		2.3																			
115		1.9																			
116		10.0																			

Table A6-3a. Seneca River Dreissenid Mussel Survey Fall 2009 - Zebra Mussel Raw Length (mm) Data

Zone	Zone XIII			Zone XIII			Zone XIII			Zone XIII			Zone XIV			Zone XIV		
Transect	Transect B			Transect C			Transect D			Transect E			Transect A			Transect B		
Location	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red
Median Length	**2**	**12**	**14**	**9**	**0**	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**9**	**12**	**13**	**13**	**9**	**13**
Mean Length	**2.7**	**12.3**	**13.6**	**9.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**9.6**	**0.0**	**0.0**	**9.2**	**11.4**	**13.3**	**13.1**	**9.4**	**16.3**
1	3.9	24.1	25.2	9.4						28.3			9.3	6.5	9.2	13.0	23.7	24.8
2	2.0	17.4	14.4							7.8			16.4	6.2	13.7	13.2	22.7	22.8
3	2.4	12.7	20.1							6.5			12.0	5.7	17.4		14.1	13.3
4	2.5	15.6	18.9							6.8			11.3	6.2	19.9		9.6	11.0
5		3.9	12.2							5.3			8.0	11.5	20.4		10.3	9.8
6		12.3	25.7							2.7			7.4	10.9	14.8		9.0	
7		14.3	19.1										9.7	10.6	16.6		13.5	
8		14.6	23.4										9.1	12.8	13.0		10.5	
9		16.1	17.9										7.3	12.8	15.5		9.4	
10		14.3	22.7										11.1	8.4	9.9		9.3	
11		12.3	16.0										9.2	7.8	9.1		11.5	
12		9.8	25.9										9.3	13.4	9.5		4.7	
13		11.6	12.8										7.6	16.8	7.9		5.6	
14		10.9	13.8										7.3	12.7	8.7		9.8	
15		6.0	16.8										4.2	15.0			5.1	
16		7.8	12.1										8.1	14.8			8.9	
17		5.0	16.6											15.4			7.5	
18			15.8											10.3			3.0	
19			14.4											18.3			14.3	
20			12.8														9.4	
21			16.9														8.9	
22			14.8														6.6	
23			13.7														11.6	
24			7.2														9.7	
25			20.1														11.8	
26			14.6														6.0	
27			22.2														12.2	
28			11.8														8.7	
29			14.2														3.4	
30			15.7														10.9	
31			13.4														12.6	
32			13.7														15.1	
33			13.4														11.2	
34			13.2														10.8	
35			8.9														9.7	
36			12.6														9.9	
37			18.4														9.5	
38			18.5														7.2	
39			14.8														7.6	
40			27.8														6.1	
41			25.3														4.7	
42			24.2														7.5	
43			18.5														7.2	
44			14.9														7.2	
45			16.8														8.7	
46			19.1														11.2	
47			17.8														9.8	
48			13.8														9.3	
49			10.2														5.5	
50			11.2														9.3	
51			10.3														7.4	

Table A6-3a. Seneca River Dreissenid Mussel Survey Fall 2009 - Zebra Mussel Raw Length (mm) Data

Zone	Zone XIII			Zone XIII			Zone XIII			Zone XIII			Zone XIV			Zone XIV		
Transect	Transect B			Transect C			Transect D			Transect E			Transect A			Transect B		
Location	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red
52			11.6														9.9	
53			4.4														2.5	
54			10.4														13.2	
55			5.2														12.9	
56			7.8														13.6	
57			15.8														8.9	
58			13.7														4.5	
59			14.6														12.0	
60			11.9														8.0	
61			11.5														5.4	
62			7.8														4.5	
63			17.8														6.6	
64			13.2														10.0	
65			5.4														4.7	
66			16.7														11.6	
67			6.8														9.8	
68			14.6															
69			14.4															
70			12.8															
71			15.4															
72			9.3															
73			6.3															
74			25.7															
75			11.1															
76			10.9															
77			12.6															
78			9.6															
79			16.7															
80			15.4															
81			13.3															
82			13.3															
83			15.6															
84			15.3															
85			15.8															
86			10.8															
87			13.6															
88			11.0															
89			15.3															
90			12.2															
91			15.5															
92			8.5															
93			10.4															
94			7.6															
95			6.2															
96			4.4															
97			13.0															
98			15.4															
99			4.1															
100			11.2															
101			6.1															
102			6.0															
103			6.5															
104			3.5															

Table A6-3a. Seneca River Dreissenid Mussel Survey Fall 2009 - Zebra Mussel Raw Length (mm) Data

Zone	Zone XIII			Zone XIII			Zone XIII			Zone XIII			Zone XIV			Zone XIV		
Transect	Transect B			Transect C			Transect D			Transect E			Transect A			Transect B		
Location	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red
105			3.1															
106			4.8															
107			3.6															
108			4.3															
109																		
110																		
111																		
112																		
113																		
114																		
115																		
116																		

Table A6-3b. Seneca River Dreissenid Mussel Survey Fall 2009 - Quagga Mussel Raw Length (mm) Data

Zone	Zone III			Zone III			Zone III			Zone X			Zone X			Zone X			Zone XIII		
Transect	Transect A			Transect B			Transect C			Transect A			Transect B			Transect C			Transect A		
Location	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red
Median Length	**12**	**11**	**7**	**11**	**6**	**0**	**8**	**13**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Mean Length	**11.5**	**10.5**	**8.2**	**10.7**	**5.9**	**0.0**	**7.7**	**12.6**	**3.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1	11.5	14.9	11.9	10.7	5.9		7.7	12.6	3.2												
2		15.3	7.0						2.7												
3		10.0	5.6																		
4		9.2																			
5		11.2																			
6		11.3																			
7		11.1																			
8		10.9																			
9		9.4																			
10		11.1																			
11		11.2																			
12		8.8																			
13		9.3																			
14		10.9																			
15		10.1																			
16		11.8																			
17		6.3																			
18		6.7																			
19																					
20																					
21																					
22																					
23																					
24																					
25																					
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49																					

Table A6-3b. Seneca River Dreissenid Mussel Survey Fall 2009 - Quagga Mussel Raw Length (mm) Data

Zone	Zone III			Zone III			Zone III			Zone X			Zone X			Zone X			Zone XIII		
Transect	Transect A			Transect B			Transect C			Transect A			Transect B			Transect C			Transect A		
Location	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red
50																					
51																					
52																					
53																					
54																					
55																					
56																					
57																					
58																					
59																					
60																					
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97																					
98																					
99																					
100																					

Table A6-3b. Seneca River Dreissenid Mussel Survey Fall 2009 - Quagga Mussel Raw Length (mm) Data

Zone	Zone III			Zone III			Zone III			Zone X			Zone X			Zone X			Zone XIII		
Transect	Transect A			Transect B			Transect C			Transect A			Transect B			Transect C			Transect A		
Location	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red
101																					
102																					
103																					
104																					
105																					
106																					
107																					
108																					
109																					
110																					
111																					
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144																					
145																					
146																					
147																					
148																					
149																					
150																					

Table A6-3b. Seneca River Dreissenid Mussel Survey Fall 2009 - Quagga Mussel Raw Length (mm) Data

Zone	Zone XIII			Zone XIII			Zone XIII			Zone XIII			Zone XIV			Zone XIV		
Transect	Transect B			Transect C			Transect D			Transect E			Transect A			Transect B		
Location	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red
Median Length	**0**	**22**	**17**	**0**	**0**	**0**	**0**	**0**	**0**	**16**	**0**	**0**	**10**	**13**	**16**	**11**	**7**	**14**
Mean Length	**0.0**	**22.0**	**17.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**15.9**	**0.0**	**0.0**	**10.6**	**13.0**	**15.3**	**11.5**	**9.4**	**14.4**
1		22.0	28.1							18.1			8.2	25.3	16.9	17.4	19.4	18.3
2			24.0							16.8			9.0	21.0	18.6	19.4	19.2	15.5
3			23.1							14.7			9.6	16.2	17.9	20.1	8.2	15.6
4			22.1							16.6			10.2	14.4	17.9	9.7	12.8	19.1
5			23.6							16.0			12.8	13.5	13.5	7.9	5.2	15.6
6			17.7							17.4			7.6	12.9	17.6	8.1	6.0	12.8
7			14.4							25.7			12.7	11.1	17.2	9.4	7.0	14.3
8			15.8							16.8			12.5	10.1	19.4	9.2	7.1	15.0
9			17.2							20.3			7.1	14.2	18.2	11.4	6.7	16.8
10			19.7							23.1			8.5	12.1	20.2	14.9	5.3	21.3
11			16.7							15.7			12.7	11.9	10.7	9.7	20.7	20.0
12			11.1							16.1			13.1	14.6	16.8	11.4	5.4	14.9
13			15.6							16.4			11.4	24.1	14.7	17.5	7.9	18.4
14			14.6							17.9			13.7	13.7	17.3	14.5	6.0	14.5
15			24.7							16.3			10.0	15.9	12.0	11.5	4.4	21.2
16			15.5							25.9			12.9	13.2	13.8	12.1	6.5	11.3
17			16.7							16.4			15.4	20.5	18.5	12.7	2.9	11.7
18			18.2							15.9			6.7	12.8	18.7	10.8	4.5	12.0
19			14.6							15.9			7.6	12.0	17.1	14.9	19.2	12.8
20			14.4							14.4			10.3	14.3	15.2	15.3	4.3	12.1
21			15.6							16.4			9.7	10.1	15.9	13.6	18.2	13.7
22			15.1							15.7			7.2	16.4	19.8	13.3	8.7	20.5
23			11.6							17.3			4.7	13.7	14.2	12.8	5.3	15.4
24			17.0							16.3			5.9	11.3	17.6	11.2	18.2	24.9
25										21.2			6.7	5.8	15.0	11.0	6.3	13.7
26										17.2			14.8	13.5	10.6	10.8	22.3	11.6
27										18.7			9.0	13.8	14.9	11.0	3.1	17.4
28										17.9			11.2	20.4	15.2	13.4	20.3	13.5
29										16.1			15.5	15.7	12.4	11.7	7.8	15.8
30										15.9			13.2	12.3	19.3	11.3	4.0	13.2
31										16.0			17.3	13.1	19.4	11.3	5.6	12.9
32										18.2			15.1	14.1	17.3	13.1	4.1	10.9
33										16.4			12.5	22.2	18.8	11.0	17.1	13.2
34										17.8			14.6	13.6	10.7	12.1	7.0	15.1
35										20.6			21.0	10.9	17.8	13.0	13.5	12.5
36										17.7			6.5	14.2	13.0	12.2	9.3	13.8
37										16.9			17.4	14.1	15.9	11.4	3.8	14.9
38										15.4			13.3	12.9	17.7	11.5	8.9	13.0
39										17.2			11.4	15.7	14.9	11.7	2.1	12.9
40										15.4			15.0	11.1	16.8	11.2	5.8	11.2
41										17.9			8.6	11.9	12.0	9.4	6.6	13.1
42										14.7			15.2	13.9	18.7	9.9	24.9	12.5
43										21.9			7.3	11.9	14.9	10.8	9.8	10.2
44										14.9			9.1	13.2	13.4	9.0	8.1	11.2
45										16.4			8.4	20.6	11.3	9.7	17.3	12.9
46										17.6			11.4	11.3	14.6	9.3	7.9	16.4
47										13.6			12.3	15.5	11.2	10.2	10.1	15.7
48										15.6			10.4	11.5	17.3	10.2	4.6	13.2
49										13.5			9.3	13.4	12.6	7.9	6.7	14.5

Table A6-3b. Seneca River Dreissenid Mussel Survey Fall 2009 - Quagga Mussel Raw Length (mm) Data

Zone	Zone XIII			Zone XIII			Zone XIII			Zone XIII			Zone XIV			Zone XIV		
Transect	Transect B			Transect C			Transect D			Transect E			Transect A			Transect B		
Location	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red
50										15.2			13.1	10.6	22.3	7.4	5.8	17.8
51										16.7			9.9	11.0	12.2	7.0	19.5	20.3
52										16.1			7.7	9.4	16.1	9.1	14.4	11.5
53										17.1			9.0	19.3	16.8	9.8	6.7	11.8
54										15.5			14.2	10.6	17.0	8.0	20.8	12.6
55										5.5			22.0	11.8	13.7	11.3	18.0	14.6
56										14.3			5.2	14.9	10.7	10.1	10.9	11.3
57										12.9			7.4	10.5	12.5	7.5	6.1	13.6
58										14.9			8.6	11.2	17.4		5.9	8.8
59										21.0			6.4	17.6	13.9		2.1	11.8
60										14.6			8.8	10.4	16.1		13.8	14.1
61										14.4			12.9	13.7	14.8		14.4	12.0
62										17.6			9.5	9.9	14.3		5.6	14.6
63										17.8			7.2	12.9	12.7		15.7	12.2
64										15.4			5.6	6.9	16.1		4.9	11.1
65										12.1			6.0	15.0	10.9		9.7	14.1
66										16.8			20.3	8.2	17.6		10.3	11.4
67										15.3			14.7	11.8	19.4		7.0	13.6
68										16.9			8.4	14.7	14.3		6.4	14.3
69										17.5			10.0	9.1	16.0		10.1	16.2
70										17.1			11.8	11.9	12.2		6.6	13.2
71										15.8			10.6	10.6	16.1		5.1	12.7
72										17.4			11.3	14.2	16.9		15.5	16.7
73										17.6			11.5	14.0	16.3		7.3	12.3
74										16.1			7.3	11.9	16.9		4.8	17.0
75										12.4			7.3	13.5	18.6		7.9	17.2
76										13.1			6.5	9.4	18.1		6.4	17.4
77										15.2			6.7	12.4	10.3		6.2	11.1
78										15.9			10.7	12.1	17.5		6.6	17.6
79										13.7			14.1	10.8	13.1		4.5	13.7
80										15.3			7.1	13.4	18.3		5.0	12.0
81										13.5			7.8	13.0	17.1		6.4	14.2
82										14.5			10.6	14.4	16.8		5.9	13.6
83										13.7			5.3	13.0	15.5		6.7	20.3
84										13.1			12.6	8.9	14.4		6.3	21.6
85										13.7			9.9	12.7	21.6		7.1	13.4
86										14.8			9.4	12.4	15.0		4.8	13.9
87										13.6			9.0	13.3	11.9		18.8	12.1
88										14.9			7.1	10.2	12.3		7.9	15.6
89										7.3				9.4	12.3		11.1	14.3
90										14.0				14.1	16.3		7.4	10.9
91										15.9				11.8	11.9		9.5	11.6
92										13.6				11.9	13.8		9.7	12.1
93										14.1				11.6	13.9		8.8	13.3
94										12.6				13.3	8.4		8.3	17.8
95										13.9				9.2	11.7		10.2	15.9
96										13.6				9.8	13.7		8.7	12.5
97										14.8				10.8	15.2		3.4	18.6
98										11.6				8.3	10.7		5.2	13.2
99										14.0				10.3	10.2		21.9	11.5
100										8.9				6.8	17.6		20.8	7.9

