

Dreissenid Mussel Survey (2011):
Onondaga Lake and the Seneca River



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Dreissenid Mussel Survey (2011): Onondaga Lake and the Seneca River

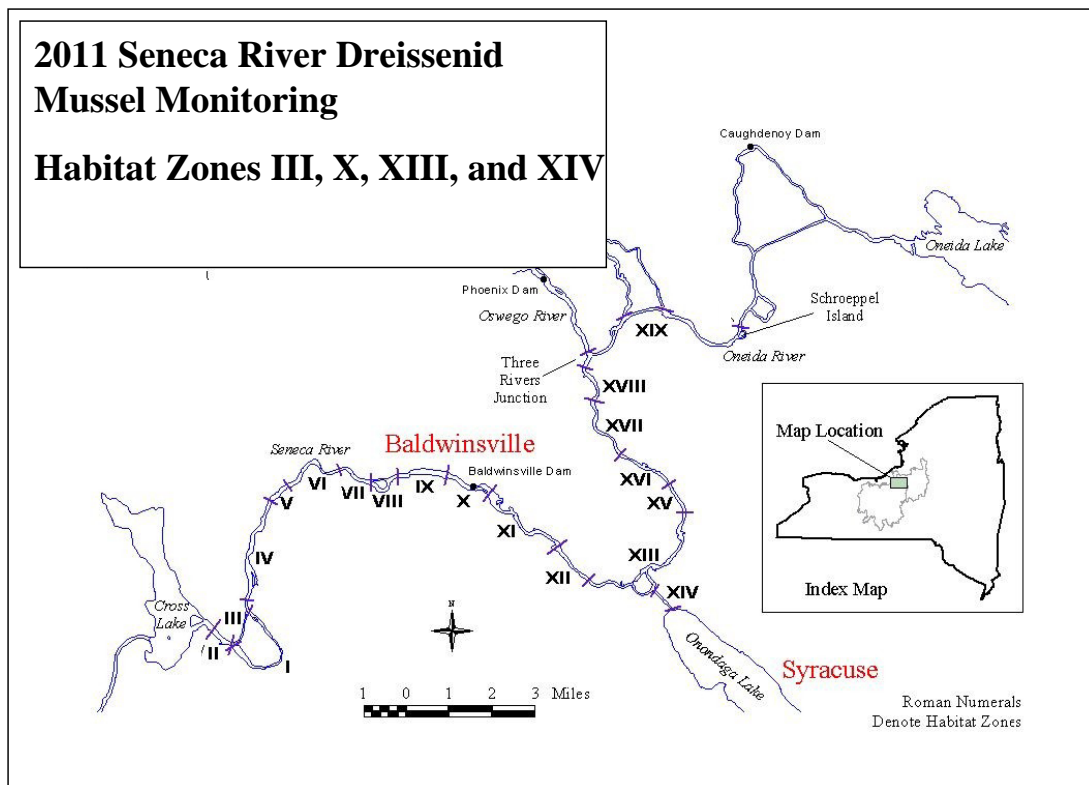
During the fall of 2011, OCDWEP staff completed the Onondaga Lake and Seneca River dreissenid mussel survey in support of the model development and/or validation needs for the Three Rivers Water Quality Model (TRWQM) and Onondaga Lake Water Quality Model (OLWQM). The survey included both zebra mussels (*Dreissena polymorpha*) and quagga mussels (*Dreissena bugensis*).

A6-1 Seneca River

The October 3, 2011, 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, density (#/m²) and biomass (g/m²). 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 in² (226 cm²).

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 2011 field effort.

A6-2 Onondaga Lake

The October 18, 2011, 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. In 2011 to determine if dreissenid mussels were found in deeper water an additional sample (4.5 – 6.0 m) was collected in each transect. The recent efforts provide a limited measure of length frequency distribution, density (#/m²) and biomass (g/m²) in Onondaga Lake. The monitoring locations include the following eight (8) habitat zones:

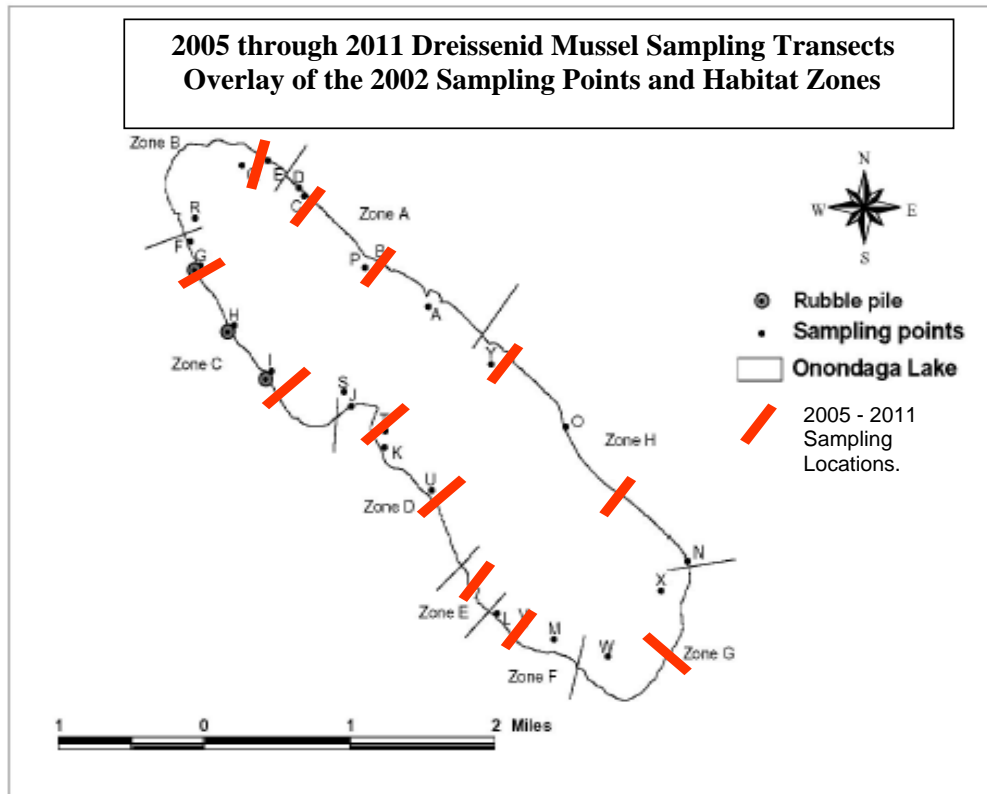
- Zone A – 2 Transects, 3 samples per transect, at 0-1.5 m, 1.5 – 3 m, and 3 – 4.5 m, 4.5 – 6.0 m
- Zone B – 1 Transect, 3 samples per transect, at 0-1.5 m, 1.5 – 3 m, and 3 – 4.5 m, 4.5 – 6.0 m
- Zone C – 2 Transects, 3 samples per transect, at 0-1.5 m, 1.5 – 3 m, and 3 – 4.5 m, 4.5 – 6.0 m
- Zone D – 2 Transects, 3 samples per transect, at 0-1.5 m, 1.5 – 3 m, and 3 – 4.5 m, 4.5 – 6.0 m
- Zone E – 1 Transect, 3 samples per transect, at 0-1.5 m, 1.5 – 3 m, and 3 – 4.5 m, 4.5 – 6.0 m
- Zone F – 1 Transect, 3 samples per transect, at 0-1.5 m, 1.5 – 3 m, and 3 – 4.5 m, 4.5 – 6.0 m
- Zone G – 1 Transect, 3 samples per transect, at 0-1.5 m, 1.5 – 3 m, and 3 – 4.5 m, 4.5 – 6.0 m
- Zone H – 2 Transects, 3 samples per transect, at 0-1.5 m, 1.5 – 3 m, and 3 – 4.5 m, 4.5 – 6.0 m

Four (4) samples were collected along each transect at water depths between 0 to 1.5 meters, 1.5 to 3.0 meters, 3.0 to 4.5 meters, and 4.5 to 6.0 meters. A single grab sample was collected at each depth interval with a petit ponar dredge, which has a sample area of 35 in² (226 cm²).

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.

Forty-eight (48) samples were collected in Onondaga Lake during the 2011 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 October 3, 2011, 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 2011, 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-one (21) of the thirty-nine (39) individual samples collected contained zebra mussels, and ten (10) of the thirty-nine (39) individual samples collected contained quagga mussels.

Zebra mussels were identified in all transects sampled in 2011 except two (2), Zone X Transect A and B. Zebra mussels represented nearly 76% (by number) and 23% (by biomass) of the Seneca River dreissenid mussels sampled, and nearly 60% (by number) and 21% (by biomass) of the Lake Outlet dreissenid mussels sampled.

Quagga mussels were identified in transects near Kline Island (Zone XIII B and XIII E), both of the Lake outlet transects (Zone XIV A and XIV B), and the State Ditch Cut (Zone III B). The Quagga mussels represented 24% (by number) and 77% (by biomass) of the Seneca River dreissenid mussels sampled, and nearly 40% (by number) and 79% (by biomass) 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. While the zebra mussel is the most prevalent species in the Seneca River by numbers, it is being displaced by the quagga mussel in the Onondaga lake outlet. Since quagga mussels were first observed in the lake outlet in 2007 they have increased from 4% of the total population to 61% in 2010 and 40% in 2011. This shift in dominance is most apparent in biomass estimates in which quagga mussels have comprised over 79% of the total biomass since 2009. Additionally, zebra mussel densities reported in 2011 from the State Ditch Cut (Zone III) were the lowest reported

since 2004. Zebra mussels that were collected from the State Ditch Cut (Zone III) were small, averaging 4.3 mm in length.

The observed dreissenid mussel population variations in the lake outlet and the Seneca River are difficult to attribute to any one factor. Nutrient levels, water flows, changes in water quality, sampling gear, and annual variability in populations are all possible contributing factors.

Note: The 2004 data utilized scuba divers for sample collection, and the 2005 through 2011 data utilized the petit ponar dredge for sample collection.

A6-5 Onondaga Lake Data

On October 18, 2011, 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 2011, the survey identified that all eight (8) zones sampled contain zebra mussels, and seven (7) of the eight (8) zones sampled contained quagga mussels. Forty-one (41) of the forty-eight (48) individual samples collected contained zebra mussels, and twenty-five (25) of the forty-eight (48) individual samples collected contained quagga mussels.

Zebra mussels were identified in all transects, and represented nearly 49% (by number) and 21% (by biomass) 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 51% (by number) and 79% (by biomass) 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 in 2011 from zebra mussels as the most abundant *Dreissena* sp. to quagga mussels. Zebra mussels were the most abundant species reported in 2007, 2008, and 2010 however, in 2009 and 2011 quagga mussels displaced the zebra mussel as the most abundant species (Table A6-5a). Sampling efforts in 2009 and 2011 reported biomass estimates of quagga mussels 3 – 7 times greater than those reported for zebra mussels (Table A6-5b).

Quagga mussel densities and biomass in 2011 were highest in Zones B, C and D located on the north end and west side of Onondaga Lake. In contrast zebra mussel densities were highest in zones B, C and E located at the north end and southwest side of Onondaga Lake (Table A6-5a and Table A6-5b). Lake wide biomass estimates of dreissenid mussels in 2011 (0 – 6 m) was 588.95 (g) per m². To better compare 2011 lake wide biomass estimates of dreissenid mussels biomass estimates to previous years the 4.5- 6.0 m samples were excluded. Biomass estimates from (0 - 4.5 m) in 2011 were 490.45 (g) per m² lower than those reported in 2007 – 2010 (Table A6-7a and Table A6-7b).

The observed dreissenid mussel population variations in Onondaga Lake are difficult to attribute to anyone factor. Nutrient levels, wave action, changes in water quality, sampling gear, and annual variability in populations are all possible contributing factors.

Note: The 2002 data utilized scuba divers for sample collection, and the 2005 through 2011 data utilized the petit ponar dredge for sample collection

Table A6-1. Seneca River Dreissenid Mussel Survey Fall 2011 – Length and Weight Data Summary

Zone	Transect	Transect Coordinates	Channel Location	Water Depth (m)	(A) Number of Mussels Per Sub-Sample		(B) Weight Per Sub-Sample (g)		(C) 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			
					Zebra Mussel	Quagga Mussel	Zebra Mussel	Quagga Mussel	Zebra Mussel	Quagga Mussel	Zebra Mussel	Quagga Mussel	Zebra Mussel	Quagga Mussel	Zebra Mussel	Quagga Mussel	Zebra Mussel	Quagga Mussel	Zebra Mussel	Quagga Mussel	Zebra Mussel	Quagga Mussel	Zebra Mussel	Quagga Mussel	Zebra Mussel	Quagga Mussel
					III	A	N 43 06.473, W 76 26.456	Green	0.5	1	0	0.1	0	0.1	0	4.4	0.0	8.8	0.0	4.0	0.0	4.1	0.0	1	0	44.2
			Middle	4.2	16	0	0.5	0	0.5	0	22.1	0.0			4.0	0.0	4.9	0.0	16	0	708.0	0.0				
			Red	1.2	0	0	0	0	0	0	0	0.0			0.0	0.0	0.0	0.0	0	0	0.0	0.0				
III	B	N 43 06.613, W 76 26.416	Green	0.7	0	0	0	0	0	0	0	0.0	17.7	8.8	0.0	0.0	0.0	0.0	0	0	0.0	0.0	368.7	29		
			Middle	4.3	4	0	0.1	0	0.1	0	4.4	0.0			4.0	0.0	3.7	0.0	4	0	177.0	0.0				
			Red	1.0	21	2	1.1	0.6	1.1	0.6	48.8	26.5			5.0	13.0	5.7	12.9	21	2	929.2	88.5				
III	C	N 43 06.760, W 76 26.378	Green	1.5	29	0	0.2	0	0.2	0	8.8	0.0	17.7	0.0	3.0	0.0	3.4	0.0	29	0	1283.2	0.0	1224.2	0		
			Middle	4.3	6	0	0.5	0	0.5	0	22.1	0.0			5.0	0.0	6.8	0.0	6	0	265.5	0.0				
			Red	1.3	48	0	0.5	0	0.5	0	22.1	0.0			3.0	0.0	3.9	0.0	48	0	2123.9	0.0				
X	A	N 43 09.667, W 76 20.703	Green	2.6	0	0	0	0	0	0	0	0.0	23.6	0.0	0.0	0.0	0.0	0.0	0	0	0.0	0.0	132.7	0		
			Middle	4.2	9	0	1.9	0	1.9	0	70.8	0.0			12.0	0.0	10.4	0.0	9	0	398.2	0.0				
			Red	1.8	0	0	0	0	0	0	0	0.0			0.0	0.0	0.0	0.0	0	0	0.0	0.0				
X	B	N 43 09.550, W 76 20.407	Green	2.0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0.0	0.0	0.0	0		
			Middle	4.1	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	0		
			Red	2.7	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	0		
X	C	N 43 09.310, W 76 19.659	Green	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	0.0	0.0	0.0	0		
			Middle	4.0	0	0	0	0	0	0	0	0.0			0.0	0.0	0.0	0.0	0	0	0.0	0.0	0.0	0		
			Red	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	0.0	0		
XIII	A	N 43 07.456, W 76 16.740	Green	2.0	74	0	1.3	0	1.3	0	57.5	0.0	84.1	0.0	4.0	0.0	4.7	0.0	74	0	3274.3	0.0	5147.5	0		
			Middle	6.8	0	0	0	0	0	0	0	0.0			0.0	0.0	0.0	0.0	0	0	0.0	0.0				
			Red	2.2	100	0	1.6	0	4.4	0	194.7	0.0			4.0	0.0	4.6	0.0	275	0	12168.1	0.0				
			Green	1.0	0	0	0	0	0	0	0	0.0			0.0	0.0	0.0	0.0	0	0	0.0	0.0				
XIII	B	N 43 07.469, W 76 16.143	Middle	7.2	0	0	0	0	0	0	0	0.0	53.1	460.2	0.0	0.0	0.0	0.0	0	0	0.0	0.0	191.7	796		
			Red	2.1	13	54	3.6	31.2	3.6	31.2	159.3	1380.5			12.0	12.0	12.1	13.7	13	54	575.2	2389.4				
			Green	1.7	0	0	0	0	0	0	0	0.0			0.0	0.0	0.0	0.0	0	0	0.0	0.0				
XIII	C	N 43 07.599, W 76 15.457	Middle	5.5	1	0	0.5	0	0.5	0	22.1	0.0	7.4	0.0	16.0	0.0	15.7	0.0	1	0	44.2	0.0	14.7	0		
			Red	1.5	0	0	0	0	0	0	0	0.0			0.0	0.0	0.0	0.0	0	0	0.0	0.0				
			Green	1.7	24	0	0.5	0	0.5	0	22.1	0.0			5.0	0.0	5.4	0.0	24	0	1061.9	0.0				
XIII	D	N 43 07.291, W 76 15.534	Middle	5.4	0	0	0	0	0	0	0	0.0	7.4	0.0	0.0	0.0	0.0	0.0	0	0	0.0	0.0	354.0	0		
			Red	1.2	0	0	0	0	0	0	0	0.0			0.0	0.0	0.0	0.0	0	0	0.0	0.0				
			Green	2.3	49	120	4.6	32.4	4.6	32.4	203.5	1433.6			9.0	12.0	7.9	12.0	49	120	2168.1	5309.7				
XIII	E	N 43 07.485, W 76 15.087	Middle	6.0	0	0	0	0	0	0	0	0.0	70.8	477.9	0.0	0.0	0.0	0.0	0	0	0.0	0.0	767.0	1785		
			Red	2.1	3	1	0.2	0	0.2	0	8.8	0.0			9.0	7.0	10.3	7.1	3	1	132.7	44.2				
			Green	1.6	56	5	1.8	0.1	1.8	0.1	79.6	4.4			5.0	4.0	5.4	3.9	56	5	2477.9	221.2				
XIV	A	N 43 07.241, W 76 14.949	Middle	5.3	100	150	2.6	5.6	28.6	6.7	1265.5	296.5	455.7	101.8	5.0	7.0	5.5	6.7	1100	179	48672.6	7920.4	17330.4	2729		
			Red	1.3	19	1	0.5	0.1	0.5	0.1	22.1	4.4			5.0	9.0	5.6	8.9	19	1	840.7	44.2				
			Green	1.8	100	44	2.3	1.3	4.2	1.3	185.8	57.5			4.0	4.0	4.8	5.3	183	44	8097.3	1946.9				
XIV	B	N 43 07.065, W 76 14.739	Middle	5.2	101	150	9.2	31.4	9.2	144.5	407.1	6393.8	275.8	2588.5	8.0	11.0	7.8	11.4	101	690	4469.0	30531.0	4941.0	12404		
			Red	1.8	51	107	5.3	29.7	5.3	29.7	234.5	1314.2			8.0	13.0	8.8	12.8	51	107	2256.6	4734.5				

Note: Petit Ponar Dredge Sample Area is 226 cm².

Table A6-2. Seneca River Dreissenid Mussel Survey - Fall 2004 through Fall 2011. Comparisons of Mean Weight (g/m²) and Mean Density (#/m²).

Zone	Transect	Mean Weight (g/m ²) per Transect ¹											
		2004	2005	2006	2007	2008		2009		2010		2011	
						Zebra Mussel	Quagga Mussel	Zebra Mussel	Quagga Mussel	Zebra Mussel	Quagga Mussel	Zebra Mussel	Quagga Mussel
III	A	4025.8	140.7	808.0	8.8	435.1	0	421.8	54.6	7.3	0.0	8.8	0.0
III	B	2569.0	327.1	789.1	61.9	179.9	0	38.3	2.9	8.8	1.5	17.7	8.8
III	C	1392.2	66.2	413.0	10.3	131.3	0	97.4	7.4	8.8	0.0	17.7	0.0
X	A	549.0	284.4	236.0	1.5	5.9	0	119.5	0.0	2.9	0.0	23.6	0.0
X	B	444.9	176.5	311.2	8.8	22.1	0	2.9	0.0	1.5	0.0	0.0	0.0
X	C	0.0	1.8	0.0	0	0	0	1.5	0.0	2.9	0.0	0.0	0.0
XIII	A	477.2	0.0	19.2	308.3	29	0.3	1.5	0.0	1.5	0.0	84.1	0.0
XIII	B	563.3	151.9	272.9	1.5	10.3	41.3	929.2	324.5	163.7	165.5	53.1	460.2
XIII	C	0.0	14.4	35.4	19.2	4.4	0	1.5	0.0	126.8	0.0	7.4	0.0
XIII	D	308.6	0.3	2.9	1.5	5.9	0	0.0	0.0	1.5	0.0	7.4	0.0
XIII	E	958.0	1272.8	986.7	427.7	1274.3	0	32.4	1501.5	657.8	4485.2	70.8	477.9
XIV	A	1532.1	0.0	23.6	2166.7	67.8	23.6	148.9	2004.4	79.6	2277.2	455.7	101.8
XIV	B	3042.7	146.2	1991.2	4246.3	NA	NA	203.5	4199.1	233.0	2793.5	275.8	2588.5

¹⁾ The 2007 mean weights represent total Dreissenid sp.

Table A6-3 Seneca River Dreissenid Mussel Survey - Fall 2004 through Fall 2011. Comparisons of Mean Density (#/m²).

