



Monitoring Salt Marsh Vegetation and Nekton at Fire Island National Seashore and the William Floyd Estate

2015 Summary Report

Natural Resource Data Series NPS/NCBN/NRDS—2015/995



ON THE COVER

Salt Marsh at Fire Island National Seashore.
Photograph by Monique LaFrance Bartley

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Abstract

The Northeast Coastal and Barrier Network (NCBN) began monitoring salt marsh vegetation and nekton at Fire Island National Seashore (FIIS) and the William Floyd Estate (WFE) in 2009. This report summarizes the fourth year of data collected during the summer of 2015 at both FIIS and WFE. Data summaries from sampling years prior to 2015 were prepared as two separate reports. Monitoring will continue on a biennial basis.

At FIIS, approximately fifty vegetation plots were sampled at each of the six marsh sites (total = 303 plots). In addition, a total of 151 plots were sampled at three sites located at WFE. All vegetation sampling was collected in July of 2015 except for one site at FIIS which was sampled in September due to limited accessibility. Plots established and sampled during the 2009 field season were re-visited in 2015 (between 2009 and 2013, plots were re-randomized each sampling year). The percent cover of each vegetation species and non-vegetation cover type within each 1 m² plot was visually estimated using a revised Braun-Blanquet method. Twenty-three vegetation species and four non-vegetation cover types (wrack & litter, trash, bare ground, and water) were recorded at FIIS. Twenty-eight vegetation species and four non-vegetation cover types (wrack & litter, trash, bare ground, and water) were recorded at WFE.

A total of 65 nekton stations were established (on ditches and pools/pannes) at FIIS in 2015. Each station was sampled twice during the summer—once in mid-June, and again in late July. At WFE, 38 nekton stations were established and sampled once in late June and then again in early August. Sampling stations located on pools/pannes were sampled using a 1 m² aluminum throw trap. Stations located along tidal ditches were sampled with ditch nets. There were nine species of nekton recorded at FIIS in 2015, including seven fish, one unknown crab, and one shrimp species. Examination of percent catch data indicates that *F. heteroclitus* (51.9%), *M. menidia* (4.2%), and *P. pugio* (38.7%) accounted for approximately 95% of all nekton captured at FIIS in 2015. At WFE, there were ten species of nekton recorded, including six fish, three crabs, and one shrimp species, with *P. pugio* (77.6%) and *F. heteroclitus* (18.6%) accounting for approximately 96% of all nekton captured.

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Introduction

National Park Service (NPS) managers need accurate information about how, when and why natural systems change over time in order to make sound management decisions. To address this need, the NPS initiated natural resource monitoring through the Natural Resource Challenge. The Inventory and Monitoring Program (I&M), the key component of this effort, organizes 270 park units into 32 networks tasked with conducting long-term ‘vital signs’ monitoring (Fancy et al. 2009). Vital signs are defined as measurable, early warning signals that may indicate change in the long-term health of natural systems. Early detection of potential problems allows park managers to take steps in restoring or maintaining the ecological health of park resources.

The Northeast Coastal and Barrier Network (NCBN) consists of eight parks extending along the Northeast Atlantic Coast. Vital Signs chosen as part of the Network’s monitoring plan include salt marsh vegetation communities, nekton communities, essential estuarine water quality parameters, and specific coastal geomorphologic features (Stevens et al. 2005). Detailed monitoring protocols have been developed and implemented in the eight parks. This annual report summarizes salt marsh vegetation and nekton community data collected at Fire Island National Seashore and the William Floyd Estate in 2015, according to two protocols—*Monitoring Nekton in Salt Marshes: A Protocol for the National Park Service’s Long-Term Monitoring Program, Northeast Coastal and Barrier Network* (James-Pirri et al. 2012) and *Monitoring Salt Marsh Vegetation: A Protocol for the National Park Service’s Long-Term Monitoring Program, Northeast Coastal and Barrier Network* (James-Pirri et al. In Review).

Methods

Permanent Site Selection

Six permanent 5-8 hectare salt marsh sites were selected for monitoring at FIIS (Fig. 1). In addition, three permanent sites were established at WFE (Fig. 2). The number of sites chosen was based on available habitat and the logistics and feasibility of sampling. Marsh sites were chosen randomly from all salt marsh within the park, so that statistical inference could be extended to the entire park. Detailed information about the site selection process and sampling design can be found in the Salt Marsh Vegetation (James-Pirri et al. In Review) and Nekton Protocols (James-Pirri et al. 2012).

Vegetation sampling is being conducted at all sites at FIIS and WFE. Nekton sampling is conducted at five of the sites at FIIS and three sites at WFE. Monitoring began in 2009 and will continue on a biennial basis.



Figure 1. Six permanent nekton and vegetation monitoring sites were established by NCBN at Fire Island National Seashore (FIIS) in 2009. These six sites will continue to be monitored biennially.



Figure 2. Three permanent nekton and vegetation monitoring sites were established by NCBN at the William Floyd Estate, Fire Island National Seashore in 2009. These three sites will continue to be monitored biennially.

Nekton Sampling Station Selection and Data Collection

While monitoring sites remain permanent from year to year, nekton stations within each site are re-randomized each sampling year. Ten ditch net stations were established at each monitoring site (five sites at FIIS and three at WFE). If pools were present, all fishable pools within each site were sampled. Nekton stations were randomly located along the length of each ditch or along the perimeter of a pool. Although we indicate if a ditch is obstructed, sampling of ditch habitat was not stratified by whether or not ditches were obstructed because, in many cases, obstructions may be transient and differences between these two types of ditches is not a focus of the nekton monitoring program. Nekton stations at FIIS (Table 1) and WFE (Table 2) were sampled twice, once in early summer and again in late summer. A list of all nekton stations and their respective Universal Transverse Mercator (UTM) coordinates is provided in Appendices A (FIIS) and H (WFE).

Nekton in ditches were sampled using a ditch net, an enclosure gear designed to sample tidal ditches and smaller tidal creeks up to 1 m wide and 1 m deep (James-Pirri et al. 2010). All nekton were collected from the net and density was calculated by measuring the area of water the net sampled.

Nekton in pools or flooded pannes were sampled using a 1 m² aluminum throw trap (Kushlan 1981, Sogard and Able 1991, Raposa and Roman 2001, James-Pirri et al. 2012). All nekton were collected from the trap with a 1 mm mesh dip net.

For each net or trap, all fish and decapods were identified and enumerated. Fifteen haphazardly selected individuals of each species were measured for length (fish – total length; crabs – carapace width; shrimp – total length). Once identified and measured, all organisms were returned to the location where they were collected.

Table 1. Sampling dates and total number of nekton stations at five marsh sites at FIIS in 2015. Sampling stations are displayed by habitat type. '-' habitat not present. '*' three ditch stations were dry during Event 2.

Site	Event	Dates	Habitat			Total
			Ditch		Pool/Panne	
			Unobstructed	Obstructed		
1	1	6/18/15	8	2	--	10
	2	7/31/15	8	2	--	10
2	1	6/16/15	9	1	4	14
	2	7/28/15	9	1	4	14
3	1	6/19/15	10	--	6	16
	2	7/30-7/31/15	10	--	6	16
4	1	6/17/15	4	6	5	15
	2	7/27/15	4	6	5	15
5	1	6/15/15	7	3	--	10
	2	7/29/15	7	0*	--	7

Table 2. Sampling dates and number of nekton stations at three marsh sites at WFE in 2015. Sampling stations are displayed by habitat type. '-' habitat not present. '*' three pool stations were dry during Event 1.

Site	Event	Dates	Habitat			Total
			Ditch		Pool/Panne	
			Unobstructed	Obstructed		
1	1	6/24/15	3	7	2*	12
1	2	8/3, 8/5/15	3	7	5	15
2	1	6/23, 6/25/15	8	2	3	13
2	2	8/5, 8/6/15	8	2	3	13
3	1	6/22/15	8	2	--	10
3	2	8/4, 8/5/15	8	2	--	10

Vegetation Plot Selection and Data Collection

Vegetation sampling was conducted once at each of the monitoring sites at FIIS (Table 3) and WFE (Table 4). Plots established and sampled in 2009 were revisited in 2015 (prior to 2015, between 2009 and 2013, the plots were re-randomized each sampling year). Ten transects extending from bay to upland were systematically placed based on a single random start. Plots were located by treating the total length of all transects as a single transect and randomly selecting 50 points along this total length. This combination of systematic transects and replicate plots is necessary to ensure interspersed of the plots throughout the marsh study area, thus providing a representative sample of all salt marsh communities (e.g., low marsh, high marsh).

For each plot, all vegetation species and non-vegetation cover types were recorded (Table 5), and the estimated percent cover was determined using a modified Braun-Blanquet cover scale (0: 0%; 1: <1%; 2: 1-5%; 3: 6-25%; 4: 26-50%; 5: 51-75%; 6: 76-100%), (Kent and Coker 1992).

Table 3. Sampling dates and number of vegetation plots sampled at five marsh sites at FIIS in 2015

Site	Dates	Total
1	7/21/15	50
2	7/14/15	50
3	7/13/15	50
4	7/16/15	50
5	7/17/15	52
6	9/9/15	51

Table 4. Sampling dates and number of vegetation plots at three marsh sites at WFE in 2015.

Site	Dates	Total
1	7/9/15	51
2	7/10/15	50
3	7/8, 7/9/15	50

Table 5. Definition of standard cover type categories used in the Northeast Coastal and Barrier Network salt marsh vegetation monitoring protocol (James-Pirri et al. In Review).

Live vascular plants	Identified to species (herbaceous and shrubs).
Standing non-living vascular plants	Identified to species (e.g., <i>S. alterniflora</i> Not Living). This category only includes standing dead (attached) plants that are from a previous year's growth. There may be some dead leaves from this year's growth (e.g., the ends of leaves or leaves that are being replaced by new growth, etc.). In cases where dead leaves are from the current growing season, plant cover is recorded as live.
Macroalgae	Identified to genus. Generally includes the rockweeds (e.g., <i>Fucus</i> , <i>Ascophyllum</i>). Microalgae (e.g., diatom mats) and fine filamentous algae are not included in this category.
Bare ground	Includes mud, sand, microalgae cover, etc. These are areas that are not flooded with water and are devoid of standing live, standing dead, or macroalgae. There can be a thin film of surface water within the bare ground category.
Water	Standing water is identified in plots that are partly within a creek, ditch, marsh pool, or flooded panne. If water is present, note whether it is a pool, ditch, creek, panne, rivulet, or a low wet area.
Wrack/litter	Wrack is material that has floated into the plot. This is generally dead (not attached) plant material. Litter is dead plant material that is highly decomposed and is no longer attached.
Trash	Items such as logs, old piers, tires, etc.
Rock	Boulders or rocks can be found on the surface of northern New England marshes.

Data Summary

Nekton

Species composition, average density, average length of nekton, and standard error were all calculated using standard formulae. The same is true of the average values of the environmental variables (water temp, salinity, and depth) calculated for each habitat type during each sampling event. Details can be found in the Analysis and Reporting Standard Operating Procedure of James-Pirri et al. (2012).

Vegetation

Vegetation data were recorded using the modified Braun-Blanquet scale as described above (Kent and Coker 1992). For summary purposes, each Braun-Blanquet value was converted to the midpoint of the percent range it represented (Table 6) as described in Wikum and Shanholtzer (1978).

Table 6. Modified Braun-Blanquet scale and corresponding midpoint values for determining percent cover of salt marsh vegetation.