Table A6-3b. Seneca River Dreissenid Mussel Survey Fall 2009 - Quagga Mussel Raw Length (mm) Data

Zone	Zone XIII			Zone XIII			Zone XIII			Zone XIII			Zone XIV			Zone XIV		
Transect	Transect B			Transect C			Transect D			Transect E			Transect A			Transect B		
Location	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red
101										11.7								
102										9.9								
103										14.2								
104										14.1								
105										5.3								
106										14.5								
107										8.9								
108										8.1								
109										7.1								
110										6.2								
111										6.5								
112										8.5								
113										7.2								
114										7.5								
115										7.7								
116										8.3								
117										4.9								
118										4.5								
119										5.2								
120										26.1								
121										18.5								
122										24.4								
123										16.2								
124										14.8								
125										14.9								
126										15.9								
127										15								
128										17.3								
129										18.5								
130										18.2								
131										17.8								
132										19.6								
133										16.5								
134										16.9								
135										18								
136										10.9								
137										13.7								
138										20.1								
139										14.9								
140										14.5								
141										15.5								
142										15.3								
143										16.6								
144										18.5								
145										21.1								
146										14.6								
147										12.2								
148										18.2								
149										16.6								
150										15.7								

Table A6.4. Onondaga Lake Dressenid Mussel Survey Fall 2009 - Length and Weight Data Summary

Zone	Transect	Transect Coordinates	Water Depth at Sample Collection (m)	Water Depth Section/Range (m)	Number of Mussels Per Sub-Sample	Weight Per Sub-Sample (g)	Weight Per Entire Sample (g)	Total Weight (g/m^2)	Mean Weight (g/m^2) per Transect	Mean Weight (g/m^2) per Zone	Median Mussel Length (mm)	Mean Mussel Length (mm)	Total Number of Mussels Per Sample	Estimated Total Number of Mussels per m^2	Mean Estimated Number of Mussels per m^2 by Transect	Mean Estimated Number of Mussels per m^2 by Zone
A	1	N 43 06.259, W 76 13.183	0.7	0-1.5	100 (118)	21.6 (17.1)	33.5 (20.9)	1482.3 (924.8)	740.4 (354.0)	485.25 (321.6)	10 (7)	10.5 (8.7)	155 (144)	6858.4 (6371.7)	6002.9 (2625.4)	4019 (2301)
		N 43 06.244, W 76 13.214	2.2	1.5-3.0	100 (32)	10.7 (3.0)	14.9 (3.0)	659.3 (132.7)			9 (9)	8.7 (9.2)	139 (32)	6150.4 (1415.9)		
		N 43 06.240, W 76 13.213	4.0	3.0-4.5	100 (2)	1.6 (0.1)	1.8 (0.1)	79.6 (4.4)			5 (9)	5.1 (8.5)	113 (2)	5000.0 (88.5)		
A	2	N 43 06.615, W 76 13.696	0.9	0-1.5	135 (64)	15.2 (10.5)	15.2 (10.5	672.6 (464.6)	230.1 (289.1)		9 (11)	9.0 (11)	135 (64)	5973.5 (2831.9)	2035.4 (1976.4)	
		N 43 06.603, W 76 13.735	1.7	1.5-3.0	2 (63)	0.3 (8.3)	0.3 (8.3)	13.3 (367.3)			12 (9)	11.5 (9.9)	2 (63)	88.5 (2787.6)		
		N 43 06.590, W 76 13.738	3.6	3.0-4.5	1 (7)	0.1 (0.8)	0.1 (0.8)	4.4 (35.4)			5 (11)	4.5 (10.5)	1 (7)	44.2 (309.7)		
B	1	N 43 06.907, W 76 14.324	0.7	0-1.5	110 (100)	15.8 (22.6)	15.8 (69.0)	699.1 (3053.1)	241.9 (4402.7)	241.9 (4402.7)	9 (11)	8.9 (11.5)	110 (305)	4867.3 (13495.6)	1814.2 (8908.6)	1814 (8909)
		N 43 06.889, W 76 14.316	2.5	1.5-3.0	0 (0)	0 (0)	0 (0)	0 (0)			0 (0)	0 (0)	0 (0)	0 (0)		
		N 43 06.887, W 76 14.321	4.0	3.0-4.5	13 (100)	0.6 (10.2)	0.6 (30.5)	26.5 (1349.6)			6 (6)	7.0 (7.3)	13 (299)	575.2 (13230.1)		
C	1	N 43 06.350, W 76 14.566	1.2	0-1.5	1 (2)	0.2 (0.3)	0.2 (0.3)	8.8 (13.3)	184.3 (3885.0)	109.1 (2000.8)	13 (12)	12.9 (11.6)	1 (2)	44.2 (88.5)	855.4 (18038.3)	516 (9226)
		N 43 06.358, W 76 14.536	2.5	1.5-3.0	10 (100)	4.1 (25.6)	4.1 (82.2)	181.4 (3637.2)			8 (12)	10.2 (12.2)	10 (321)	442.5 (14203.5)		
		N 43 06.360, W 76 14.521	4.3	3.0-4.5	47 (100)	8.2 (20.1)	8.2 (180.9)	362.8 (8004.4)			11 (10)	11.2 (10.6)	47 (900)	2079.6 (39823.0)		
C	2	N 43 05.549, W 76 13.917	0.9	0-1.5	4 (24)	2.1 (7.4)	2.1 (7.4)	92.9 (327.4)	33.9 (116.5)		14 (14)	14.9 (12.7)	4 (24)	177.0 (1061.9)	147.5 (412.9)	
		N 43 05.562, W 76 13.896	2.8	1.5-3.0	4 (1)	0.1 (0.1)	0.1 (0.1)	4.4 (4.4)			5 (11)	5.5 (10.7)	4 (1)	177.0 (44.2)		
		N 43 05.571, W 76 13.895	4.2	3.0-4.5	2 (3)	0.1 (0.4)	0.1 (0.4)	4.4 (17.7)			5 (12)	5.3 (11.1)	2 (3)	88.5 (132.7)		
D	1	N 43 05.258, W 76 13.075	1.3	0-1.5	5 (1)	0.5 (0.3)	0.5 (0.3)	22.1 (13.3)	22.1 (1765.5)	42.8 (894.6)	9 (8)	8.7 (8.1)	5 (1)	221.2 (44.2)	383.5 (7964.6)	5479 (4034)
		N 43 05.265, W 76 13.061	2.0	1.5-3.0	4 (0)	0.2 (0)	0.2 (0)	8.8 (0)			6 (0)	7.7 (0)	4 (0)	177.0 (0)		
		N 43 05.271, W 76 13.031	4.0	3.0-4.5	17 (149)	0.8 (33.0)	0.8 (119.4)	35.4 (5283.2)			8 (12)	8.3 (12.3)	17 (539)	752.2 (23849.6)		
D	2	N 43 04.865, W 76 12.593	1.0	0-1.5	0 (0)	0 (0)	0 (0)	0 (0)	63.4 (23.6)		0 (0)	0 (0)	0 (0)	0 (0)	10575.2 (103.2)	
		N 43 04.871, W 76 12.589	2.1	1.5-3.0	150 (3)	0.9 (0.1)	4.3 (0.1)	190.3 (4.4)			3 (3)	3.1 (2.7)	717 (3)	31725.7 (132.7)		
		N 43 04.887, W 76 12.587	3.9	3.0-4.5	0 (4)	0 (1.5)	0 (1.5)	0 (66.4)			0 (15)	0 (14.8)	0 (4)	0 (177.0)		
E	1	N 43 04.321, W 76 12.242	0.9	0-1.5	0 (0)	0 (0)	0 (0)	0 (0)	53.1 (949.9)	53.1 (949.9)	0 (0)	0 (0)	0 (0)	0 (0)	722.7 (6268.4)	723 (6268)
		N 43 04.333, W 76 12.200	2.1	1.5-3.0	3 (58)	0.1 (8.5)	0.1 (8.5)	4.4 (376.1)			7 (11)	6.2 (11.1)	3 (58)	132.7 (2566.4)		
		N 43 04.330, W 76 12.191	4.2	3.0-4.5	46 (100)	3.5 (15.2)	3.5 (55.9)	154.9 (2473.5)			9 (6)	8.2 (8.4)	46 (367)	2035.4 (16238.9)		
F	1	N 43 04.083, W 76 11.638	0.7	0-1.5	70 (10)	24.2 (3.6)	24.2 (3.6)	1070.8 (159.3)	532.4 (3830.4)	532.4 (3830.4)	13 (11)	12.6 (11.6)	70 (10)	3097.3 (442.5)	2522.1 (12064.9)	2522 (12065)
		N 43 04.113, W 76 11.627	1.9	1.5-3.0	51 (100)	7.4 (32.9)	7.4 (118.8)	327.4 (5256.6)			10 (15)	9.7 (13.5)	51 (361)	2256.6 (15973.5)		
		N 43 04.124, W 76 11.614	4.0	3.0-4.5	50 (100)	4.5 (30.7)	4.5 (137.3)	199.1 (6075.2)			8 (13)	8.2 (13.3)	50 (447)	2212.4 (19778.8)		
G	1	N 43 04.041, W 76 10.834	1.1	0-1.5	1 (0)	0.1 (0)	0.1 (0)	4.4 (0)	4.4 (0)	4.4 (0)	4 (0)	4.1 (0)	1 (0)	44.2 (0)	177.0 (0)	177 (0)
		N 43 04.048, W 76 10.958	2.8	1.5-3.0	11 (0)	0.2 (0)	0.2 (0)	8.8 (0)			6 (0)	4.8 (0)	11 (0)	486.7 (0)		
		N 43 04.068, W 76 10.991	4.0	3.0-4.5	0 (0)	0 (0)	0 (0)	0 (0)			0 (0)	0 (0)	0 (0)	0 (0)		
H	1	N 43 04.882, W 76 11.078	1.1	0-1.5	58 (21)	9.8 (3.7)	9.8 (3.7)	433.6 (163.7)	296.5 (755.2)	405.6 (432.9)	11 (10)	10.7 (11.1)	58 (21)	2566.4 (929.2)	2138.7 (7817.1)	3716.9 (5221.3)
		N 43 04.861, W 76 11.120	1.9	1.5-3.0	87 (100)	10.3 (9.1)	10.3 (41.6)	455.8 (1840.7)			7 (4)	8.4 (5.7)	87 (457)	3849.6 (20221.2)		
		N 43 04.845, W 76 11.148	3.8	3.0-4.5	0 (52)	0 (5.9)	0 (5.9)	0 (261.1)			0 (10)	0 (9.7)	0 (52)	0 (2300.9)		
H	2	N 43 05.629, W 76 12.040	1.2	0-1.5	85 (26)	12.9 (2.2)	12.9 (2.2)	570.8 (97.3)	514.7 (110.6)		10 (7)	9.7 (8.3)	85 (26)	3761.1 (1150.4)	5295.0 (2625.4)	
		N 43 05.626, W 76 12.107	1.8	1.5-3.0	100 (100)	9.4 (3.7)	19.9 (4.2)	880.5 (185.8)			8 (6)	8.3 (6.1)	212 (113)	9380.5 (5000.0)		
		N 43 05.622, W 76 12.116	3.8	3.0-4.5	62 (39)	2.1 (1.1)	2.1 (1.1)	92.9 (48.7)			6 (6)	5.7 (5.9)	62 (39)	2743.4 (1725.7)		

Note: Petit Ponar Dredge Sample Area is 226 cm^2.
Results expressed as Zebra mussel (Quagga mussel).

Note: Samples were collected on October 12, 2009.

Table A6.5a. Onondaga Lake Dreissenid Mussel Survey - Fall 2002, and Fall 2005 through Fall 2009 Comparison of Density (#/m^2)

Zone	Water Depth Section/Range (m)	Mean Estimated Total Number of Mussels per m^2 by Depth						Mean Estimated Number of Mussels per m^2 by Zone					
		2002	2005	2006	2007	2008	2009	2002 (0-4.5 M)	2005 (0-4.5 M)	2006 (0-4.5 M)	2007 (0-4.5 M)	2008 (0-4.5 M)	2009 (0-4.5 M)
A	0 -1.5	2036.2	66.4	774.4	17704.0 (199.1)	486.7 (0)	6416.0 (4601.8)						
	1.5 - 3.0	3465.5	3385.0	6216.4	21084.2 (398.3)	2854.0 (2566.4)	3119.5 (2101.8)	1834	1187	5465	14559 (229)	2721 (1328)	4019 (2301)
	3.0 - 4.5	0.0	110.6	9403.5	4889.4 (88.5)	4823.0 (1415.9)	2522.1 (199.1)						
B	0 -1.5	0.0	0.0	13877.7	14896.8 (0)	5044.2 (575.2)	4867.3 (13495.6)						
	1.5 - 3.0	0.0	221.2	531.0	21238.9 (0)	1283.2 (6858.4)	0 (0)	0	133	4803	12148 (0)	2522 (4558)	1814 (8909)
	3.0 - 4.5	0.0	177.0	0.0	309.7 (0)	1238.9 (6238.9)	575.2 (13230.1)						
C	0 -1.5	754.7	44.8	3340.7	4002.3 (0)	4535.4 (508.9)	110.6 (575.2)						
	1.5 - 3.0	788.6	2013.3	2522.2	16017.7 (1305.3)	6615.1 (2566.4)	309.8 (7123.9)	514	1040	1991	12396 (2522)	5627 (2980)	516 (9226)
	3.0 - 4.5	0.0	951.3	110.6	17455.8 (2477.9)	5730.1 (5862.9)	1084.1 (19977.9)						
D	0 -1.5	3941.9	1017.7	199.1	4911.5 (132.8)	2920.4 (2035.4)	110.6 (22.1)						
	1.5 - 3.0	124.8	774.4	221.2	4292.1 (132.8)	1305.4 (885.0)	15951.4 (66.4)	1356	907	774	18791 (281)	1460 (1092)	5479 (4034)
	3.0 - 4.5	0.0	929.2	1902.7	47168.2 (575.2)	154.9 (354.0)	376.1 (12013.3)						
E	0 -1.5	225.0	575.2	2522.1	20452.3 (0)	7212.4 (7831.9)	0 (0)						
	1.5 - 3.0	4154.5	442.5	619.5	619.5 (0)	4469.0 (7876.1)	132.7 (2566.4)	1460	752	1549	7806 (0)	5782 (12448)	723 (6268)
	3.0 - 4.5	0.0	1238.9	1504.4	2345.1 (0)	5663.7 (21637.2)	2035.4 (16238.9)						
F	0 -1.5	3069.8	929.2	88.5	6761.5 (0)	8185.8 (442.5)	3097.3 (442.5)						
	1.5 - 3.0	351.7	8274.3	88.5	26737 (0)	5000.0 (2920.4)	2256.6 (15973.5)	1141	3319	59	13211 (0)	7965 (6785)	2522 (12065)
	3.0 - 4.5	0.0	752.2	0.0	6134.4 (0)	10708.0 (16991.2)	2212.4 (19778.8)						
G	0 -1.5	0.0	0.0	0.0	354 (0)	3008.8 (221.2)	44.2 (0)						
	1.5 - 3.0	0.0	44.2	0.0	6795.2 (0)	3451.3 (0)	486.7 (0)	0	15	0	2383 (0)	2522 (501)	177 (0)
	3.0 - 4.5	0.0	0.0	0.0	0 (0)	1106.2 (1283.2)	0 (0)						
H	0 -1.5	2650.6	22.1	2500.0	3473.5 (0)	464.6 (22.1)	3163.8 (1039.8)						
	1.5 - 3.0	655.9	2256.7	1371.7	1283.2 (0)	17190.3 (420.4)	6615.1 (12610.6)	1102	789	1667	2463 (0)	8120 (244)	3716.9 (5221.3)
	3.0 - 4.5	0.0	88.5	1128.3	2632.7 (0)	6703.5 (287.6)	1371.7 (2013.3)						
Total 0-1.5 M		12678	2655	23302	72556 (332)	31858 (11637)	17810 (20177)						
Total 1.5 to 3.0 M		9541	17411	11570	98068 (1836)	42168 (24093)	28872 (40443)						
Total 3.0 to 4.5 M		0	4248	14049	80935 (3142)	36128 (54071)	10177 (83451)						
Total 0 to 3.0 M		22219	20067	34873	170624 (2168)	74027 (35730)	46682 (60620)	**Mean**	926	1018	2038	10470 (379)	4590 (3742)	2371 (6003)
Total 0 to 4.5 M		22219	24314	48922	251559 (5310)	110155 (89801)	56859 (144071)	**Sum**	7406	8142	16307	83757 (3032)	36719 (29936)	18967 (48024)

Note: Results expressed as Zebra mussel (Quagga mussel) when Quagga mussels are present.
The 2002 data utilized scuba divers for sample collection, and the 2005 through 2009 data utilized the petit ponar dredge for sample collection.