Zone	Transect	Mean Estimated Number of Mussels per m ² by Transect												
		2004	2005	2006	2007		2008		2009		2010		2011	
					Zebra Mussel	Quagga Mussel	Zebra Mussel	Quagga Mussel	Zebra Mussel	Quagga Mussel	Zebra Mussel	Quagga Mussel	Zebra Mussel	Quagga Mussel
III	A	11987	15433	5760	1608	0	11001	0	2891	325	797	0	250.7	0
III	B	9691	5525	6638	4241	74	5663	0	2684	30	737	44	368.7	29
III	C	17860	12133	6449	1740	0	4017	0	3569	59	664	0	1224.7	0
X	A	1500	1796	546	15	0	74	0	575	0	207	0	132.7	0
X	B	1692	546	619	88.5	15	88	0	74	0	44	0	0	0
X	C	0	88	0	0	0	0	0	74	0	44	0	0	0
XIII	A	1909	0	44	959	251	221	15	15	0	44	0	5147.5	0
XIII	B	2012	826	560	29	0	89	74	1903	369	443	207	191.7	796
XIII	C	0	162	2581	118	0	0	0	15	0	2212	0	14.7	0
XIII	D	1815	59	162	29	0	310	0	0	0	885	0	354	0
XIII	E	5042	3290	4869	2271	413	3586	0	89	3186	5177	7139	767	1785
XIV	A	8157	0	3053	21211	811	2168	177	723	6032	1932	5738	17330.4	2729
XIV	B	15445	796	10041	24676	929	4199	7242	1091	16121	9558	12463	4941	12404

Table A6-4a. Seneca River Dreissenid Mussel Survey Fall 2011 – Raw Length (mm) Data Zebra Mussel

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	4	0	0	4	5	3	5	3	0	12	0	0	0	0	0	0	0	4	0	4
Mean Length	4.1	4.9	0.0	0.0	3.7	5.7	3.4	6.8	3.9	0.0	10.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7	0.0	4.6
1	4.1	4.1	0.0	0.0	3.5	3.0	5.9	13.4	5.9	0.0	14.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	0.0	7.0
2		2.1			3.7	11.4	2.9	10.1	5.8		13.3								7.0		4.4
3		2.5			5.0	10.0	8.9	5.5	5.7		14.8								4.1		6.7
4		5.5			2.5	9.9	5.1	4.1	4.7		11.8								4.9		4.7
5		4.3				8.9	4.7	5.1	4.5		11.8								8.8		5.1
6		4.2				10.0	3.4	2.7	3.8		9.6								4.5		3.7
7		2.6				9.9	2.1		5.2		10.0								1.7		3.1
8		2.8				9.2	2.7		3.5		4.3								5.5		4.8
9		2.1				6.4	4.0		5.5		3.7								5.3		4.1
10		3.8				5.3	3.4		4.4										4.7		4.1
11		3.4				1.5	4.4		4.1										2.9		5.9
12		10.9				1.6	3.1		3.1										3.8		3.2
13		8.9				4.7	3.5		5.1										12.1		2.4
14		3.3				4.9	3.1		5.3										3.1		3.4
15		9.9				4.4	2.9		3.3										5.8		4.1
16		8.2				3.1	3.4		4.1										6.2		4.6
17						3.4	2.9		3.3										5.4		4.1
18						4.5	1.9		2.4										3.5		5.7
19						2.3	2.8		4.9										4.8		4.2
20						3.0	3.1		3.2										3.0		13.0
21						2.6	2.5		3.8										8.5		6.0
22							3.3		4.3										5.9		3.0
23							2.0		3.4										4.0		3.8
24							2.8		3.2										7.5		6.3
25							2.9		5.4										2.9		5.0
26							2.3		3.9										3.1		3.2
27							3.5		5.1										6.4		4.2
28							2.1		3.1										6.5		3.7
29							1.7		3.7										7.1		7.3
30									3.9										5.2		6.9
31									4.1										6.5		3.2
32									2.5										8.4		4.4
33									3.4										7.0		3.2
34									3.2										7.3		4.0
35									2.8										7.4		3.2
36									2.9										3.8		4.1
37									10.2										4.2		2.5
38									1.9										3.9		7.0
39									2.9										2.4		3.1
40									2.2										5.8		8.2
41									3.3										5.2		5.0
42									2.6										3.5		3.2
43									2.2										3.1		3.5
44									2.9										5.2		5.5

Table A6-4a. Seneca River Dreissenid Mussel Survey Fall 2011 – Raw Length (mm) Data Zebra Mussel (continued)

Zone Transect Location	Zone III Transect A			Zone III Transect B			Zone III Transect C			Zone X Transect A			Zone X Transect B			Zone X Transect C			Zone XIII Transect A		
	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red
45									2.1										3.4		4.5
46									2.7										2.6		3.7
47									2.6										6.1		5.7
48									3.3										5.2		4.9
49																			6.2		6.4
50																			5.4		5.5
51																			2.7		4.9
52																			5.8		6.0
53																			4.2		4.2
54																			4.3		2.5
55																			2.7		2.0
56																			3.8		5.3
57																			2.5		5.1
58																			4.8		3.3
59																			5.8		4.7
60																			3.8		5.9
61																			4.2		4.8
62																			4.3		4.2
63																			4.1		4.5
64																			3.5		2.9
65																			3.7		3.9
66																			2.0		5.0
67																			3.0		4.6
68																			3.5		5.3
69																			3.8		3.0
70																			3.6		3.9
71																			3.5		3.7
72																			2.5		4.2
73																			2.6		6.6
74																			2.1		3.9
75																					6.9
76																					3.4
77																					6.0
78																					7.5
79																					3.9
80																					3.6
81																					3.9
82																					4.7
83																					5.5
84																					3.9
85																					5.6
86																					4.0
87																					3.5
88																					4.8
89																					4.2
90																					5.1

Table A6-4a. Seneca River Dreissenid Mussel Survey Fall 2011 – Raw Length (mm) Data Zebra Mussel (continued)

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	
91																						5.2
92																						3.6
93																						3.9
94																						7.4
95																						3.5
96																						3.7
97																						3.8
98																						4.5
99																						4.8
100																						4.0
101																						

Table A6-4a. Seneca River Dreissenid Mussel Survey Fall 2011 – Raw Length (mm) Data Zebra Mussel (continued)

Zone	Zone XIII						Zone XIII						Zone XIII						Zone XIV			Zone XIV		
Transect	Transect B			Transect C			Transect D			Transect E			Transect A			Transect B								
Location	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red					
Median Length	4	0	0	12	0	16	0	5	0	0	9	0	9	5	5	5	4	8	8					
Mean Length	4.6	0.0	0.0	12.1	0.0	15.7	0.0	5.4	0.0	0.0	7.9	0.0	10.3	5.4	5.5	5.6	4.8	7.8	8.8					
1	7.0	0.0	0.0	16.9	0.0	15.7	0.0	5.4	0.0	0.0	9.5	0.0	8.2	17.7	9.4	4.0	1.5	14.7	6.7					
2	4.4			15.8				5.4			9.6		9.0	3.9	9.1	6.3	11.4	9.1	7.7					
3	6.7			12.5				5.1			8.4		13.6	9.0	6.1	5.9	12.0	8.2	8.1					
4	4.7			9.9				8.7			7.6			6.0	3.9	6.9	9.0	14.2	8.4					
5	5.1			12.1				9.4			8.1			7.1	4.2	9.6	7.5	13.1	6.9					
6	3.7			8.7				2.6			8.5			5.5	8.5	6.2	4.8	10.4	7.4					
7	3.1			11.9				7.5			8.4			9.0	11.3	2.4	2.7	9.6	9.3					
8	4.8			11.6				8.3			9.3			8.0	5.6	3.4	6.7	6.9	9.1					
9	4.1			9.3				4.2			7.8			6.9	8.2	6.3	4.7	8.5	8.3					
10	4.1			12.5				7.2			2.0			3.1	4.5	4.0	6.7	8.6	7.6					
11	5.9			12.4				3.6			2.0			3.5	4.4	3.1	5.5	10.7	8.1					
12	3.2			9.9				6.9			2.7			4.8	5.4	9.0	3.5	6.9	8.8					
13	2.4			14.1				3.7			1.4			4.4	7.6	5.1	6.0	8.1	7.8					
14	3.4							3.8			2.7			5.6	3.0	7.5	5.5	8.7	6.1					
15	4.1							7.1			2.0			5.9	3.9	4.0	6.2	6.5	6.2					
16	4.6							7.5			2.3			7.8	5.8	5.0	4.4	9.7	7.8					
17	4.1							4.5			4.4			5.9	4.4	8.3	5.1	12.8	7.6					
18	5.7							4.1			4.5			7.9	8.5	5.4	2.6	6.5	8.0					
19	4.2							5.1			3.4			8.5	7.6	3.3	9.1	9.8	8.4					
20	13.0							3.5			10.8			7.2	7.1		1.9	10.1	8.2					
21	6.0							4.8			8.8			7.0	4.9		7.2	9.0	7.6					
22	3.0							4.5			7.5			6.8	5.9		5.4	9.6	6.5					
23	3.8							3.8			10.0			4.9	2.3		8.4	7.9	7.6					
24	6.3							2.7			9.4			8.6	2.7		9.2	7.4	6.0					
25	5.0										8.5			3.7	4.6		6.3	7.5	7.6					
26	3.2										7.2			4.7	2.4		4.1	10.2	4.2					
27	4.2										9.1			5.4	3.6		10.8	7.8	6.9					
28	3.7										8.6			4.9	6.2		7.3	7.4	4.9					
29	7.3										9.1			4.2	2.5		5.1	11.5	15.6					
30	6.9										10.8			7.1	3.9		3.6	7.5	11.6					
31	3.2										9.8			5.0	5.5		3.2	7.6	10.0					
32	4.4										8.8			5.3	6.8		8.3	6.6	11.4					
33	3.2										8.2			3.5	3.6		3.1	9.6	10.1					
34	4.0										9.6			5.4	3.4		2.5	10.5	12.1					
35	3.2										8.0			5.9	5.8		4.6	5.8	10.6					
36	4.1										10.3			3.6	5.4		3.0	6.8	11.6					
37	2.5										6.1			5.7	4.4		2.3	4.7	10.9					
38	7.0										13.9			8.5	4.6		3.2	5.5	10.6					
39	3.1										13.4			5.0	4.9		4.3	6.3	10.4					
40	8.2										13.1			3.2	2.2		2.3	8.3	9.8					
41	5.0										11.0			4.9	6.1		6.3	9.1	9.3					
42	3.2										7.7			5.9	5.6		4.9	5.5	10.2					
43	3.5										6.3			3.9	4.9		3.7	7.9	10.9					
44	5.5										11.3			3.7	6.7		6.6	8.2	10.2					

Table A6-4a. Seneca River Dreissenid Mussel Survey Fall 2011 – Raw Length (mm) Data Zebra Mussel (continued)

Zone	Zone XIII						Zone XIII						Zone XIII						Zone XIV			Zone XIV		
Transect	Transect B			Transect C			Transect D			Transect E			Transect A			Transect B								
Location	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red					
45	4.5										4.9			5.4	2.7		6.9	7.3	9.5					
46	3.7										11.7			2.6	4.0		3.7	4.6	9.4					
47	5.7										8.6			4.7	2.8		7.8	8.2	10.7					
48	4.9										10.4			3.6	5.9		4.9	4.6	8.8					
49	6.4										9.2			3.5	5.8		4.6	11.5	9.2					
50	5.5													3.0	6.0		3.0	5.7	8.8					
51	4.9													2.8	7.1		2.5	4.3	7.9					
52	6.0													3.0	3.7		2.5	6.9						
53	4.2													3.1	4.1		1.6	8.2						
54	2.5													2.4	10.6		2.5	5.5						
55	2.0													2.4	3.6		4.5	5.4						
56	5.3													2.7	4.0		3.5	3.8						
57	5.1														4.9		7.6	9.4						
58	3.3														7.7		8.7	8.0						
59	4.7														5.4		8.9	9.4						
60	5.9														9.6		1.6	5.9						
61	4.8														10.6		5.4	7.7						
62	4.2														11.0		3.6	6.5						
63	4.5														2.9		8.3	7.6						
64	2.9														10.2		2.3	8.5						
65	3.9														4.5		4.7	8.7						
66	5.0														3.0		1.3	9.7						
67	4.6														4.5		9.2	7.9						
68	5.3														4.4		8.5	6.6						
69	3.0														3.7		7.3	10.4						
70	3.9														9.0		5.1	6.7						
71	3.7														3.9		4.8	9.6						
72	4.2														4.7		4.5	7.9						
73	6.6														4.3		3.3	7.6						
74	3.9														3.8		3.0	7.0						
75	6.9														5.2		2.5	9.3						
76	3.4														7.7		4.3	7.4						
77	6.0														5.9		2.3	6.1						
78	7.5														6.4		4.6	6.3						
79	3.9														8.0		8.7	7.9						
80	3.6														6.0		1.8	6.4						
81	3.9														3.2		3.8	7.3						
82	4.7														3.3		5.1	6.1						
83	5.5														6.9		3.9	6.0						
84	3.9														5.2		1.8	5.6						
85	5.6														9.1		4.7	7.9						
86	4.0														6.8		2.4	6.0						
87	3.5														7.0		5.8	8.6						
88	4.8														4.1		7.0	7.6						
89	4.2														2.9		3.0	8.4						
90	5.1														6.9		3.3	12.9						

Table A6-4a. Seneca River Dreissenid Mussel Survey Fall 2011 – Raw Length (mm) Data Zebra Mussel (continued)

Zone	Zone XIII						Zone XIII						Zone XIV			Zone XIV			
Transect	Transect B			Transect C			Transect D			Transect E			Transect A			Transect B			
Location	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red	Green	Middle	Red
91	5.2													5.4			3.7	6.5	
92	3.6													2.7			3.4	5.8	
93	3.9													3.4			3.2	4.9	
94	7.4													8.3			2.0	4.4	
95	3.5													5.2			3.4	4.5	
96	3.7													5.3			4.2	4.4	
97	3.8													5.4			3.7	9.0	
98	4.5													4.6			3.5	9.0	
99	4.8													3.7			1.8	8.0	
100	4.0													2.7			2.4	5.7	
101																		5.4	

Table A6-4b. Seneca River Dreissenid Mussel Survey Fall 2011 – Raw Length (mm) Data Quagga Mussel

Zone	Zone III			Zone III			Zone III			Zone X			Zone X			Zone X			Zone XIII		
	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	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean Length	0.0	0.0	0.0	0.0	0.0	12.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	0.0	0.0	0.0	0.0	0.0	14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2						11.8															
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					
13																					
14																					
15																					
16																					
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36																					
37																					
38																					
39																					
40																					
41																					
42																					

Table A6-4b. Seneca River Dreissenid Mussel Survey Fall 2011 – Raw Length (mm) Data Quagga Mussel (continued)

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	0	12	0	0	0	0	0	0	12	0	7	4	7	9	4	11	13
Mean Length	0.0	0.0	13.7	0.0	0.0	0.0	0.0	0.0	0.0	12.0	0.0	7.1	3.9	6.7	8.9	5.3	11.4	12.8
1	0.0	0.0	26.0	0.0	0.0	0.0	0.0	0.0	0.0	17.6	0.0	7.1	5.4	12.1	8.9	1.0	11.6	17.6
2			23.2							19.9			2.5	7.3		2.7	12.8	19.8
3			10.2							14.5			2.9	8.1		4.4	8.6	13.2
4			23.2							13.9			4.8	5.1		4.1	7.7	17.1
5			22.1							12.9			3.8	3.5		2.2	9.0	18.2
6			21.2							10.7				7.3		1.4	5.7	17.5
7			17.2							12.3				8.6		8.1	14.1	16.4
8			22.1							19.5				2.1		8.7	13.0	16.6
9			12.3							11.9				1.9		12.8	13.6	17.1
10			11.4							14.1				3.8		10.9	17.6	21.2
11			11.5							12.1				5.0		9.6	14.7	15.1
12			28.9							19.3				3.1		8.3	12.1	15.1
13			24.4							11.3				15.1		9.9	12.7	16.8
14			11.6							12.9				6.8		9.6	10.4	15.6
15			13.3							14.8				11.8		9.9	9.6	17.2
16			21.2							12.4				6.3		8.4	8.8	12.1
17			18.5							11.6				7.0		10.2	14.8	19.0
18			15.3							11.8				17.8		6.3	9.1	12.4
19			12.8							10.7				10.3		9.0	12.5	13.1
20			10.2							11.7				6.8		8.5	11.5	15.1
21			9.5							12.2				3.9		5.2	9.8	15.4
22			10.3							13.0				9.6		9.4	11.5	16.5
23			8.8							9.3				7.7		5.0	11.4	15.9
24			16.6							13.7				6.1		6.8	8.3	15.2
25			10.0							11.4				10.7		3.2	9.0	11.9
26			8.9							14.2				6.8		3.8	10.9	15.8
27			12.5							12.9				4.8		1.5	9.8	15.7
28			11.1							11.5				9.2		3.1	16.0	13.5
29			13.2							7.9				5.5		3.0	9.3	12.8
30			12.8							11.0				2.7		2.7	13.1	9.6
31			12.8							8.6				15.0		3.0	11.2	8.8
32			12.7							10.4				10.9		3.7	9.7	10.4
33			13.7							12.6				6.4		3.4	9.0	12.5
34			11.7							10.8				9.2		3.3	9.5	11.4
35			11.4							14.7				8.3		2.0	13.0	11.0
36			9.1							13.9				2.7		4.7	11.9	14.4
37			10.3							12.1				6.1		3.2	12.7	7.7
38			12.5							11.4				11.6		2.7	12.6	8.5
39			11.5							11.3				4.4		2.5	15.1	13.4
40			14.4							7.8				15.6		1.8	10.8	12.0
41			10.7							11.4				8.7		3.9	8.5	11.4
42			11.5							12.9				7.5		5.2	10.7	7.7

Table A6-4b. Seneca River Dreissenid Mussel Survey Fall 2011 – Raw Length (mm) Data Quagga Mussel (continued)

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
43			10.1							8.2				4.8		2.6	7.9	11.9
44			8.0							20.8				8.7		3.4	11.8	10.9
45			9.6							21.6				9.2			17.6	10.3
46			13.5							18.4				7.6			15.7	11.4
47			12.8							19.0				11.9			9.4	9.1
48			11.2							14.8				6.7			9.9	9.8
49			11.8							12.2				3.8			13.9	12.7
50			10.0							8.2				4.7			11.5	13.3
51			9.3							8.2				6.4			14.2	13.2
52			9.9							12.0				1.8			9.1	14.2
53			12.0							7.7				5.8			10.5	8.0
54			10.3							9.7				2.8			7.7	9.4
55										11.3				8.6			11.1	8.1
56										10.9				1.9			10.9	10.6
57										11.9				8.5			6.2	10.5
58										12.5				3.6			10.3	8.8
59										11.4				7.7			11.0	12.9
60										10.1				1.8			12.3	13.6
61										11.0				2.7			10.4	13.9
62										13.3				1.9			9.4	15.9
63										10.6				5.4			9.5	12.6
64										10.8				9.0			13.7	16.1
65										7.6				13.0			12.5	11.0
66										10.1				6.7			9.6	9.9
67										19.0				5.1			9.8	7.8
68										12.5				12.1			11.2	8.7
69										14.3				2.6			10.9	10.8
70										12.7				5.7			16.4	11.7
71										12.7				8.6			11.0	13.7
72										10.9				11.2			12.2	14.1
73										12.3				9.9			12.4	14.0
74										10.8				3.6			10.1	12.8
75										9.5				2.1			10.3	15.2
76										14.1				2.0			12.5	12.8
77										11.5				2.0			14.7	12.7
78										15.5				14.0			14.7	13.7
79										7.9				9.1			11.3	13.0
80										10.9				4.5			9.7	11.8
81										10.1				7.7			12.3	11.9
82										14.4				7.5			11.8	12.5
83										12.6				7.3			10.6	13.3
84										10.8				7.2			13.9	14.2
85										12.1				3.8			12.2	12.0
86										11.2				3.7			10.7	12.5

Table A6-4b. Seneca River Dreissenid Mussel Survey Fall 2011 – Raw Length (mm) Data Quagga Mussel (continued)

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
87										13.9				5.1		12.4	14.2	
88										7.4				6.2		11.3	11.6	
89										10.5				6.6		13.7	12.4	
90										13.6				3.6		12.1	9.2	
91										10.8				7.7		5.5	8.1	
92										12.4				3.4		10.5	13.1	
93										12.7				3.3		14.1	8.9	
94										10.7				6.5		12.7	9.8	
95										2.7				5.2		11.1	11.6	
96										2.3				6.6		12.2	12.5	
97										6.3				1.6		12.5	12.5	
98										8.0				6.6		12.2	12.2	
99										11.9				2.9		10.8	10.5	
100										9.3				4.7		10.9	12.2	
101										10.6				7.5		13.3	14.2	
102										10.5				7.4		13.5	10.8	
103										5.6				4.2		11.8	12.1	
104										12.6				3.3		13.2	11.7	
105										8.2				3.1		10.9	10.7	
106										6.8				2.8		8.5	11.2	
107										12.6				7.5		12.9	9.2	
108										7.9				7.3		11.9		
109										10.7				6.0		8.6		
110										11.0				2.9		10.8		
111										10.3				5.9		8.8		
112										12.7				4.2		12.4		
113										12.6				2.4		11.6		
114										12.2				3.0		10.5		
115										10.7				5.1		10.5		
116										6.9				6.6		8.7		
117										4.9				3.4		9.4		
118										9.9				3.1		12.9		
119										9.0				6.1		9.0		
120										8.9				3.1		13.9		
121														6.4		12.6		
122														5.3		11.3		
123														3.4		11.2		
124														7.3		14.3		
125														2.6		11.3		
126														3.7		10.5		
127														2.3		9.9		
128														7.5		9.7		
129														2.8		15.0		
130														3.3		12.0		

Table A6-4b. Seneca River Dreissenid Mussel Survey Fall 2011 – Raw Length (mm) Data Quagga Mussel (continued)

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
131														7.2			10.7	
132														7.3			12.4	
133														2.4			10.7	
134														2.6			10.8	
135														1.8			11.0	
136														3.9			10.6	
137														2.5			10.7	
138														2.1			10.6	
139														5.4			12.9	
140														2.4			10.8	
141														3.9			9.0	
142														2.9			13.0	
143														5.6			12.4	
144														6.5			12.4	
145														8.8			10.9	
146														7.5			11.2	
147														3.8			11.9	
148														4.7			10.3	
149														6.1			8.9	
150														5.3			11.1	

Table A6-5a. Onondaga Lake Dreissenid Mussel Survey Fall 2011 – Length, Weight and Biomass Data Summary for Zebra Mussel.