BB Value	Percent Cover	Midpoint
0	0%	0%
1	< 1%	0.50%
2	1 - 5%	3%
3	6 - 25%	15.50%
4	26 - 50%	38%
5	51 - 75%	63%
6	76 - 100%	88%

Wikum and Shanholtzer (1978) outline a method for calculating an importance value for each species. So as not to confuse this value with ecological importance, we refer to it as a ‘relative prevalence’ value. Although Wikum and Shanholtzer (1978) present their importance value as a sum of the percent frequency and percent cover values, we have chosen to average these values so that relative prevalence is on a more readily interpretable percent scale. We present the relative percent prevalence for each species and non-vegetation cover type as the average of the relative percent cover and the relative percent frequency. A detailed description of the analyses and formulae are presented in the salt marsh vegetation protocol (James-Pirri et al. In Review).

Relative percent cover is the percentage of all plots that each species covers relative to all other species present in the plots. The sum of all relative percent cover values for all species and non-vegetation cover types equals 100%. Relative percent frequency is the number of plots where each species is present, relative to all other species observed in the plots. The sum of the relative percent frequency values for all species and non-vegetation cover type equals 100%.

In addition to relative percent prevalence, we report the average percent cover of each species and non-vegetation cover type for all plots combined. Because the relative percent prevalence incorporates both percent frequency and percent cover, it provides information about how a species is distributed (*i.e.*, its ‘patchiness’) throughout the salt marsh and may differ substantially from the average percent cover for a given species.

If any identified vegetation species in the sample plots are listed by the United States Department of Agriculture (USDA) or the state of New York as exotic, invasive, threatened, endangered, or rare, these species are noted in the vegetation data summary. Information about plants listed by each state as exotic, invasive, threatened, endangered, or rare is available online (USDA 2015). In some cases, more specific information may be available on state websites. Information about plants listed by the state of New York as exotic or invasive is available online via the New York State Invasive Species Info website. Information about plants listed by the state of New York as threatened, endangered, or rare can be obtained from the rare plant list edited by Young (2010) for the New York Natural Heritage Program.

If any species from one of the above categories is observed, these plots are noted in Appendices B (FIIS) and I (WFE), which includes a table of all vegetation plots and their respective Universal Transverse Mercator (UTM) coordinates.

Results

Fire Island National Seashore

Nekton

The average nekton density at FIIS is presented in Tables 7a and b. Nekton species richness is presented in Table 8. Common mummichog (*F. heteroclitus*), Atlantic silverside (*M. menidia*), and daggerblade grass shrimp (*P. pugio*) account for approximately 95% of all nekton captured in 2015 (Table 9). The average, maximum, and minimum lengths for each species are presented in Table 10. Additional tables summarizing data by site are provided in the Appendices.

Environmental variables at each nekton sampling station were recorded during each sampling event. These measures provide limited insight into differences between habitats that may affect nekton (Table 11). Currently, these data are collected in a manner that may help to explain anomalies in nekton observed at a particular location during a specific sampling event. These parameters would need to be measured continuously over the course of the field season in order to lend any real insight into observed changes in the nekton community.

Vegetation

Twenty-three vegetation species and four non-vegetation cover types (bare ground, wrack & litter, water, and trash) were recorded at five marsh sites at FIIS in 2015 (Table 12). Species are grouped by salinity tolerances (USDA 2015). As explained in the Data Summary section, the relative percent prevalence combines information about how much of each site each species ‘covers’ relative to all other species present and how frequently it appears throughout the site relative to all other species present. Tables summarizing vegetation data by site are provided in the Appendices.

One of the vegetation species observed at FIIS in 2015, *Phragmites australis*, is listed as an exotic species (USDA 2015).

Table 7. (a) Average density and standard error [individuals per 1 m² ± SE (total count)] of nekton captured at FIIS in 2015. Data are summarized for each sampling event and both events combined. (b) Number of nekton stations sampled at FIIS in 2015. ‘*’ three ditch stations were dry during Event 2.

(a)	Average Density		
	[individuals per 1 m ² ± SE (no. of nekton)]		
Habitat	Event 1	Event 2	Events 1 & 2
Unobstructed Ditch	3.0 ± 1.2 (59)	48.3 ± 9.6 (949)	25.6 ± 4.9 (1008)
Obstructed Ditch	0.5 ± 0.2 (3)	21.6 ± 10.7 (117)	8.4 ± 4.1 (120)
Pool/Panne	0.5 ± 0.3 (8)	8.1 ± 3.1 (122)	4.3 ± 1.7 (130)
All	1.9 ± 0.7 (70)	34.7 ± 6.5 (1188)	17.5 ± 3.2 (1258)

(b)	No. of Stations		
	Event 1	Event 2	Events 1 & 2
Unobstructed Ditch	38	38	38
Obstructed Ditch	12	9*	12
Pool/Panne	15	15	15
All	65	62	65

Table 8. Nekton species richness (No. of Species) at FIIS in 2015. Data are summarized for each sampling event and both events combined. ‘*’ three ditch stations were dry during Event 2.

Event	No. of Stations	No. of Species
1	65	7
2	62*	9
1 & 2	65	11

Table 9. Nekton species and community composition at FIIS in 2015. Data are summarized for each sampling event and both events combined. n = total number of nekton captured. '-' species or community was not present.

Life History Group/Species	Common Name	Group/Species Composition (%)		
		Event 1 (n=70)	Event 2 (n=1188)	Events 1 & 2 (n=1258)
Resident Fish		51.4	56.8	56.5
<i>Fundulus heteroclitus</i>	mummichog	41.4	52.5	51.9
<i>Cyprinodon variegatus</i>	sheepshead minnow	1.4	3.5	3.3
<i>Fundulus lucia</i>	spotfin killifish	7.1	0.3	0.6
<i>Fundulus majalis</i>	striped killifish	--	0.6	0.6
<i>Anchoa mitchilli</i>	bay anchovy	1.4	--	0.1
Resident Shrimp		25.7	39.5	38.7
<i>Palaemonetes pugio</i>	daggerblade grass shrimp	25.7	39.5	38.7
Transient Fish		18.6	3.5	4.4
<i>Menidia menidia</i>	Atlantic silverside	18.6	3.4	4.2
<i>Brevoortia tyrannus</i>	atlantic menhaden	--	0.2	0.2
Unknown		4.3	0.2	0.4
Unknown Juvenile	Unknown juvenile fish	4.3	--	0.2
Unknown Crab	Unknown Crab	--	0.1	0.1

Table 10. (a) Average length [mm $\pm$ SE (no. measured)] of nekton at FIIS in 2015. Length data for each species is summarized over all stations sampled during each event and both events combined. '-' species or community was not present. (b) Minimum and maximum length (mm) of each nekton species at FIIS in 2015.

(a)		Average Length [mm $\pm$ SE (no. measured)]		
Life History Group/Species	Common Name	Event 1	Event 2	Events 1 & 2
Resident Fish				
<i>Anchoa mitchilli</i>	bay anchovy	30.0 (1)	--	30.0 (1)
<i>Cyprinodon variegatus</i>	sheepshead minnow	12.0 (1)	20.0 $\pm$ 1.3 (41)	19.9 $\pm$ 1.3 (42)
<i>Fundulus heteroclitus</i>	mummichog	48.3 $\pm$ 3.7 (29)	30.8 $\pm$ 0.5 (436)	31.9 $\pm$ 0.5 (465)
<i>Fundulus lucia</i>	spotfin killifish	32.0 $\pm$ 1.8 (5)	34.3 $\pm$ 2.4 (3)	32.9 $\pm$ 1.4 (8)
<i>Fundulus majalis</i>	striped killifish	--	34.0 $\pm$ 2.5 (7)	34.0 $\pm$ 2.5 (7)
Resident Shrimp				
<i>Palaemonetes pugio</i>	daggerblade grass shrimp	33.6 $\pm$ 1.8 (18)	21.8 $\pm$ 0.4 (164)	23 $\pm$ 0.5 (182)
Transient Fish				
<i>Brevoortia tyrannus</i>	atlantic menhaden	--	42.0 $\pm$ 5.0 (2)	42.0 $\pm$ 5.0 (2)
<i>Menidia menidia</i>	Atlantic silverside	18.9 $\pm$ 1.6 (13)	29.9 $\pm$ 1 (16)	25.0 $\pm$ 1.4 (29)
Unknown				
Unknown Crab	Unknown Crab	--	5.0 (1)	5.0 (1)
Unknown fish	Unknown fish	--	62.0 (1)	62.0 (1)
Unknown Juvenile	Unknown juvenile fish	7.7 $\pm$ 1.5 (3)	--	7.7 $\pm$ 1.5 (3)

(b)		Event 1		Event 2		Events 1 & 2	
Life History Group/Species	Common Name	Min.	Max.	Min.	Max.	Min.	Max.
Resident Fish							
<i>Anchoa mitchilli</i>	bay anchovy	30	30	--	--	30	30
<i>Cyprinodon variegatus</i>	sheepshead minnow	12	12	9	38	9	38
<i>Fundulus heteroclitus</i>	mummichog	11	100	11	78	11	100
<i>Fundulus lucia</i>	spotfin killifish	29	38	31	39	29	39
<i>Fundulus majalis</i>	striped killifish	--	--	24	43	24	43
Resident Shrimp							
<i>Palaemonetes pugio</i>	daggerblade grass shrimp	11	43	8	43	8	43
Transient Fish							
<i>Brevoortia tyrannus</i>	atlantic menhaden	--	--	37	47	37	47
<i>Menidia menidia</i>	Atlantic silverside	10	28	19	37	10	37
Unknown							
Unknown Crab	Unknown Crab	--	--	5	5	5	5
Unknown fish	Unknown fish	--	--	62	62	62	62

Table 11. Average water temperature, depth, and salinity [Average $\pm$ SE (no. of stations)] at nekton sampling stations at FIIS in 2015. Data are summarized over all stations for each sampling event. '*' three ditch stations were dry during Event 2.

Habitat	Average $\pm$ SE (no. of stations)					
	Event 1			Event 2		
	Ditch		Pool/Panne	Ditch		Pool/Panne
	Unobstructed	Obstructed		Unobstructed	Obstructed*	
Temperature ($^{\circ}$ C)	21.6 $\pm$ 0.4 (38)	21.4 $\pm$ 0.9 (12)	29.3 $\pm$ 1.2 (15)	26.3 $\pm$ 0.6 (38)	26.2 $\pm$ 1.0 (9)	35.2 $\pm$ 0.5 (15)
Depth (cm)	31.5 $\pm$ 2.0 (38)	25.9 $\pm$ 2.7 (12)	8.9 $\pm$ 2.4 (15)	30.2 $\pm$ 2.2 (38)	25.8 $\pm$ 1.5 (9)	9.3 $\pm$ 1.8 (15)
Salinity (ppt)	28.6 $\pm$ 0.7 (38)	22.6 $\pm$ 1.6 (12)	28.6 $\pm$ 1.6 (15)	31.3 $\pm$ 0.4 (38)	36.1 $\pm$ 1.4 (9)	38.0 $\pm$ 1.7 (15)

Table 12. Average percent cover (Average % Cover $\pm$ SE), frequency, and relative percent prevalence of each plant species and non-vegetation cover type observed at FIIS in 2015. Data were summarized over all 303 plots. Percent cover was estimated using the midpoint values of Braun-Blanquet percent ranges (Table 4). (NL) indicates standing non-living vegetation. '*' species listed as invasive or exotic (USDA 2015).