Table A6.5b. Onondaga Lake Dreissenid Mussel Survey - Fall 2002, and Fall 2005 through Fall 2009 Comparison of Density (g/m^2)

Zone	Water Depth Section/Range (m)	Mean Estimated Total Weight (g) of Mussels per m^2 by Depth						Mean Estimated Weight of Mussels (g) per m^2 by Zone					
		2002	2005	2006	2007 *	2008 *	2009		2002 (0-4.5 M)	2005 (0-4.5 M)	2006 (0-4.5 M)	2007 * (0-4.5 M)	2008 * (0-4.5 M)	2009 (0-4.5 M)
A	0 -1.5	1134.8	0.5	53.1	1648.2	73.0	1077.5 (694.7)							
	1.5 - 3.0	2100.8	122.7	672.6	1721.2	544.3	336.3 (250.0)		1078.5	41.9	716.8	1150.4	297.9	485.25 (321.6)
	3.0 - 4.5	0.0	2.4	1424.8	81.9	276.5	42 (19.9)							
B	0 -1.5	0.0	0.0	110.6	893.8	323.0	699.1 (3053.1)							
	1.5 - 3.0	0.0	12.8	31.0	106.2	854.0	0 (0)		0.0	6.0	47.2	337.8	650.4	241.9 (4402.7)
	3.0 - 4.5	0.0	5.3	0.0	13.3	774.3	26.5 (1349.6)							
C	0 -1.5	246.6	3.1	13.3	314.2	278.8	50.9 (170.4)							
	1.5 - 3.0	265.1	67.3	208.0	2146.0	847.4	92.9 (1820.8)		170.6	57.6	74.5	1747.8	855.5	109.1 (2000.8)
	3.0 - 4.5	0.0	102.4	2.2	2783.2	1440.3	183.6 (4011.1)							
D	0 -1.5	1076.1	81.6	28.8	2115.0	1015.5	11.1 (6.7)							
	1.5 - 3.0	8.8	6.9	4.4	35.4	336.3	99.6 (2.2)		361.6	45.1	70.1	1442.5	472.7	42.8 (894.6)
	3.0 - 4.5	0.0	46.7	177.0	1473.5	66.4	17.7 (2674.8)							
E	0 -1.5	386.4	14.6	8.9	920.4	1385.0	0 (0)							
	1.5 - 3.0	2529.4	8.9	22.1	57.5	1097.3	4.4 (376.1)		971.9	16.8	26.6	348.1	1435.1	53.1 (949.9)
	3.0 - 4.5	0.0	27.0	48.7	66.4	1823.0	154.9 (2473.5)							
F	0 -1.5	3363.7	62.8	17.7	1203.5	854.0	1070.8 (159.3)							
	1.5 - 3.0	12.3	240.3	4.4	6283.2	1084.1	327.4 (5256.6)		1125.3	133.5	7.4	2585.5	1619.5	532.4 (3830.4)
	3.0 - 4.5	0.0	97.4	0.0	269.9	2920.4	199.1 (6075.2)							
G	0 -1.5	0.0	0.0	0.0	4.4	628.3	4.4 (0)							
	1.5 - 3.0	0.0	0.4	0.0	190.3	172.6	8.8 (0)		0.0	0.1	0.0	64.9	324.5	4.4 (0)
	3.0 - 4.5	0.0	0.0	0.0	0.0	172.6	0 (0)							
H	0 -1.5	2356.2	0.2	26.5	617.3	64.2	502.2 (130.5)							
	1.5 - 3.0	45.7	59.3	88.5	247.8	526.6	668.2 (1013.3)		800.6	22.6	94.4	457.2	272.1	405.6 (432.9)
	3.0 - 4.5	0.0	8.4	168.1	506.6	225.7	46.5 (154.9)							
Total 0-1.5 M		8564	163	259	7717	4622	3416 (4215)							
Total 1.5 to 3.0 M		4962	519	1031	10788	5463	1538 (8719)							
Total 3.0 to 4.5 M		0	290	1821	5195	7699	670 (16759)							
Total 0 to 3.0 M		13526	681	1290	18504	10084	4954 (12934)	**Mean**	563.6	40.5	129.6	1016.8	741.0	234.3 (1604.1)
Total 0 to 4.5 M		13526	971	3111	23699	17784	5624 (29693)	**Sum**	4508.6	323.7	1036.9	6983.8	5927.7	1874.6 (12832.9)

Note: * Weights represent the combined *Dreissena* sp., Zebra and Quagga mussel.
All other results expressed as Zebra mussel (Quagga mussel) when Quagga mussels are present.
The 2002 data utilized scuba divers for sample collection, and the 2005 through 2009 data utilized the petit ponar dredge for sample collection.

Table A6.6a. Onondaga Lake Dreissenid Mussel Survey Fall 2009 - Zebra Mussel Raw Length (mm) Data.

Zone	Zone A			Zone A			Zone B			Zone C			Zone C			Zone D			Zone D		
Transect	Transect 1			Transect 2			Transect 1			Transect 1			Transect 2			Transect 1			Transect 2		
Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5
Median Length	**10**	**9**	**5**	**9**	**12**	**5**	**9**	**0**	**6**	**13**	**8**	**11**	**14**	**5**	**5**	**9**	**6**	**8**	**0**	**3**	**0**
Mean Length	**10.5**	**8.7**	**5.1**	**9.0**	**11.5**	**4.5**	**8.9**	**0.0**	**7.0**	**12.9**	**10.2**	**11.2**	**14.9**	**5.5**	**5.3**	**8.7**	**7.7**	**8.3**	**0.0**	**3.1**	**0.0**
1	12.0	16.7	9.9	13.9	10.9	4.5	8.3		8.9	12.9	28.3	18.8	14.6	5.5	5.6	12.8	13.0	10.3		3.6	
2	10.6	5.9	9.5	12.0	12.1		11.9		5.8		14.3	12.0	19.4	6.8	4.9	10.1	5.9	7.7		2.0	
3	18.8	13.8	7.2	14.5			9.0		11.9		14.2	12.8	13.3	5.2		4.8	7.0	6.4		8.6	
4	12.3	6.0	7.1	6.6			5.3		14.4		9.3	13.6	12.1	4.6		8.6	5.0	6.9		2.4	
5	13.5	11.1	7.0	8.8			10.3		5.7		8.5	14.5				7.4		8.5		2.8	
6	9.8	14.5	7.1	15.5			9.7		3.7		8.0	13.7						8.1		2.3	
7	7.3	9.9	6.5	10.4			6.0		3.8		5.3	12.1						12.2		1.0	
8	13.7	14.2	4.7	9.5			8.1		10.9		5.7	9.6						10.1		2.7	
9	12.3	10.4	5.9	14.7			17.4		5.3		5.0	14.9						6.6		2.7	
10	8.6	9.7	6.6	11.0			8.8		4.7		3.8	20.3						8.4		9.4	
11	10.3	12.5	7.0	10.5			7.5		6.0			12.0						6.4		3.5	
12	17.1	5.8	6.1	11.2			7.1		7.5			19.1						7.6		2.2	
13	9.4	9.3	6.1	6.6			5.8		3.0			11.5						9.2		2.2	
14	6.3	14.7	6.2	14.3			5.6					13.3						10.5		2.3	
15	14.9	10.1	6.4	8.5			8.5					8.2						8.2		3.4	
16	15.4	4.4	5.7	15.0			13.8					10.7						9.1		2.5	
17	13.1	5.7	4.2	15.7			9.0					13.9						4.7		3.3	
18	8.2	11.7	3.4	6.6			9.5					14.6								3.6	
19	10.8	7.5	4.6	9.0			6.8					10.9								3.1	
20	15.4	6.4	5.7	10.4			5.7					12.2								8.1	
21	6.3	10.9	5.1	13.2			7.2					13.6								2.8	
22	7.4	9.9	5.1	11.7			9.2					8.5								2.1	
23	17.8	5.1	5.9	16.1			4.8					10.5								2.0	
24	10.8	8.4	5.2	11.1			8.1					12.1								3.1	
25	8.7	12.2	6.7	10.8			8.1					10.9								9.6	
26	8.6	6.1	6.5	5.0			12.7					8.8								2.8	
27	13.0	7.1	6.2	7.2			8.9					11.5								2.6	
28	10.4	6.7	5.6	10.1			18.4					9.3								2.1	
29	9.9	7.9	5.5	12.9			13.6					11.1								2.5	
30	6.4	6.8	6.0	9.0			15.0					11.8								2.6	
31	7.6	10.9	3.7	6.1			11.7					12.1								1.2	
32	8.5	9.1	7.4	7.2			8.8					6.3								1.9	
33	18.8	17.7	5.8	4.8			9.9					8.9								3.2	
34	14.4	3.3	6.5	9.1			10.7					11.2								2.6	
35	9.6	3.9	6.1	8.5			7.2					8.5								4.6	
36	4.2	14.8	5.6	7.8			7.3					8.8								3.2	
37	12.7	10.6	5.0	5.0			8.9					8.6								3.5	
38	13.4	8.5	4.9	6.7			13.0					10.5								1.9	
39	11.8	10.2	5.7	6.5			7.2					6.4								3.7	
40	7.3	8.5	4.6	5.4			5.7					9.3								3.5	
41	8.1	5.8	5.2	11.8			9.4					7.7								4.0	
42	14.0	5.1	4.6	15.5			8.0					9.1								2.7	
43	17.7	7.9	4.5	8.6			11.5					7.4								3.1	
44	9.3	9.6	6.6	11.1			11.2					10.2								3.9	
45	10.3	11.7	6.7	12.7			7.0					5.7								1.8	
46	15.0	6.0	5.8	14.0			6.7					11.4								3.1	
47	10.1	10.1	6.3	13.9			11.7					6.4								2.5	
48	6.6	6.8	6.1	11.7			3.9													3.3	

Table A6.6a. Onondaga Lake Dreissenid Mussel Survey Fall 2009 - Zebra Mussel Raw Length (mm) Data.

Zone	Zone A			Zone A			Zone B			Zone C			Zone C			Zone D			Zone D		
Transect	Transect 1			Transect 2			Transect 1			Transect 1			Transect 2			Transect 1			Transect 2		
Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5
49	8.3	7.3	6.6	11.7			9.4													3.6	
50	8.1	5.6	6.0	9.6			12.3													3.4	
51	12.4	4.7	5.9	10.2			7.6													6.0	
52	9.3	18.1	2.6	10.3			7.4													2.8	
53	11.7	9.0	5.2	12.9			9.0													3.4	
54	12.0	11.8	5.3	11.1			9.5													2.4	
55	6.1	6.1	6.0	8.5			10.7													2.9	
56	4.8	10.8	2.8	9.7			10.5													3.2	
57	4.9	10.8	2.8	9.6			10.3													2.2	
58	9.7	11.7	2.1	9.6			12.4													2.2	
59	5.8	3.1	3.2	8.3			8.3													3.2	
60	9.2	8.4	3.5	8.1			10.0													1.7	
61	11.8	7.5	4.0	8.2			5.4													2.2	
62	16.1	9.7	4.2	9.1			7.1													3.6	
63	9.1	11.9	3.6	8.0			11.9													3.5	
64	12.9	10.3	3.4	6.8			8.1													2.3	
65	9.6	7.5	2.7	11.4			6.2													9.4	
66	15.1	7.0	4.8	9.9			8.9													4.3	
67	10.1	7.6	4.2	8.9			9.4													4.2	
68	12.2	9.5	2.8	7.9			9.1													2.3	
69	9.3	8.5	4.9	7.2			8.9													6.2	
70	11.8	7.2	5.8	7.2			10.0													1.4	
71	11.5	11.7	4.6	15.3			9.7													2.1	
72	11.4	7.6	4.8	14.2			8.8													3.7	
73	11.0	8.9	4.1	8.8			10.9													3.6	
74	10.8	11.8	2.9	9.1			11.6													5.0	
75	12.1	4.8	2.8	15.3			7.9													1.8	
76	12.2	4.8	3.9	12.1			11.9													2.7	
77	8.2	7.8	5.1	10.9			7.5													2.4	
78	11.1	11.1	3.9	10.0			6.5													4.1	
79	13.4	9.7	4.0	10.1			11.1													1.4	
80	9.2	9.3	4.7	10.5			9.9													2.5	
81	4.8	5.9	5.1	9.5			12.7													4.0	
82	8.1	4.8	5.7	5.3			12.4													2.6	
83	6.9	5.0	4.4	5.3			6.6													3.8	
84	8.4	9.7	3.2	10.1			5.8													4.7	
85	7.3	5.5	4.8	7.5			8.1													3.3	
86	5.1	10.9	4.8	10.7			12.6													2.6	
87	8.8	5.0	4.2	11.6			10.3													3.5	
88	16.0	4.6	5.6	9.9			12.0													1.7	
89	11.9	12.3	4.0	8.4			4.6													2.2	
90	12.3	12.1	5.1	4.5			8.2													2.3	
91	11.6	5.5	5.4	4.9			10.6													2.0	
92	7.2	10.8	4.8	5.6			11.1													1.9	
93	12.2	11.5	3.8	8.4			10.3													2.0	
94	9.5	7.7	4.3	6.1			10.3													2.8	
95	7.4	4.6	3.0	7.6			9.1													4.3	
96	8.9	4.1	4.9	9.3			4.6													2.5	
97	7.6	7.0	4.2	5.5			7.4													1.5	
98	7.7	6.3	3.9	7.6			9.3													4.5	

Table A6.6a. Onondaga Lake Dreissenid Mussel Survey Fall 2009 - Zebra Mussel Raw Length (mm) Data.