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 Biomass (g/m ²)	Mean Biomass (g/m ²) per	Mean Biomass (g/m ²) per	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
N - 06.238 W - 13.146	1.0	0-1.5	3	0.3	0.3	13.3	14.4	203.0	3	6.2	3.0	132.7	376	4170
N - 06.238 W - 13.188	2.4	1.5-3.0	9	0.4	0.4	17.7			6	6.0	9.0	398.2		
N - 06.238 W - 13.191	3.1	3.0-4.5	17	0.5	0.5	22.1			5	5.7	17.0	752.2		
N - 06.238 W - 13.194	5.2	4.5 - 6.0	5	0.1	0.1	4.4			7	6.8	5.0	221.2		
N - 06.615 W - 13.688	0.9	0-1.5	55	3.2	3.2	141.6	391.6	203.0	7	7.0	55.0	2433.6	7965	4170
N - 06.615 W - 13.734	2.8	1.5-3.0	100	3.7	14.5	641.6			6	5.8	392.0	17345.1		
N - 06.615 W - 13.737	4.4	3.0-4.5	100	7.7	15.7	694.7			7	7.0	203.0	8982.3		
N - 06.615 W - 13.739	5.5	4.5 - 6.0	70	2.0	2.0	88.5			5	5.2	70.0	3097.3		
N - 06.894 W - 14.216	0.8	0-1.5	100	3.2	24.4	1079.6	436.9	436.9	6	5.9	762.0	33716.8	14735	14735
N - 06.894 W - 14.286	2.2	1.5-3.0	100	2	9.3	411.5			5	4.8	465.0	20575.2		
N - 06.894 W - 14.308	3.8	3.0-4.5	27	1.1	1.1	48.7			6	6.2	27.0	1194.7		
N - 06.894 W - 14.335	6.0	4.5 - 6.0	78	4.7	4.7	208.0			7	7.3	78.0	3451.3		
N - 06.384 W - 14.556	1.2	0-1.5	0	0	0	0.0	508.8	390.5	0	0.0	0.0	0.0	9480	9010
N - 06.384 W - 14.522	2.5	1.5-3.0	100	5.3	22.4	991.2			5	6.0	422.0	18672.6		
N - 06.384 W - 14.521	4.0	3.0-4.5	100	5.1	7.5	331.9			7	7.2	147.0	6504.4		
N - 06.384 W - 14.519	5.0	4.5 - 6.0	100	5.6	16.1	712.4			6	6.6	288.0	12743.4		
N - 05.551 W - 13.935	0.6	0-1.5	52	6.3	6.3	278.8	272.1	390.5	8	8.1	52.0	2300.9	8540	9010
N - 05.551 W - 13.887	2.5	1.5-3.0	100	1.9	12.7	561.9			5	4.9	668.0	29557.5		
N - 05.554 W - 13.887	4.0	3.0-4.5	25	2.3	2.3	101.8			8	8.3	25.0	1106.2		
N - 05.530 W - 13.887	5.8	4.5 - 6.0	27	3.3	3.3	146.0			9	8.9	27.0	1194.7		
N - 05.253 W - 13.091	1.0	0-1.5	96	3.5	3.5	154.9	77.4	135.0	6	6.2	96.0	4247.8	2909	6034
N - 05.246 W - 13.080	2.1	1.5-3.0	150	3.5	3.5	154.9			4.7	5.1	167.0	7389.4		
N - 05.256 W - 13.011	4.4	3.0-4.5	0	0.0	0.0	0.0			0	0.0	0.0	0.0		
N - 05.260 W - 12.998	5.8	4.5 - 6.0	0	0.0	0.0	0.0			0	0.0	0.0	0.0		
N - 04.877 W - 12.618	1.3	0-1.5	10	0.1	0.1	4.4	192.5	217.9	3	3.8	10.0	442.5	9159	10100
N - 04.885 W - 12.603	2.2	1.5-3.0	115	1.7	11.2	495.6			4	4.1	758.0	33539.8		
N - 04.895 W - 12.591	3.8	3.0-4.5	25	3.6	3.6	159.3			10	9.8	25.0	1106.2		
N - 04.897 W - 12.584	5.7	4.5 - 6.0	35	2.5	2.5	110.6			7	7.1	35.0	1548.7		
N - 04.318 W - 12.220	0.8	0-1.5	136	2.7	17.6	778.8	217.9	217.9	4	4.5	887.0	39247.8	10100	10100
N - 04.327 W - 12.186	2.5	1.5-3.0	14	0.8	0.8	35.4			8	7.0	14.0	619.5		
N - 04.327 W - 12.178	4.0	3.0-4.5	12	1.3	1.3	57.5			10	9.1	12.0	531.0		
N - 04.330 W - 12.173	5.8	4.5 - 6.0	0	0.0	0.0	0.0			0	0.0	0.0	0.0		
N - 04.044 W - 11.681	1.3	0-1.5	19	3.7	3.7	163.7	64.7	64.7	11	10.8	19.0	840.7	2058	2058
N - 04.080 W - 11.449	2.0	1.5-3.0	111	1.0	1.9	81.9			4	3.7	166.0	7345.1		
N - 04.099 W - 11.504	4.1	3.0-4.5	1	0.3	0.3	13.3			12	12.4	1.0	44.2		
N - 04.111 W - 11.499	5.8	4.5 - 6.0	0	0.0	0.0	0.0			0	0.0	0.0	0.0		
N - 04.037 W - 10.809	1.2	0-1.5	0	0.0	0.0	0.0	1.1	1.1	0	0.0	0.0	0.0	133	133
N - 04.039 W - 10.899	2.0	1.5-3.0	11	0.0	0.0	0.0			4	3.8	11.0	486.7		
N - 04.040 W - 10.868	3.1	3.0-4.5	1	0.1	0.1	4.4			7	6.9	1.0	44.2		
N - 04.045 W - 10.896	4.8	4.5 - 6.0	0	0	0	0.0			0	0.0	0.0	0.0		
N - 04.874 W - 11.065	1.1	0-1.5	64	2.4	2.4	106.2	158.2	140.5	5	5.6	64.0	2831.9	4591	6781
N - 04.849 W - 11.128	2.4	1.5-3.0	100	3.9	8.7	385.0			6	6.2	279.0	12345.1		
N - 04.842 W - 11.140	4.2	3.0-4.5	4	0.1	0.1	4.4			8	7.9	4.0	177.0		
N - 04.833 W - 11.133	4.9	4.5 - 6.0	68	3.1	3.1	137.2			6	6.4	68.0	3008.8		
N - 05.623 W - 12.003	0.8	0-1.5	3	0.1	0.1	4.4	122.8	140.5	7	6.7	3.0	132.7	8971	6781
N - 05.620 W - 12.094	1.9	1.5-3.0	100	1.0	7.3	323.0			3	3.7	730.0	32300.9		
N - 05.606 W - 12.099	4.3	3.0-4.5	71	2.6	2.6	115.0			5	5.5	71.0	3141.6		
N - 05.608 W - 12.115	5.8	4.5 - 6.0	7	1.1	1.1	48.7			10	9.3	7.0	309.7		

r Dredge Sample Area is 226 cm².
sd depth 4.5 - 6.0

Table A6-5b. Onondaga Lake Dreissenid Mussel Survey Fall 2011 – Length, Weight and Biomass Data Summary for Quagga Mussel.

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 Biomass (g/m ²)	Mean Biomass (g/m ²) per	Mean Biomass (g/m ²) per	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
N - 06.238 W - 13.146	1.0	0-1.5	0	0.0	0.0	0.0	4.4	496.1	0	0.0	0	0.0	133	3451
N - 06.238 W - 13.188	2.4	1.5-3.0	0	0.0	0.0	0.0			0	0.0	0	0.0		
N - 06.238 W - 13.191	3.1	3.0-4.5	0	0.0	0.0	0.0			0	0.0	0	0.0		
N - 06.238 W - 13.194	5.2	4.5 - 6.0	12	0.4	0.4	17.7	987.8	496.1	7	6.2	12	531.0	6770	3451
N - 06.615 W - 13.688	0.9	0-1.5	9	0.7	0.7	31.0			8	9.0	9	398.2		
N - 06.615 W - 13.734	2.8	1.5-3.0	100	11.0	47.4	2097.3			4	6.7	431	19070.8		
N - 06.615 W - 13.737	4.4	3.0-4.5	40	0.6	0.6	26.5			4	4.6	40	1769.9		
N - 06.615 W - 13.739	5.5	4.5 - 6.0	100	30.8	40.6	1796.5			9	10.1	132	5840.7		
N - 06.894 W - 14.216	0.8	0-1.5	113	6.5	6.5	287.6			7	7.1	113	5000.0		
N - 06.894 W - 14.286	2.2	1.5-3.0	76	3.2	3.2	141.6	2797.6	2797.6	5	5.9	76	3362.8	19336	19336
N - 06.894 W - 14.308	3.8	3.0-4.5	100	18.4	42.9	1898.2			9	9.7	233	10309.7		
N - 06.894 W - 14.335	6.0	4.5 - 6.0	100	15.1	200.3	8862.8			9	9.5	1326	58672.6		
N - 06.384 W - 14.556	1.2	0-1.5	1	0.1	0.1	4.4	2757.7	3560.8	2	2.2	1	44.2	14657	22506
N - 06.384 W - 14.522	2.5	1.5-3.0	100	7.2	9.5	420.4			7	7.4	131	5796.5		
N - 06.384 W - 14.521	4.0	3.0-4.5	100	20.6	90.1	3986.7			10	10.4	437	19336.3		
N - 06.384 W - 14.519	5.0	4.5 - 6.0	100	19.8	149.6	6619.5	4363.9	3560.8	5	8.8	756	33451.3	30354	22506
N - 05.551 W - 13.935	0.6	0-1.5	36	6.0	6.0	265.5			9	9.5	36	1592.9		
N - 05.551 W - 13.887	2.5	1.5-3.0	100	10.8	24.7	1092.9			7	8.0	321	14203.5		
N - 05.554 W - 13.887	4.0	3.0-4.5	100	17.8	249.5	11039.8	61.9	1370.0	6	8.7	1402	62035.4	409	4652
N - 05.530 W - 13.887	5.8	4.5 - 6.0	100	11.6	114.3	5057.5			7	8.5	985	43584.1		
N - 05.253 W - 13.091	1.0	0-1.5	7	0.3	0.3	13.3			7	7.3	7	309.7		
N - 05.246 W - 13.080	2.1	1.5-3.0	4	0.2	0.2	8.8	2678.1	1370.0	5	6.5	4	177.0	8894	4215
N - 05.256 W - 13.011	4.4	3.0-4.5	26	5.1	5.1	225.7			11	11.3	26	1150.4		
N - 05.260 W - 12.998	5.8	4.5 - 6.0	0	0.0	0.0	0.0			0	0.0	0	0.0		
N - 04.877 W - 12.618	1.3	0-1.5	0	0	0	0.0	922.6	922.6	0	0.0	0	0.0	509	509
N - 04.885 W - 12.603	2.2	1.5-3.0	12	0.1	0.1	4.4			4	4.2	12	531.0		
N - 04.895 W - 12.591	3.8	3.0-4.5	150	41.8	71.0	3141.6			13	12.7	254	11238.9		
N - 04.897 W - 12.584	5.7	4.5 - 6.0	100	31.8	171	7566.4	144.9	143.8	10	11.6	538	23805.3	509	509
N - 04.318 W - 12.220	0.8	0-1.5	13	0.1	0.1	4.4			5	5.2	13	575.2		
N - 04.327 W - 12.186	2.5	1.5-3.0	104	23.0	23.0	1017.7			12	11.4	104	4601.8		
N - 04.327 W - 12.178	4.0	3.0-4.5	100	22.8	60.3	2668.1	0.0	0.0	12	11.8	264	11681.4	0	0
N - 04.330 W - 12.173	5.8	4.5 - 6.0	0	0.0	0.0	0.0			0	0.0	0	0.0		
N - 04.044 W - 11.681	1.3	0-1.5	20	8.6	8.6	380.5			12	13.7	20	885.0		
N - 04.080 W - 11.449	2.0	1.5-3.0	1	0.1	0.1	4.4	128.3	351.2	3	2.6	1	44.2	830	1228
N - 04.099 W - 11.504	4.1	3.0-4.5	25	4.4	4.4	194.7			11	11.3	25	1106.2		
N - 04.111 W - 11.499	5.8	4.5 - 6.0	0	0.0	0.0	0.0			0	0.0	0	0.0		
N - 04.037 W - 10.809	1.2	0-1.5	0	0.0	0.0	0.0	574.1	351.2	0	0.0	0	0.0	1626	1626
N - 04.039 W - 10.899	2.0	1.5-3.0	0	0.0	0.0	0.0			0	0.0	0	0.0		
N - 04.040 W - 10.868	3.1	3.0-4.5	0	0.0	0.0	0.0			0	0.0	0	0.0		
N - 04.045 W - 10.896	4.8	4.5 - 6.0	0	0	0	0.0	128.3	351.2	0	0.0	0	0.0	830	1228
N - 04.874 W - 11.065	1.1	0-1.5	3	0.1	0.1	4.4			9	8.5	3	132.7		
N - 04.849 W - 11.128	2.4	1.5-3.0	66	10.9	10.9	482.3			8	9.2	66	2920.4		
N - 04.842 W - 11.140	4.2	3.0-4.5	0	0.0	0.0	0.0	574.1	351.2	0	0.0	0	0.0	1626	1626
N - 04.833 W - 11.133	4.9	4.5 - 6.0	6	0.6	0.6	26.5			6	7.2	6	265.5		
N - 05.623 W - 12.003	0.8	0-1.5	0	0.0	0.0	0.0			0	0.0	0	0.0		
N - 05.620 W - 12.094	1.9	1.5-3.0	33	4.3	4.3	190.3	128.3	351.2	0	9.4	33	1460.2	1626	1626
N - 05.606 W - 12.099	4.3	3.0-4.5	19	3.3	3.3	146.0			11	10.8	19	840.7		
N - 05.608 W - 12.115	5.8	4.5 - 6.0	95	44.3	44.3	1960.2			15	15.5	95	4203.5		

r Dredge Sample Area is 226 cm².
 11 added depth 4.5 - 6.0

Table A6-6a. Onondaga Lake Dreissenid Mussel Survey - Fall 2002, and Fall 2005 through Fall 2011 Comparison of Density (#/m²) for Zebra Mussel.

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	2010	2011	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)	2010 (0-4.5 M)	2011 (0-6.0 M)	
A	0 -1.5	2036.2	66.4	774.4	1770.4	486.7	6416	287.6	1283.2	1834	1187	5465	14559	2721	4019	6844	4170	
	1.5 - 3.0	3465.5	3385.0	6216.4	21084.2	2854	3119.5	14867.3	8871.7									
	3.0 - 4.5	0.0	110.6	9403.5	4889.4	4823	2522.1	5376.2	4867.3									
	4.5 - 6.0	NA	NA	NA	NA	NA	NA	NA	1659.3									
B	0 -1.5	0.0	0.0	13877.7	14896.8	5044.2	4867.3	1061.9	33716.8	0	133	4803	12148	2522	1814	4513	14735	
	1.5 - 3.0	0.0	221.2	531.0	21238.9	1283.2	0.0	12256.6	20575.2									
	3.0 - 4.5	0.0	177.0	0.0	309.7	1238.9	575.2	221.2	1194.7									
	4.5 - 6.0	NA	NA	NA	NA	NA	NA	NA	3451.3									
C	0 -1.5	754.7	44.8	3340.7	4002.3	4535.4	110.6	862.9	1150.4	514	1003	1991	12492	5627	502	5133	9010	
	1.5 - 3.0	788.6	2013.3	2522.2	16017.7	6615.1	309.8	12876.1	24115.0									
	3.0 - 4.5	0.0	951.3	110.6	17455.8	5730.1	1084.1	1659.3	3805.3									
	4.5 - 6.0	NA	NA	NA	NA	NA	NA	NA	6969.0									
D	0 -1.5	3941.9	1017.7	199.1	4911.5	2920.4	110.6	22.1	2345.1	1356	907	774	18791	1460	5479	501	6034	
	1.5 - 3.0	124.8	774.4	221.2	4292.1	1305.4	15951.4	1393.8	20464.6									
	3.0 - 4.5	0.0	929.2	1902.7	47168.2	154.9	376.1	88.5	553.1									
	4.5 - 6.0	NA	NA	NA	NA	NA	NA	NA	774.3									
E	0 -1.5	225.0	575.2	2522.1	20452.3	7212.4	0.0	1150.4	39247.8	1460	752	1549	7806	5782	723	2330	10100	
	1.5 - 3.0	4154.5	442.5	619.5	619.5	4469.0	132.7	1814.2	619.5									
	3.0 - 4.5	0.0	1238.9	1504.4	2345.1	5663.7	2035.4	4026.5	531.0									
	4.5 - 6.0	NA	NA	NA	NA	NA	NA	NA	0.0									
F	0 -1.5	3069.8	929.2	88.5	6761.5	8185.8	3097.3	1814.2	840.7	1141	3319	59	13211	7965	2522	3245	2058	
	1.5 - 3.0	351.7	8274.3	88.5	26737	5000.0	2256.6	5663.7	7345.1									
	3.0 - 4.5	0.0	752.2	0.0	6134.4	10708.0	2212.4	2256.6	44.2									
	4.5 - 6.0	NA	NA	NA	NA	NA	NA	NA	0.0									
G	0 -1.5	0.0	0.0	0.0	354	3008.8	44.2	44.2	0.0	0	15	0	2383	2522	177	516	133	
	1.5 - 3.0	0.0	44.2	0.0	6795.2	3451.3	486.7	354	486.7									
	3.0 - 4.5	0.0	0.0	0.0	0	1106.2	0.0	1150.4	44.2									
	4.5 - 6.0	NA	NA	NA	NA	NA	NA	NA	0.0									
H	0 -1.5	2650.6	22.1	2500.0	3473.5	464.6	3163.8	4491.2	1482.3	1102	789	1667	2463	8119	3717	2935	6781	
	1.5 - 3.0	655.9	2256.7	1371.7	1283.2	17190.3	6615.1	3252.2	22323.0									
	3.0 - 4.5	0.0	88.5	1128.3	2632.7	6703.5	1371.7	1062	1659.3									
	4.5 - 6.0	NA	NA	NA	NA	NA	NA	NA	1659.3									
Total 0-1.5 M		12678	2655	23302	72556	31858	17810	9735	80066									
Total 1.5 to 3.0 M		9541	17411	11570	98068	42168	28872	52478	104801									
Total 3.0 to 4.5 M		0	4248	14049	80935	36128	10177	15841	12699									
Total 4.5 to 6.0 M		NA	NA	NA	NA	NA	NA	NA	14513.3									
Total 0 to 3.0 M		22219	20067	34873	170624	74027	46682	62212	184867									
Total 0 to 4.5 M		22219	24314	48922	251559	110155	56859	78053	197566	Mean	926	1013	2038	10482	4590	2369	3252	6627
Total 0 to 6.0 M		NA	NA	NA	NA	NA	NA	NA	212079.6	Sum	7406	8105	16307	83853	36718	18953	26018	53020

Note: The 2002 data utilized scuba divers for sample collection, and the 2005 through 2010 data utilized the petit ponar dredge for sample collection.
 Note: 2011 added depth 4.5 - 6.0

Table A6-6b. Onondaga Lake Dreissenid Mussel Survey - Fall 2002, and Fall 2005 through Fall 2011 Comparison of Density (#/m²) for Quagga Mussel.