Cover Type						
Salinity Tolerance		Avg. %		Rel. %	Rel. %	Rel. %
Species	Common Name	Cover $\pm$ SE	Freq.	Cover	Freq.	Prevalence
Vegetation		93.7 $\pm$ 1.9	299	78.5	75.2	76.8
High Salinity Tolerance		88.9 $\pm$ 2.2	294	74.5	68.4	71.5
<i>Spartina alterniflora</i>	saltmarsh cordgrass	44.3 $\pm$ 1.8	245	37.1	13.9	25.5
<i>Spartina alterniflora</i> (NL)	saltmarsh cordgrass (NL)	13.4 $\pm$ 0.9	236	11.3	13.4	12.4
<i>Spartina patens</i>	salt meadow cordgrass	11.3 $\pm$ 1.2	128	9.5	7.3	8.4
<i>Spartina patens</i> (NL)	salt meadow cordgrass (NL)	2.7 $\pm$ 0.3	110	2.2	6.2	4.2
<i>Salicornia</i> sp.	glasswort species	4.0 $\pm$ 0.5	183	3.3	10.4	6.8
<i>Salicornia</i> sp. (NL)	glasswort species (NL)	0.1 $\pm$ 0.0	11	0.1	0.6	0.4
<i>Distichlis spicata</i>	spikegrass	7.6 $\pm$ 1.0	116	6.4	6.6	6.5
<i>Distichlis spicata</i> (NL)	spikegrass (NL)	2.3 $\pm$ 0.3	91	1.9	5.2	3.5
<i>Juncus gerardii</i>	black grass	1.4 $\pm$ 0.4	21	1.2	1.2	1.2
<i>Juncus gerardii</i> (NL)	black grass (NL)	0.4 $\pm$ 0.1	15	0.3	0.9	0.6
<i>Iva frutescens</i>	marsh elder	0.7 $\pm$ 0.3	12	0.6	0.7	0.6
<i>Iva frutescens</i> (NL)	marsh elder	< 0.05	3	< 0.05	0.2	0.1
<i>Solidago sempervirens</i>	seaside goldenrod	0.2 $\pm$ 0.1	10	0.2	0.6	0.4
<i>Solidago sempervirens</i> (NL)	seaside goldenrod (NL)	< 0.05	3	< 0.05	0.2	0.1
<i>Limonium carolinianum</i>	sea lavender	0.2 $\pm$ 0.1	6	0.1	0.3	0.2
<i>Limonium carolinianum</i> (NL)	sea lavender (NL)	< 0.05	1	< 0.05	0.1	< 0.05
<i>Schoenoplectus robustus</i>	saltmarsh bulrush	0.1 $\pm$ 0.1	4	0.1	0.2	0.2
<i>Schoenoplectus robustus</i> (NL)	saltmarsh bulrush (NL)	< 0.05	1	< 0.05	0.1	< 0.05
<i>Symphyotrichum tenuifolium</i>	perennial saltmarsh aster	0.1 $\pm$ 0.1	2	0.1	0.1	0.1
<i>Suaeda maritima</i>	herbaceous seepweed	0.1 $\pm$ 0.1	1	< 0.05	0.1	< 0.05
<i>Suaeda maritima</i> (NL)	herbaceous seepweed (NL)	< 0.05	1	< 0.05	0.1	< 0.05
Medium Salinity Tolerance		2.0 $\pm$ 0.7	11	1.6	1.7	1.6
<i>Kosteletzkya virginica</i>	salt marsh mallow	0.3 $\pm$ 0.2	6	0.3	0.3	0.3
<i>Typha angustifolia</i>	narrowleaf cattail	0.4 $\pm$ 0.2	5	0.3	0.3	0.3
<i>Typha angustifolia</i> (NL)	narrowleaf cattail (NL)	0.3 $\pm$ 0.2	3	0.3	0.2	0.2

Table 13. (continued)

Cover Type							
Salinity Tolerance							
Species	Common Name	Avg. % Cover $\pm$ SE	Freq.	Rel. % Cover	Rel. % Freq.	Rel. % Prevalence	
<i>Baccharis halimifolia</i>	Eastern baccharis	0.4 $\pm$ 0.2	3	0.3	0.2	0.2	
<i>Baccharis halimifolia</i> (NL)	Eastern baccharis (NL)	0.1 $\pm$ 0.1	2	0.1	0.1	0.1	
<i>Toxicodendron radicans</i>	poison ivy	0.2 $\pm$ 0.1	3	0.2	0.2	0.2	
<i>Schoenoplectus pungens</i> var. <i>pungens</i>	common threesquare	0.1 $\pm$ 0.1	1	< 0.05	0.1	< 0.05	
<i>Schoenoplectus pungens</i> var. <i>pungens</i> (NL)	common threesquare (NL)	0.1 $\pm$ 0.1	1	0.1	0.1	0.1	
<i>Juncus canadensis</i>	Canadian rush	< 0.05	1	< 0.05	0.1	< 0.05	
<i>Schoenoplectus americanus</i>	American bulrush	< 0.05	1	< 0.05	0.1	< 0.05	
Low Salinity Tolerance		2.0 $\pm$ 0.5	37	1.7	4.4	3.1	
* <i>Phragmites australis</i>	common reed	1.4 $\pm$ 0.4	32	1.2	1.8	1.5	
* <i>Phragmites australis</i> (NL)	common reed (NL)	0.4 $\pm$ 0.1	34	0.3	1.9	1.1	
<i>Pluchea odorata</i>	marsh fleabane	0.2 $\pm$ 0.1	11	0.2	0.6	0.4	
<i>Mikania scandens</i>	climbing hempvine	< 0.05	1	< 0.05	0.1	< 0.05	
No Salinity Tolerance		< 0.05	1	< 0.05	0.1	< 0.05	
<i>Teucrium canadense</i>	American germander	< 0.05	1	< 0.05	0.1	< 0.05	
Unknown Salinity Tolerance		0.8 $\pm$ 0.4	9	0.7	0.6	0.6	
Unknown algae	unknown algae	0.7 $\pm$ 0.4	4	0.6	0.2	0.4	
Dead shrub (NL)	dead shrub (NL)	< 0.05	2	< 0.05	0.1	< 0.05	
Dead tree (NL)	dead tree (NL)	0.1 $\pm$ 0.1	1	< 0.05	0.1	< 0.05	
<i>Eleocharis</i> sp.	spikerush	< 0.05	1	< 0.05	0.1	< 0.05	
Unknown Herbaceous	unknown herbaceous	< 0.05	1	< 0.05	0.1	< 0.05	
Non-Vegetation		20.3 $\pm$ 1.5	249	17.0	17.9	17.4	
water	water	16.5 $\pm$ 1.4	188	13.8	10.7	12.2	
bare ground	bare ground	3.8 $\pm$ 0.5	127	3.2	7.2	5.2	
Incidental Cover		5.3 $\pm$ 0.7	120	4.4	7.4	5.9	
Wrack & litter	wrack / litter	5.0 $\pm$ 0.7	118	4.2	6.7	5.5	
trash	garbage	0.3 $\pm$ 0.1	13	0.3	0.7	0.5	

William Floyd Estate

Nekton

The average nekton density at WFE is presented in Tables 13a and b. Nekton species richness is presented in Table 14. Common mummichog (*F. heteroclitus*) and daggerblade grass shrimp (*P. pugio*) account for approximately 96% of all nekton captured at WFE in 2015 (Table 15). The average, maximum, and minimum lengths for each species are presented in Table 16. Additional tables summarizing data by site are provided in the Appendices.

One crab species observed at WFE, *Hemigrapsus sanguineus* (Asian shore crab), is considered an invasive species. Information about this species can be found online via the New York State Invasive Species Info website (nyis.info).

Environmental variables at each nekton sampling station were recorded during each sampling event. These measures provide limited insight into differences between habitats that may affect nekton (Table 17). Currently, these data are collected in a manner that may help to explain anomalies in nekton observed at a particular location during a specific sampling event. These parameters would need to be measured continuously over the course of the field season in order to lend any real insight into observed changes in the nekton community.

Vegetation

Twenty-eight vegetation species and four non-vegetation cover types (bare ground, wrack & litter, water, and trash) were recorded at three marsh sites at WFE in 2015 (Table 18). Species are grouped by salinity tolerances (USDA 2015). As explained in the Data Summary section, the relative percent prevalence combines information about how much of each site each species ‘covers’ relative to all other species present and how frequently it appears throughout the site relative to all other species present. Tables summarizing vegetation data by site are provided in the Appendices.

Two vegetation species observed at WFE in 2015, *Persicaria perfoliata* (mile-a-minute weed), and *Phragmites australis*, are listed as invasive species (USDA 2015).

Table 14. (a) Average density and standard error [individuals per 1 m² ± SE (total count)] of nekton captured at WFE in 2015. Data are summarized for each sampling event and both events combined. (b) Number of nekton stations sampled at WFE in 2015. '*' indicates 3 pool stations were dry during Event 1.

(a)	Average Density		
	[individuals per 1 m ² ± SE (total count)]		
Habitat	Event 1	Event 2	Events 1 & 2
Unobstructed Ditch	30.9 ± 8.5 (414)	158.1 ± 86.6 (2387)	94.5 ± 44.9 (2801)
Obstructed Ditch	1.7 ± 0.9 (12)	42.6 ± 23.1 (305)	22.2 ± 11.5 (317)
Pool/Panne	11.4 ± 8.5 (57)	7.0 ± 5.6 (56)	7.2 ± 5.5 (113)
All	18.9 ± 5.2 (483)	92.9 ± 44.6 (2748)	55.2 ± 23.3 (3231)
(b)	No. of Stations		
Habitat	Event 1	Event 2	Events 1 & 2
Unobstructed Ditch	19	19	19
Obstructed Ditch	11	11	11
Pool/Panne	5*	8	8
All	35	38	38

Table 15. Nekton species richness (No. of Species) at WFE in 2015. Data are summarized for each sampling event and both events combined. '*' indicates 3 pool stations were dry during Event 1.

Event	No. of Stations	Observed No. of Species
1	35*	8
2	38	8
1 & 2	38	11

Table 16. Nekton species and community composition (% catch) at WFE in 2015. Data are summarized for each sampling event and both events combined. n = total number of nekton captured. '-' species or community was not present. '*' indicates an invasive species (nyis.info).

Life History Group/Species	Common Name	Group/Species Composition (%)		
		Event 1 (n=483)	Event 2 (n=2748)	Events 1 & 2 (n=3231)
Resident Crustacean		--	< 0.05	< 0.05
<i>Carcinus maenas</i>	green crab	--	< 0.05	< 0.05
Resident Fish		36.2	17.3	20.1
<i>Fundulus heteroclitus</i>	mummichog	31.9	16.3	18.6
<i>Cyprinodon variegatus</i>	sheepshead minnow	1.0	1.0	1.0
<i>Fundulus majalis</i>	striped killifish	2.5	--	0.4
<i>Fundulus lucia</i>	spotfin killifish	0.6	--	0.1
<i>Lucania parva</i>	rainwater killifish	0.2	--	0.0
Resident Shrimp		53.8	81.8	77.6
<i>Palaemonetes pugio</i>	daggerblade grass shrimp	53.8	81.8	77.6
Transient Crustacean		0.2	< 0.05	0.1
<i>Callinectes sapidus</i>	blue crab	0.2	< 0.05	0.1
Transient Fish		9.7	0.5	1.9
<i>Menidia menidia</i>	Atlantic silverside	9.7	0.5	1.9
Unknown Life History		--	0.3	0.2
* <i>Hemigrapsus sanguineus</i>	Asian shore crab	--	0.2	0.2
Unknown Juvenile	unknown juvenile fish	--	0.1	0.1

Table 17. (a) Average length [mm $\pm$ SE (no. measured)] of nekton at WFE in 2015. Length data for each species is summarized over all stations sampled during each event and both events combined. '-' species or community was not present. (b) Minimum and maximum length (mm) of each nekton species at WFE in 2015. '-' species or community was not present. '**' indicates an invasive species (nyis.info)