Zone	Zone A			Zone A			Zone B			Zone C			Zone C			Zone D			Zone D		
Transect	Transect 1			Transect 2			Transect 1			Transect 1			Transect 2			Transect 1			Transect 2		
Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5
99	8.2	7.4	3.7	9.8			8.1													3.5	
100	9.5	8.5	4.6	10.4			8.3													2.4	
101				6.2			7.8													2.6	
102				11.7			6.5													4.2	
103				10.3			6													3.5	
104				9.3			7													2.3	
105				6			4.6													1.9	
106				6.4			7.3													3.3	
107				8.6			7.3													3.6	
108				7.4			6.3													2.2	
109				6.3			5.9													4	
110				7.4			5.2													2.6	
111				5.5																2.9	
112				7.3																1.7	
113				5.2																3.1	
114				8.1																2.6	
115				3.9																1.9	
116				6.6																1.9	
117				6.3																3.2	
118				5.6																5.1	
119				7.2																2.3	
120				10.5																2.1	
121				7.3																2.6	
122				7.1																2.6	
123				6.5																2	
124				8.9																2.4	
125				6.8																1.3	
126				4.8																3.3	
127				4.9																2.4	
128				10.7																1.9	
129				8																5.1	
130				6.5																2.1	
131				7.6																2.7	
132				6.2																4	
133				5.8																2.5	
134				4.3																2.4	
135				3.8																4.4	
136																				3.4	
137																				2	
138																				2.1	
139																				2.7	
140																				4.3	
141																				4.4	
142																				4	
143																				3.2	
144																				1.7	
145																				1.7	
146																				2.8	
147																				2.2	
148																				4	

Table A6.6a. Onondaga Lake Dreissenid Mussel Survey Fall 2009 - Zebra Mussel Raw Length (mm) Data.

Zone	Zone A			Zone A			Zone B			Zone C			Zone C			Zone D			Zone D		
Transect	Transect 1			Transect 2			Transect 1			Transect 1			Transect 2			Transect 1			Transect 2		
Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5
149																				1.7	
150																				2.8	

Table A6.6a. Onondaga Lake Dreissenid Mussel Survey Fall 2009 - Zebra Mussel Raw Length (mm) Data.

Zone	Zone E			Zone F			Zone G			Zone H			Zone H		
Transect	Transect 1			Transect 1			Transect 1			Transect 1			Transect 2		
Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5
Median Length	**0**	**7**	**9**	**13**	**10**	**8**	**4**	**6**	**0**	**11**	**7**	**0**	**10**	**8**	**6**
Mean Length	**0.0**	**6.2**	**8.2**	**12.6**	**9.7**	**8.2**	**4.1**	**4.8**	**0.0**	**10.7**	**8.4**	**0.0**	**9.7**	**8.3**	**5.7**
1		7.2	4.7	17.9	10.9	7.8	4.1	7.7		13.0	6.5		10.3	6.4	2.9
2		6.9	4.5	2.2	6.6	14.8		6.1		9.7	6.7		9.7	14.3	7.1
3		4.4	10.4	4.5	12.4	13.3		3.7		5.6	5.4		9.2	5.3	7.9
4			5.8	11.0	9.5	7.2		3.9		7.7	5.3		4.4	6.6	6.1
5			9.8	15.8	9.1	8.6		5.9		12.4	15.4		7.1	4.5	4.9
6			7.1	6.5	11.4	5.8		3.3		6.0	4.2		7.8	8.6	6.2
7			7.8	15.0	13.6	6.9		6.9		8.7	14.6		17.2	8.8	7.0
8			9.0	13.0	6.7	6.2		5.9		9.0	6.5		14.1	2.9	11.6
9			10.0	12.4	8.2	8.6		5.6		14.5	11.9		11.8	13.1	4.7
10			10.9	12.8	11.5	6.5		2.2		14.3	13.8		9.2	10.4	5.2
11			7.0	11.7	12.3	10.6		2.0		15.7	13.2		10.8	9.3	6.7
12			8.7	11.9	11.6	7.0				13.8	10.6		17.2	2.8	9.8
13			4.3	10.6	9.5	7.8				14.0	7.2		12.8	9.8	6.7
14			9.7	13.0	9.2	10.1				9.4	12.7		13.4	7.2	3.6
15			9.0	12.8	11.6	6.2				11.4	13.0		5.9	10.2	5.8
16			9.1	11.6	7.4	8.9				12.3	8.9		12.2	7.2	4.3
17			10.6	17.5	5.4	6.4				9.4	12.8		9.6	6.6	10.9
18			11.1	15.8	16.7	8.3				11.3	5.4		12.1	5.8	7.1
19			8.9	12.9	6.7	7.1				10.0	16.0		8.8	11.9	7.2
20			3.6	17.2	8.6	12.6				6.7	13.5		9.9	12.1	9.9
21			6.4	17.4	7.3	9.4				10.5	14.2		8.6	8.9	4.4
22			3.5	11.2	10.3	10.8				11.6	7.0		12.0	14.2	4.1
23			7.9	14.2	8.8	9.2				15.2	16.4		7.0	8.6	6.4
24			11.0	12.6	7.8	7.7				11.0	8.5		12.0	7.5	8.9
25			4.1	12.9	10.7	6.3				9.9	5.6		5.2	11.3	8.6
26			9.7	6.2	9.5	8.3				11.7	4.8		13.0	13.9	7.4
27			3.5	10.0	11.2	9.4				10.6	5.7		15.6	8.6	4.0
28			9.0	18.0	8.2	7.1				10.4	12.8		8.6	7.9	6.1
29			10.5	11.4	12.0	8.3				9.2	8.7		3.8	5.7	5.8
30			6.0	10.7	5.8	8.8				8.1	6.9		8.5	8.5	5.4
31			7.4	13.7	7.3	7.8				10.6	6.6		9.6	3.7	6.5
32			7.1	13.6	9.9	7.2				13.9	13.1		7.5	10.4	7.2
33			9.9	13.0	7.4	9.9				6.6	7.3		11.3	12.1	4.9
34			7.3	17.1	8.3	12.2				13.4	11.1		12.0	7.6	6.1
35			8.8	16.6	10.0	8.6				10.4	10.1		8.9	8.4	7.5
36			11.7	13.9	5.0	7.7				4.6	9.2		9.5	5.9	7.2
37			7.5	10.7	12.2	9.5				10.2	11.3		8.5	3.3	6.4
38			9.7	14.8	12.1	7.8				13.9	4.8		12.7	15.8	3.7
39			9.7	20.7	11.8	8.0				8.9	6.3		9.9	4.4	4.8
40			7.1	9.8	11.9	5.1				12.1	14.4		15.0	5.1	6.9
41			11.6	15.7	11.6	9.0				13.1	12.7		10.2	10.7	5.0
42			7.5	6.1	11.6	8.6				7.1	5.2		6.6	5.9	3.3
43			4.6	10.5	7.5	6.9				10.5	13.9		4.9	8.5	3.7
44			7.7	7.2	13.3	6.6				13.4	4.4		10.2	11.1	4.8
45			13.4	15.6	10.2	8.1				11.9	13.6		8.7	10.7	3.8
46			11.4	7.8	15.9	8.9				12.3	9.6		8.6	6.0	2.9
47				15.9	8.0	4.1				8.6	6.3		9.9	6.1	3.0
48				13.2	5.6	6.6				9.4	4.1		9.1	8.2	3.2

Table A6.6a. Onondaga Lake Dreissenid Mussel Survey Fall 2009 - Zebra Mussel Raw Length (mm) Data.

Zone	Zone E			Zone F			Zone G			Zone H			Zone H		
Transect	Transect 1			Transect 1			Transect 1			Transect 1			Transect 2		
Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5
49				16.6	11.3	5.3				11.9	13.3		7.2	6.5	3.6
50				21.6	5.0	5.9				9.1	7.9		10.8	12.9	6.9
51				17.7	7.4					13.0	5.8		11.2	3.1	3.9
52				14.4						7.9	9.1		11.2	8.0	4.8
53				24.1						5.5	13.2		5.6	9.5	5.1
54				8.9						13.4	11.1		11.7	7.6	2.9
55				14.1						11.3	4.8		6.7	5.4	4.8
56				6.3						13.9	4.2		11.3	3.4	6.7
57				15.9						10.0	11.0		9.7	5.6	5.7
58				8.5						9.8	10.0		10.0	8.1	5.3
59				11.6							12.4		9.4	5.1	4.2
60				12.7							10.3		12.2	5.1	6.1
61				11.8							3.1		9.8	5.0	2.9
62				10.9							3.3		10.0	2.8	4.7
63				9.7							6.3		11.0	11.6	
64				10.7							8.8		10.7	8.9	
65				11.4							6.2		8.0	10.6	
66				6.3							11.8		10.8	7.1	
67				7.7							4.1		9.1	6.5	
68				13.6							5.1		8.9	6.5	
69				7.6							4.8		9.0	12.3	
70				12.0							5.9		13.1	10.2	
71											10.4		11.2	4.2	
72											5.1		10.3	12.4	
73											6.8		8.7	12.3	
74											6.7		8.4	10.1	
75											4.1		7.8	6.7	
76											5.1		9.2	8.8	
77											5.1		9.6	6.2	
78											6.0		12.2	7.1	
79											4.8		10.9	8.5	
80											9.2		6.7	8.6	
81											12.5		6.9	5.6	
82											6.0		8.0	10.2	
83											4.4		5.7	5.3	
84											5.3		3.7	13.2	
85											4.4		3.2	10.8	
86											3.5			11.9	
87											4.5			12.2	
88														2.0	
89														10.1	
90														11.4	
91														5.8	
92														11.2	
93														9.8	
94														6.1	
95														7.1	
96														7.6	
97														11.6	
98														11.6	

Table A6.6a. Onondaga Lake Dreissenid Mussel Survey Fall 2009 - Zebra Mussel Raw Length (mm) Data.

Zone	Zone E			Zone F			Zone G			Zone H			Zone H		
Transect	Transect 1			Transect 1			Transect 1			Transect 1			Transect 2		
Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5
99														7.2	
100														11.4	
101															
102															
103															
104															
105															
106															
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143															
144															
145															
146															
147															
148															

Table A6.6a. Onondaga Lake Dreissenid Mussel Survey Fall 2009 - Zebra Mussel Raw Length (mm) Data.

Zone	Zone E			Zone F			Zone G			Zone H			Zone H		
Transect	Transect 1			Transect 1			Transect 1			Transect 1			Transect 2		
Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5
149															
150															

Table A6.6b. Onondaga Lake Dreissenid Mussel Survey Fall 2009 - Quagga Mussel Raw Length (mm) Data.

Zone	Zone A			Zone A			Zone B			Zone C			Zone C			Zone D			Zone D		
Transect	Transect 1			Transect 2			Transect 1			Transect 1			Transect 2			Transect 1			Transect 2		
Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5
Median Length	**7**	**9**	**9**	**11**	**9**	**11**	**11**	**0**	**6**	**12**	**12**	**10**	**14**	**11**	**12**	**8**	**0**	**12**	**0**	**3**	**15**
Mean Length	**8.7**	**9.2**	**8.5**	**11.0**	**9.9**	**10.5**	**11.5**	**0.0**	**7.3**	**11.6**	**12.2**	**10.6**	**12.7**	**10.7**	**11.1**	**8.1**	**0.0**	**12.3**	**0.0**	**2.7**	**14.8**
1	17.0	16.4	9.1	15.2	15.3	12.4	11.5		18.1	11.3	7.1	4.7	18.1	10.7	12.3	8.1		13.8		3.2	17.1
2	7.5	15.0	7.9	12.8	17.1	11.4	13.1		16.7	11.8	15.2	4.7	19.9		9.5			14.9		1.9	12.4
3	16.7	12.5		11.2	4.3	13.2	11.8		5.8		14.7	12.6	17.0		11.6			15.5		2.9	13.3
4	18.1	11.1		16.0	9.8	11.2	11.0		17.2		13.9	26.6	12.2					14.1			16.2
5	15.9	11.0		11.9	13.4	11.7	15.6		3.1		23.3	11.2	15.5					10.0			
6	18.3	7.8		12.4	15.5	10.1	5.8		5.0		15.4	7.7	14.3					13.8			
7	17.3	8.2		11.9	14.4	3.4	10.2		14.9		25.5	11.0	14.7					10.7			
8	17.1	9.5		11.4	13.4		21.2		18.2		10.9	25.0	14.1					13.6			
9	7.4	13.6		12.3	13.8		19.3		15.3		10.2	8.6	16.0					14.8			
10	8.5	10.3		11.5	8.6		15.8		7.9		22.8	4.7	12.4					15.8			
11	12.8	4.3		9.2	10.7		12.0		6.9		13.3	3.2	10.3					14.8			
12	4.4	8.2		10.7	10.1		12.1		5.1		10.5	9.5	16.8					14.5			
13	12.9	12.8		11.6	13.2		15.4		11.3		7.0	15.1	14.5					14.1			
14	5.4	10.9		13.3	10.7		10.2		1.6		8.2	6.7	14.5					9.9			
15	5.1	8.2		9.0	11.8		14.6		2.1		12.4	24.7	8.4					13.7			
16	15.3	11.1		14.9	10.3		10.3		6.2		15.2	13.2	7.7					10.0			
17	13.1	11.2		10.7	8.6		10.3		1.4		13.3	13.7	13.2					16.1			
18	5.6	9.2		17.1	18.9		11.9		19.9		10.7	12.3	9.7					11.4			
19	7.8	8.8		14.0	10.3		7.8		6.9		8.2	9.9	14.3					13.3			
20	7.2	10.6		13.6	9.4		7.4		2.8		7.2	9.2	13.0					12.5			
21	5.0	9.4		11.2	13.2		6.9		2.0		15.1	13.5	8.8					14.1			
22	7.8	8.1		10.6	14.6		12.6		4.1		15.8	9.1	8.2					12.0			
23	7.6	5.3		10.0	7.8		12.6		17.6		12.8	6.6	6.7					7.0			
24	7.4	8.1		11.2	8.1		18.0		13.8		8.7	23.1	3.7					9.9			
25	8.3	4.9		11.4	14.0		12.3		4.7		10.3	14.1						11.5			
26	3.9	6.5		6.9	14.9		11.1		8.2		14.1	7.9						13.4			
27	6.9	6.2		11.7	10.8		11.0		13.3		16.3	8.9						9.2			
28	3.1	3.4		9.4	14.5		14.3		10.4		15.8	8.8						7.9			
29	4.5	9.4		11.7	9.0		9.2		6.5		10.5	10.0						13.5			
30	4.7	6.4		12.2	8.7		6.9		3.7		13.7	10.9						13.8			
31	2.6	10.0		9.1	13.2		13.3		6.7		12.7	10.2						7.7			
32	2.5	7.1		11.6	9.0		12.8		3.4		10.4	7.5						9.0			
33	5.0			10.9	13.0		13.4		2.8		11.8	3.5						13.7			
34	19.3			12.0	9.8		12.8		5.7		13.8	5.2						16.5			
35	4.5			14.3	12.3		9.5		2.9		11.1	24.8						11.7			
36	6.5			10.2	9.1		5.1		4.2		9.1	14.8						10.0			
37	9.1			12.5	12.2		11.0		3.3		13.0	12.7						6.7			
38	19.2			9.3	14.2		14.0		16.6		10.3	12.5						16.7			
39	5.9			13.7	6.8		8.0		5.6		11.4	8.1						8.0			
40	5.3			12.8	7.3		16.1		4.5		11.6	10.5						11.0			
41	17.2			11.7	7.6		15.8		11.7		9.2	13.9						12.7			
42	5.0			9.2	6.4		13.5		2.7		11.2	11.0						9.9			
43	13.6			7.5	6.1		12.3		5.4		12.1	13.1						14.4			
44	11.1			8.8	7.9		9.7		7.3		14.1	5.7						14.7			
45	13.7			9.6	8.0		13.7		14.0		13.3	8.6						9.1			
46	11.3			12.6	7.5		10.3		2.8		16.1	11.5						9.7			

Table A6.6b. Onondaga Lake Dreissenid Mussel Survey Fall 2009 - Quagga Mussel Raw Length (mm) Data.