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					
		2007	2008	2009	2010	2011	2007 (0-4.5 M)	2008 (0-4.5 M)	2009 (0-4.5 M)	2010 (0-4.5 M)	2011 (0-6.0 M)	
A	0 -1.5	199.1	0	4601.8	154.9	199.1	229	1327	2301	4653	3451	
	1.5 - 3.0	398.3	2566.4	2101.8	4004.4	9535.4						
	3.0 - 4.5	88.5	1415.9	199.1	9800.9	885.0						
	4.5 - 6.0	NA	NA	NA	NA	3185.8						
B	0 -1.5	0	575.2	13495.6	137.2	5000.0	0	4558	8909	91	19336	
	1.5 - 3.0	0	6858.4	0.0	137.2	3362.8						
	3.0 - 4.5	0	6238.9	13230.1	0	10309.7						
	4.5 - 6.0	NA	NA	NA	NA	58672.6						
C	0 -1.5	0	508.9	575.2	88.5	818.6	1261	2979	9226	1291	22506	
	1.5 - 3.0	1305.3	2566.4	7123.9	464.6	10000.0						
	3.0 - 4.5	2477.9	5862.9	19977.9	3318.6	40685.8						
	4.5 - 6.0	NA	NA	NA	NA	38517.7						
D	0 -1.5	132.8	2035.4	22.1	0	154.9	280	1091	4034	190	4652	
	1.5 - 3.0	132.8	885	66.4	376.1	354.0						
	3.0 - 4.5	575.2	354	12013.3	194.6	6194.7						
	4.5 - 6.0	NA	NA	NA	NA	11902.7						
E	0 -1.5	0	7831.9	0.0	988.5	575.2	0	12448	6268	10359	4215	
	1.5 - 3.0	0	7876.1	2566.4	619.5	4601.8						
	3.0 - 4.5	0	21637.2	16238.9	29469	11681.4						
	4.5 - 6.0	NA	NA	NA	NA	0.0						
F	0 -1.5	0	442.5	442.5	1460.2	885.0	0	6785	12065	4440	509	
	1.5 - 3.0	0	2920.4	15973.5	1548.7	44.2						
	3.0 - 4.5	0	16991.2	19778.8	10309.7	1106.2						
	4.5 - 6.0	NA	NA	NA	NA	0.0						
G	0 -1.5	0	221.2	0.0	0	0.0	0	501	0	0	0	
	1.5 - 3.0	0	0.0	0.0	0	0.0						
	3.0 - 4.5	0	1283.2	0.0	0	0.0						
	4.5 - 6.0	NA	NA	NA	NA	0.0						
H	0 -1.5	0	22.1	1039.8	597.4	66.4	0	243	5221	580	1228	
	1.5 - 3.0	0	420.4	12610.6	154.9	2190.3						
	3.0 - 4.5	0	287.6	2013.3	988.5	420.4						
	4.5 - 6.0	NA	NA	NA	NA	2234.5						
Total 0-1.5 M		332	11637	20177	3427	7699						
Total 1.5 to 3.0 M		1836	24093	40443	7305	30088						
Total 3.0 to 4.5 M		3142	54071	83451	54081	71283						
Total 4.5 to 6.0 M		NA	NA	NA	NA	114513.3						
Total 0 to 3.0 M		2168	35730	60620	10732	37788						
Total 0 to 4.5 M		5310	89801	144071	64813	109071	Mean	221	3742	6003	2701	6987
Total 0 to 6.0 M		NA	NA	NA	NA	223584.1	Sum	1770	29934	48024	21604	55896

Note: The 2002 data utilized scuba divers for sample collection, and the 2005 through 2010 data utilized the petit ponar dredge for sample collection.

Note: 2011 added depth 4.5 - 6.0

Table A6-7a. Onondaga Lake Dreissenid Mussel Survey - Fall 2002, and Fall 2005 through Fall 2011 Comparison of Biomass (g/m²) for Zebra Mussel.

Zone	Water Depth Section/Range (m)	Mean Estimated Biomass (g/m ²) by Depth								Mean Estimated Biomass (g/m ²) by Zone								
		2002	2005	2006	2007 *	2008 *	2009	2010	2011	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)	2010 (0-4.5 M)	2011 (0-6.0 M)	
A	0 -1.5	1134.8	0.5	53.1	1648.2	73.0	1077.5	11.05	77.4	1078.5	41.9	716.8	1150.4	297.9	485.3	351.1	203.0	
	1.5 - 3.0	2100.8	122.7	672.6	1721.2	544.3	336.3	736.8	329.6									
	3.0 - 4.5	0.0	2.4	1424.8	81.9	276.5	42	305.3	358.4									
	4.5 - 6.0	NA	NA	NA	NA	NA	NA	NA	46.5									
B	0 -1.5	0.0	0.0	110.6	893.8	323.0	699.1	57.5	1079.6	0.0	6.0	47.2	337.8	650.4	241.9	175.5	436.9	
	1.5 - 3.0	0.0	12.8	31.0	106.2	854.0	0	464.6	411.5									
	3.0 - 4.5	0.0	5.3	0.0	13.3	774.3	26.5	4.42	48.7									
	4.5 - 6.0	NA	NA	NA	NA	NA	NA	NA	208.0									
C	0 -1.5	246.6	3.1	13.3	314.2	278.8	50.9	79.7	139.4	170.6	57.6	74.5	1747.8	855.5	109.1	140.7	390.5	
	1.5 - 3.0	265.1	67.3	208.0	2146.0	847.4	92.9	296	776.5									
	3.0 - 4.5	0.0	102.4	2.2	2783.2	1440.3	183.6	46.5	216.8									
	4.5 - 6.0	NA	NA	NA	NA	NA	NA	NA	429.2									
D	0 -1.5	1076.1	81.6	28.8	2115.0	1015.5	11.1	2.2	79.6	361.6	45.1	70.1	1208.0	472.7	42.8	36.9	135.0	
	1.5 - 3.0	8.8	6.9	4.4	35.4	336.3	99.6	106.2	325.2									
	3.0 - 4.5	0.0	46.7	177.0	1473.5	66.4	17.7	2.2	79.6									
	4.5 - 6.0	NA	NA	NA	NA	NA	NA	NA	55.3									
E	0 -1.5	386.4	14.6	8.9	920.4	1385.0	0	61.9	778.8	971.9	16.8	26.6	348.1	1435.1	53.1	110.6	217.9	
	1.5 - 3.0	2529.4	8.9	22.1	57.5	1097.3	4.4	128.3	35.4									
	3.0 - 4.5	0.0	27.0	48.7	66.4	1823.0	154.9	141.6	57.5									
	4.5 - 6.0	NA	NA	NA	NA	NA	NA	NA	0.0									
F	0 -1.5	3363.7	62.8	17.7	1203.5	854.0	1070.8	106.2	163.7	1125.3	133.5	7.4	2585.5	1619.5	532.4	147.5	64.7	
	1.5 - 3.0	12.3	240.3	4.4	6283.2	1084.1	327.4	207.9	81.9									
	3.0 - 4.5	0.0	97.4	0.0	269.9	2920.4	199.1	128.3	13.3									
	4.5 - 6.0	NA	NA	NA	NA	NA	NA	NA	0.0									
G	0 -1.5	0.0	0.0	0.0	4.4	628.3	4.4	4.424	0.0	0.0	0.1	0.0	64.9	324.5	4.4	11.8	1.1	
	1.5 - 3.0	0.0	0.4	0.0	190.3	172.6	8.8	8.85	0.0									
	3.0 - 4.5	0.0	0.0	0.0	0.0	172.6	0	22.123	4.4									
	4.5 - 6.0	NA	NA	NA	NA	NA	NA	NA	0.0									
H	0 -1.5	2356.2	0.2	26.5	617.3	64.2	502.2	166	55.3	800.6	22.6	94.4	457.2	272.2	405.6	114.3	140.5	
	1.5 - 3.0	45.7	59.3	88.5	247.8	526.6	668.2	110.6	354.0									
	3.0 - 4.5	0.0	8.4	168.1	506.6	225.7	46.5	66.4	59.7									
	4.5 - 6.0	NA	NA	NA	NA	NA	NA	NA	92.9									
Total 0-1.5 M		8564	163	259	7717	4622	3416	489	2374									
Total 1.5 to 3.0 M		4962	519	1031	10788	5463	1538	2059	2314									
Total 3.0 to 4.5 M		0	290	1821	5195	7699	670	717	838									
Total 4.5 to 6.0 M		NA	NA	NA	NA	NA	NA	NA	832									
Total 0 to 3.0 M		13526	681	1290	18504	10084	4954	2548	4688									
Total 0 to 4.5 M		13526	971	3111	23699	17784	5624	3265	5527									
Total 0 to 6.0 M		NA	NA	NA	NA	NA	NA	NA	6358	Mean	563.6	40.5	129.6	987.5	741.0	234.3	136.0	198.7
										Sum	4508.6	323.7	1036.9	7899.7	5927.9	1874.6	1088.4	1589.6

Note: Weights represent the combined *Dreissena* sp., Zebra and Quagga mussel.

Note: The 2002 data utilized scuba divers for sample collection, and the 2005 through 2010 data utilized the petit ponar dredge for sample collection.

Note: 2011 added 4.5-6.0m sample depth

Table A6-7b. Onondaga Lake Dreissenid Mussel Survey - Fall 2002, and Fall 2005 through Fall 2011 Comparison of Biomass (g/m²) for Quagga Mussel.

Zone	Water Depth Section/Range (m)	Mean Estimated Biomass (g/m ²) by Depth					Mean Estimated Biomass (g/m ²) by Zone					
		2007 *	2008 *	2009	2010	2011	2007 * (0-4.5 M)	2008 * (0-4.5 M)	2009 (0-4.5 M)	2010 (0-4.5 M)	2011 (0-6.0 M)	
A	0 - 1.5	1648.2	73.0	694.7	6.6	15.5	1150.4	297.9	321.5	1149.0	496.1	
	1.5 - 3.0	1721.2	544.3	250	159.3	1048.7						
	3.0 - 4.5	81.9	276.5	19.9	3281	13.3						
	4.5 - 6.0	NA	NA	NA	NA	907.1						
B	0 - 1.5	893.8	323.0	3053.1	22.1	31.0	337.8	650.4	1467.6	8.8	987.8	
	1.5 - 3.0	106.2	854.0	0	4.4	2097.3						
	3.0 - 4.5	13.3	774.3	1349.6	0	26.5						
	4.5 - 6.0	NA	NA	NA	NA	1796.5						
C	0 - 1.5	314.2	278.8	170.4	15.5	135.0	1747.8	855.5	2000.8	405.6	3560.8	
	1.5 - 3.0	2146.0	847.4	1820.8	99.6	756.6						
	3.0 - 4.5	2783.2	1440.3	4011.1	1101.8	7513.3						
	4.5 - 6.0	NA	NA	NA	NA	5838.5						
D	0 - 1.5	2115.0	1015.5	6.7	0	6.6	1208.0	472.7	894.6	20.6	1370.0	
	1.5 - 3.0	35.4	336.3	2.2	42	6.6						
	3.0 - 4.5	1473.5	66.4	2674.8	19.9	1683.6						
	4.5 - 6.0	NA	NA	NA	NA	3783.2						
E	0 - 1.5	920.4	1385.0	0	13.3	4.4	348.1	1435.1	949.9	3799.4	922.6	
	1.5 - 3.0	57.5	1097.3	376.1	53.1	1017.7						
	3.0 - 4.5	66.4	1823.0	2473.5	11331.9	2668.1						
	4.5 - 6.0	NA	NA	NA	NA	0.0						
F	0 - 1.5	1203.5	854.0	159.3	677	380.5	2585.5	1619.5	3830.4	2193.2	144.9	
	1.5 - 3.0	6283.2	1084.1	5256.6	212.4	4.4						
	3.0 - 4.5	269.9	2920.4	6075.2	5690.3	194.7						
	4.5 - 6.0	NA	NA	NA	NA	0.0						
G	0 - 1.5	4.4	628.3	0	0	0.0	64.9	324.5	0.0	0.0	0.0	
	1.5 - 3.0	190.3	172.6	0	0	0.0						
	3.0 - 4.5	0.0	172.6	0	0	0.0						
	4.5 - 6.0	NA	NA	NA	NA	0.0						
H	0 - 1.5	617.3	64.2	130.5	55	2.2	457.2	272.2	432.9	39.7	351.2	
	1.5 - 3.0	247.8	526.6	1013.3	57.5	336.3						
	3.0 - 4.5	506.6	225.7	154.9	6.7	73.0						
	4.5 - 6.0	NA	NA	NA	NA	993.4						
Total 0-1.5 M		7717	4622	4215	790	575						
Total 1.5 to 3.0 M		10788	5463	8719	628	5268						
Total 3.0 to 4.5 M		5195	7699	16759	21432	12173						
Total 4.5 to 6.0 M		NA	NA	NA	NA	13319						
Total 0 to 3.0 M		18504	10084	12934	1418	5843						
Total 0 to 4.5 M		23699	17784	29693	22849	18015						
Total 0 to 6.0 M		NA	NA	NA	NA	31334						
							Mean	987.5	741.0	1237.2	952.1	979.2
							Sum	7899.7	5927.9	9897.6	7616.5	7833.5

Note: Weights represent the combined *Dreissena* sp., Zebra and Quagga mussel.

Note: The 2002 data utilized scuba divers for sample collection, and the 2005 through 2010 data utilized the petit ponar dredge for sample collection.

Note: 2011 added 4.5-6.0m sample depth

Table A6-8a. Onondaga Lake Dreissenid Mussel Survey Fall 2011 – Zebra Mussel Raw Length (mm) Data

Zone Transect	Zone A				Zone A				Zone B				Zone C				Zone C			
	Transect 1				Transect 2				Transect 1				Transect 1				Transect 2			
	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0
Median Length	3	6	5	7	7	6	7	5	6	5	6	7	0	5	7	6	8	5	8	9
Mean Length	6.2	6.0	5.7	6.8	7.0	5.8	7.0	5.2	5.9	4.8	6.2	7.3	0.0	6.0	7.2	6.6	8.1	4.9	8.3	8.9
1	12.6	6.7	9.2	5.1	12.5	13.2	14.2	11.8	8.8	6.1	10.5	12.4	0.0	13.2	4.7	4.5	16.0	4.3	7.3	11.9
2	3.4	7.7	10.9	8.6	13.0	2.8	14.5	10.5	4.7	1.8	8.5	10.1		2.7	5.3	5.1	14.5	5.1	10.3	8.7
3	2.6	6.3	7.4	7.3	11.9	7.6	5.6	9.8	10.2	3.0	5.3	12.3		6.0	3.7	6.0	6.2	5.3	4.1	6.9
4		6.6	7.2	5.8	11.4	5.1	8.2	9.3	9.6	3.5	10.0	10.7		5.2	5.2	8.9	10.1	12.1	5.4	5.7
5		7.5	8.2	7.2	10.6	2.8	12.1	9.0	10.1	5.8	7.2	9.6		4.0	4.7	4.0	9.6	5.3	6.6	10.6
6		5.6	6.1		10.9	3.4	9.1	9.2	3.0	4.0	11.5	12.9		3.8	13.6	7.4	11.6	4.2	11.3	9.5
7		4.9	4.8		9.2	8.1	9.6	10.9	3.9	5.0	5.0	7.4		3.6	6.7	10.8	8.2	6.3	5.8	7.0
8		5.5	4.9		9.4	7.4	10.9	7.8	6.5	3.5	6.7	6.6		2.4	8.2	12.3	12.0	6.0	2.2	5.7
9		3.5	3.2		9.0	6.9	9.5	9.3	8.3	4.6	7.5	5.0		1.8	10.2	8.6	8.5	3.8	12.9	4.0
10			4.6		8.6	8.7	10.6	7.5	5.5	2.4	5.9	6.4		3.6	58.9	8.8	10.4	3.4	11.9	9.3
11			4.1		8.8	7.5	10.2	8.2	5.9	2.6	4.4	8.3		2.8	8.8	7.9	10.5	3.5	6.3	10.3
12			4.6		8.2	4.7	10.6	4.7	3.7	2.0	4.0	6.7		1.8	5.3	11.3	11.4	3.8	11.1	10.3
13			4		8.6	6.5	6.2	7.7	4.6	4.5	7.2	6.8		3.1	2.3	7.7	6.0	2.0	9.0	10.4
14			5.2		8.1	2.1	10.7	6.9	5.4	2.2	5.2	2.7		3.4	5.6	10.6	9.3	5.6	5.5	20.0
15			5.2		8.3	2.1	10.7	7.2	4.7	4.4	6.9	6.3		4.1	6.4	7.7	5.6	5.2	11.9	6.1
16			5.1		8.1	10.9	9.6	5.7	6.6	3.7	4.9	3.8		2.7	7.2	6.5	8.3	6.8	10.8	7.1
17			2.1		7.7	6.9	9.2	5.8	6.4	4.2	6.1	6.6		1.6	7.1	5.4	12.6	1.9	13.1	8.6
18					9.0	6.5	6.3	7.4	5.4	6.2	5.1	10.4		8.2	6.2	5.0	7.7	4.2	8.3	8.3
19					8.2	10.4	9.0	7.1	8.4	3.2	6.8	8.8		4.7	6.3	10.3	11.3	2.9	8.8	12.6
20					7.8	10.1	8.0	7.1	5.2	3.8	5.2	7.0		7.9	7.4	6.8	8.3	2.6	6.9	7.6
21					7.9	3.1	11.9	6.6	3.5	1.8	5.7	7.4		9.4	5.3	11.1	7.5	5.0	5.0	10.7
22					7.0	6.4	9.8	7.0	4.1	3.1	4.2	3.1		11.4	9.3	5.8	7.4	5.6	13.7	6.1
23					7.9	6.0	8.6	6.5	7.7	5.9	5.6	6.7		9.3	5.3	6.3	8.3	4.7	8.0	8.6
24					7.4	6.3	11.5	4.7	6.5	3.0	3.7	5.4		8.0	7.0	8.9	9.6	6.3	3.2	9.0
25					6.9	6.9	10.4	5.1	2.6	9.5	3.2	4.8		2.9	6.3	6.7	9.7	3.8	6.9	7.6
26					6.7	6.6	11.5	3.8	2.4	5.2	5.9	4.0		6.1	6.3	5.4	10.0	2.4		10.9
27					6.5	6.8	9.8	2.2	6.8	3.8	4.8	5.7		3.1	6.2	6.7	8.2	5.1		7.0
28					7.2	6.7	8.0	6.3	3.2	4.8		3.9		4.4	7.9	4.5	7.8	7.0		
29					7.0	4.9	7.7	4.6	3.0	1.8		9.4		3.2	5.1	4.2	8.1	10.0		
30					6.8	7.1	3.5	3.8	4.4	3.9		9.5		1.9	2.9	3.9	6.7	2.3		
31					7.5	5.4	13.5	6.1	6.8	2.9		10.6		3.6	8.7	5.3	12.3	6.7		
32					6.9	3.3	4.4	4.6	8.1	9.8		8.3		6.3	9.9	3.9	7.1	5.1		
33					6.1	5.4	10.8	5.3	3.7	12.3		9.7		8.3	8.9	4.9	8.6	6.0		
34					5.8	5.6	6.8	7.3	8.0	4.0		7.4		10.2	6.5	10.5	7.9	6.6		
35					6.2	8.1	9.1	3.6	3.2	6.0		9.1		7.5	2.8	5.4	7.6	3.0		
36					5.3	5.6	8.5	4.6	3.6	5.9		6.3		8.8	9.1	4.5	6.8	6.2		
37					5.2	10.1	3.4	5.1	4.5	4.8		4.8		4.4	8.5	5.1	6.3	3.9		
38					5.8	2.2	2.7	3.8	3.7	2.0		6.0		4.3	7.2	4.7	5.8	5.9		
39					6.0	9.8	9.8	5.5	2.8	5.0		2.3		7.0	5.6	6.7	4.9	5.2		
40					4.6	6.1	12.5	4.8	6.4	5.3		8.1		3.0	5.8	3.6	6.2	4.9		
41					5.2	2.2	6.6	2.6	4.1	7.6		7.6		2.0	5.9	5.0	7.2	2.6		
42					4.3	6.3	8.4	4.7	6.9	5.9		5.4		2.9	8.0	8.3	5.5	3.2		

Table A6-8a. Onondaga Lake Dreissenid Mussel Survey Fall 2011 – Zebra Mussel Raw Length (mm) Data (continued)