(a)		Average Length [mm $\pm$ SE (no. measured)]		
Life History Group/Species	Common Name	Event 1	Event 2	Events 1 & 2
Resident Crustacean				
<i>Carcinus maenas</i>	green crab	--	64.0 (1)	64.0 (1)
Resident Fish				
<i>Fundulus heteroclitus</i>	mummichog	24.5 $\pm$ 1.2 (103)	33.7 $\pm$ 0.6 (252)	31.1 $\pm$ 0.6 (355)
<i>Cyprinodon variegatus</i>	sheepshead minnow	13.8 $\pm$ 3.4 (5)	21.1 $\pm$ 1.0 (26)	19.9 $\pm$ 1.1 (31)
<i>Fundulus majalis</i>	striped killifish	23.1 $\pm$ 1.5 (12)	--	23.1 $\pm$ 1.5 (12)
<i>Fundulus lucia</i>	spotfin killifish	33.0 $\pm$ 1.2 (3)	--	33.0 $\pm$ 1.2 (3)
<i>Lucania parva</i>	rainwater killifish	39.0 (1)	--	39.0 (1)
Resident Shrimp				
<i>Palaemonetes pugio</i>	daggerblade grass shrimp	35.0 $\pm$ 0.5 (88)	23.2 $\pm$ 0.4 (223)	26.6 $\pm$ 0.4 (311)
Transient Crustacean				
<i>Callinectes sapidus</i>	blue crab	59.0 (1)	100.0 (1)	79.5 $\pm$ 20.5 (2)
Transient Fish				
<i>Menidia menidia</i>	Atlantic silverside	32.5 $\pm$ 3.4 (35)	30.2 $\pm$ 1.4 (15)	31.8 $\pm$ 2.4 (50)
Unknown Life History				
* <i>Hemigrapsus sanguineus</i>	Asian shore crab	--	7.5 $\pm$ 1.1 (6)	7.5 $\pm$ 1.1 (6)
Unknown Juvenile	unknown juvenile fish	--	10.5 $\pm$ 0.5 (2)	10.5 $\pm$ 0.5 (2)

(b)		Event 1		Event 2		Events 1 & 2	
Life History Group/Species	Common Name	Min.	Max.	Min.	Max.	Min.	Max.
Resident Crustacean							
<i>Carcinus maenas</i>	green crab	--	--	64	64	64	64
Resident Fish							
<i>Fundulus heteroclitus</i>	mummichog	13	72	15	70	13	72
<i>Cyprinodon variegatus</i>	sheepshead minnow	8	27	12	30	8	30
<i>Fundulus majalis</i>	striped killifish	16	35	--	--	16	35
<i>Fundulus lucia</i>	spotfin killifish	31	35	--	--	31	35
<i>Lucania parva</i>	rainwater killifish	39	39	--	--	39	39
Resident Shrimp							
<i>Palaemonetes pugio</i>	daggerblade grass shrimp	25	44	9	42	9	44
Transient Crustacean							
<i>Callinectes sapidus</i>	blue crab	59	59	100	100	59	100
Transient Fish							
<i>Menidia menidia</i>	Atlantic silverside	12	74	21	41	12	74
Unknown Life History							
* <i>Hemigrapsus sanguineus</i>	Asian shore crab	--	--	4	10	4	10
Unknown Juvenile	unknown juvenile fish	--	--	10	11	10	11

Table 18. Average water temperature, depth, and salinity [Average $\pm$ SE (no. of stations)] at nekton sampling stations at WFE in 2015. Data are summarized over all stations for each sampling event. '*' indicates 3 pool stations were dry during Event 1.

Habitat	Average $\pm$ SE (no. of stations)					
	Event 1*			Event 2		
	Ditch		Pool/Panne	Ditch		Pool/Panne
	Unobstructed	Obstructed		Unobstructed	Obstructed	
Temperature ($^{\circ}$ C)	28.4 $\pm$ 0.5 (19)	27.9 $\pm$ 0.8 (11)	30.6 $\pm$ 1.0 (5)	28.7 $\pm$ 0.6 (19)	30.0 $\pm$ 0.5 (11)	31.9 $\pm$ 1.0 (8)
Depth (cm)	26.5 $\pm$ 2.1 (19)	27.6 $\pm$ 2.9 (11)	8.7 $\pm$ 1.6 (5)	30.3 $\pm$ 3.3 (19)	32.6 $\pm$ 2.8 (11)	10.9 $\pm$ 2.3 (8)
Salinity (ppt)	26.2 $\pm$ 1.1 (19)	22.3 $\pm$ 2.5 (11)	36.6 $\pm$ 2.0 (5)	33.3 $\pm$ 0.4 (19)	34.7 $\pm$ 2.0 (11)	39.0 $\pm$ 1.6 (8)

Table 19. Average percent cover (Average % Cover $\pm$ SE), frequency, and relative percent prevalence of each plant species and non-vegetation cover type observed at WFE in 2015. Data were summarized over all 151 plots. Percent cover was estimated using the midpoint values of Braun-Blanquet percent ranges (Table 4). (NL) indicates standing non-living vegetation. '**' species is listed as invasive or exotic (USDA 2015).

Cover Type						
Salinity Tolerance						
Species	Common Name	Avg. % Cover $\pm$ SE	Freq.	Rel. % Cover	Rel. % Freq.	Rel. % Prevalance
Vegetation		118.1 $\pm$ 3.5	145	77.6	74.3	75.9
High Salinity Tolerance		107.3 $\pm$ 4.2	139	70.6	64.7	67.7
<i>Spartina alterniflora</i>	saltmarsh cordgrass	41.0 $\pm$ 2.5	122	27.0	13.0	20.0
<i>Spartina alterniflora</i> (NL)	saltmarsh cordgrass (NL)	32.4 $\pm$ 2.3	119	21.3	12.7	17.0
<i>Distichlis spicata</i>	spikegrass	8.2 $\pm$ 1.3	69	5.4	7.4	6.4
<i>Distichlis spicata</i> (NL)	spikegrass (NL)	4.1 $\pm$ 0.9	47	2.7	5.0	3.8
<i>Salicornia</i> sp.	glasswort species	2.3 $\pm$ 0.4	95	1.5	10.1	5.8
<i>Salicornia</i> sp. (NL)	glasswort species (NL)	0.1 $\pm$ 0.1	8	0.1	0.9	0.5
<i>Spartina patens</i>	salt meadow cordgrass	9.7 $\pm$ 1.8	45	6.3	4.8	5.5
<i>Spartina patens</i> (NL)	salt meadow cordgrass (NL)	3.4 $\pm$ 0.7	42	2.2	4.5	3.4
<i>Iva frutescens</i>	marsh elder	2.5 $\pm$ 0.7	24	1.6	2.6	2.1
<i>Iva frutescens</i> (NL)	marsh elder (NL)	0.7 $\pm$ 0.4	5	0.4	0.5	0.4
<i>Juncus gerardii</i>	black grass	1.5 $\pm$ 0.7	9	1.0	1.0	1.0
<i>Juncus gerardii</i> (NL)	black grass (NL)	0.4 $\pm$ 0.2	9	0.3	1.0	0.6
<i>Limonium carolinianum</i>	sea lavender	0.7 $\pm$ 0.5	3	0.4	0.3	0.4
<i>Limonium carolinianum</i> (NL)	sea lavender (NL)	< 0.05	1	< 0.05	0.1	< 0.05
<i>Solidago sempervirens</i>	seaside goldenrod	0.3 $\pm$ 0.1	5	0.2	0.5	0.4
<i>Atriplex patula</i>	spreading orache	< 0.05	1	< 0.05	0.1	< 0.05
<i>Suaeda maritima</i>	herbaceous seepweed	< 0.05	1	< 0.05	0.1	< 0.05
<i>Symphyotrichum tenuifolium</i>	perennial saltmarsh aster	< 0.05	1	< 0.05	0.1	< 0.05
Medium Salinity Tolerance		1.2 $\pm$ 0.7	6	0.8	0.8	0.8
<i>Baccharis halimifolia</i>	Eastern baccharis	0.5 $\pm$ 0.3	3	0.3	0.3	0.3
<i>Elaeagnus umbellata</i>	autumn olive	0.6 $\pm$ 0.6	1	0.4	0.1	0.2
<i>Schoenoplectus pungens</i> var. <i>pungens</i>	common threesquare	0.1 $\pm$ 0.1	2	0.1	0.2	0.2
<i>Lepidium species</i>	pepperweed species	< 0.05	1	< 0.05	0.1	< 0.05
<i>Toxicodendron radicans</i>	poison ivy	< 0.05	1	< 0.05	0.1	< 0.05

Table 20. (continued)

Cover Type						
Salinity Tolerance						
Species	Common Name	Avg. % Cover $\pm$ SE	Freq.	Rel. % Cover	Rel. % Freq.	Rel. % Prevalance
Low Salinity Tolerance		4.3 $\pm$ 1.3	28	2.8	5.7	4.2
<i>*Phragmites australis</i>	common reed	3.2 $\pm$ 0.9	27	2.1	2.9	2.5
<i>*Phragmites australis</i> (NL)	common reed (NL)	1.0 $\pm$ 0.4	24	0.7	2.6	1.6
<i>Pluchea odorata</i>	marsh fleabane	0.1 $\pm$ 0.1	1	0.1	0.1	0.1
<i>Mikania scandens</i>	climbing hempvine	< 0.05	1	< 0.05	0.1	< 0.05
No Salinity Tolerance		1.0 $\pm$ 0.7	4	0.7	0.9	0.8
<i>Teucrium canadense</i>	American germander	0.7 $\pm$ 0.6	3	0.5	0.3	0.4
<i>Elymus virginicus</i>	Virginia Rye Grass	0.1 $\pm$ 0.1	1	0.1	0.1	0.1
<i>Parthenocissus quinquefolia</i>	Virginia creeper	0.1 $\pm$ 0.1	1	0.1	0.1	0.1
<i>Solidago rugosa</i>	wrinkle-leaved goldenrod	0.1 $\pm$ 0.1	1	0.1	0.1	0.1
<i>Smilax rotundifolia</i>	common greenbrier	< 0.05	1	< 0.05	0.1	< 0.05
<i>Smilax rotundifolia</i> (NL)	common greenbrier (NL)	< 0.05	1	< 0.05	0.1	< 0.05
<i>Vitis rotundifolia</i>	muscadine Grape	< 0.05	1	< 0.05	0.1	< 0.05
Unknown Salinity Tolerance		4.2 $\pm$ 1.3	15	2.8	2.2	2.5
Unknown algae	unknown algae	3.6 $\pm$ 1.2	11	2.3	1.2	1.8
Dead shrub (NL)	dead shrub (NL)	0.4 $\pm$ 0.3	3	0.2	0.3	0.2
<i>*Persicaria perfoliata</i>	mile-a-minute	0.1 $\pm$ 0.1	1	0.1	0.1	0.1
Unknown Herbaceous	unknown herbaceous	< 0.05	2	< 0.05	0.2	0.1
Unknown Grass	unknown grass	0.1 $\pm$ 0.1	1	0.1	0.1	0.1
<i>Lonicera</i> species	honeysuckle species	< 0.05	1	< 0.05	0.1	< 0.05
<i>Rosa</i> sp.	rose spp.	< 0.05	1	< 0.05	0.1	< 0.05
Unknown plant	unknown plant	< 0.05	1	< 0.05	0.1	< 0.05
Non-Vegetation		28.1 $\pm$ 2.6	124	18.5	16.4	17.4
water	water	21.5 $\pm$ 2.4	83	14.1	8.9	11.5
bare ground	bare ground	6.7 $\pm$ 1.3	70	4.4	7.5	6.0
Incidental Cover		5.9 $\pm$ 1.1	85	3.9	9.3	6.6
Wrack & litter	wrack / litter	5.7 $\pm$ 1.1	83	3.7	8.9	6.3
trash	garbage	0.2 $\pm$ 0.1	4	0.2	0.4	0.3

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Appendix A: Coordinates for nekton stations at FIIS in 2015

Table A-1. Coordinates for nekton stations sampled at FIIS site 1 in 2015, UTM, Zone 18, NAD 83, meters.