Zone	Zone A			Zone A			Zone B			Zone C			Zone C			Zone D			Zone D		
Transect	Transect 1			Transect 2			Transect 1			Transect 1			Transect 2			Transect 1			Transect 2		
Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5
47	8.6			11.3	9.0		8.0		6.1		7.3	6.4						12.6			
48	6.9			6.3	4.9		13.9		4.3		10.2	8.3						12.2			
49	7.9			9.8	7.8		13.9		3.7		7.6	3.0						14.6			
50	6.6			11.9	6.3		11.2		7.0		11.6	9.0						11.2			
51	6.4			9.6	5.8		13.6		4.1		9.9	12.5						14.0			
52	6.4			11.1	7.4		11.5		13.6		9.4	14.3						11.5			
53	9.0			8.4	7.9		11.3		8.9		11.4	4.3						13.2			
54	8.0			11.9	6.1		8.9		5.8		12.9	10.7						6.9			
55	6.3			11.8	6.3		6.0		14.0		15.8	10.0						6.1			
56	6.3			11.0	5.5		11.6		15.4		7.3	8.9						12.1			
57	17.8			7.1	8.2		6.2		16.8		7.9	11.9						10.9			
58	8.9			12.2	7.1		10.4		8.6		8.6	11.8						14.8			
59	3.9			6.1	10.0		13.9		8.2		10.4	10.2						10.1			
60	7.0			8.9	7.2		17.2		4.2		15.5	13.5						13.1			
61	19.8			5.7	7.3		11.2		5.6		12.2	7.8						12.5			
62	12.9			10.6	6.6		10.0		5.7		12.5	13.7						17.0			
63	6.0			11.6	3.2		8.5		3.8		10.0	5.7						12.1			
64	12.8			7.5			6.5		4.2		14.9	5.9						13.1			
65	8.3						9.5		13.3		10.6	7.3						15.9			
66	4.2						6.9		3.4		13.7	7.6						10.0			
67	4.0						9.0		5.2		12.9	15.7						13.3			
68	3.8						9.7		4.9		10.7	15.8						16.4			
69	10.5						5.6		6.1		8.3	8.8						10.1			
70	9.6						13.8		5.0		11.4	12.8						8.9			
71	7.8						16.0		5.5		12.5	9.6						7.8			
72	12.4						4.9		4.5		12.4	9.3						9.2			
73	5.2						11.1		3.0		7.6	10.4						12.6			
74	5.7						13.5		5.3		13.4	9.1						17.3			
75	14.6						7.7		4.9		14.3	10.1						12.4			
76	6.2						4.4		4.1		13.1	8.4						12.8			
77	8.8						19.9		2.5		11.9	4.1						13.6			
78	7.8						12.9		2.1		13.6	7.9						9.9			
79	5.4						12.0		3.4		12.0	9.8						13.5			
80	4.8						8.2		13.5		15.7	7.7						9.2			
81	4.2						16.5		7.6		7.4	6.9						16.0			
82	6.8						17.6		7.7		14.1	7.1						15.1			
83	6.0						12.6		12.8		9.8	6.3						10.5			
84	5.6						10.2		2.9		10.8	7.9						9.5			
85	4.3						7.9		18.8		7.5	8.8						10.7			
86	3.8						12.4		4.5		11.7	6.5						7.4			
87	3.1						13.5		8.8		10.3	21.7						6.3			
88	19.7						10.0		7.9		20.4	16.1						13.6			
89	16.1						7.7		2.8		14.5	8.3						13.3			
90	14.7						8.4		3.2		8.6	7.0						11.8			
91	8.7						13.4		6.8		11.7	7.2						13.1			
92	6.0						11.1		4.4		12.1	23.9						14.6			
93	18.1						9.1		4.2		8.1	12.1						12.1			
94	7.7						7.9		7.9		22.6	11.8						15.6			

Table A6.6b. Onondaga Lake Dreissenid Mussel Survey Fall 2009 - Quagga Mussel Raw Length (mm) Data.

Zone	Zone A			Zone A			Zone B			Zone C			Zone C			Zone D			Zone D		
Transect	Transect 1			Transect 2			Transect 1			Transect 1			Transect 2			Transect 1			Transect 2		
Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5
95	5.8						9.4		4.3		10.7	10.1						12.0			
96	4.9						20.8		1.5		12.2	12.2						15.8			
97	6.2						14.0		2.0		12.9	12.6						12.4			
98	14.1						11.2		1.0		13.4	13.2						13.2			
99	8.9						13.7		7.1		13.3	11.0						12.2			
100	7.7						7.7		19.3		7.2	5.7						16.0			
101	6.5																	21.1			
102	5.3																	19.9			
103	7.1																	8.2			
104	4.9																	14			
105	9.2																	17.2			
106	5.9																	15.9			
107	3.4																	8			
108	6.1																	12.6			
109	6.1																	17.1			
110	5.2																	13.3			
111	3.1																	11.4			
112	3.8																	10.2			
113	4.3																	11.9			
114	19.5																	12.3			
115	5.5																	14			
116	14.3																	12			
117	5.5																	10			
118	14.3																	12.3			
119																		14.2			
120																		10.3			
121																		13.6			
122																		11			
123																		14.1			
124																		8			
125																		12.4			
126																		15.4			
127																		16			
128																		10.2			
129																		15.5			
130																		14.2			
131																		11.7			
132																		13.6			
133																		9.8			
134																		12.2			
135																		12.5			
136																		13			
137																		11.2			
138																		12.4			
139																		8.6			
140																		11.8			
141																		4.6			
142																		9.7			

Table A6.6b. Onondaga Lake Dreissenid Mussel Survey Fall 2009 - Quagga Mussel Raw Length (mm) Data.

Zone	Zone A			Zone A			Zone B			Zone C			Zone C			Zone D			Zone D		
Transect	Transect 1			Transect 2			Transect 1			Transect 1			Transect 2			Transect 1			Transect 2		
Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5
143																		9.6			
144																		11.1			
145																		7.8			
146																		6.7			
147																		19.2			
148																		15.7			
149																		15.2			
150																					

Table A6.6b. Onondaga Lake Dreissenid Mussel Survey Fall 2009 - Quagga Mussel Raw Length (mm) Data.

Zone	Zone E			Zone F			Zone G			Zone H			Zone H		
Transect	Transect 1			Transect 1			Transect 1			Transect 1			Transect 2		
Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5
Median Length	**0**	**11**	**6**	**11**	**15**	**13**	**0**	**0**	**0**	**10**	**4**	**10**	**7**	**6**	**6**
Mean Length	**0.0**	**11.1**	**8.4**	**11.6**	**13.5**	**13.3**	**0.0**	**0.0**	**0.0**	**11.1**	**5.7**	**9.7**	**8.3**	**6.1**	**5.9**
1		13.7	16.9	4.3	11.9	13.1				14.3	10.8	11.8	13.1	4.3	9.7
2		12.4	14.8	17.5	7.3	11.4				5.4	18.0	9.0	16.2	7.1	7.0
3		9.9	15.8	22.6	5.2	11.6				10.4	5.9	8.4	15.6	7.4	8.0
4		13.6	19.5	20.6	7.2	12.8				12.9	6.3	7.2	13.5	6.1	9.4
5		10.4	16.0	13.8	4.5	15.6				9.5	4.4	4.6	12.5	4.6	9.9
6		11.6	16.2	13.1	5.6	17.6				13.6	3.9	5.8	7.4	16.5	5.8
7		11.6	22.9	6.8	12.7	11.3				16.5	5.1	20.9	8.3	9.4	7.3
8		9.8	11.6	8.3	11.7	11.5				9.6	9.4	10.0	7.4	11.3	8.2
9		9.4	14.3	4.6	15.8	17.1				8.0	3.7	7.8	7.3	3.7	8.3
10		9.3	13.4	4.4	15.2	15.8				13.4	3.2	8.5	11.5	11.2	7.9
11		5.8	3.6		16.3	20.2				4.5	20.1	8.6	9.2	8.9	6.7
12		10.1	7.1		9.5	20.6				10.9	9.1	10.8	9.1	6.0	8.1
13		9.9	15.3		15.4	15.8				7.4	3.1	5.6	5.5	3.9	5.8
14		12.4	12.3		7.9	16.3				8.5	4.9	9.3	7.9	7.0	6.1
15		9.0	5.5		9.1	13.5				9.6	5.1	10.6	5.0	4.8	6.4
16		13.1	3.0		18.3	13.1				8.0	22.9	21.3	5.3	3.3	7.8
17		13.9	19.5		12.2	10.0				10.2	10.5	11.1	4.4	3.0	7.1
18		9.9	5.8		13.9	14.3				9.9	5.2	5.0	6.9	2.6	5.7
19		10.8	4.4		14.5	15.0				10.4	8.5	11.5	8.1	4.9	5.5
20		11.4	13.4		12.4	13.9				16.3	4.1	10.0	7.6	5.0	6.6
21		9.2	4.6		7.9	16.8				23.1	8.3	11.6	5.2	4.0	3.8
22		11.1	2.6		5.3	13.1					4.4	11.6	6.7	5.7	4.6
23		10.2	4.3		15.2	12.6					4.6	8.1	5.9	5.2	3.5
24		12.1	3.3		8.3	13.8					3.3	8.6	7.4	4.9	3.7
25		12.4	15.8		16.3	14.3					4.7	8.4	4.6	9.1	2.8
26		9.9	16.6		13.6	15.1					4.1	10.6	4.7	4.3	3.4
27		11.6	18.2		12.0	11.5					5.0	9.7		6.8	6.3
28		13.3	17.0		14.0	15.1					4.0	12.2		7.7	5.1
29		14.0	5.3		14.5	13.6					6.9	9.8		6.0	5.7
30		15.8	5.5		15.0	22.3					4.9	11.5		11.1	4.6
31		9.2	5.1		17.6	14.2					8.4	10.4		7.3	4.1
32		9.5	5.1		14.8	18.6					5.2	10.5		4.9	4.6
33		9.3	4.7		14.9	12.5					3.5	11.7		4.0	4.5
34		11.0	3.1		15.2	20.9					2.4	10.6		7.3	3.8
35		13.5	5.6		22.0	12.2					3.9	10.1		5.2	6.2
36		6.3	4.1		14.9	14.9					2.0	9.8		6.5	3.2
37		10.2	3.7		9.6	13.9					7.5	9.0		5.2	4.8
38		12.5	2.6		12.0	10.7					5.5	7.4		8.0	3.2
39		9.0	15.7		16.5	9.5					4.3	6.2		7.2	4.4
40		13.5	13.5		11.4	16.1					2.2	6.7		3.9	
41		13.6	5.9		12.4	10.7					4.0	8.4		4.8	
42		12.1	5.5		15.3	14.5					20.1	8.1		6.1	
43		10.6	15.2		10.2	11.2					4.3	12.2		6.7	
44		11.0	15.5		15.6	15.5					12.0	9.1		5.8	
45		10.9	11.3		11.5	12.0					3.7	7.9		6.2	
46		10.6	17.6		15.2	8.7					9.3	11.1		4.0	

Table A6.6b. Onondaga Lake Dreissenid Mussel Survey Fall 2009 - Quagga Mussel Raw Length (mm) Data.