Zone Transect Water Depth	Zone A				Zone A				Zone B				Zone C				Zone C			
	Transect 1				Transect 2				Transect 1				Transect 1				Transect 2			
	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0
43					4.4	6.8	2.8	2.8	6.0	4.9		9.7		2.9	4.0	3.7	6.3	3.8		
44					3.9	6.7	3.1	4.4	2.0	7.7		6.7		4.9	6.1	4.2	7.3	3.9		
45					5.1	6.4	2.7	6.5	3.4	5.3		10.5		2.1	13.1	5.8	4.9	3.8		
46					5.7	6.2	11.1	2.0	6.0	4.3		10.7		1.8	7.2	5.1	5.1	5.1		
47					4.7	7.8	5.5	4.7	5.2	5.6		3.1		1.0	4.8	5.0	5.9	3.7		
48					5.5	5.4	4.8	3.7	7.9	4.9		10.8		5.2	2.9	7.0	6.2	4.1		
49					4.7	7.6	3.5	4.1	9.2	5.6		11.2		11.6	5.7	6.4	5.9	4.5		
50					4.6	7.9	10.9	3.9	4.6	6.3		3.3		5.2	9.7	9.6	4.2	5.4		
51					3.9	8.2	2.4	2.6	6.7	5.0		5.7		8.8	9.1	7.3	5.4	6.1		
52					4.0	1.9	6.9	2.5	6.2	4.4		11.7		3.6	7.7	6.4	4.6	6.0		
53					4.3	9.1	8.8	4.6	7.3	6.5		5.6		3.8	8.6	7.4		8.2		
54					3.5	7.0	6.6	4.0	7.5	8.3		7.3		2.8	6.8	7.0		4.6		
55					3.9	2.8	7.3	4.8	8.4	5.8		5.1		2.9	5.9	5.3		5.9		
56						6.3	3.7	3.8	7.8	5.3		6.6		2.8	5.8	8.7		6.5		
57						2.9	7.0	3.2	8.4	2.1		9.3		1.4	8.6	4.9		2.3		
58						4.3	10.8	2.8	9.5	2.6		5.6		14.4	9.4	5.1		5.7		
59						4.9	3.3	3.7	6.8	1.9		2.2		3.7	6.1	4.0		4.2		
60						4.3	2.3	3.1	2.7	4.6		4.3		5.2	3.0	9.6		6.9		
61						2.4	2.3	2.1	5.5	5.1		6.9		7.9	9.4	7.4		2.1		
62						1.3	3.1	1.8	4.1	4.8		10.7		8.4	6.4	10.6		3.2		
63						8.6	2.4	2.8	5.9	5.9		11.3		4.3	8.0	5.5		6.1		
64						3.1	6.3	3.8	8.7	7.1		4.2		2.3	5.6	4.8		6.5		
65						7.3	8.0	2.8	3.3	5.9		9.9		9.2	11.2	9.4		6.0		
66						6.5	3.0	3.5	2.0	7.0		5.3		10.2	6.9	11.0		2.9		
67						4.4	6.8	2.9	2.4	5.1		9.0		4.7	7.6	6.0		2.6		
68						6.5	2.4	2.7	7.5	1.7		7.9		6.5	4.5	10.2		4.2		
69						6.7	2.3	3.2	5.1	3.4		10.1		8.5	8.2	5.7		3.9		
70						7.4	2.5	2.6	6.3	5.4		10.0		6.9	8.2	6.9		3.8		
71						2.3	3.2		4.7	3.2		7.8		11.1	7.2	7.3		3.2		
72						2.3	6.7		7.4	6.9		7.1		7.7	8.2	4.7		2.4		
73						7.8	8.3		7.1	2.4		9.3		4.3	11.1	7.7		3.7		
74						4.6	4.6		5.6	9.7		6.8		10.8	8.1	2.6		3.5		
75						4.7	7.8		4.5	7.8		6.9		4.3	3.6	2.8		6.0		
76						2.5	6.7		8.0	1.7		2.9		4.8	3.0	5.3		6.4		
77						7.3	2.0		6.9	4.1		1.7		3.6	6.5	8.2		3.2		
78						9.4	6.1		6.6	5.3		3.5		1.5	2.8	6.7		3.1		
79						2.3	2.3		9.3	4.9				1.4	3.5	8.7		4.4		
80						2.6	3.0		8.1	5.2				12.2	2.6	4.5		5.9		
81						10.1	1.9		8.9	1.7				7.7	2.2	4.1		6.1		
82						3.7	3.0		6.0	2.8				14.2	6.9	10.8		4.3		
83						2.7	9.4		3.3	2.1				12.6	9.5	3.1		3.2		
84						8.2	10.3		4.7	7.7				7.3	6.8	3.8		7.1		
85						2.5	8.0		6.2	5.9				14.8	7.3	7.8		2.1		
86						7.7	5.4		9.0	2.8				3.2	10.7	8.6		5.3		

Table A6-8a. Onondaga Lake Dreissenid Mussel Survey Fall 2011 – Zebra Mussel Raw Length (mm) Data (continued)

Zone Transect Water Depth	Zone A				Zone A				Zone B				Zone C				Zone C				
	Transect 1				Transect 2				Transect 1				Transect 1				Transect 2				
	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	
87						2.2	4.5			4.5	6.5				7.8	8.6	5.5		7.2		
88						1.7	6.3			5.1	5.6				10.2	6.5	8.8		5.9		
89						7.6	6.1			4.9	3.1				3.7	12.4	6.8		9.9		
90						8.8	5.6			6.6	5.1				13.0	8.3	6.6		4.0		
91						3.5	4.7			7.3	6.7				7.7	5.7	4.5		4.9		
92						6.2	2.3			5.4	6.4				8.4	8.4	4.1		5.7		
93						9.8	9.4			8.1	1.9				7.3	7.4	4.3		4.0		
94						6.0	9.4			10.7	7.2				6.7	5.2	4.8		4.8		
95						8.0	7.5			6.5	5.3				2.5	5.0	9.7		5.5		
96						1.3	6.8			3.0	3.4				9.4	6.4	4.6		4.5		
97						5.4	7.6			4.4	5.0				10.7	4.9	5.1		5.4		
98						1.6	9.5			5.6	5.5				4.5	2.5	5.2		8.3		
99						1.1	4.2			6.0	7.3				10.4	3.2	5.4		7.4		
100						9.7	3.1			5.3	8.1				6.7	1.9	6.7		5.0		
101																					
102																					
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Table A6-8a. Onondaga Lake Dreissenid Mussel Survey Fall 2011 – Zebra Mussel Raw Length (mm) Data (continued)

Zone	Zone D				Zone D				Zone E				Zone F				Zone G			
	Transect 1				Transect 2				Transect 1				Transect 1				Transect 1			
Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0
Median Length	6	4.7	0	0	3	4	10	7	4	8	10	0	11	4	12	0	0	4	7	0
Mean Length	6.2	5.1	0.0	0.0	3.8	4.1	9.8	7.1	4.5	7.0	9.1	0.0	10.8	3.7	12.4	0.0	0.0	3.8	6.9	0.0
1	5.8	2.7	0.0	0.0	7.7	12.7	5.1	12.3	6.8	8.3	11.7	0.0	12.9	8.4	12.4	0.0	0.0	4.6	6.9	0.0
2	10.1	3.4			6.0	4.1	6.7	7.8	2.5	2.6	9.2		13.2	3.7				3.2		
3	11.4	3.4			3.2	9.5	9.7	6.2	5.5	8.5	6.5		18.0	2.1				3.6		
4	6.8	1.8			4.2	8.2	16.0	10.3	3.8	8.0	11.8		10.3	2.6				2.8		
5	5.5	2.7			2.5	2.0	10.3	10.0	2.5	9.5	10.9		13.8	6.7				3.9		
6	8.3	8.7			2.8	10.4	9.3	3.4	6.9	4.2	7.6		8.8	4.1				4.1		
7	5.6	2.8			3.2	5.7	11.6	2.5	5.0	4.2	10.2		7.7	4.9				4.6		
8	13.7	5.2			2.7	8.4	11.0	6.7	1.7	2.8	9.5		10.6	5.0				4.1		
9	7.1	5.9			3.1	3.1	8.5	2.6	3.6	9.2	9.5		6.1	6.3				4.7		
10	8.5	2.6			3.0	3.5	9.1	9.2	3.9	4.0	9.9		8.5	4.1				4.0		
11	6.9	4.4				2.3	10.3	8.0	4.8	9.9	7.0		11.6	3.9				2.6		
12	6.7	7.4				1.7	6.3	3.0	4.8	10.3	5.0		11.5	2.1						
13	6.8	6.6				2.0	10.2	5.2	4.9	7.7			10.0	2.0						
14	6.6	4.3				5.2	12.4	4.8	3.2	8.7			11.9	2.0						
15	5.1	3.9				6.7	11.0	6.6	5.3				6.4	2.1						
16	6.0	3.1				3.0	15.4	8.6	3.4				14.7	2.9						
17	6.0	4.4				4.1	9.6	9.7	4.6				8.4	5.7						
18	7.2	4.0				7.1	8.8	6.0	7.6				10.8	2.8						
19	9.4	4.4				3.0	11.5	8.7	4.5				10.4	1.7						
20	5.1	6.8				2.5	6.0	7.7	3.6					6.7						
21	7.2	4.6				4.2	12.8	5.6	4.8					4.5						
22	5.0	6.8				3.0	6.5	12.1	6.4					2.5						
23	5.1	5.6				2.8	12.7	7.7	3.4					4.8						
24	4.4	8.8				3.8	6.8	9.5	3.5					6.1						
25	7.0	2.6				3.6	8.1	13.7	2.5					5.9						
26	10.2	5.0				1.7		14.0	3.3					4.6						
27	5.6	5.9				4.4		9.0	4.3					5.9						
28	7.2	8.7				4.0		12.0	4.3					4.1						
29	8.4	3.4				3.5		4.4	4.6					2.5						
30	8.4	3.7				5.5		3.0	5.4					2.3						
31	8.7	2.7				5.8		4.0	3.8					4.2						
32	5.0	2.7				4.2		3.4	4.2					7.3						
33	6.4	5.4				8.4		3.5	2.3					3.3						
34	6.2	5.8				2.6		5.3	2.8					2.0						
35	5.9	4.2				3.1		2.8	5.6					2.9						
36	6.2	4.8				1.8			3.9					2.5						
37	9.0	12.6				4.1			5.9					2.8						
38	9.6	9.8				3.7			5.3					4.5						
39	7.5	2.6				3.5			3.7					1.9						
40	6.7	4.9				3.0			4.7					1.7						
41	5.6	6.6				8.8			5.2					2.6						
42	8.3	7.9				4.8			4.3					5.4						

Table A6-8a. Onondaga Lake Dreissenid Mussel Survey Fall 2011 – Zebra Mussel Raw Length (mm) Data (continued)

Zone	Zone D				Zone D				Zone E				Zone F				Zone G			
Transect	Transect 1				Transect 2				Transect 1				Transect 1				Transect 1			
Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0
43	5.4	6.7				2.8			3.9					3.6						
44	3.1	4.8				4.2			6.6					5.4						
45	7.5	12.3				5.2			6.0					3.6						
46	5.8	4.8				4.1			9.7					3.1						
47	7.4	1.8				3.8			4.5					3.5						
48	9.7	3.3				2.2			5.9					1.2						
49	6.4	3.5				3.5			2.6					6.0						
50	3.9	5.1				2.3			3.7					2.9						
51	3.1	3.5				3.5			4.3					2.8						
52	8.3	3.7				2.3			6.2					2.9						
53	5.0	6.6				1.8			3.1					4.3						
54	5.8	3.5				4.1			3.9					2.0						
55	5.0	3.6				1.8			5.6					1.6						
56	3.6	7.6				1.9			2.8					2.5						
57	3.8	3.4				5.1			4.1					3.1						
58	5.9	3.8				3.5			10.0					1.9						
59	8.5	4.8				2.5			2.1					3.1						
60	4.6	3.2				3.7			3.7					2.4						
61	6.9	2.9				4.2			5.2					2.3						
62	9.8	6.1				5.7			4.6					3.3						
63	4.3	4.8				7.7			3.9					3.5						
64	4.4	4.6				2.0			3.8					3.8						
65	5.9	4.5				3.2			4.7					3.0						
66	3.7	4.0				4.8			5.2					3.1						
67	5.9	3.8				2.9			7.1					3.8						
68	4.4	4.9				4.6			3.5					2.9						
69	10.5	4.1				4.9			11.0					2.9						
70	5.0	4.9				3.2			6.5					2.2						
71	5.8	6.5				4.0			3.2					2.6						
72	6.7	4.3				6.8			4.1					1.8						
73	9.7	5.6				4.4			2.6					2.2						
74	7.0	8.5				3.0			5.9					2.1						
75	5.0	9.2				2.8			2.4					3.7						
76	7.3	6.7				1.3			2.3					3.2						
77	3.2	10.3				3.1			3.1					3.8						
78	4.7	6.6				2.5			5.7					3.6						
79	3.4	9.3				4.7			2.9					3.2						
80	4.3	3.4				5.0			3.4					6.4						
81	4.3	6.9				1.8			4.1					4.0						
82	7.6	8.2				2.6			6.9					8.8						
83	4.8	3.7				2.9			5.4					3.2						
84	6.3	3.7				4.7			5.7					4.3						
85	4.6	4.0				2.8			2.3					3.8						
86	3.6	3.8				4.6			2.6					5.3						

Table A6-8a. Onondaga Lake Dreissenid Mussel Survey Fall 2011 – Zebra Mussel Raw Length (mm) Data (continued)

Zone	Zone D				Zone D				Zone E				Zone F				Zone G			
	Transect	Transect 1				Transect 2				Transect 1				Transect 1				Transect 1		
Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0
87	4.9	7.2				7.2			4.0					4.4						
88	3.7	5.7				4.0			7.1					3.3						
89	3.4	7.3				1.6			5.6					2.1						
90	3.9	3.6				3.4			3.9					4.4						
91	3.7	4.4				3.5			5.1					3.1						
92	4.1	3.5				2.0			2.3					5.5						
93	4.8	5.9				3.1			2.2					4.0						
94	4.6	3.9				4.2			5.2					4.9						
95	4.1	5.5				5.6			5.4					3.5						
96	2.3	5.6				4.8			3.9					5.7						
97		4.6				2.7			4.8					3.8						
98		9.7				2.6			5.1					4.7						
99		5.4				4.3			3.8					2.6						
100		5.2				2.9			6.5					2.5						
101		3.7				6.4			3.5					2						
102		4.2				4.4			5.1					2.3						
103		2.6				4.4			3.6					4.1						
104		4.8				2.9			3.7					4.5						
105		3.1				6.8			3.9					3.9						
106		3.4				2.6			5.2					5.4						
107		2.9				4.7			5.7					3.9						
108		5.2				4.1			4.1					2						
109		6.4				6.7			7.1					4.9						
110		3.2				2.7			6.2					5.6						
111		5.7				5.2			3.8					2.2						
112		3.0				2.8			4											
113		6.5				7.4			3.9											
114		7.4				3.9			7.1											
115		5.9				3.7			5.4											
116		9.4							3.1											
117		6.8							2.7											
118		9.1							2.7											
119		1.5							3.9											
120		3.8							4.2											
121		6.2							2.4											
122		8.0							3.6											
123		6.8							5.2											
124		6.2							5.7											
125		4.9							2.1											
126		4.7							2.9											
127		4.7							4.3											
128		4.3							4.5											
129		6.6							3.1											
130		6.3							6.2											

Table A6-8a. Onondaga Lake Dreissenid Mussel Survey Fall 2011 – Zebra Mussel Raw Length (mm) Data (continued)

Zone	Zone D				Zone D				Zone E				Zone F				Zone G			
Transect	Transect 1				Transect 2				Transect 1				Transect 1				Transect 1			
Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0
131		7.3							7.3											
132		4.2							4.5											
133		3.7							6.6											
134		3.9							5.3											
135		4.1							7.2											
136		5.2							4.1											
137		6.3																		
138		6.8																		
139		3.2																		
140		3.9																		
141		4.7																		
142		4.1																		
143		5.6																		
144		4.2																		
145		3.4																		
146		4.5																		
147		3.9																		
148		5.6																		
149		3.6																		
150		3.3																		

Table A6-8a. Onondaga Lake Dreissenid Mussel Survey Fall 2011 – Zebra Mussel Raw Length (mm) Data (continued)

Zone Transect	Zone H Transect 1				Zone H Transect 2			
	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0
Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0
Median Length	5	6	8	6	7	3	5	10
Mean Length	5.6	6.2	7.9	6.4	6.7	3.7	5.5	9.3
1	15.5	6.1	7.6	12.1	8.8	2.8	14.3	6.9
2	13.6	8.9	10.9	10.8	6.8	2.0	13.5	11.2
3	10.2	5.3	4.6	5.1	4.4	3.4	12.7	12.9
4	10.1	3.8	8.4	8.5		3.0	7.7	9.6
5	9.9	5.2		9.8		4.5	12.1	12.8
6	10.5	9.7		6.4		3.8	14.7	7.1
7	9.7	4.7		8.0		2.7	3.8	4.3
8	9.3	4.3		6.5		3.2	10.0	
9	8.9	8.0		11.5		2.1	6.3	
10	8.2	3.2		9.7		1.7	8.3	
11	5.1	8.8		9.0		4.0	9.8	
12	7.2	3.2		9.2		3.5	6.5	
13	8.4	9.3		6.3		3.0	6.6	
14	7.6	7.2		7.3		4.5	9.7	
15	6.6	1.7		7.7		3.4	5.2	
16	6.2	3.6		7.2		4.0	4.2	
17	7.1	10.7		8.1		2.9	7.9	
18	6.7	6.6		7.6		5.2	8.6	
19	6.2	10.0		4.4		4.2	2.9	
20	6.2	9.3		4.8		3.1	7.8	
21	8.1	5.1		4.1		2.7	1.6	
22	5.8	6.4		9.3		5.5	7.3	
23	5.4	5.3		8.6		4.3	8.8	
24	5.6	6.7		7.0		2.8	7.7	
25	6.3	3.1		6.1		3.3	5.5	
26	4.9	8.5		5.9		6.5	6.7	
27	6.0	8.2		8.1		4.2	7.1	
28	4.9	5.0		7.5		3.3	6.4	
29	2.7	8.7		7.5		5.4	8.5	
30	5.4	7.9		5.5		2.7	6.4	
31	5.1	8.6		6.0		4.6	3.6	
32	5.9	4.0		6.4		2.7	4.7	
33	5.3	7.4		7.6		2.4	4.0	
34	5.3	5.5		6.1		3.9	2.5	
35	5.4	7.8		4.3		2.4	3.0	
36	3.4	4.8		5.8		4.4	2.0	
37	5.4	1.9		5.9		5.5	4.5	
38	5.2	4.5		6.3		1.6	3.1	
39	5.3	8.4		7.6		2.1	3.4	
40	4.9	5.8		7.6		2.6	3.0	
41	4.2	5.2		9.1		3.4	2.9	
42	3.5	5.9		4.7		1.2	2.3	

Table A6-8a. Onondaga Lake Dreissenid Mussel Survey Fall 2011 – Zebra Mussel Raw Length (mm) Data (continued)

Zone Transect	Zone H				Zone H			
	Transect 1				Transect 2			
	Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5
43	4.6	5.9		6.0		3.6	2.8	
44	4.8	8.6		6.4		5.6	6.4	
45	4.5	3.8		5.8		3.6	6.5	
46	4.0	8.7		5.6		3.8	5.7	
47	3.1	3.1		5.8		4.0	2.0	
48	2.1	3.6		7.1		1.6	3.1	
49	3.8	10.5		5.4		3.6	4.3	
50	3.2	5.3		5.1		2.4	2.9	
51	3.5	6.7		6.7		3.3	3.1	
52	2.9	4.9		6.2		4.0	3.9	
53	2.8	5.3		6.0		1.1	2.6	
54	3.5	7.0		5.6		2.4	2.3	
55	3.1	5.7		5.8		6.4	5.3	
56	3.2	2.1		5.0		3.3	2.2	
57	2.5	10.5		4.0		3.1	4.7	
58	3.1	10.0		6.1		3.0	4.4	
59	2.5	3.0		2.0		2.5	4.7	
60	2.6	6.4		5.9		3.3	4.5	
61	2.4	4.6		4.9		1.8	5.1	
62	3.1	4.0		2.6		3.6	1.8	
63	2.3	6.0		5.4		2.8	4.7	
64	1.6	6.0		4.2		1.9	2.3	
65		8.0		3.1		3.9	1.9	
66		4.7		3.9		5.1	4.9	
67		6.0		3.0		6.5	4.8	
68		8.1		2.3		8.4	4.3	
69		6.0				9.4	5.2	
70		3.9				2.1	4.0	
71		4.9				3.3	4.1	
72		6.4				2.2		
73		5.0				6.6		
74		10.0				2.3		
75		6.3				6.5		
76		5.0				2.9		
77		9.5				2.6		
78		5.6				1.5		
79		8.2				2.4		
80		8.4				3.0		
81		5.1				3.2		
82		3.3				1.8		
83		5.9				4.8		
84		5.1				3.3		
85		4.4				3.1		
86		5.3				2.7		

Table A6-8a. Onondaga Lake Dreissenid Mussel Survey Fall 2011 – Zebra Mussel Raw Length (mm) Data (continued)

Zone Transect	Zone H				Zone H				
	Transect 1				Transect 2				
	Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0
87		10.5				7.1			
88		7.6				9.1			
89		5.3				7.1			
90		4.6				7.3			
91		3.6				8.2			
92		9.6				6.6			
93		7.8				5.3			
94		4.5				2.7			
95		4.3				2.9			
96		5.4				3.0			
97		8.1				2.4			
98		7.1				2.9			
99		7.1				2.5			
100		3.9				4.6			
101									
102									
103									
104									
105									
106									
107									
108									
109									
110									
111									
112									
113									
114									
115									
116									
117									
118									
119									
120									
121									
122									
123									
124									
125									
126									
127									
128									
129									
130									

Table A6-8b. Onondaga Lake Dreissenid Mussel Survey Fall 2011 – Quagga Mussel Raw Length (mm) Data