Station ID	Habitat	UTM X (east)	UTM Y (north)
F1D1_2015	Unobstructed Ditch	675947	4509941
F1D12_2015	Unobstructed Ditch	675986	4510003
F1D15_2015	Unobstructed Ditch	676040	4510024
F1D16_2015	Obstructed Ditch	676080	4509947
F1D18_2015	Unobstructed Ditch	675922	4509997
F1D19_2015	Obstructed Ditch	676089	4509927
F1D21_2015	Unobstructed Ditch	676041	4510031
F1D5_2015	Unobstructed Ditch	675935	4509969
F1D6_2015	Unobstructed Ditch	675976	4509878
F1D7_2015	Unobstructed Ditch	676064	4509833

Table A-2. Coordinates for nekton stations sampled at FIIS site 2 in 2015, UTM, Zone 18, NAD 83, meters.

Station ID	Habitat	UTM X (east)	UTM Y (north)
F2D12_2015	Unobstructed Ditch	676701	4509937
F2D15_2015	Unobstructed Ditch	676729	4509950
F2D18_2015	Unobstructed Ditch	676588	4509885
F2D20_2015	Unobstructed Ditch	676680	4509948
F2D21_2015	Obstructed Ditch	676581	4509872
F2D22_2015	Unobstructed Ditch	676560	4509872
F2D3_2015	Unobstructed Ditch	676484	4509837
F2D5_2015	Unobstructed Ditch	676673	4509924
F2D7_2015	Unobstructed Ditch	676616	4509898
F2D8_2015	Unobstructed Ditch	676644	4509911
F2P1_2015	Pool / Panne	676597	4509805
F2P2_2015	Pool / Panne	676680	4509901
F2P3_2015	Pool / Panne	676707	4509973
F2P4_2015	Pool / Panne	676721	4509981

Table A-3. Coordinates for nekton stations sampled at FIIS site 3 in 2015, UTM, Zone 18, NAD 83, meters.

Station ID	Habitat	UTM X (east)	UTM Y (north)
F3D1_2015	Unobstructed Ditch	676140	4510108
F3D10_2015	Unobstructed Ditch	676214	4510091
F3D11_2015	Unobstructed Ditch	676284	4510082
F3D13_2015	Unobstructed Ditch	676318	4510031
F3D14_2015	Unobstructed Ditch	676363	4509989
F3D3_2015	Unobstructed Ditch	676406	4510108
F3D4_2015	Unobstructed Ditch	676416	4510052
F3D5_2015	Unobstructed Ditch	676201	4510119
F3D6_2015	Unobstructed Ditch	676419	4510080
F3D8_2015	Unobstructed Ditch	676355	4510221
F3P1_2015	Pool / Panne	676299	4510040
F3P2_2015	Pool / Panne	676263	4510024
F3P3_2015	Pool / Panne	676319	4510045
F3P4_2015	Pool / Panne	676325	4510080
F3P5_2015	Pool / Panne	676398	4510047
F3P6_2015	Pool / Panne	676373	4510077

Table A-4. Coordinates for nekton stations sampled at FIIS site 4 in 2015, UTM, Zone 18, NAD 83, meters.

Station ID	Habitat	UTM X (east)	UTM Y (north)
F4D11_2015	Unobstructed Ditch	670864	4507019
F4D12_2015	Obstructed Ditch	670688	4506950
F4D13_2015	Obstructed Ditch	670691	4506924
F4D14_2015	Unobstructed Ditch	670800	4507045
F4D15_2015	Obstructed Ditch	670677	4507042
F4D18_2015	Unobstructed Ditch	670806	4506988
F4D2_2015	Obstructed Ditch	670740	4507034
F4D3_2015	Unobstructed Ditch	670862	4507036
F4D5_2015	Obstructed Ditch	670647	4506889
F4D7_2015	Obstructed Ditch	670621	4506995
F4P1_2015	Pool / Panne	670660	4506899
F4P2_2015	Pool / Panne	670689	4506914
F4P3_2015	Pool / Panne	670659	4506938
F4P4_2015	Pool / Panne	670692	4506931
F4P5_2015	Pool / Panne	670728	4506968

Table A-5. Coordinates for nekton stations sampled at FIIS site 5 in 2015, UTM, Zone 18, NAD 83, meters.

Station ID	Habitat	UTM X (east)	UTM Y (north)
F5D13_2015	Obstructed Ditch	675515	4509423
F5D14_2015	Obstructed Ditch	675470	4509437
F5D15_2015	Unobstructed Ditch	675652	4509563
F5D18_2015	Obstructed Ditch	675504	4509448
F5D20_2015	Unobstructed Ditch	675704	4509595
F5D21_2015	Unobstructed Ditch	675571	4509739
F5D22_2015	Unobstructed Ditch	675609	4509509
F5D3_2015	Unobstructed Ditch	675664	4509536
F5D5_2015	Unobstructed Ditch	675559	4509767
F5D8_2015	Unobstructed Ditch	675557	4509625

Appendix B: Coordinates for vegetation plots at FIIS in 2015

Table B-1. Coordinates for vegetation plots sampled at FIIS site 1 in 2015, UTM, Zone 18, NAD 83, meters. '*' a species listed as invasive or exotic was present (USDA 2015).

Plot ID	UTM X (east)	UTM Y (north)	Plot ID	UTM X (east)	UTM Y (north)
F1V1009	676114	4509796	F1V3909	675946	4510033
*F1V109	676118	4509740	*F1V4009	676065	4509754
F1V1209	676070	4509871	F1V409	675970	4509969
F1V1409	676045	4509852	F1V4109	675939	4510098
F1V1509	676008	4510084	F1V4209	676020	4510051
F1V1609	675970	4509925	F1V4309	675953	4510057
F1V1709	675969	4510014	F1V4409	676013	4510024
F1V1809	675981	4510027	F1V4509	676093	4509852
F1V1909	676021	4510003	F1V4609	676043	4509988
F1V2009	675943	4510084	F1V4709	675983	4509934
*F1V2109	676066	4509751	F1V4809	676142	4509807
*F1V215	676133	4509786	*F1V4909	676143	4509805
F1V2209	676036	4510007	F1V5009	676020	4509919
F1V2309	675971	4509967	F1V509	676056	4509952
*F1V2409	676089	4509731	F1V5109	676045	4509809
F1V2509	675969	4509928	F1V5209	676069	4509919
F1V2609	676024	4510041	F1V5309	675929	4510082
F1V2709	676041	4509949	F1V5409	675962	4510035
*F1V2909	676131	4509748	F1V5509	676009	4509864
F1V3009	675965	4509984	F1V5609	676038	4509959
F1V309	676029	4510028	F1V5809	676102	4509829
F1V3109	676095	4509802	F1V609	676081	4509884
F1V3209	675915	4510032	F1V709	675979	4509902
F1V3309	675975	4510043	F1V809	676043	4509856
F1V3709	675995	4509944	F1V909	676017	4509842

Table B-2. Coordinates for vegetation plots sampled at FIIS site 2 in 2015, UTM, Zone 18, NAD 83, meters. '*' a species listed as invasive or exotic was present (USDA 2015).

Plot ID	UTM X (east)	UTM Y (north)	Plot ID	UTM X (east)	UTM Y (north)
*F2V1009	676610	4509782	F2V3609	676657	4509951
F2V109	676505	4509881	F2V3709	676530	4509836
*F2V1109	676430	4509760	F2V3909	676704	4509955
F2V1209	676596	4509974	F2V4009	676607	4509871
F2V1309	676575	4509927	F2V409	676547	4509806
F2V1409	676595	4509809	F2V4309	676431	4509757
F2V1509	676638	4509816	*F2V4409	676460	4509789
F2V1609	676591	4509816	*F2V4509	676679	4509829
*F2V1709	676500	4509805	F2V4609	676574	4509847
F2V1809	676617	4509937	F2V4709	676484	4509833
*F2V1909	676474	4509766	F2V4809	676679	4509913
F2V2009	676665	4509853	F2V4909	676580	4509836
F2V209	676535	4509915	F2V5009	676722	4509838
F2V2209	676542	4509903	*F2V509	676717	4509847
F2V2309	676772	4509835	*F2V5109	676646	4509802
F2V2409	676677	4510003	F2V5209	676732	4509906
F2V2509	676631	4509829	F2V5309	676529	4509838
F2V2609	676642	4509809	F2V5509	676728	4509913
F2V2809	676614	4509859	F2V5609	676623	4509926
*F2V2909	676405	4509715	F2V5709	676608	4509952
*F2V309	676672	4509842	*F2V5909	676757	4509862
*F2V3109	676715	4509851	F2V609	676644	4509973
F2V3209	676504	4509796	F2V709	676694	4509972
F2V3409	676558	4509874	F2V809	676633	4509825
F2V3509	676611	4509864	F2V909	676506	4509794

Table B-3. Coordinates for vegetation plots sampled at FIIS site 3 in 2015, UTM, Zone 18, NAD 83, meters.

Plot ID	UTM X (east)	UTM Y (north)	Plot ID	UTM X (east)	UTM Y (north)
F3V1009	676264	4510148	F3V3509	676368	4510178
F3V1109	676385	4510096	F3V3609	676192	4510101
F3V1209	676286	4510178	F3V3709	676395	4510042
F3V1309	676357	4510098	F3V3809	676372	4510161
F3V1409	676289	4510023	F3V3909	676222	4510084
F3V1509	676285	4510182	F3V4009	676277	4510220
F3V1609	676367	4510183	F3V4109	676190	4510110
F3V1709	676171	4510068	F3V4209	676228	4510053
F3V1809	676229	4510046	F3V4309	676195	4510085
F3V1909	676269	4510121	F3V4409	676325	4510257
F3V2009	676382	4510111	F3V4509	676194	4510087
F3V2109	676366	4510049	F3V4609	676178	4510027
F3V215	676261	4510024	F3V4709	676248	4510089
F3V2209	676321	4510140	F3V4809	676258	4510179
F3V2309	676280	4510067	F3V4909	676220	4510096
F3V2409	676282	4510197	F3V5009	676303	4510233
F3V2509	676416	4510079	F3V509	676274	4510096
F3V2609	676189	4510116	F3V5109	676370	4510170
F3V2709	676302	4510095	F3V5209	676228	4510052
F3V2809	676303	4510231	F3V5309	676328	4510105
F3V2909	676326	4510255	F3V5409	676287	4510173
F3V3109	676393	4510055	F3V609	676336	4510201
F3V3209	676279	4510213	F3V709	676307	4510212
F3V3309	676190	4510107	F3V809	676336	4510062
F3V3409	676346	4510150	F3V909	676279	4510210

Table B-4. Coordinates for vegetation plots sampled at FIIS site 4 in 2015, UTM, Zone 18, NAD 83, meters. '*' a species listed as invasive or exotic was present (USDA 2015).