Zone	Zone E			Zone F			Zone G			Zone H			Zone H		
Transect	Transect 1			Transect 1			Transect 1			Transect 1			Transect 2		
Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5
47		13.2	14.2		16.2	13.8					4.2	9.1		7.2	
48		8.5	8.6		12.5	12.8					3.7	8.1		8.0	
49		9.7	6.0		15.2	11.6					4.1	11.4		3.5	
50		10.5	4.8		14.8	14.1					9.6	8.6		6.5	
51		13.6	8.2		12.5	13.9					6.7	6.3		7.8	
52		13.1	5.2		11.6	13.3					3.9	9.7		5.5	
53		11.0	4.8		17.2	16.1					4.4			8.0	
54		12.5	7.0		18.9	15.1					3.6			6.4	
55		8.8	6.0		17.6	8.6					4.7			4.5	
56		13.1	7.0		13.6	9.3					2.0			6.5	
57		8.9	4.3		13.4	14.0					5.2			5.2	
58		10.6	9.2		13.6	10.9					5.9			3.9	
59			4.2		11.6	13.0					5.2			4.0	
60			5.0		16.9	12.5					4.6			7.4	
61			3.8		17.2	8.9					3.8			3.4	
62			3.0		7.7	13.2					7.5			6.2	
63			6.7		18.7	13.9					3.6			4.5	
64			3.7		8.7	15.6					4.2			12.2	
65			4.3		16.2	13.4					3.7			7.5	
66			4.4		16.4	17.1					5.9			5.2	
67			10.0		8.2	10.5					4.4			5.4	
68			2.7		14.4	10.4					3.8			2.9	
69			6.1		8.1	10.6					3.5			7.0	
70			4.4		16.7	7.3					4.8			4.8	
71			7.2		15.0	8.1					3.3			3.0	
72			4.7		15.9	14.3					2.2			6.6	
73			14.3		15.0	8.0					2.0			8.5	
74			4.4		11.4	13.9					2.8			6.3	
75			4.8		14.7	13.5					5.6			6.0	
76			4.0		15.2	12.8					5.7			9.4	
77			9.6		16.0	10.7					19.4			5.3	
78			5.9		12.7	12.4					3.7			6.8	
79			4.0		16.9	23.1					4.0			5.9	
80			4.3		16.8	12.0					3.3			5.9	
81			3.6		14.8	10.7					4.3			6.1	
82			5.3		14.5	18.1					4.4			4.4	
83			4.1		11.9	11.6					4.6			3.0	
84			11.0		10.3	8.5					4.2			4.1	
85			5.0		15.5	14.9					4.5			4.7	
86			15.2		14.3	12.3					3.8			5.6	
87			6.2		13.0	11.1					8.6			6.6	
88			2.4		9.6	14.7					7.7			5.5	
89			4.3		12.8	14.1					4.4			5.7	
90			17.1		20.6	10.8					2.6			5.2	
91			3.5		14.8	17.8					4.6			6.9	
92			5.5		16.3	10.9					3.2			5.9	
93			16.5		14.8	11.7					3.6			4.6	
94			5.3		17.5	10.2					3.3			4.9	

Table A6.6b. Onondaga Lake Dreissenid Mussel Survey Fall 2009 - Quagga Mussel Raw Length (mm) Data.

Zone	Zone E			Zone F			Zone G			Zone H			Zone H		
Transect	Transect 1			Transect 1			Transect 1			Transect 1			Transect 2		
Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5
95			11.3		11.9	10.7					2.7			5.5	
96			5.1		16.1	12.8					2.1			4.6	
97			15.5		19.4	8.8					9.1			4.6	
98			3.8		12.2	11.7					3.0			7.3	
99			4.7		8.1	10.4					5.9			7.9	
100			12.5		16.0	11.6					10.6			8.2	
101															
102															
103															
104															
105															
106															
107															
108															
109															
110															
111															
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132															
133															
134															
135															
136															
137															
138															
139															
140															
141															
142															

Table A6.6b. Onondaga Lake Dreissenid Mussel Survey Fall 2009 - Quagga Mussel Raw Length (mm) Data.

Zone	Zone E			Zone F			Zone G			Zone H			Zone H		
Transect	Transect 1			Transect 1			Transect 1			Transect 1			Transect 2		
Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5	0 - 1.5	1.5 - 3	3 - 4.5
143															
144															
145															
146															
147															
148															
149															
150															

Figure A6.1 - Seneca River Dreissenid Mussel Survey – *Dreissena* sp. Length Frequency Distribution by Transect (04'-09')

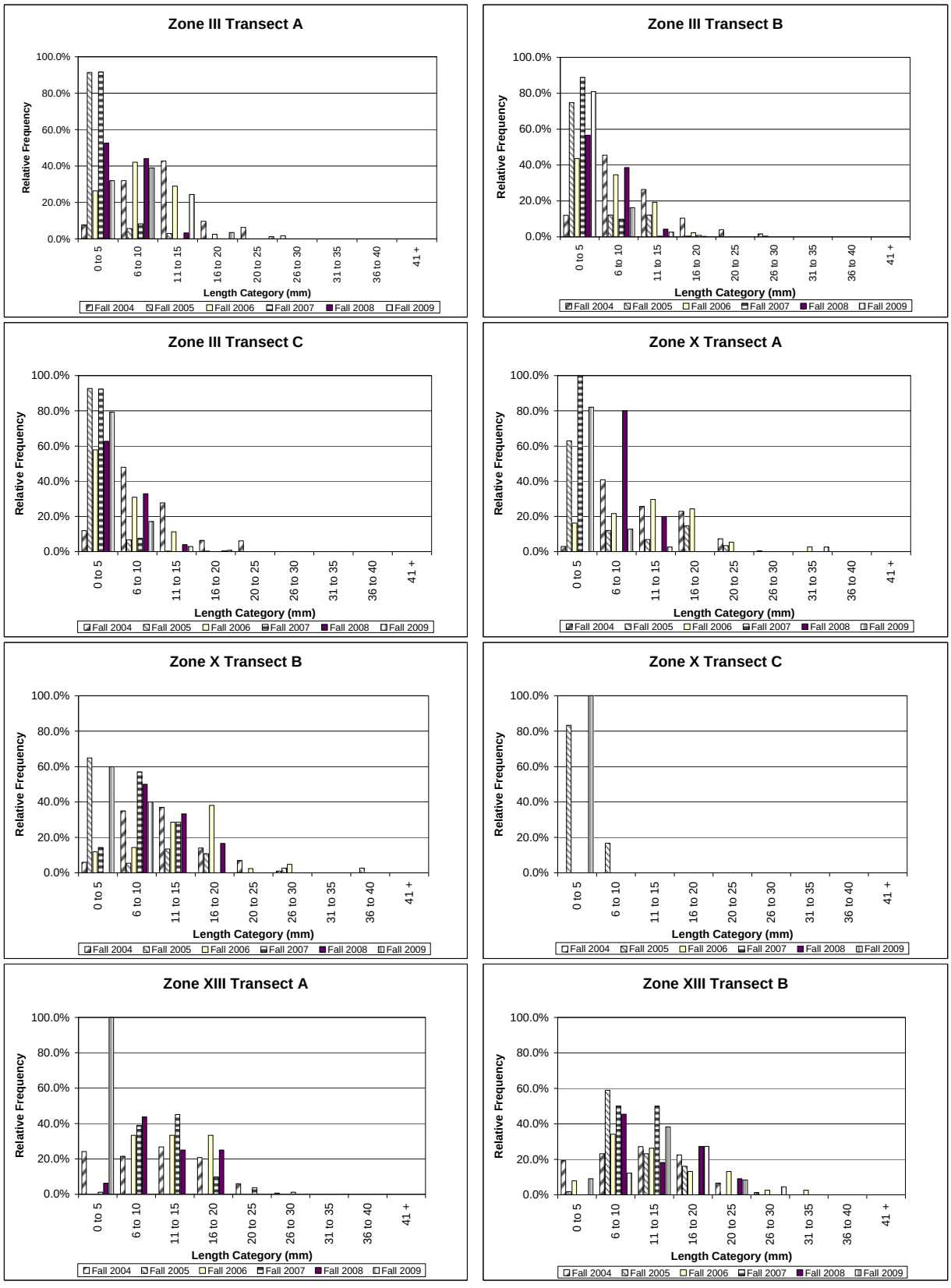
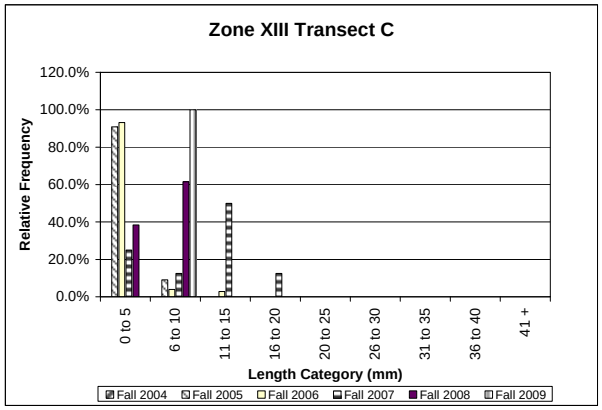
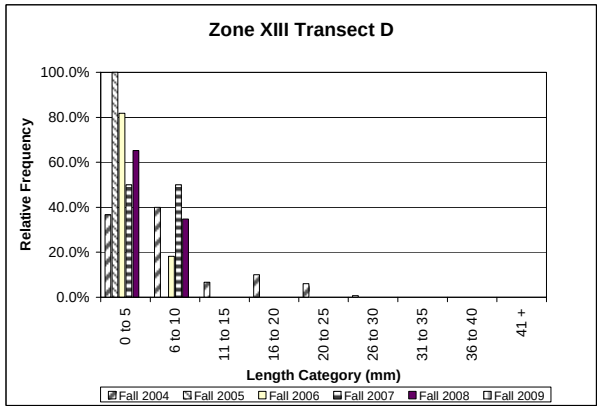
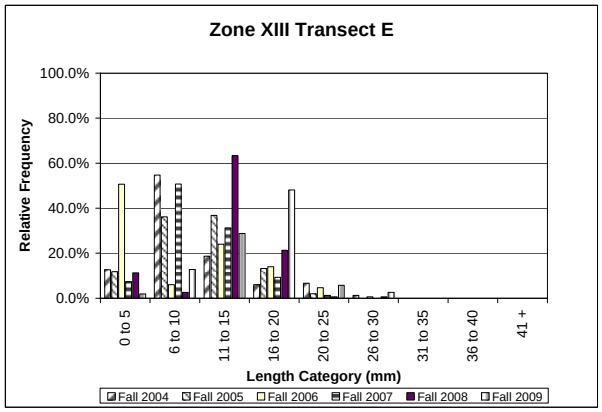
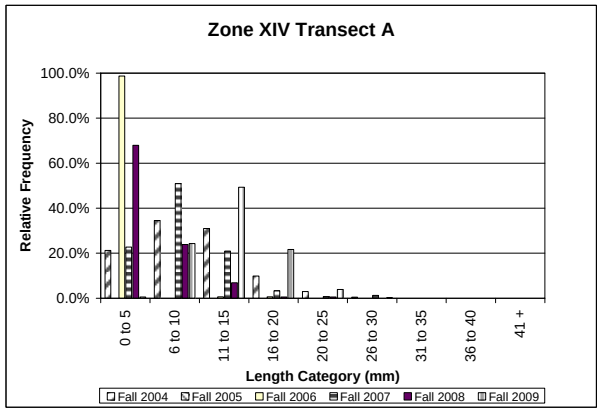


Figure A6.1 - Seneca River Dreissenid Mussel Survey – *Dreissena* sp. Length Frequency Distribution by Transect (04'-09') (continued)









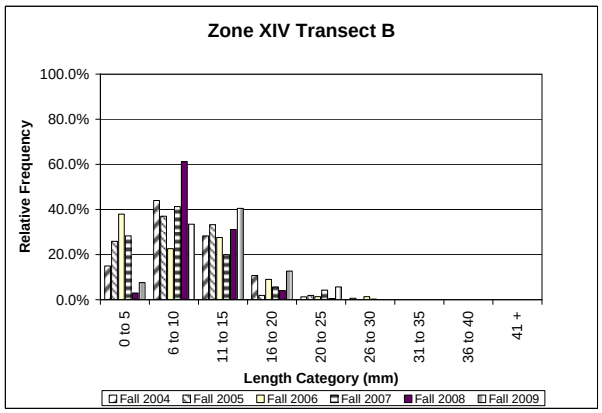


Figure A6.2 – Seneca River Dreissenid Mussel Survey Fall 2009 – Length Frequency Distribution by Transect for Zebra and Quagga Mussels

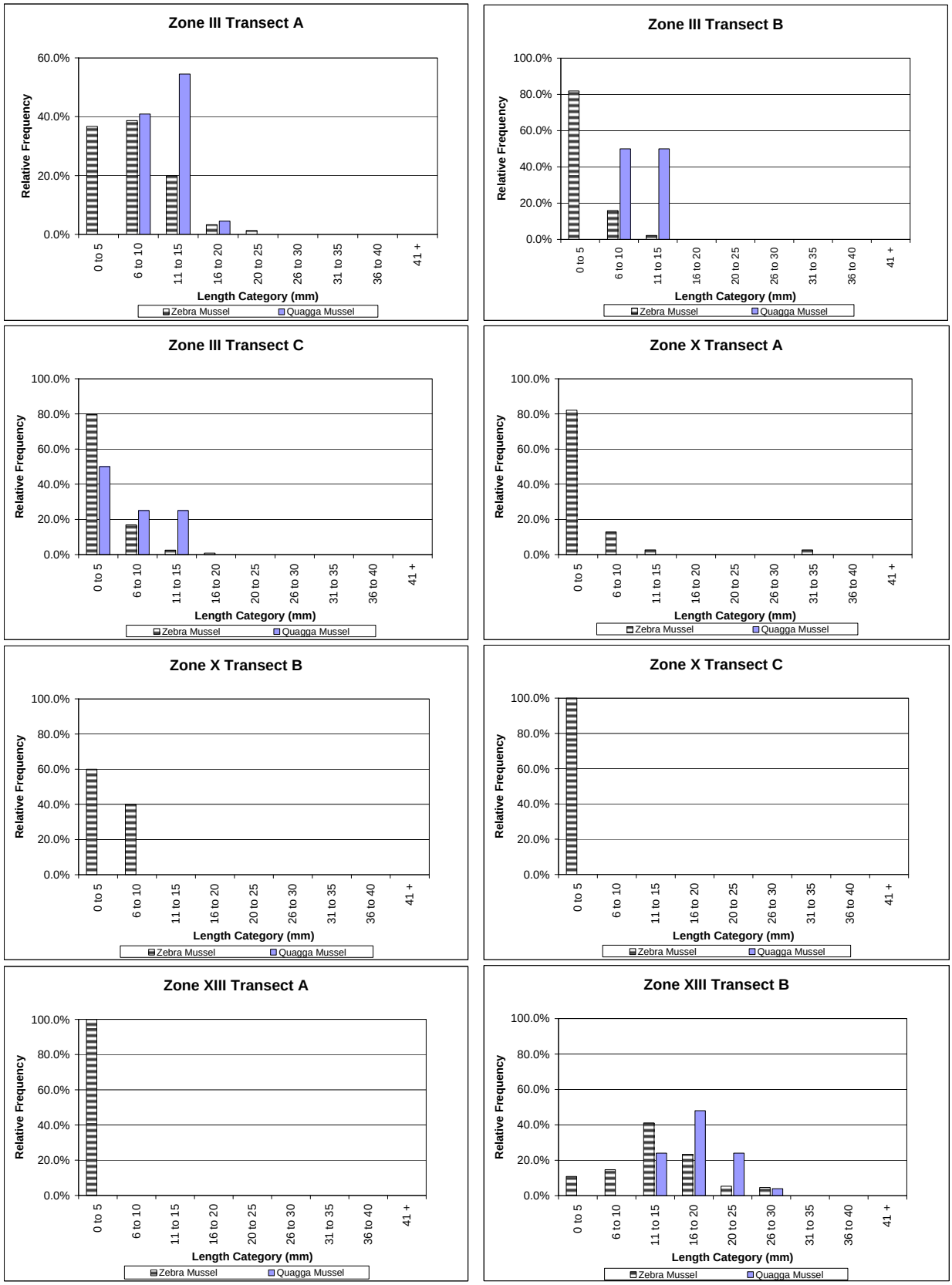
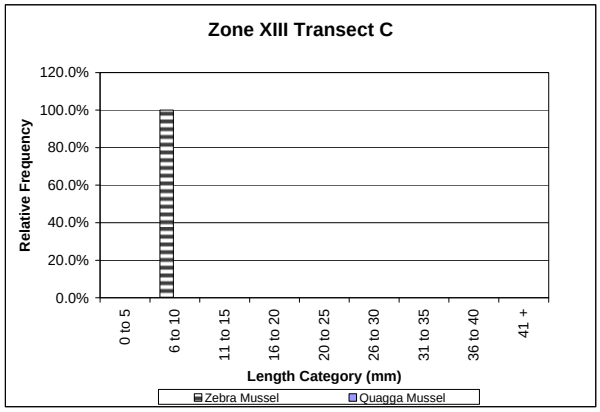
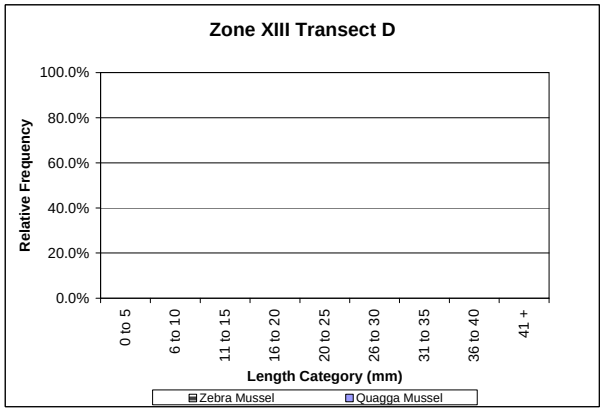
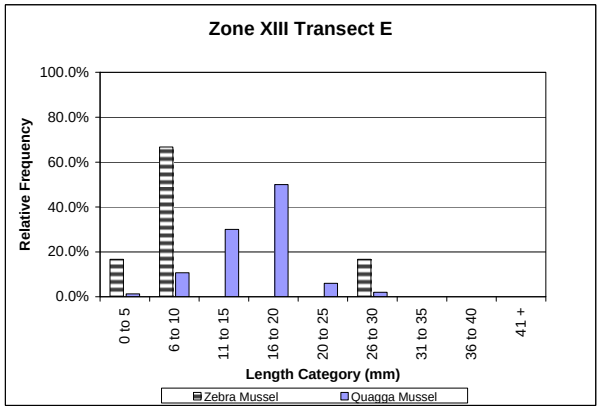
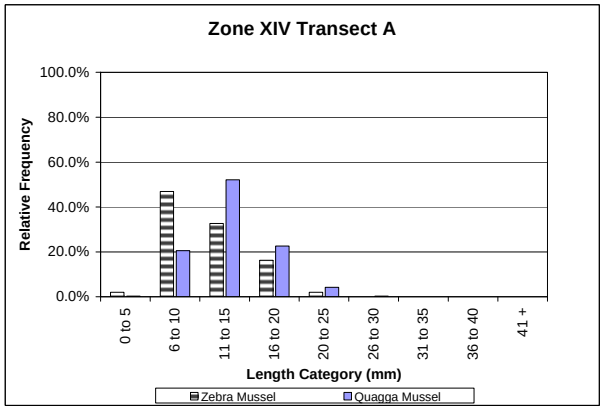