Zone	Zone A				Zone A				Zone B				Zone C				Zone C			
	Transect 1				Transect 2				Transect 1				Transect 1				Transect 2			
Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0
Median Length	0	0	0	7	8	4	4	9	7	5	9	9	2	7	10	5	9	7	6	7
Mean Length	0.0	0.0	0.0	6.2	9.0	6.7	4.6	10.0	7.1	5.9	9.7	9.5	2.2	7.4	10.4	8.8	9.5	8.0	8.7	8.5
1	0.0	0.0	0.0	7.2	10.4	13.5	5.9	26.9	17.5	5.4	20.4	16.8	2.2	24.7	19.2	4.1	14.4	17.5	1.2	5.5
2				6.5	12.9	7.1	2.8	24.4	20.0	15.5	4.4	13.2		6.6	9.3	8.3	14.6	6.7	12.0	7.1
3				11.0	12.0	16.2	6.2	24.8	8.5	3.8	23.1	7.7		4.5	16.4	4.1	12.2	3.7	13.5	5.1
4				8.0	7.6	3.5	4.4	22.9	7.2	4.3	15.5	16.7		5.4	2.4	2.8	10.9	4.5	4.3	16.8
5				6.9	8.4	19.9	2.2	22.3	11.5	6.0	16.2	10.3		19.6	2.1	2.5	14.3	3.8	12.1	7.4
6				6.1	8.2	4.3	4.8	26.6	7.0	4.3	10.7	12.2		8.0	10.0	8.4	12.7	6.0	18.8	6.6
7				7.1	5.9	3.5	4.2	18.1	9.2	3.0	6.1	8.6		20.3	2.4	3.5	13.7	5.1	6.2	9.8
8				6.6	6.7	2.8	9.0	19.3	15.8	8.2	2.7	14.2		12.3	14.7	4.1	9.0	6.8	7.3	10.1
9				3.9		8.0	1.8	18.9	6.9	9.1	7.6	3.0		2.4	8.7	4.8	8.5	3.6	18.6	10.2
10				5.1		13.3	2.1	18.5	12.5	18.1	7.7	6.9		5.2	12.6	5.3	12.3	22.4	4.3	5.1
11				2.8		2.7	4.5	22.0	6.1	1.7	9.6	11.7		9.0	9.3	2.9	11.7	6.2	5.3	7.2
12				2.6		2.9	6.7	18.7	4.9	2.8	9.7	9.8		6.4	4.6	2.5	11.8	6.7	4.8	4.9
13						19.1	2.3	13.7	10.7	3.2	12.7	4.8		4.6	3.6	18.0	10.5	4.9	14.1	5.1
14						5.7	6.4	12.2	8.3	9.5	9.0	4.8		10.3	8.0	10.8	12.1	2.9	4.1	4.3
15						7.1	3.1	15.6	8.0	3.5	13.8	6.2		5.2	9.0	5.0	10.5	7.1	3.7	4.6
16						4.5	4.4	19.3	7.6	3.8	20.3	7.2		6.6	16.6	19.6	9.8	10.0	4.6	8.1
17						9.6	8.5	16.2	8.5	13.1	9.0	17.5		3.1	17.7	2.6	9.1	2.6	15.1	5.9
18						3.7	2.5	16.1	6.5	3.1	2.4	14.5		5.4	4.9	4.3	7.2	18.0	13.6	16.0
19						13.1	9.1	11.2	8.0	2.1	7.0	8.1		9.4	16.4	3.4	8.5	4.0	17.7	10.6
20						9.0	6.6	12.9	6.0	2.9	11.5	15.1		7.8	15.3	2.4	9.8	6.7	12.1	8.4
21						5.5	6.0	8.8	14.9	3.8	8.1	9.2		9.4	16.1	3.5	6.6	6.4	10.5	4.4
22						6.9	5.8	8.9	10.2	15.5	12.3	6.2		6.3	11.8	3.2	7.1	8.8	7.1	5.8
23						4.3	2.1	10.0	8.8	3.5	7.5	4.6		4.9	7.1	14.2	13.1	13.7	3.5	8.8
24						14.5	8.4	3.0	4.6	5.2	16.9	10.3		9.6	16.3	17.2	9.1	7.0	4.2	7.5
25						3.6	7.1	4.5	4.0	5.9	6.6	15.3		8.7	3.7	15.8	8.5	8.0	2.6	7.3
26						3.0	6.9	13.3	6.4	3.8	11.4	10.7		5.8	19.0	20.5	7.0	9.1	18.5	4.2
27						3.4	7.1	16.5	8.4	9.4	9.9	6.8		6.1	15.9	2.0	10.1	11.0	3.4	7.1
28						17.4	7.4	1.6	10.8	10.9	9.4	13.2		4.2	16.2	4.5	9.7	15.1	5.1	7.2
29						20.9	1.8	16.4	6.7	8.8	17.6	10.5		7.7	7.2	3.1	6.4	2.4	3.2	6.0
30						13.0	2.1	11.1	3.7	5.3	7.7	6.8		8.0	11.4	2.7	6.7	9.7	21.3	5.0
31						5.8	6.0	11.5	5.8	4.3	6.2	9.3		11.5	11.5	10.9	6.2	7.1	3.0	3.4
32						3.7	3.4	9.9	10.7	12.1	4.2	11.4		5.2	15.4	10.8	5.2	6.4	3.7	4.9
33						3.0	2.6	7.9	1.6	7.1	6.1	8.2		3.1	13.9	2.9	5.1	17.4	6.3	13.3
34						13.2	2.8	9.1	2.3	1.9	7.4	8.0		5.4	16.8	19.6	6.0	19.2	2.8	4.9
35						5.7	2.0	6.5	10.2	2.8	4.0	4.3		4.3	14.1	3.6	5.1	3.5	5.3	5.3
36						6.4	4.6	10.2	10.6	5.1	5.3	2.5		2.1	4.9	3.5	4.7	4.0	5.6	5.2
37						3.0	1.7	7.2	8.2	6.4	6.6	3.3		11.3	14.9	4.5		7.7	2.5	14.6
38						3.3	3.8	19.5	4.4	2.8	3.2	6.3		5.6	12.4	22.3		4.8	3.0	7.3
39						4.6	3.2	11.3	8.4	5.3	6.4	19.7		6.1	3.0	5.2		17.2	3.8	2.4
40						2.8	2.0	7.9	6.4	8.3	5.7	15.9		8.1	2.1	2.9		10.1	13.3	3.3
41						1.9		2.6	6.4	7.9	7.9	11.1		5.3	2.1	2.6		4.9	5.3	18.6
42						3.2		4.1	8.7	10.5	6.4	5.1		4.3	21.4	16.9		2.8	2.3	11.4

Table A6-8b. Onondaga Lake Dreissenid Mussel Survey Fall 2011 – Quagga Mussel Raw Length (mm) Data (continued)

Zone Transect	Zone A				Zone A				Zone B				Zone C				Zone C			
	Transect 1				Transect 2				Transect 1				Transect 1				Transect 2			
	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0
43						6.7		3.0	6.9	3.6	3.8	10.4		7.1	20.3	5.2		3.4	5.9	3.8
44						11.9		4.2	6.5	3.2	12.5	16.8		7.9	14.6	24.8		8.3	4.5	7.7
45						2.4		5.1	10.5	8.2	4.6	6.2		4.7	17.5	10.3		15.8	3.0	15.1
46						8.8		5.2	5.8	7.8	7.6	8.2		2.7	17.5	18.9		16.9	3.1	3.8
47						2.9		4.4	8.3	8.8	13.2	7.1		14.9	5.5	1.9		5.0	16.3	14.1
48						2.8		2.1	6.0	8.2	2.6	6.5		7.7	2.3	3.5		5.2	6.3	17.1
49						3.9		4.2	5.1	6.4	18.5	4.2		4.9	3.4	3.9		7.4	5.8	15.7
50						1.1		4.8	5.9	6.5	4.9	10.9		10.4	15.3	20.6		7.2	4.6	14.9
51						1.6		4.5	9.3	7.1	15.4	3.5		9.7	12.3	6.9		10.1	10.0	7.0
52						2.9		2.6	8.8	2.5	20.1	9.4		4.4	8.3	4.1		11.8	20.4	10.4
53						14.8		4.6	5.8	7.7	7.6	9.8		7.1	11.0	5.3		5.3	9.2	6.3
54						7.4		3.5	8.7	2.7	7.0	18.1		9.8	8.8	3.4		6.2	6.7	12.1
55						7.8		4.3	5.6	4.6	10.2	13.6		10.7	9.2	4.2		5.5	3.2	8.0
56						2.6		6.7	3.9	4.6	15.6	6.8		1.8	5.5	3.6		4.8	4.4	11.8
57						3.1		4.8	9.4	7.3	15.4	5.5		8.3	4.2	21.5		2.9	20.6	12.3
58						16.2		11.3	8.3	8.6	7.5	2.6		7.1	5.5	4.1		4.3	6.7	10.0
59						15.2		6.7	9.3	5.8	11.9	11.1		4.9	4.0	9.6		2.6	19.9	7.6
60						15.6		15.0	7.7	4.3	9.2	9.2		6.1	3.5	4.6		4.2	20.0	6.0
61						2.1		12.8	6.6	3.6	6.2	17.9		5.5	13.6	16.0		6.6	5.2	9.1
62						3.4		9.3	6.6	4.8	5.2	5.3		5.6	7.2	6.1		7.3	5.9	5.9
63						3.4		6.4	11.9	4.3	3.8	6.4		4.7	6.3	4.7		5.3	9.0	12.1
64						4.0		10.3	7.1	3.8	18.4	8.1		4.8	4.2	3.5		4.3	4.1	23.9
65						2.4		12.2	8.3	6.1	3.3	10.7		8.9	12.0	15.2		4.2	7.5	16.6
66						4.0		11.7	5.2	4.8	7.5	6.2		6.7	2.8	4.4		2.1	13.2	6.8
67						2.3		5.7	4.9	4.7	2.4	10.0		9.1	2.9	17.6		12.3	13.8	5.9
68						2.7		2.7	8.4	4.4	10.7	5.7		2.7	14.6	5.9		14.3	8.8	6.5
69						2.8		4.6	7.6	6.4	9.6	8.5		3.8	5.5	16.8		7.7	4.1	6.3
70						4.4		9.9	9.4	2.2	13.2	13.5		6.3	2.3	11.1		3.4	4.9	12.5
71						4.0		10.6	5.6	3.8	12.8	8.0		4.8	17.7	9.1		6.4	5.0	8.6
72						3.2		1.7	6.8	3.2	14.9	13.6		4.7	7.2	18.2		6.4	6.1	18.8
73						3.7		17.9	8.9	6.0	15.0	10.0		5.0	7.3	11.3		18.3	19.8	8.7
74						8.1		22.5	3.3	5.8	5.1	4.4		10.8	6.2	15.3		6.8	3.3	8.0
75						2.8		14.8	5.8	3.6	13.0	2.7		11.5	11.5	15.1		7.1	5.8	11.6
76						12.7		5.0	9.7	4.2	4.0	5.7		10.9	8.6	15.6		13.6	21.6	6.7
77						14.0		2.8	8.9		9.7	5.5		10.6	20.2	18.8		8.4	8.8	5.2
78						3.1		11.6	7.3		8.4	7.2		2.3	17.8	3.2		5.5	9.0	10.3
79						4.3		3.7	8.8		17.6	21.0		6.0	4.5	19.7		7.2	6.4	3.4
80						10.1		3.0	7.0		11.7	14.5		10.3	3.9	12.5		16.7	5.9	5.4
81						4.6		2.5	7.6		15.8	16.3		6.3	16.3	2.6		7.6	10.6	4.3
82						7.0		2.2	6.0		7.3	18.5		1.8	3.5	4.6		8.7	3.2	8.6
83						3.7		8.7	3.6		14.2	16.1		6.8	4.4	5.3		7.0	5.1	5.1
84						15.4		6.8	2.9		6.5	9.8		8.6	4.1	3.3		4.5	2.8	7.3
85						2.5		7.5	6.5		5.6	14.0		9.3	19.0	3.4		3.9	20.1	8.4
86						11.9		6.4	8.0		2.9	7.5		9.6	16.7	2.2		6.7	6.2	7.2

Table A6-8b. Onondaga Lake Dreissenid Mussel Survey Fall 2011 – Quagga Mussel Raw Length (mm) Data (continued)

Zone Transect Water Depth	Zone A				Zone A				Zone B				Zone C				Zone C			
	Transect 1				Transect 2				Transect 1				Transect 1				Transect 2			
	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0
87						11.2		9.2	3.2		6.6	4.2		10.6	15.5	4.1		8.4	2.9	4.8
88						15.0		6.9	3.6		4.9	3.7		5.8	14.1	14.8		7.1	20.4	8.1
89						1.5		3.4	3.0		12.9	5.1		9.3	9.4	5.2		9.5	7.1	9.7
90						3.4		3.2	3.6		14.5	6.1		10.3	3.2	21.9		8.2	5.7	14.8
91						9.8		4.0	5.6		10.7	8.2		8.5	15.2	18.9		7.2	5.4	7.7
92						9.1		10.8	2.9		12.2	16.5		6.9	5.6	11.0		11.5	12.2	4.6
93						3.0		6.6	5.8		6.6	11.2		6.2	18.3	4.9		7.9	13.6	13.2
94						3.5		13.7	4.2		16.5	13.5		8.9	17.8	6.3		8.6	8.4	5.4
95						4.9		6.9	3.1		13.4	8.2		7.5	18.2	22.2		9.1	23.8	8.2
96						3.7		10.5	7.7		12.2	9.6		10.2	10.8	20.1		13.8	17.3	5.3
97						4.2		4.4	4.7		6.8	6.9		7.0	7.2	3.7		4.9	4.5	3.3
98						2.9		11.3	7.3		8.0	11.0		5.1	15.6	3.2		12.4	13.2	11.0
99						2.0		4.9	7.0		8.9	6.9		4.6	5.4	2.9		12.7	4.7	11.1
100						6.6		7.0	5.3		4.1	6.2		10.0	10.7	7.0		6.1	10.8	13.9
101									3.4											
102									4.6											
103									5.3											
104									6.9											
105									6.3											
106									3.9											
107									4.5											
108									4.6											
109									6.1											
110									5.3											
111									5.2											
112									2.2											
113									4.2											
114																				
115																				
116																				
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Table A6-8b. Onondaga Lake Dreissenid Mussel Survey Fall 2011 – Quagga Mussel Raw Length (mm) Data (continued)

Zone	Zone D				Zone D				Zone E				Zone F				Zone G			
Transect	Transect 1				Transect 2				Transect 1				Transect 1				Transect 1			
Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0
Median Length	7	5	11	0	0	4	13	10	5	12	12	0	12	3	11	0	0	0	0	0
Mean Length	7.3	6.5	11.3	0.0	0.0	4.2	12.7	11.6	5.2	11.4	11.8	0.0	13.7	2.6	11.3	0.0	0.0	0.0	0.0	0.0
1	5.7	12.0	11.7	0.0	0.0	4.0	8.1	23.7	8.9	18.1	20.4	0.0	24.9	2.6	9.0	0.0	0.0	0.0	0.0	0.0
2	6.7	4.7	14.3			5.6	14.4	16.0	6.6	16.5	13.8		20.3		13.1					
3	9.7	5.5	10.6			6.6	14.4	19.8	6.5	14.7	8.8		19.1		15.2					
4	8.7	3.7	11.4			5.3	14.3	12.0	6.4	11.6	11.9		15.6		12.2					
5	9.2		14.6			3.8	17.2	7.8	3.2	22.9	14.1		12.0		12.0					
6	7.1		11.4			3.8	16.6	9.9	6.4	15.8	10.9		13.7		11.1					
7	3.8		13.1			5.4	16.2	6.2	5.2	12.5	15.1		12.2		17.1					
8			13.3			4.7	7.5	12.0	4.9	12.3	18.4		10.4		12.1					
9			10.5			3.2	15.8	9.4	4.5	19.5	12.1		19.8		13.2					
10			15.2			2.9	13.0	11.9	3.4	13.9	17.2		18.5		14.2					
11			11.5			2.9	14.6	6.9	3.6	11.3	16.2		10.4		11.1					
12			12.2			1.9	12.2	6.8	4.0	12.5	16.7		12.7		10.6					
13			13.3				11.5	3.5	4.6	18.1	10.0		11.0		12.8					
14			10.6				11.4	15.3		13.9	6.3		11.8		12.2					
15			12.6				13.4	16.3		16.7	11.3		10.6		12.7					
16			10.8				12.9	6.4		14.5	8.4		10.3		9.8					
17			12.7				8.6	5.1		18.0	9.7		9.9		9.8					
18			11.7				23.3	16.8		10.3	8.3		10.3		12.1					
19			9.6				12.7	16.1		8.8	11.5		10.2		10.6					
20			8.1				11.1	6.9		9.9	8.8		9.5		9.8					
21			9.9				15.7	2.4		11.8	11.7				8.9					
22			9.1				13.1	17.8		9.7	15.2				8.7					
23			9.4				12.1	3.7		16.0	15.0				7.6					
24			7.6				19.4	3.3		16.6	8.5				6.3					
25			7.7				15.3	19.7		11.5	9.9				9.1					
26			10.2				15.7	18.9		15.8	11.5									
27							13.1	21.2		12.1	7.9									
28							12.1	19.3		10.5	10.3									
29							19.4	9.2		10.3	12.6									
30							15.3	19.1		12.8	10.9									
31							8.9	9.4		7.4	12.1									
32							10.6	19.1		8.4	8.5									
33							4.1	16.5		10.5	11.2									
34							14.7	20.4		11.8	11.1									
35							13.2	16.2		13.8	11.7									
36							12.1	6.2		13.4	13.6									
37							15.4	16.8		15.8	11.6									
38							11.1	17.6		11.5	9.8									
39							6.2	17.9		12.1	10.6									
40							16.8	18.1		13.1	10.6									
41							15.5	14.6		11.0	8.3									
42							13.2	16.1		14.1	17.4									

Table A6-8b. Onondaga Lake Dreissenid Mussel Survey Fall 2011 – Quagga Mussel Raw Length (mm) Data (continued)

Zone D				Zone D				Zone E				Zone F				Zone G			
Transect 1				Transect 2				Transect 1				Transect 1				Transect 1			
0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0
43							16.1	7.2		14.3	15.8								
44							16.8	15.2		7.3	19.5								
45							4.9	10.1		13.1	13.5								
46							9.7	6.8		14.0	11.8								
47							12.6	13.0		11.9	13.0								
48							23.1	16.7		10.9	10.2								
49							14.5	5.7		13.9	9.5								
50							8.1	5.6		15.1	14.6								
51							14.8	17.9		13.3	9.5								
52							15.3	19.8		13.9	8.4								
53							16.1	6.6		9.8	9.7								
54							15.7	3.1		13.6	8.9								
55							14.2	20.0		5.8	9.3								
56							4.7	3.7		10.0	9.2								
57							4.6	7.3		14.9	9.7								
58							4.4	4.5		12.9	14.1								
59							13.6	9.2		12.0	13.8								
60							12.2	8.5		11.8	5.2								
61							9.1	5.8		17.9	10.8								
62							10.6	6.5		6.7	12.2								
63							10.0	5.4		5.0	14.0								
64							11.9	1.9		13.7	13.1								
65							16.4	17.4		13.0	10.1								
66							15.9	7.2		9.5	14.5								
67							17.4	9.6		11.5	11.8								
68							15.7	3.1		7.5	9.5								
69							19.5	7.8		9.3	13.7								
70							12.6	1.7		11.7	14.8								
71							16.4	7.9		12.7	9.1								
72							15.3	19.1		15.9	13.4								
73							13.4	20.6		12.8	14.2								
74							7.5	7.8		11.9	10.8								
75							9.1	9.6		14.7	11.6								
76							14.2	6.6		11.6	11.8								
77							14.2	5.9		6.9	4.6								
78							18.3	22.0		7.5	9.1								
79							17.7	16.6		7.1	9.2								
80							12.9	8.4		6.9	14.8								
81							13.7	11.5		6.4	10.5								
82							11.2	19.7		8.3	13.5								
83							14.6	3.6		6.9	18.1								
84							6.8	2.8		9.0	12.3								
85							9.1	5.6		5.6	11.3								
86							6.7	16.9		12.8	13.0								

Table A6-8b. Onondaga Lake Dreissenid Mussel Survey Fall 2011 – Quagga Mussel Raw Length (mm) Data (continued)

Zone D				Zone D				Zone E				Zone F				Zone G			
Transect 1				Transect 2				Transect 1				Transect 1				Transect 1			
0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0
87							11.0	17.2		8.8	8.8								
88							14.8	7.3		9.6	15.0								
89							10.5	10.3		10.0	13.4								
90							10.4	3.4		7.4	11.4								
91							12.0	9.2		12.8	7.1								
92							10.6	5.5		8.5	7.8								
93							12.5	21.5		4.9	10.6								
94							13.1	18.4		5.5	8.7								
95							9.5	19.6		8.3	11.5								
96							14.2	12.9		9.8	5.3								
97							13.5	4.8		6.2	15.5								
98							14.9	13.1		10.7	15.8								
99							11.3	12.9		7.9	15.0								
100							14.2	21.4		8.5	12.3								
101							16.6			5.0									
102							11.5			5.5									
103							13.1			6.4									
104							11.2			4.2									
105							14.1												
106							12.9												
107							15.7												
108							15.0												
109							13.8												
110							8.6												
111							9.1												
112							9.1												
113							10.0												
114							12.9												
115							17.2												
116							13.6												
117							16.3												
118							17.8												
119							11.9												
120							6.8												
121							8.5												
122							10.1												
123							6.1												
124							11.7												
125							10.3												
126							12.8												
127							13.5												
128							12.8												
129							12.6												
130							11.0												

Table A6-8b. Onondaga Lake Dreissenid Mussel Survey Fall 2011 – Quagga Mussel Raw Length (mm) Data (continued)

Zone D				Zone D				Zone E				Zone F				Zone G			
Transect 1				Transect 2				Transect 1				Transect 1				Transect 1			
0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0
131							11.8												
132							13.4												
133							17.1												
134							14.6												
135							10.9												
136							20.0												
137							12.0												
138							14.5												
139							11.7												
140							11.1												
141							11.4												
142							10.6												
143							4.2												
144							10.8												
145							9.8												
146							13.8												
147							11.8												
148							14.3												
149							11.9												
150							8.5												

Table A6-8b. Onondaga Lake Dreissenid Mussel Survey Fall 2011 – Quagga Mussel Raw Length (mm) Data (continued)