Plot ID	UTM X (east)	UTM Y (north)	Plot ID	UTM X (east)	UTM Y (north)
F4V1009	670747	4506994	F4V3609	670683	4507090
F4V109	670822	4507070	F4V3709	670820	4507042
F4V1109	670816	4506990	F4V3909	670711	4506984
F4V1215	670702	4506851	F4V4009	670818	4507013
F4V1309	670716	4507062	*F4V409	670846	4506910
*F4V1415	670740	4506894	F4V4109	670639	4506965
F4V1509	670679	4507030	F4V4209	670754	4507109
F4V1609	670849	4506954	F4V4309	670747	4507004
F4V1709	670893	4507076	F4V4409	670825	4507117
F4V1809	670786	4507059	F4V4509	670750	4507041
F4V1909	670610	4507051	F4V4609	670819	4507029
F4V2009	670848	4506937	F4V4809	670894	4507089
F4V209	670715	4507045	F4V4909	670819	4507030
F4V2109	670683	4507095	*F4V509	670847	4506921
F4V2209	670746	4506984	F4V5309	670709	4506955
F4V2309	670787	4507062	F4V5409	670611	4507064
F4V2509	670746	4506986	F4V5509	670641	4506991
F4V2609	670747	4507006	F4V5609	670887	4506992
F4V2909	670852	4506999	F4V5709	670678	4507023
F4V3009	670708	4506943	F4V5809	670749	4507033
F4V309	670780	4506972	F4V5909	670821	4507060
F4V3109	670883	4506930	F4V609	670848	4506933
F4V3209	670636	4506919	F4V709	670683	4507085
F4V3309	670676	4506992	F4V815	670739	4506880
F4V3509	670893	4507084	F4V909	670711	4506982

Table B-5. Coordinates for vegetation plots sampled at FIIS site 5 in 2015, UTM, Zone 18, NAD 83, meters. '*' a species listed as invasive or exotic was present (USDA 2015).

Plot ID	UTM X (east)	UTM Y (north)	Plot ID	UTM X (east)	UTM Y (north)
F5V109	675470	4509429	F5V3909	675533	4509674
F5V1209	675554	4509699	F5V4009	675520	4509526
F5V1309	675473	4509536	F5V409	675529	4509623
F5V1409	675469	4509543	F5V4109	675496	4509615
F5V1509	675492	4509454	F5V4209	675501	4509608
*F5V1709	675475	4509422	F5V4309	675649	4509509
*F5V1809	675740	4509490	F5V4409	675696	4509552
F5V1909	675514	4509478	*F5V4509	675583	4509491
F5V2009	675663	4509544	F5V4709	675661	4509547
F5V209	675618	4509608	F5V4809	675605	4509516
F5V2109	675455	4509506	F5V4909	675647	4509511
*F5V2209	675510	4509484	*F5V5009	675553	4509478
F5V2309	675532	4509619	F5V509	675499	4509555
F5V2409	675500	4509554	F5V5109	675489	4509625
F5V2509	675434	4509537	*F5V5209	675546	4509433
*F5V2609	675700	4509491	*F5V5309	675701	4509490
*F5V2709	675533	4509450	F5V5409	675574	4509670
*F5V3009	675661	4509492	F5V5509	675457	4509503
*F5V309	675718	4509521	F5V5609	675478	4509529
F5V3109	675673	4509585	*F5V5709	675531	4509454
*F5V3209	675631	4509478	F5V5909	675529	4509624
F5V3309	675500	4509666	F5V6009	675570	4509622
F5V3509	675556	4509642	F5V609	675489	4509570
F5V3609	675519	4509638	F5V709	675696	4509553
*F5V3709	675542	4509438	F5V809	675428	4509546
F5V3809	675531	4509678	F5V909	675471	4509428

Table B-6. Coordinates for vegetation plots sampled at FIIS site 6 in 2015, UTM, Zone 18, NAD 83, meters. ‘*’ a species listed as invasive or exotic in New York State was present (Invasive Plant Council of New York 2007).

Plot ID	UTM X (east)	UTM Y (north)	Plot ID	UTM X (east)	UTM Y (north)
F6V1009	687180	4514726	F6V3509	687111	4514765
F6V109	687340	4514808	F6V3609	687294	4514813
F6V1109	687337	4514804	F6V3709	687128	4514722
F6V1209	687162	4514834	F6V3809	687330	4514862
F6V1309	687352	4514892	F6V3909	686962	4514697
F6V1409	687340	4514876	F6V4009	686977	4514717
F6V1509	687419	4514848	F6V4109	687381	4514864
F6V1609	687144	4514810	F6V4209	687468	4514848
F6V1709	687129	4514722	F6V4309	687009	4514761
F6V1809	687089	4514736	F6V4409	687168	4514776
F6V1909	687358	4514899	F6V4509	687279	4514792
F6V2009	687333	4514866	F6V4609	687089	4514735
F6V209	687012	4514698	F6V4709	687249	4514752
F6V2109	687407	4514900	F6V4809	687196	4514747
F6V2209	687384	4514869	F6V4909	687084	4514728
F6V2309	687436	4514873	F6V5009	687026	4514784
F6V2409	687013	4514766	F6V509	686993	4514672
F6V2509	687251	4514822	F6V5109	686973	4514712
F6V2609	687329	4514860	F6V5209	687024	4514715
F6V2709	686945	4514741	F6V5309	687289	4514807
F6V2809	687266	4514775	F6V5409	687006	4514690
F6V2909	687436	4514872	F6V609	687409	4514835
F6V3009	687058	4514760	F6V709	687059	4514762
F6V309	687183	4514796	F6V809	687389	4514874
F6V3209	687031	4514790	F6V909	687377	4514859
F6V3409	687247	4514749			

Appendix C: Nekton density summarized by site

Table C-1. Average density and standard error [individuals per 1 m² ± SE (total count)] of nekton captured at FIIS in 2015. Data were summarized for each site and sampling event as well as both events combined. n = number of stations sampled. “*” three ditch stations were dry during Event 2.

Site	Average Density		
	[individuals per 1 m ² ± SE (total count)]		
	Event 1 (n=65)	Event 2 (n=62)*	Events 1 & 2 (n=65)
1	2.5 ± 1.7 (14)	44.8 ± 13.2 (218)	23.7 ± 8.1 (232)
2	0.7 ± 0.3 (7)	21.3 ± 4.7 (195)	11.0 ± 3.0 (202)
3	1.3 ± 0.5 (17)	40.4 ± 12.9 (299)	20.9 ± 7.3 (316)
4	1.2 ± 0.7 (10)	12.0 ± 6.8 (123)	6.6 ± 3.5 (133)
5	5.3 ± 4.3 (22)	82.6 ± 38.4 (353)	37.2 ± 18 (375)

Appendix D: Nekton species richness summarized by site and sampling event

Table D-1. (i) Species richness (observed number of species) at FIIS in 2015. Data were summarized by site. (ii) Species richness (observed number of species) at FIIS in 2015. Data are summarized by site and sampling event. '*' three ditch stations were dry during Event 2.

(i)

Site	No. of Stations	Observed No. of Species
1	10	6
2	14	4
3	16	9
4	15	6
5	10	7

(ii)

Site	Event	No. of Stations	Observed No. of Species
1	1	10	3
1	2	10	7
2	1	14	3
2	2	14	5
3	1	16	4
3	2	16	4
4	1	15	5
4	2	15	3
5	1	10	4
5	2	7*	5

Appendix E: Nekton species and community composition summarized by site and sampling event

Table E-1. (i) Nekton species and community composition at FIIS in 2015. Data were summarized by site. n = total number of nekton captured. '-' species or community was not present. (ii) Nekton species and community composition at FIIS in 2015. Data were summarized by site and sampling event. n = total number of nekton captured. '-' species or community was not present.

(i)

Life History Group/Species	Common Name	Group/Species Composition (%)				
		Site1 (n=232)	Site 2 (n=202)	Site 3 (n=316)	Site 4 (n=133)	Site 5 (n=375)
Resident Fish		47.8	75.2	85.1	39.8	33.6
<i>Fundulus heteroclitus</i>	mummichog	46.1	74.8	74.7	30.1	31.7
<i>Cyprinodon variegatus</i>	sheepshead minnow	--	--	8.2	8.3	1.3
<i>Fundulus lucia</i>	spotfin killifish	1.3	0.5	0.6	0.8	0.3
<i>Fundulus majalis</i>	striped killifish	0.4	--	1.6	--	0.3
<i>Anchoa mitchilli</i>	bay anchovy	--	--	--	0.8	--
Resident Shrimp		34.9	23.8	11.7	55.6	65.9
<i>Palaemonetes pugio</i>	daggerblade grass shrimp	34.9	23.8	11.7	55.6	65.9
Transient Fish		17.2	1.0	1.6	4.5	0.5
<i>Menidia menidia</i>	Atlantic silverside	16.8	1.0	1.6	4.5	0.3
<i>Brevoortia tyrannus</i>	Atlantic menhaden	0.4	--	--	--	0.3
Unknown		--	--	1.6	--	--
Unknown Juvenile	Unknown juvenile fish	--	--	0.9	--	--
Unknown Crab	Unknown Crab	--	--	0.3	--	--
Unknown fish	Unknown fish	--	--	0.3	--	--

Table E-1. (i) Nekton species and community composition at FIIS in 2015. Data were summarized by site. n = total number of nekton captured. '-' species or community was not present. (ii) Nekton species and community composition at FIIS in 2015. Data were summarized by site and sampling event. n = total number of nekton captured. '-' species or community was not present.

(ii)

Life History Group/Species	Common Name	Group/Species Composition (%)					
		Site 1		Site 2		Site 3	
		Event 1 (n=14)	Event 2 (n=218)	Event 1 (n=7)	Event 2 (n=195)	Event 1 (n=17)	Event 2 (n=299)
Resident Fish		92.9	45	57.1	75.9	17.6	89.0
<i>Fundulus heteroclitus</i>	mummichog	71.4	44.5	42.9	75.9	17.6	77.9
<i>Cyprinodon variegatus</i>	sheepshead minnow	--	--	--	--	--	8.7
<i>Fundulus lucia</i>	spotfin killifish	21.4	--	14.3	--	--	0.7
<i>Fundulus majalis</i>	striped killifish	--	0.5	--	--	--	1.7
<i>Anchoa mitchilli</i>	bay anchovy	--	--	--	--	--	--
Resident Shrimp		7.1	36.7	28.6	23.6	35.3	10.4
<i>Palaemonetes pugio</i>	daggerblade grass shrimp	7.1	36.7	28.6	23.6	35.3	10.4
Transient Fish		--	18.3	14.3	0.5	29.4	--
<i>Menidia menidia</i>	Atlantic silverside	--	17.9	14.3	0.5	29.4	--
<i>Brevoortia tyrannus</i>	atlantic menhaden	--	0.5	--	--	--	--
Unknown		--	--	--	--	17.6	0.7
Unknown Juvenile	Unknown juvenile fish	--	--	--	--	17.6	--
Unknown Crab	Unknown Crab	--	--	--	--	--	0.3
Unknown fish	Unknown fish	--	--	--	--	--	0.3

Life History Group/Species	Common Name	Group/Species Composition (%)			
		Site 4		Site 5	
		Event 1 (n=10)	Event 2 (n=123)	Event 1 (n=22)	Event 2 (n=353)
Resident Fish		10	42.3	68.2	31.4
<i>Fundulus heteroclitus</i>	mummichog	--	32.5	59.1	30
<i>Cyprinodon variegatus</i>	sheepshead minnow	--	8.9	4.5	1.1
<i>Fundulus lucia</i>	spotfin killifish	--	0.8	4.5	--
<i>Fundulus majalis</i>	striped killifish	--	--	--	0.3
<i>Anchoa mitchilli</i>	bay anchovy	10	--	--	--
Resident Shrimp		30	57.7	27.3	68.3
<i>Palaemonetes pugio</i>	daggerblade grass shrimp	30	57.7	27.3	68.3
Transient Fish		60	--	4.5	0.3
<i>Menidia menidia</i>	Atlantic silverside	60	--	4.5	--
<i>Brevoortia tyrannus</i>	atlantic menhaden	--	--	--	0.3
Unknown		--	--	--	--
Unknown Juvenile	Unknown juvenile fish	--	--	--	--
Unknown Crab	Unknown crab	--	--	--	--
Unknown fish	Unknown fish	--	--	--	--

Appendix F: Vegetation frequency summarized by site

Table F-1. Frequency of each plant species and non-vegetation cover type observed at FIIS in 2015. Data were summarized for each site and over all 303 plots. (NL) indicates standing non-living vegetation. '-' species or community not present. '*' species listed as invasive / exotic (USDA 2015).