Figure A6.2 – Seneca River Dreissenid Mussel Survey Fall 2009 – Length Frequency Distribution by Transect for Zebra and Quagga Mussels (continued)









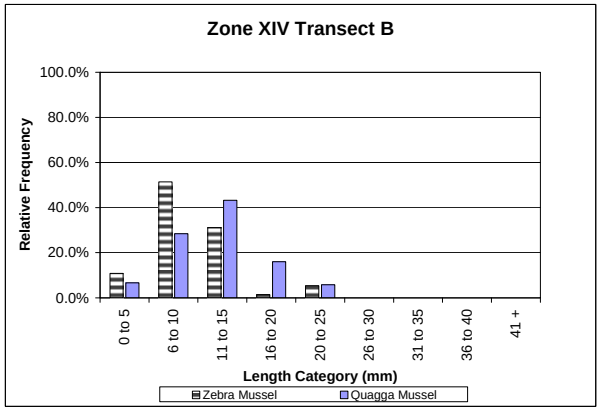


Figure A6.3 – Onondaga Lake Dreissenid Mussel Survey Fall 2009 – Length Frequency Distribution by Zone (All Transects) and Depth Range/Category (All Depths) for Zebra and Quagga Mussel

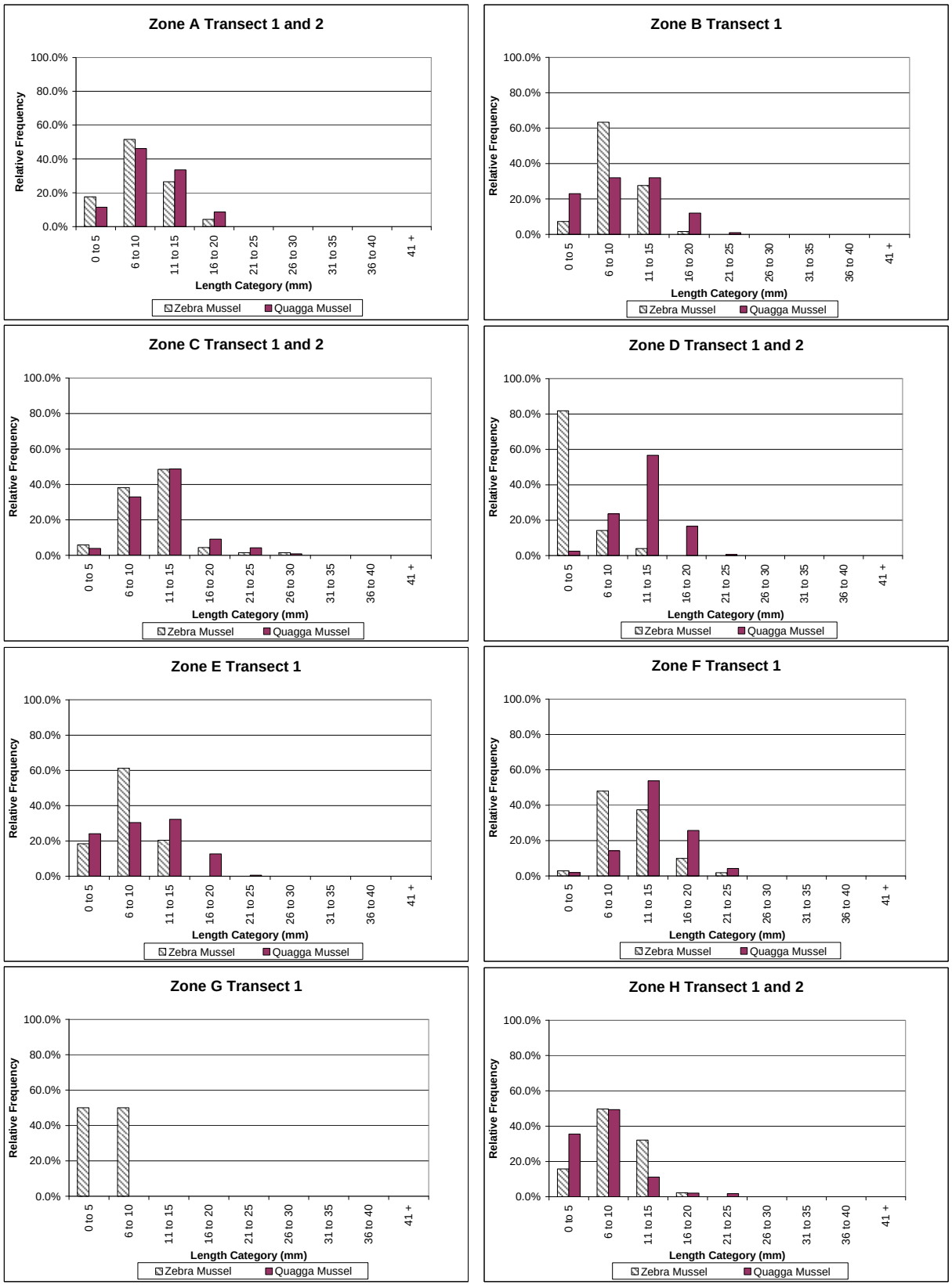
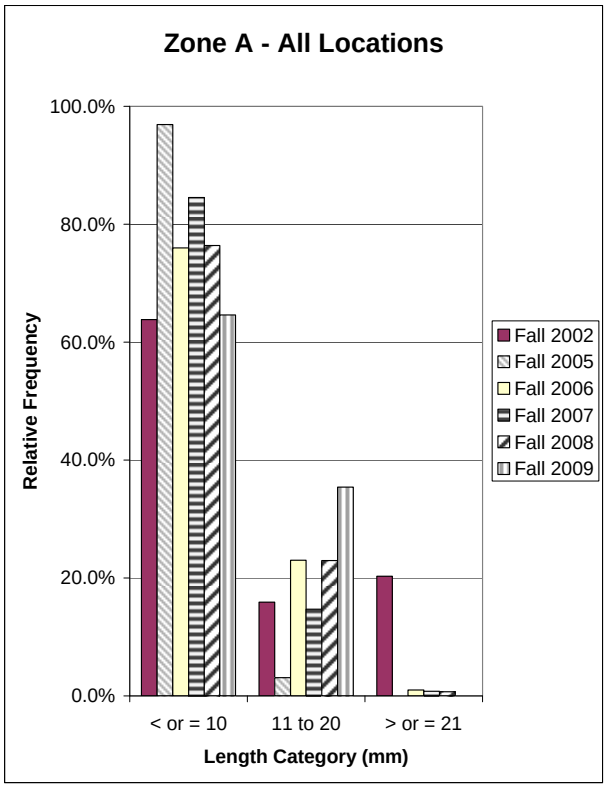
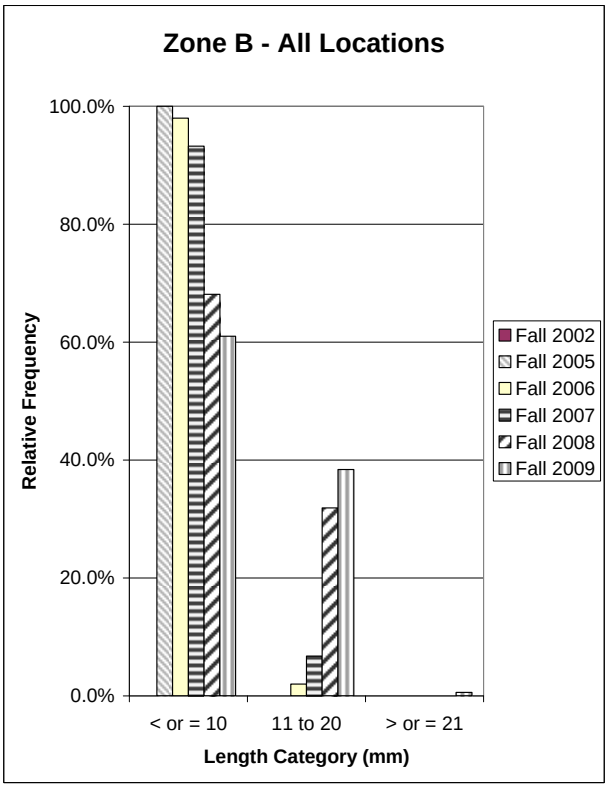
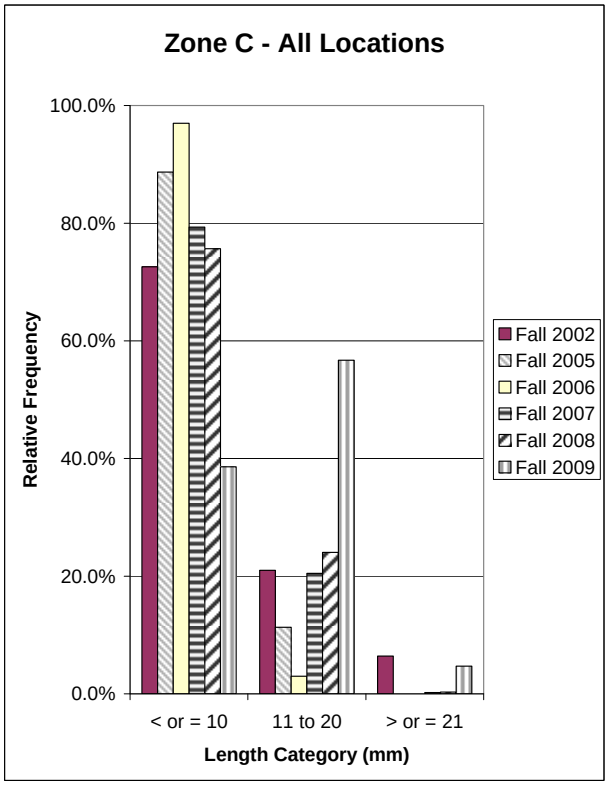


Figure A6.4 – Onondaga Lake Dreissenid Mussel Survey – Fall 2002, and 2005 through 2009 Comparison of *Dreissena* sp. Length Frequency Distribution by Zone (All Transects) and Depth Range/Category (All Depths)