Zone Transect	Zone H				Zone H			
	Transect 1				Transect 2			
	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0
Water Depth	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0
Median Length	9	8	0	6	0	10	11	15
Mean Length	8.5	9.2	0.0	7.2	0.0	9.4	10.8	15.5
1	6.6	8.2	0.0	17.6	0.0	14.0	17.8	16.3
2	9.2	7.8		6.4		15.9	16.8	7.1
3	9.7	8.3		6.2		14.5	7.1	14.8
4		8.9		4.3		11.8	16.0	11.7
5		5.2		6.0		12.2	14.6	9.2
6		14.4		2.6		12.3	13.4	10.8
7		15.8				13.2	13.6	11.4
8		5.8				10.9	14.7	14.3
9		4.7				12.2	12.7	15.8
10		7.2				10.3	14.7	16.5
11		7.5				10.8	11.4	20.1
12		14.8				11.9	8.8	16.2
13		22.0				11.5	10.6	14.0
14		9.7				9.6	9.4	12.2
15		9.2				10.3	6.9	13.2
16		7.8				11.4	3.5	12.2
17		8.2				11.8	5.6	16.7
18		6.7				11.0	3.7	16.9
19		8.5				9.7	3.1	14.2
20		18.3				10.1		16.7
21		8.4				9.9		15.4
22		6.2				8.9		18.8
23		9.4				9.7		11.0
24		11.7				6.5		14.4
25		8.7				6.6		11.7
26		8.4				6.8		16.3
27		6.7				4.8		15.3
28		4.2				3.7		11.2
29		8.5				3.5		17.3
30		6.8				3.2		14.0
31		5.4				3.5		19.0
32		14.3				3.2		25.5
33		8.5				3.1		15.6
34		13.1						14.4
35		6.2						15.5
36		20.9						15.2
37		6.7						14.2
38		3.0						14.0
39		20.1						18.7
40		6.9						15.0
41		6.3						18.5
42		16.3						13.4

Table A6-8b. Onondaga Lake Dreissenid Mussel Survey Fall 2011 – Quagga Mussel Raw Length (mm) Data (continued)

Zone Transect Water Depth	Zone H Transect 1				Zone H Transect 2			
	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0
	43		8.9					
44		16.4						14.4
45		5.2						15.8
46		5.2						13.8
47		6.5						13.9
48		17.6						19.2
49		8.1						13.8
50		6.3						16.8
51		8.1						16.1
52		10.1						20.9
53		7.7						17.3
54		7.6						14.4
55		3.7						16.9
56		1.9						13.6
57		13.0						14.2
58		11.9						11.7
59		9.7						15.5
60		10.8						12.5
61		10.0						16.6
62		7.0						14.1
63		10.2						20.2
64		5.4						18.2
65		4.0						21.3
66		3.2						15.6
67								13.8
68								14.7
69								16.7
70								14.6
71								19.8
72								14.3
73								15.1
74								16.0
75								18.7
76								11.7
77								14.7
78								10.7
79								18.1
80								16.3
81								15.1
82								15.3
83								18.7
84								17.6
85								9.6
86								13.0

Table A6-8b. Onondaga Lake Dreissenid Mussel Survey Fall 2011 – Quagga Mussel Raw Length (mm) Data (continued)

Zone	Zone H				Zone H				
	Transect	Transect 1				Transect 2			
		0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0	0 - 1.5	1.5 - 3	3 - 4.5	4.5 - 6.0
87								19.6	
88								15.6	
89								13.5	
90								21.3	
91								16.5	
92								14.0	
93								20.4	
94								19.9	
95								20.3	
96									
97									
98									
99									
100									
101									
102									
103									
104									
105									
106									
107									
108									
109									
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128									
129									
130									

Figure A6.1 - Seneca River Dreissenid Mussel Survey – *Dreissena* sp. Length Frequency Distribution by Transect (04'-11')

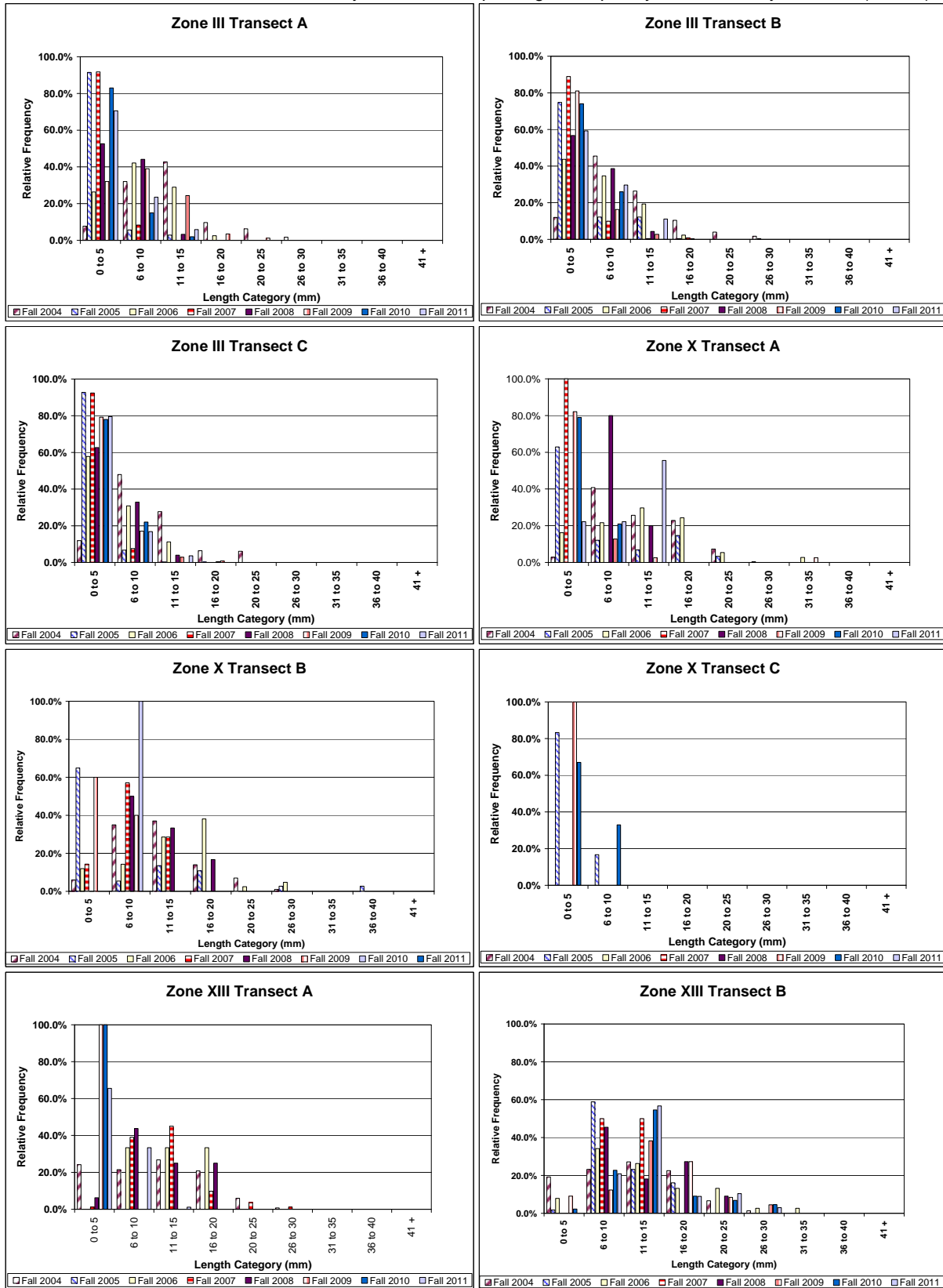


Figure A6.1 - Seneca River Dreissenid Mussel Survey – *Dreissena* sp. Length Frequency Distribution by Transect (04'-11') (continued)

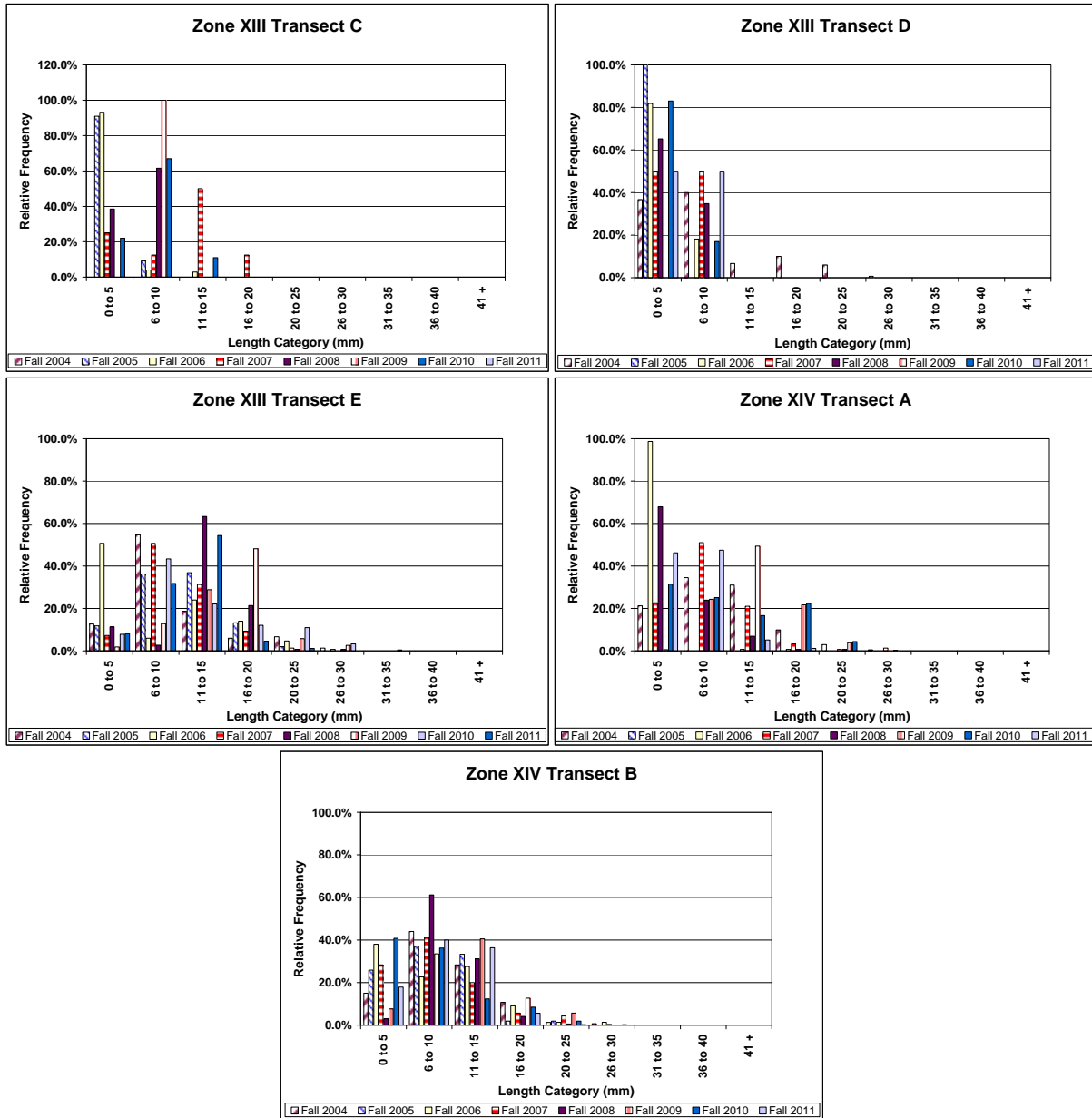


Figure A6.2 – Seneca River Dreissenid Mussel Survey Fall 2011 – Length Frequency Distribution by Transect for Zebra and Quagga Mussels

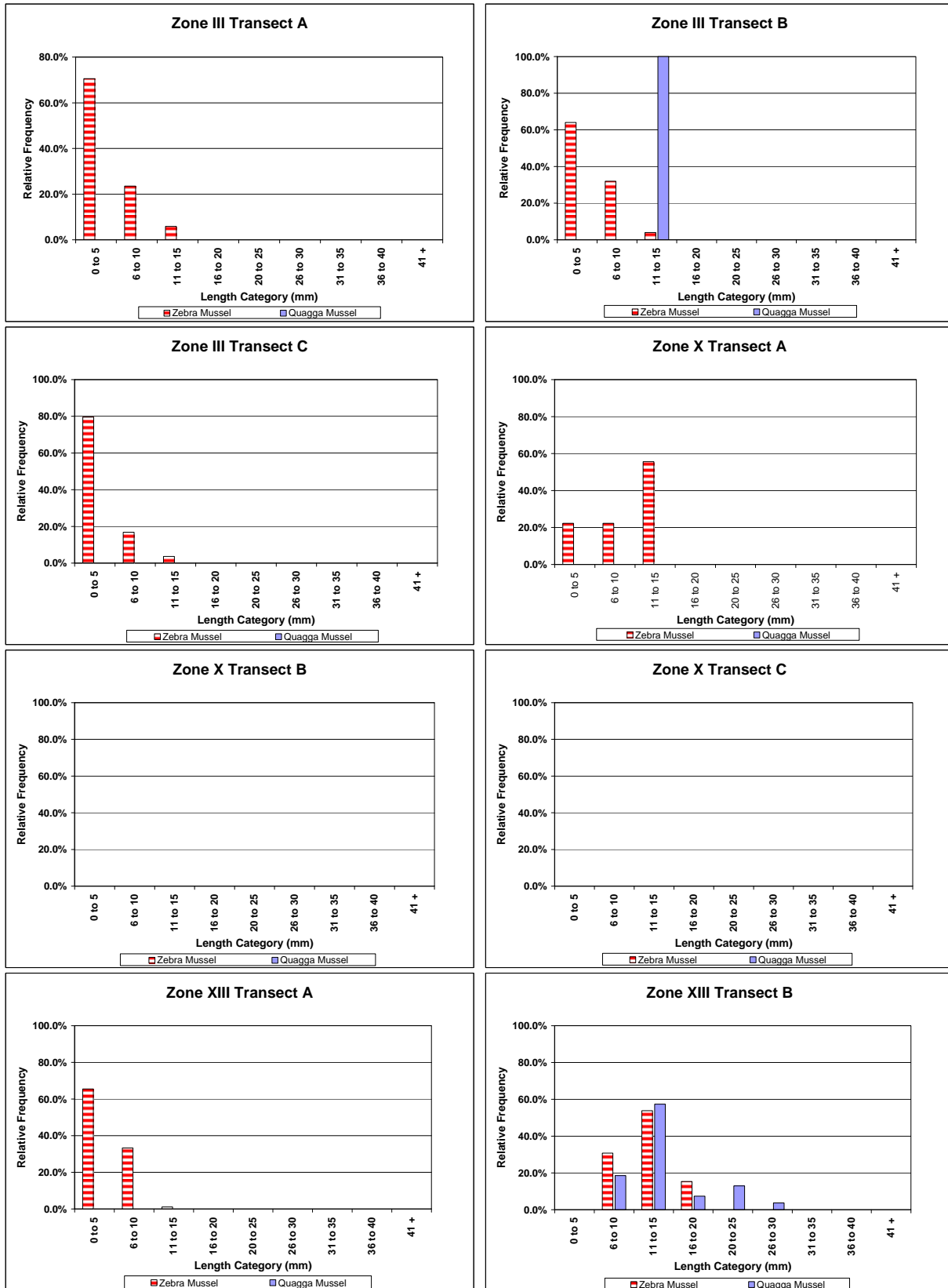


Figure A6.2 – Seneca River Dreissenid Mussel Survey Fall 2011 – Length Frequency Distribution by Transect for Zebra and Quagga Mussels (continued)

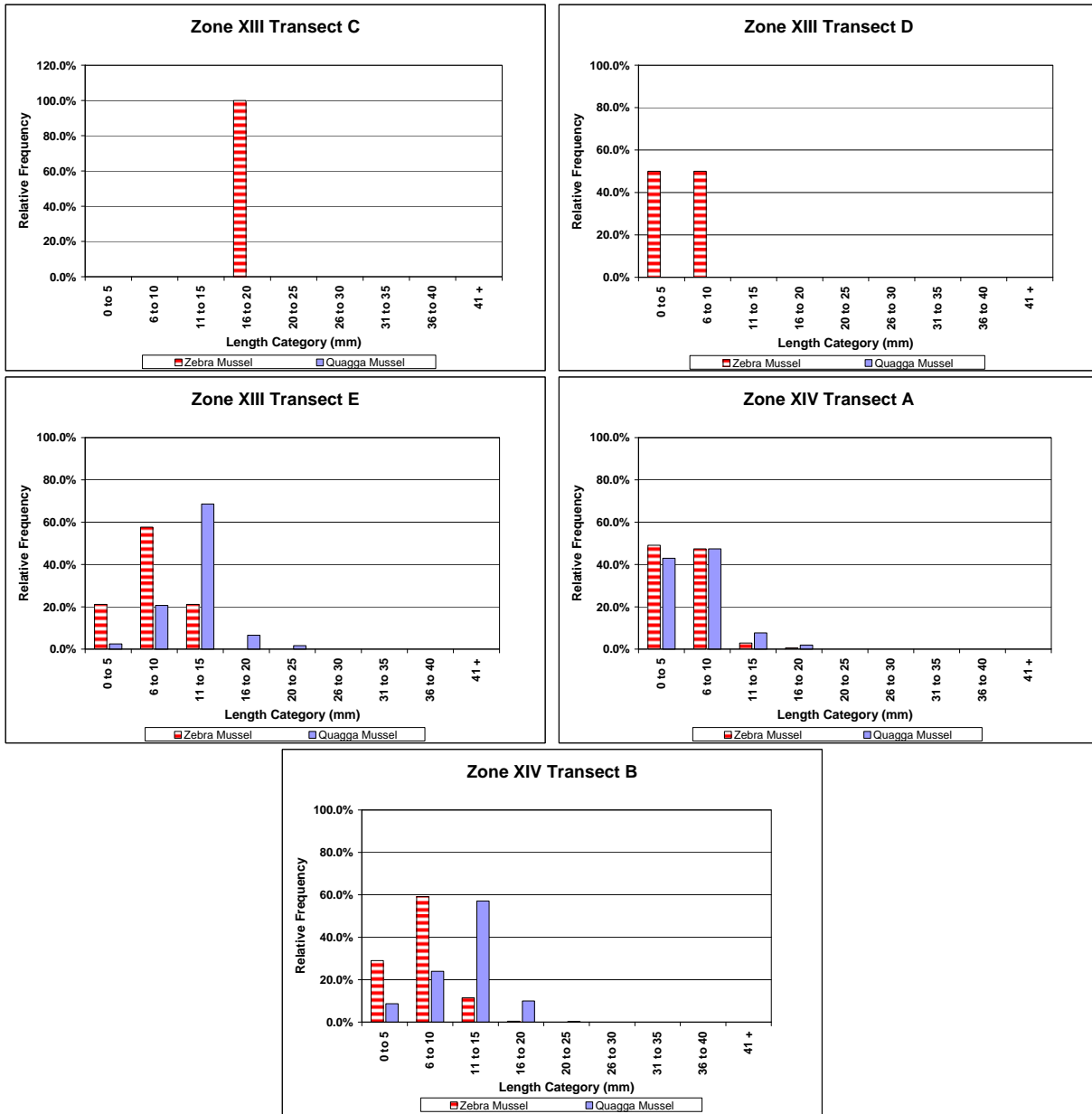


Figure A6.3 – Onondaga Lake Dreissenid Mussel Survey Fall 2011 – Length Frequency Distribution by Zone (All Transects) and Depth Range/Category (All Depths) for Zebra and Quagga Mussel

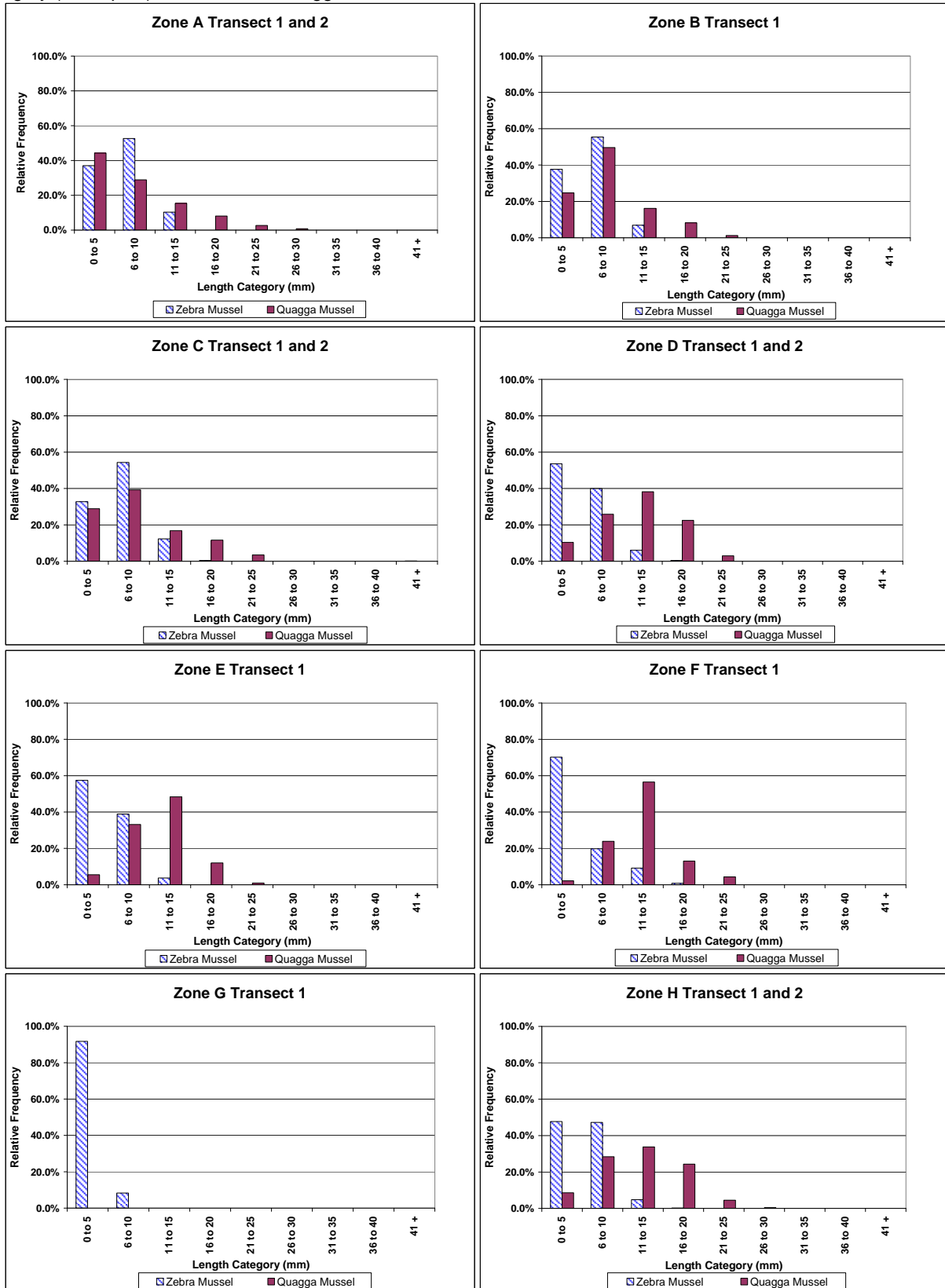


Figure A6.4 – Onondaga Lake Dreissenid Mussel Survey – Fall 2002, and 2005 through 2011 Comparison of *Dreissena* sp. Length Frequency Distribution by Zone (All Transects) and Depth Range/Category (All Depths)