Cover Type		Site (no. of plots)						
		1	2	3	4	5	6	All
Salinity Tolerance	Species	(50)	(50)	(50)	(50)	(52)	(51)	(303)
Vegetation		50	49	50	47	52	51	299
High Salinity Tolerance	High Salinity Tolerance	49	48	50	47	49	51	294
	<i>Spartina alterniflora</i>	45	23	49	35	42	51	245
	<i>Spartina alterniflora</i> (NL)	42	22	48	32	41	51	236
	<i>Salicornia</i> sp.	39	31	38	36	24	15	183
	<i>Salicornia</i> sp. (NL)	2	3	1	5	--	--	11
	<i>Spartina patens</i>	34	29	20	6	27	12	128
	<i>Spartina patens</i> (NL)	25	24	18	6	25	12	110
	<i>Limonium carolinianum</i>	--	--	--	--	--	6	6
	<i>Limonium carolinianum</i> (NL)	--	--	--	--	--	1	1
	<i>Distichlis spicata</i>	25	36	16	9	28	2	116
	<i>Distichlis spicata</i> (NL)	23	31	11	8	16	2	91
	<i>Symphyotrichum tenuifolium</i>	--	--	--	--	--	2	2
	<i>Iva frutescens</i>	3	7	--	1	1	--	12
	<i>Iva frutescens</i> (NL)	1	2	--	--	--	--	3
	<i>Juncus gerardii</i>	8	10	--	2	1	--	21
	<i>Juncus gerardii</i> (NL)	4	8	--	2	1	--	15
	<i>Schoenoplectus robustus</i>	1	1	--	--	2	--	4
	<i>Schoenoplectus robustus</i> (NL)	--	1	--	--	--	--	1
	<i>Solidago sempervirens</i>	--	7	--	3	--	--	10
	<i>Solidago sempervirens</i> (NL)	--	1	--	2	--	--	3
	<i>Suaeda maritima</i>	--	--	--	1	--	--	1
	<i>Suaeda maritima</i> (NL)	--	--	--	1	--	--	1
Medium Salinity Tolerance		2	1	--	3	5	--	11
	<i>Baccharis halimifolia</i>	--	1	--	1	1	--	3

Table F-1. (continued)

Cover Type		Site (no. of plots)						
		1 (50)	2 (50)	3 (50)	4 (50)	5 (52)	6 (51)	All (303)
Salinity Tolerance								
Species	Common Name							
<i>Juncus canadensis</i>	Canadian rush	--	--	--	--	1	--	1
<i>Kosteletzkya virginica</i>	salt marsh mallow	1	--	--	--	5	--	6
<i>Schoenoplectus americanus</i>	American bulrush	--	1	--	--	--	--	1
<i>Schoenoplectus pungens</i> var. <i>pungens</i>	common threesquare	--	--	--	--	1	--	1
<i>Schoenoplectus pungens</i> var. <i>pungens</i> (NL)	common threesquare (NL)	--	--	--	--	1	--	1
<i>Toxicodendron radicans</i>	poison ivy	1	1	--	1	--	--	3
<i>Typha angustifolia</i>	narrowleaf cattail	--	--	--	3	2	--	5
<i>Typha angustifolia</i> (NL)	narrowleaf cattail (NL)	--	--	--	3	--	--	3
Low Salinity Tolerance		7	12	--	4	14	--	37
<i>Mikania scandens</i>	climbing hempvine	--	1	--	--	--	--	1
* <i>Phragmites australis</i>	common reed	6	12	--	3	11	--	32
* <i>Phragmites australis</i> (NL)	common reed (NL)	7	11	--	2	14	--	34
<i>Pluchea odorata</i>	marsh fleabane	3	--	--	2	6	--	11
No Salinity Tolerance		1	--	--	--	--	--	1
<i>Teucrium canadense</i>	American germander	1	--	--	--	--	--	1
Unknown Salinity Tolerance		1	2	--	4	2	--	9
Dead shrub (NL)	Dead shrub (NL)	--	1	--	--	1	--	2
Dead tree (NL)	Dead tree (NL)	--	--	--	1	--	--	1
<i>Eleocharis</i> sp.	spikerush	--	1	--	--	--	--	1
Unknown algae	Unknown algae	1	--	--	3	--	--	4
Unknown Herbaceous	Unknown Herbaceous	--	--	--	--	1	--	1
Non-Vegetation		42	33	46	44	34	50	249
water	water	36	24	29	37	18	44	188
bare ground	bare ground	13	13	23	13	22	43	127
Incidental Cover		12	17	11	15	28	37	120
Wrack & litter	Wrack/Litter	11	17	11	15	27	37	118
trash	garbage	3	2	--	2	6	--	13

Appendix G: Vegetation relative percent cover summarized by site

Table G-1. Relative percent cover of each plant species and non-vegetation cover type observed at FIIS in 2015. Data were summarized for each site and over all 253 plots. (NL) indicates standing non-living vegetation. '-' species or community not present. '*' species listed as invasive / exotic (USDA 2015).

Cover Type	Salinity Tolerance	Species	Common Name	Relative % Cover					All	
				Site (No. of Plots)						
				1	2	3	4	5		6
				(50)	(50)	(50)	(50)	(52)	(51)	(303)
Vegetation				86.7	81.4	83.3	63.4	83.4	71.9	78.5
High Salinity Tolerance				82.7	78.8	83.3	54.7	73.9	71.9	74.5
		<i>Spartina alterniflora</i>	saltmarsh cordgrass	39	19.3	41.7	30.4	36.7	56.6	37.1
		<i>Spartina alterniflora</i> (NL)	saltmarsh cordgrass (NL)	13.9	9.5	20.5	6.8	9.4	6.5	11.3
		<i>Spartina patens</i>	salt meadow cordgrass	13.4	14.1	6.6	4.6	14.4	3.4	9.5
		<i>Spartina patens</i> (NL)	salt meadow cordgrass (NL)	2.6	2.9	2.0	0.3	3.7	1.9	2.2
		<i>Distichlis spicata</i>	spikegrass	5.2	16.9	6.5	2.5	6.1	0.3	6.4
		<i>Distichlis spicata</i> (NL)	spikegrass (NL)	2.0	5.2	2.1	0.6	1.2	0.1	1.9
		<i>Salicornia</i> sp.	glasswort species	3.7	2.9	3.8	7.1	1.1	1.6	3.3
		<i>Salicornia</i> sp. (NL)	glasswort species (NL)	0.1	0.1	< 0.05	0.3	--	--	0.1
		<i>Juncus gerardii</i>	black grass	1.2	4.5	--	0.5	0.7	--	1.2
		<i>Juncus gerardii</i> (NL)	black grass (NL)	0.2	1.2	--	0.1	0.3	--	0.3
		<i>Iva frutescens</i>	marsh elder	1.3	1.5	--	0.6	0.3	--	0.6
		<i>Iva frutescens</i> (NL)	marsh elder	< 0.05	0.1	--	--	--	--	< 0.05
		<i>Solidago sempervirens</i>	seaside goldenrod	--	0.5	--	0.6	--	--	0.2
		<i>Solidago sempervirens</i> (NL)	seaside goldenrod (NL)	--	< 0.05	--	0.1	--	--	0
		<i>Limonium carolinianum</i>	sea lavender	--	--	--	--	--	0.9	0.1
		<i>Limonium carolinianum</i> (NL)	sea lavender (NL)	--	--	--	--	--	0.1	< 0.05
		<i>Schoenoplectus robustus</i>	saltmarsh bulrush	< 0.05	< 0.05	--	--	0.3	--	0.1
		<i>Schoenoplectus robustus</i> (NL)	saltmarsh bulrush (NL)	--	< 0.05	--	--	--	--	< 0.05
		<i>Symphyotrichum tenuifolium</i>	perennial saltmarsh aster	--	--	--	--	--	0.5	0.1
		<i>Suaeda maritima</i>	herbaceous seepweed	--	--	--	0.3	--	--	< 0.05
		<i>Suaeda maritima</i> (NL)	herbaceous seepweed (NL)	--	--	--	0.1	--	--	< 0.05
Medium Salinity Tolerance				0.5	1.5	--	5.2	2.9	--	1.6
		<i>Baccharis halimifolia</i>	eastern baccharis	--	0.6	--	1.1	0.3	--	0.3
		<i>Baccharis halimifolia</i> (NL)	eastern baccharis (NL)	--	0.2	--	0.1	--	--	0.1

Table G-1. (continued)

Cover Type			Relative % Cover						
			Site (No. of Plots)						
Salinity Tolerance			1	2	3	4	5	6	All
Species	Common Name		(50)	(50)	(50)	(50)	(52)	(51)	(303)
<i>Typha angustifolia</i>	narrowleaf cattail		--	--	--	2.0	0.1	--	0.3
<i>Typha angustifolia</i> (NL)	narrowleaf cattail (NL)		--	--	--	1.8	--	--	0.3
<i>Toxicodendron radicans</i>	poison ivy		0.3	0.6	--	0.3	--	--	0.2
<i>Schoenoplectus pungens</i> var. <i>pungens</i>	common threesquare		--	--	--	--	0.3	--	< 0.05
<i>Schoenoplectus pungens</i> var. <i>pungens</i> (NL)	common threesquare (NL)		--	--	--	--	0.7	--	0.1
<i>Juncus canadensis</i>	Canadian rush		--	--	--	--	0.1	--	< 0.05
<i>Schoenoplectus americanus</i>	American bulrush		--	< 0.05	--	--	--	--	< 0.05
Low Salinity Tolerance			2.4	1.0	--	0.5	6.5	--	1.7
<i>Phragmites australis</i>	common reed		1.7	0.8	--	0.3	4.7	--	1.2
<i>Phragmites australis</i> (NL)	common reed (NL)		0.4	0.2	--	0.1	1.3	--	0.3
<i>Pluchea odorata</i>	marsh fleabane		0.4	--	--	0.1	0.5	--	0.2
<i>Mikania scandens</i>	climbing hempvine		--	< 0.05	--	--	--	--	< 0.05
No Salinity Tolerance			< 0.05	--	--	--	--	--	< 0.05
<i>Teucrium canadense</i>	American germander		< 0.05	--	--	--	--	--	< 0.05
Unknown Salinity Tolerance			1	0.1	--	3.1	0.1	--	0.7
Unknown algae	unknown algae		1	--	--	2.8	--	--	0.6
Dead shrub (NL)	dead shrub (NL)		--	< 0.05	--	--	0.1	--	< 0.05
Dead tree (NL)	dead tree (NL)		--	--	--	0.3	--	--	< 0.05
<i>Eleocharis</i> sp.	spikerush		--	< 0.05	--	--	--	--	< 0.05
Unknown Herbaceous	unknown Herbaceous		--	--	--	--	0.1	--	< 0.05
Non-Vegetation			10.6	14.6	14.5	33.5	5.9	23.7	17.0
water	water		9.2	12.5	12.4	31.9	4	13.2	13.8
bare ground	bare ground		1.4	2.1	2.1	1.6	1.9	10.5	3.2
Incidental Cover			2.7	4.0	2.2	3.0	10.7	4.4	4.4
Wrack & litter	wrack / litter		2.3	3.3	2.2	3.0	10.1	4.4	4.2
trash	garbage		0.4	0.7	--	0.1	0.5	--	0.3

Appendix H: Coordinates for nekton stations at WFE in 2015

Table H-1. Coordinates for nekton stations sampled at WFE site 1 in 2015, UTM, Zone 18, NAD 83, meters.