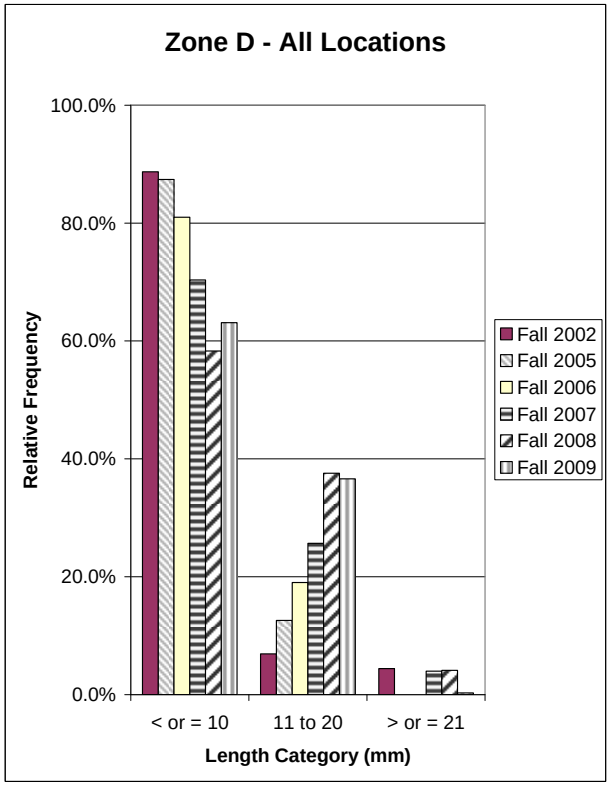
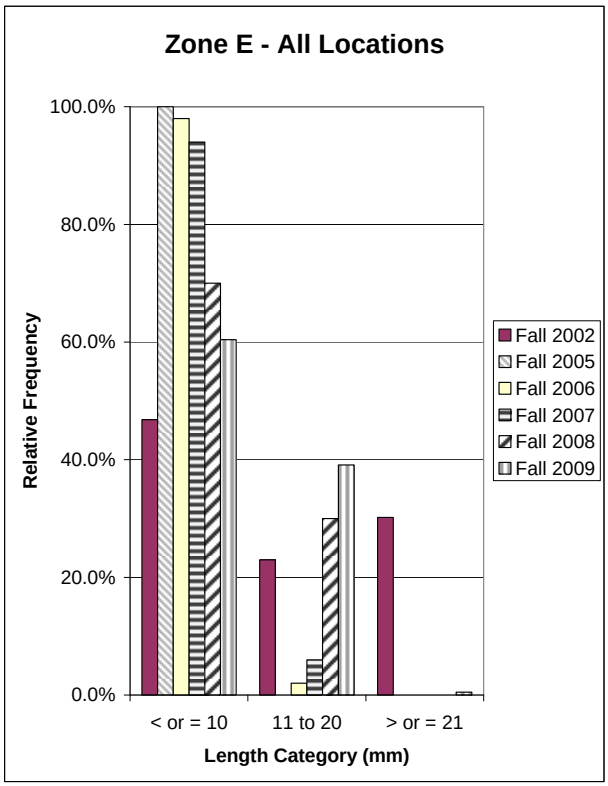
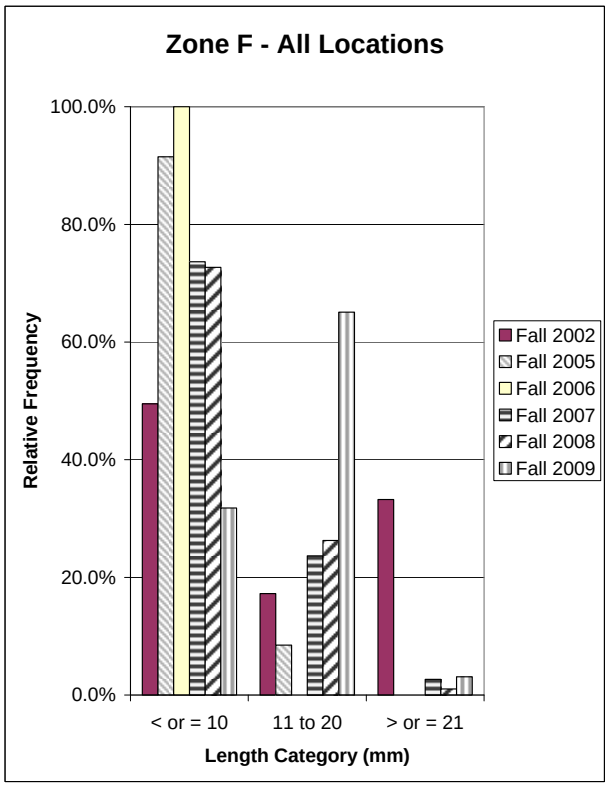
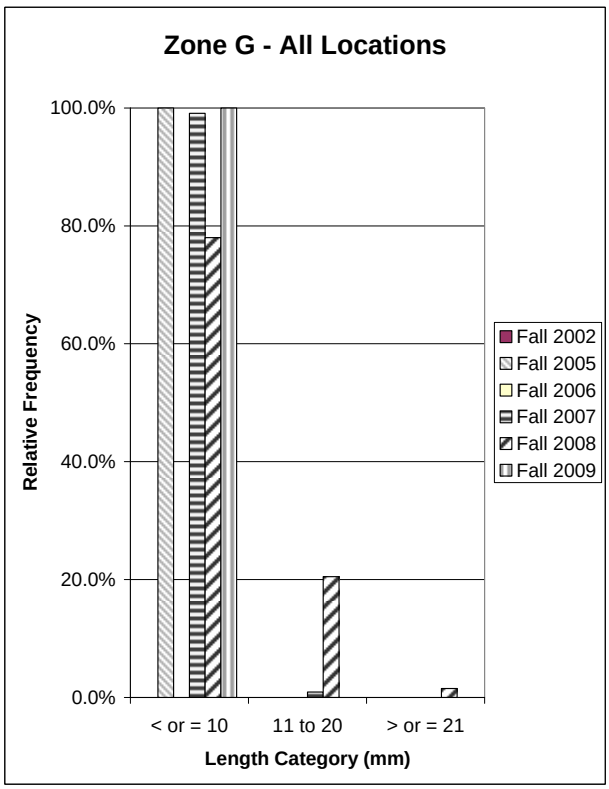


Figure A6.4 – Onondaga Lake Dreissenid Mussel Survey – Fall 2002, and 2005 through 2009 Comparison of *Dreissena* sp. Length Frequency Distribution by Zone (All Transects) and Depth Range/Category (All Depths) (continued)







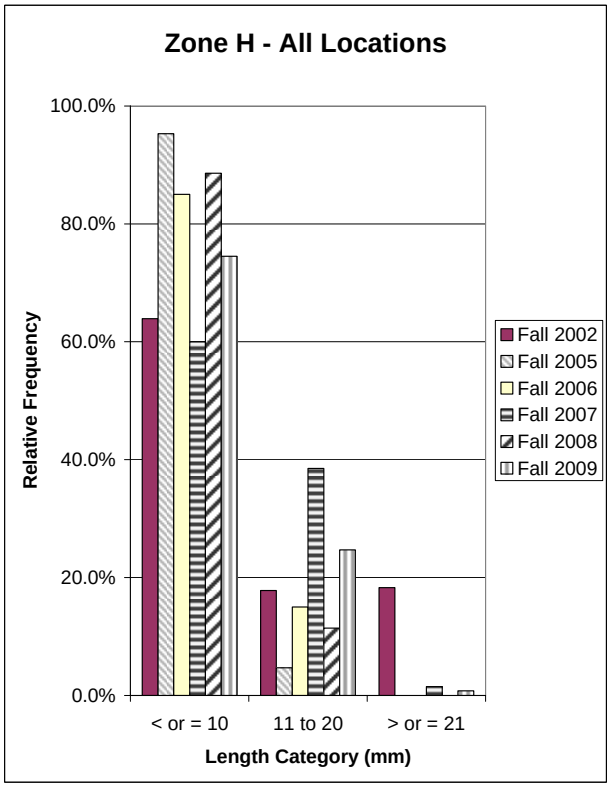


Figure A6.5 – Onondaga Lake Dreissenid Mussel Survey – Fall 2002, and 2005 through 2009 Comparison of *Dreissena* sp. Length Frequency Distribution by Zone (All Transects) and Depth Range/Category

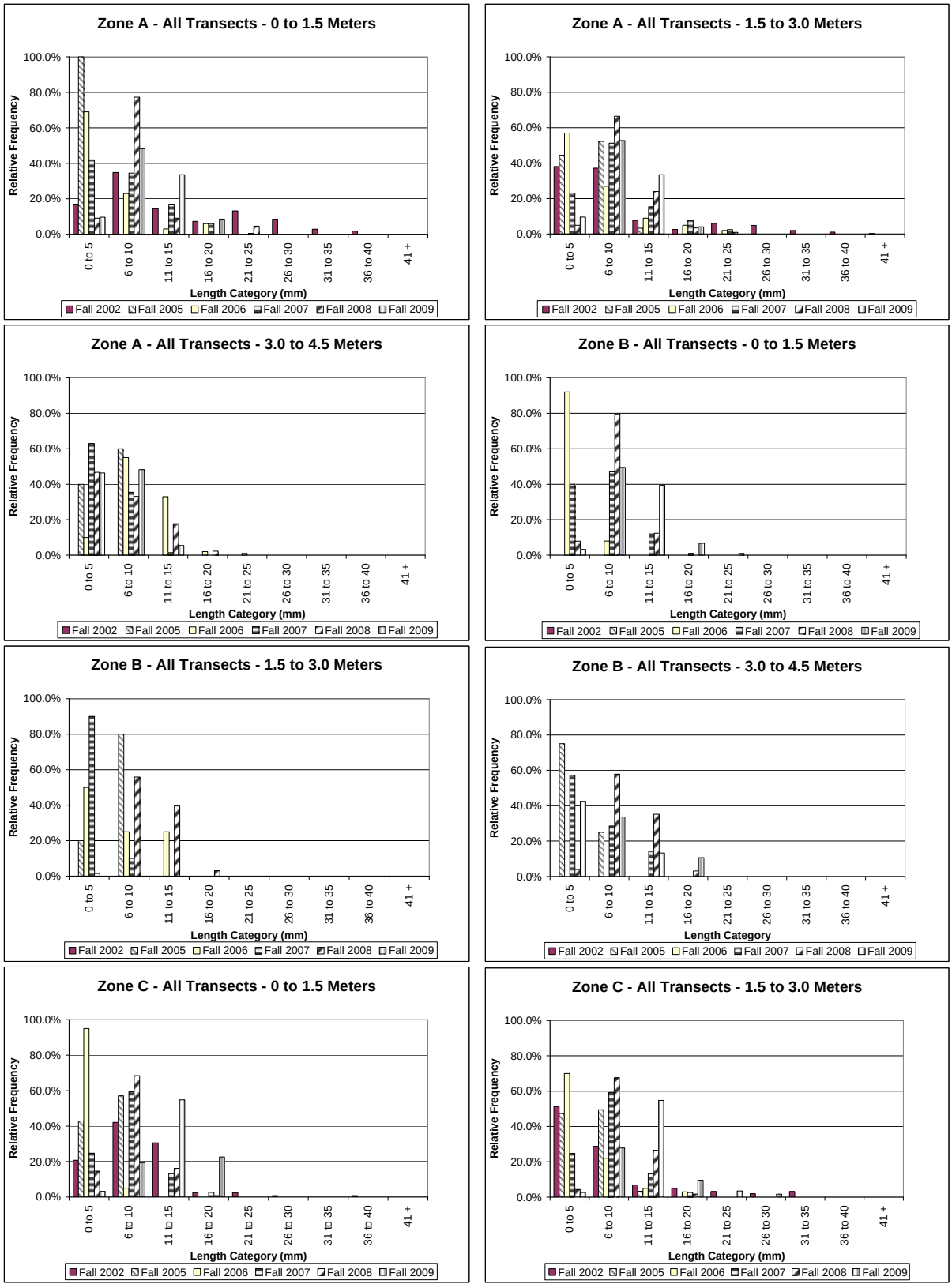


Figure A6.5 – Onondaga Lake Dreissenid Mussel Survey – Fall 2002, and 2005 through 2009 Comparison of *Dreissena* sp. Length Frequency Distribution by Zone (All Transects) and Depth Range/Category (continued)

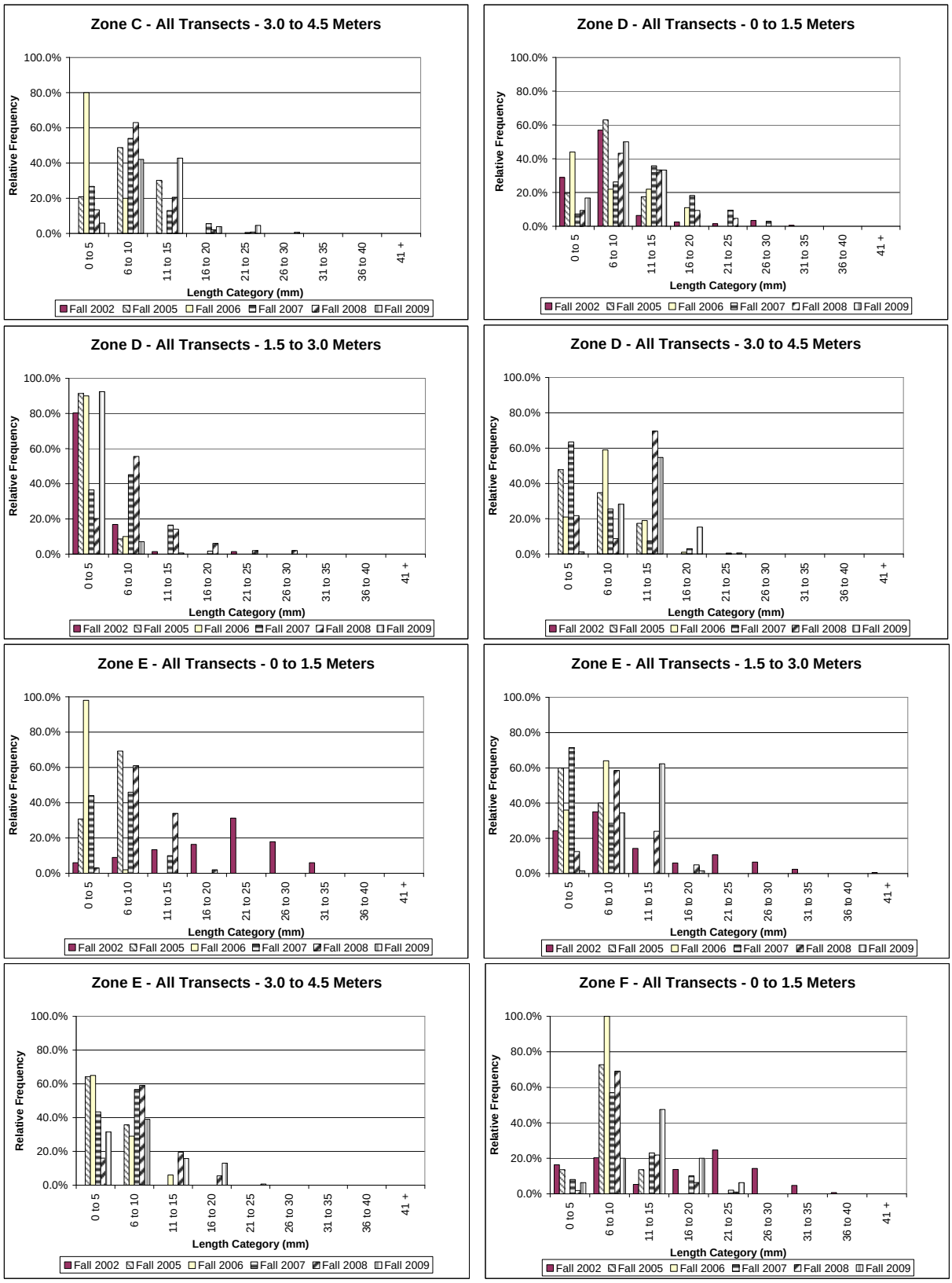


Figure A6.5 – Onondaga Lake Dreissenid Mussel Survey – Fall 2002, and 2005 through 2009 Comparison of *Dreissena* sp. Length Frequency Distribution by Zone (All Transects) and Depth Range/Category (continued)