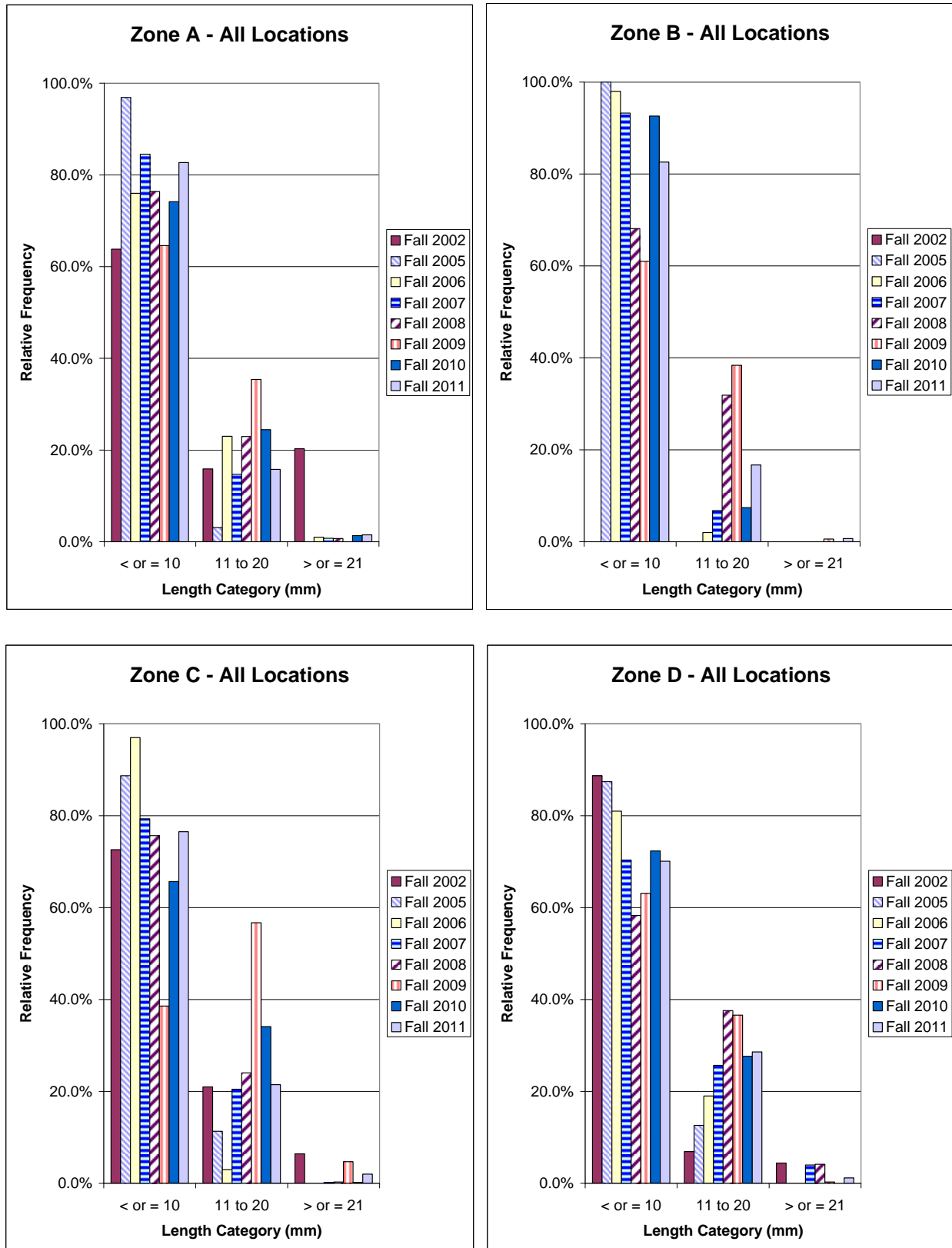


Figure A6.4 – Onondaga Lake Dreissenid Mussel Survey – Fall 2002, and 2005 through 2011 Comparison of *Dreissena* sp. Length Frequency Distribution by Zone (All Transects) and Depth Range/Category (All Depths) (continued)

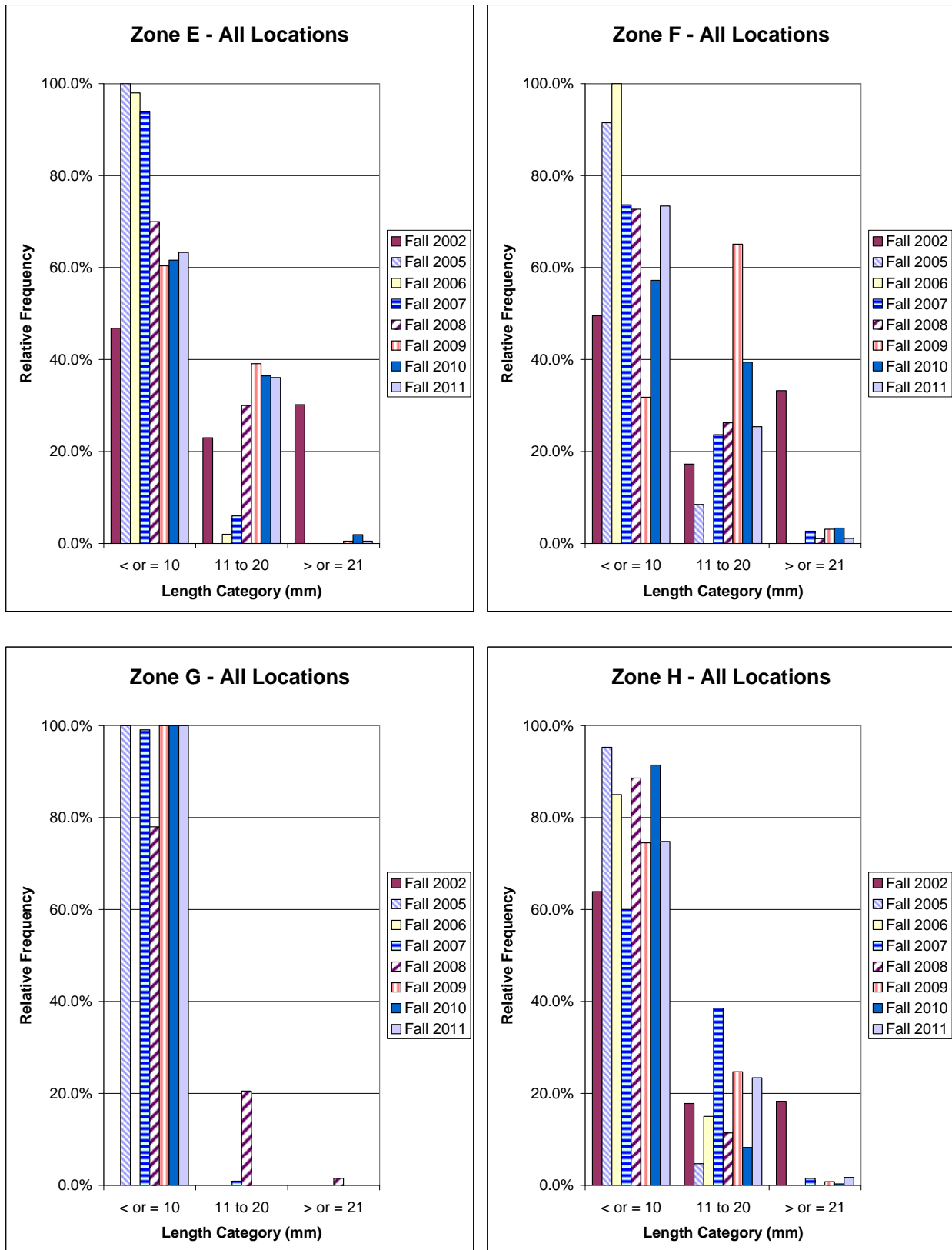


Figure A6.5 – Onondaga Lake Dreissenid Mussel Survey – Fall 2002, and 2005 through 2011 Comparison of *Dreissena* sp. Length Frequency Distribution by Zone (All Transects) and Depth Range/Category

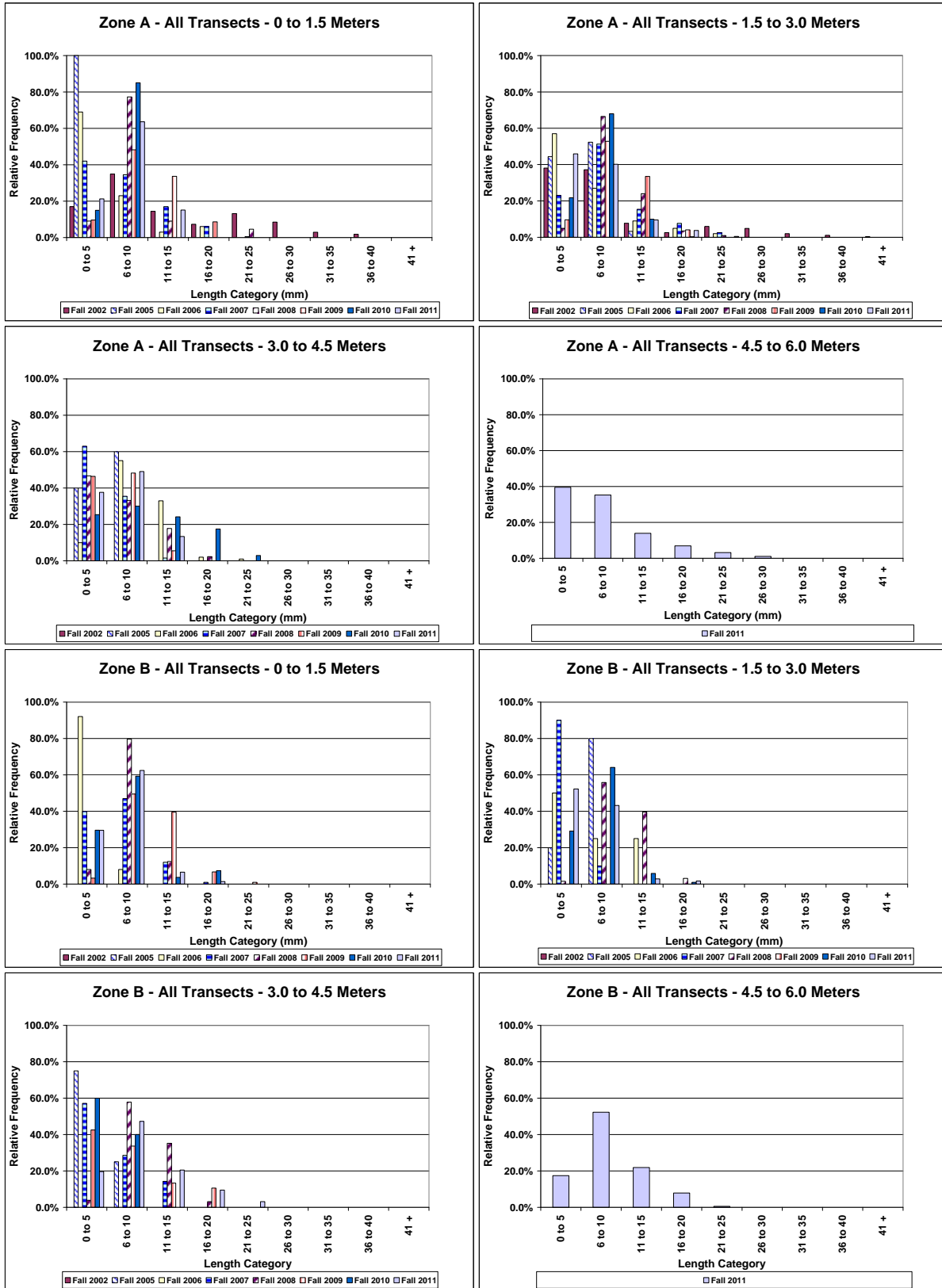


Figure A6.5 – Onondaga Lake Dreissenid Mussel Survey – Fall 2002, and 2005 through 2011 Comparison of *Dreissena* sp. Length Frequency Distribution by Zone (All Transects) and Depth Range/Category (continued)

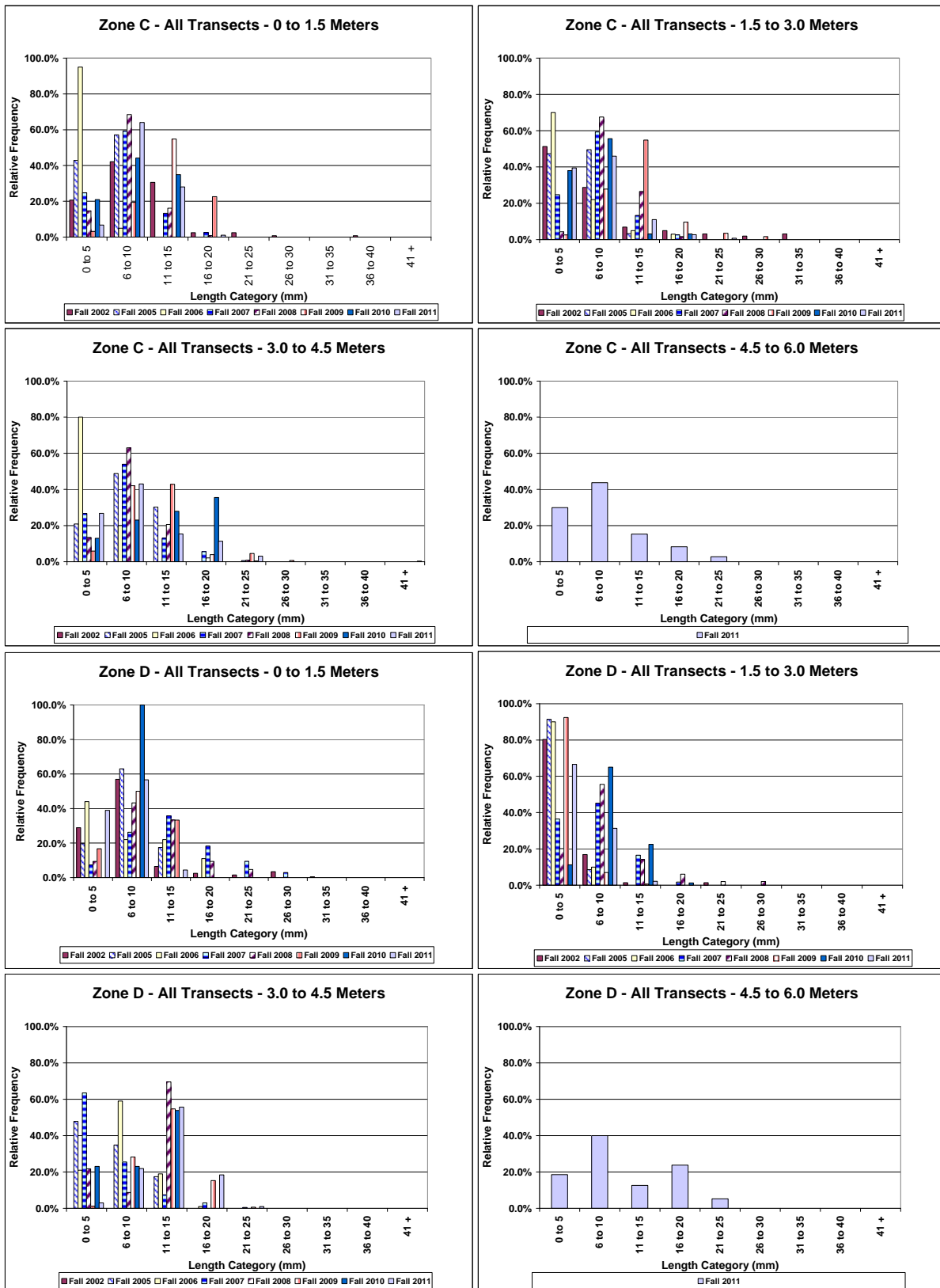


Figure A6.5 – Onondaga Lake Dreissenid Mussel Survey – Fall 2002, and 2005 through 2011 Comparison of *Dreissena* sp. Length Frequency Distribution by Zone (All Transects) and Depth Range/Category (continued)

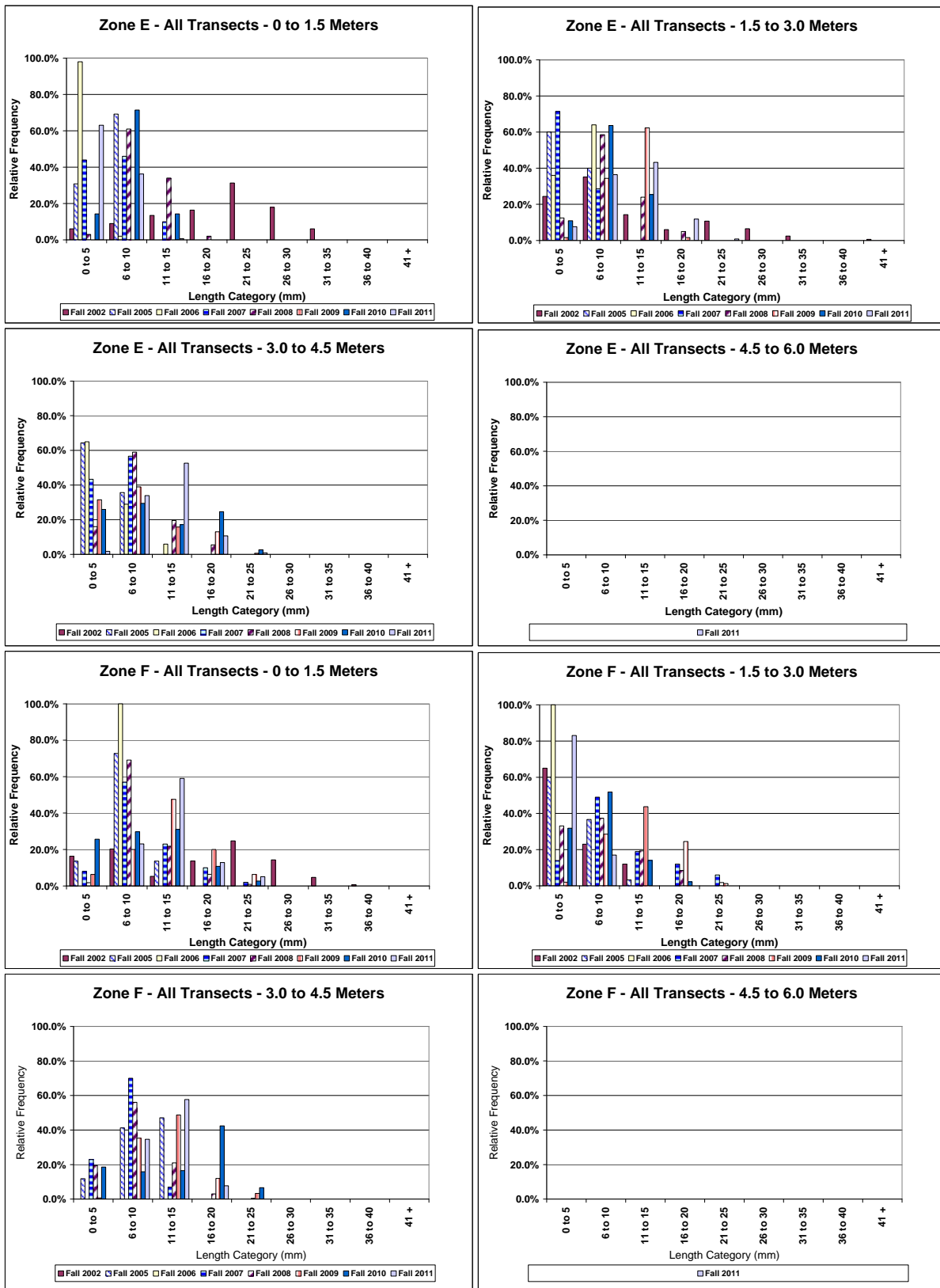


Figure A6.5 – Onondaga Lake Dreissenid Mussel Survey – Fall 2002, and 2005 through 2011 Comparison of *Dreissena* sp. Length Frequency Distribution by Zone (All Transects) and Depth Range/Category (continued)