Station ID	Habitat	UTM X (east)	UTM Y (north)
WF1D1_2015	Obstructed Ditch	683781	4514427
WF1D10_2015	Unobstructed Ditch	683873	4514331
WF1D13_2015	Obstructed Ditch	683599	4514509
WF1D15_2015	Obstructed Ditch	683749	4514358
WF1D16_2015	Unobstructed Ditch	683890	4514305
WF1D19_2015	Obstructed Ditch	683643	4514395
WF1D3_2015	Obstructed Ditch	683671	4514382
WF1D5_2015	Obstructed Ditch	683817	4514386
WF1D7_2015	Obstructed Ditch	683638	4514507
WF1D8_2015	Unobstructed Ditch	683857	4514357
WF1P1_2015	Pool / Panne	683754	4514424
WF1P2_2015	Pool / Panne	683729	4514449
WF1P3_2015	Pool / Panne	683712	4514475
WF1P4_2015	Pool / Panne	683668	4514389
WF1P5_2015	Pool / Panne	683632	4514420

Table H-2. Coordinates for nekton stations sampled at WFE site 2 in 2015, UTM, Zone 18, NAD 83, meters.

Station ID	Habitat	UTM X (east)	UTM Y (north)
WF2D11_2015	Unobstructed Ditch	684329	4514622
WF2D14_2015	Unobstructed Ditch	684238	4514706
WF2D15_2015	Unobstructed Ditch	684247	4514740
WF2D16_2015	Obstructed Ditch	684251	4514777
WF2D19_2015	Obstructed Ditch	684268	4514769
WF2D2_2015	Unobstructed Ditch	684261	4514685
WF2D20_2015	Unobstructed Ditch	684279	4514608
WF2D25_2015	Unobstructed Ditch	684182	4514634
WF2D4_2015	Unobstructed Ditch	684237	4514626
WF2D5_2015	Unobstructed Ditch	684344	4514564
WF2P1_2015	Pool / Panne	684253	4514666
WF2P2_2015	Pool / Panne	684231	4514728
WF2P3_2015	Pool / Panne	684226	4514775

Table H-3. Coordinates for nekton stations sampled at WFE site 3 in 2015, UTM, Zone 18, NAD 85, meters.

Station ID	Habitat	UTM X (east)	UTM Y (north)
WF3D1_2015	Unobstructed Ditch	684120	4514486
WF3D10_2015	Unobstructed Ditch	683851	4514590
WF3D11_2015	Unobstructed Ditch	684143	4514465
WF3D13_2015	Obstructed Ditch	684266	4514353
WF3D19_2015	Unobstructed Ditch	684099	4514484
WF3D2_2015	Unobstructed Ditch	683884	4514566
WF3D20_2015	Obstructed Ditch	683884	4514566
WF3D22_2015	Unobstructed Ditch	683923	4514568
WF3D24_2015	Unobstructed Ditch	684041	4514475
WF3D3_2015	Unobstructed Ditch	683960	4514575

Appendix I: Coordinates for vegetation plots at WFE in 2015

Table I-1. Coordinates for vegetation plots sampled at WFE site 1 in 2015, UTM, Zone 18, NAD 83, meters. '*' a species listed as invasive or exotic was present (USDA 2015).

Plot ID	UTM X (east)	UTM Y (north)	Plot ID	UTM X (east)	UTM Y (north)
WF1V1009	683820	4514407	*WF1V3609	683706	4514453
WF1V109	683790	4514397	WF1V3709	683778	4514433
WF1V1109	683673	4514359	*WF1V3909	683676	4514441
*WF1V1209	683694	4514485	WF1V4009	683651	4514420
WF1V1309	683671	4514553	WF1V409	683600	4514378
*WF1V1409	683653	4514510	*WF1V4109	683799	4514371
WF1V1509	683632	4514382	WF1V4209	683609	4514353
WF1V1609	683740	4514448	WF1V4309	683671	4514363
*WF1V1709	683656	4514499	WF1V4409	683717	4514323
*WF1V2009	683725	4514397	WF1V4509	683777	4514338
WF1V209	683730	4514384	*WF1V4609	683589	4514411
*WF1V2109	683825	4514391	WF1V4709	683689	4514500
WF1V2209	683611	4514345	WF1V4809	683901	4514268
*WF1V2309	683706	4514452	WF1V4909	683868	4514265
*WF1V2409	683635	4514467	*WF1V5009	683688	4514503
*WF1V2609	683666	4514471	WF1V509	683829	4514381
WF1V2709	683911	4514240	WF1V5109	683857	4514299
*WF1V2809	683719	4514414	WF1V5309	683832	4514371
WF1V2909	683849	4514323	WF1V5409	683660	4514395
*WF1V3009	683772	4514353	WF1V5509	683743	4514344
WF1V309	683738	4514360	WF1V5609	683581	4514337
WF1V3109	683740	4514354	WF1V609	683685	4514511
WF1V3209	683913	4514232	*WF1V709	683727	4514392
*WF1V3309	683700	4514469	WF1V809	683620	4514415
WF1V3409	683715	4514521	WF1V909	683656	4514406
WF1V3509	683923	4514203			

Appendix J: Nekton density summarized by site

Table J-1. (i) Average density and standard error [individuals per 1 m² ± SE (total count)] of nekton captured at WFE in 2015. Data are summarized by site and sampling event as well as both events combined. n = number of stations sampled. (ii) Number of nekton stations summarized by site and sampling event. '*' indicates 3 stations not sampled due to lack of water.

(i)

Average Density			
[individuals per 1 m ² ± SE (total count)]			
Site	Event 1 (n=35)	Event 2 (n=38)	Events 1 & 2 (n=35)
1	13.3 ± 7.0 (108)	15.7 ± 7.8 (180)	14.6 ± 5.2 (288)
2	10.7 ± 5.6 (119)	175.7 ± 127.0 (1810)	93.2 ± 64.4 (1929)
3	36.4 ± 13.6 (256)	101.0 ± 31.3 (758)	68.7 ± 18.2 (1014)

(ii)

Site	Event	No. of Stations
1	1	12*
1	2	15
2	1	13
2	2	13
3	1	10
3	2	10

Appendix K: Nekton species richness summarized by site and sampling event

Table K-1. (i) Species richness (observed number of species) at WFE in 2015. Data are summarized by site. (ii) Species richness (observed number of species) at WFE in 2015. Data are summarized by site and sampling event. '*' indicates 3 stations not sampled due to lack of water.

(i)

Site	No. of Stations	Observed No. of Species
1	15	8
2	13	6
3	10	6

(ii)

Site	Event	No. of Stations	Observed No. of Species
1	1	12*	6
1	2	15	5
2	1	13	6
2	2	13	6
3	1	10	5
3	2	10	4

Appendix L: Nekton species and community composition summarized by site and sampling event

Table L-1. (i) Nekton species and community composition at WFE in 2015. Data are summarized by site. n = total number of nekton captured. '-' species or community was not present. (ii) Nekton species and community composition at WFE in 2015. Data are summarized by site and sampling event. n = total number of nekton captured. '-' species or community was not present. '*' indicates an invasive species (nyis.info).

(i)

Life History Group/Species	Common Name	Group/Species Composition (%)		
		Site 1 (288)	Site 2 (1929)	Site 3 (1014)
Resident Crustacean		0.3	--	--
<i>Carcinus maenas</i>	green crab	0.3	--	--
Resident Fish		59.7	19.1	10.7
<i>Fundulus heteroclitus</i>	mummichog	56.9	17.7	9.5
<i>Cyprinodon variegatus</i>	sheepshead minnow	2.1	1.4	--
<i>Fundulus majalis</i>	striped killifish	--	--	1.2
<i>Fundulus lucia</i>	spotfin killifish	0.3	0.1	0.1
<i>Lucania parva</i>	rainwater killifish	0.3	--	--
Resident Shrimp		34.7	79.6	86.1
<i>Palaemonetes pugio</i>	daggerblade grass shrimp	34.7	79.6	86.1
Transient Crustacean	Transient Crustacean	--	--	0.2
<i>Callinectes sapidus</i>	blue crab	--	--	0.2
Transient Fish		3.1	1.2	3.0
<i>Menidia menidia</i>	Atlantic silverside	3.1	1.2	3.0
Unknown Life History Group		2.1	0.1	--
<i>Hemigrapsus sanguineus</i>	Asian shore crab	2.1	--	--
Unknown Juvenile	unknown juvenile fish	--	0.1	--

Table L-1. (continued)

(ii)

Life History Group/Species	Common Name	Group/Species Composition (%)					
		Site 1		Site 2		Site 3	
		Event 1 (108)	Event 2 (180)	Event 1 (119)	Event 2 (1810)	Event 1 (256)	Event 2 (758)
Resident Crustacean		--	0.6	--	--	--	--
<i>Carcinus maenas</i>	green crab	--	0.6	--	--	--	--
Resident Fish		70.4	53.3	47.9	17.2	16.4	8.8
<i>Fundulus heteroclitus</i>	mummichog	67.6	50.6	43.7	16.0	11.3	8.8
<i>Cyprinodon variegatus</i>	sheepshead minnow	0.9	2.8	3.4	1.3	--	--
<i>Fundulus majalis</i>	striped killifish	--	--	--	--	4.7	--
<i>Fundulus lucia</i>	spotfin killifish	0.9	--	0.8	--	0.4	--
<i>Lucania parva</i>	rainwater killifish	0.9	--	--	--	--	--
Resident Shrimp		24.1	41.1	42	82	71.9	90.9
<i>Palaemonetes pugio</i>	daggerblade grass shrimp	24.1	41.1	42	82	71.9	90.9
Transient Crustacean		--	--	--	--	0.4	0.1
<i>Callinectes sapidus</i>	blue crab	--	--	--	--	0.4	0.1
Transient Fish		5.6	1.7	10.1	0.6	11.3	0.1
<i>Menidia menidia</i>	Atlantic silverside	5.6	1.7	10.1	0.6	11.3	0.1
Unknown Life History Group		--	3.3	--	0.1	--	--
<i>*Hemigrapsus sanguineus</i>	Asian shore crab	--	3.3	--	--	--	--
Unknown Juvenile	Unknown juvenile fish	--	--	--	0.1	--	--

Appendix M: Vegetation frequency summarized by site

Table M-1. Frequency of each species and cover type observed at WFE in 2015. Data were summarized for each site and over all 151 plots. (NL) indicates standing non-living vegetation. '*' species is invasive or exotic (USDA 2015).

Cover Type		Site (no. of plots)			
Salinity Tolerance					
Species	Common Name	1 (51)	2 (50)	3 (50)	All (151)
Vegetation		48	50	47	145
High Salinity Tolerance		46	48	45	139
<i>Spartina alterniflora</i>	saltmarsh cordgrass	33	45	44	122
<i>Spartina alterniflora</i> (NL)	saltmarsh cordgrass (NL)	32	43	44	119
<i>Salicornia</i> sp.	glasswort species	28	31	36	95
<i>Salicornia</i> sp. (NL)	glasswort species (NL)	2	4	2	8
<i>Spartina patens</i>	salt meadow cordgrass	10	14	21	45
<i>Spartina patens</i> (NL)	salt meadow cordgrass (NL)	9	14	19	42
<i>Distichlis spicata</i>	spikegrass	30	19	20	69
<i>Distichlis spicata</i> (NL)	spikegrass (NL)	23	14	10	47
<i>Iva frutescens</i>	marsh elder	17	3	4	24
<i>Iva frutescens</i> (NL)	marsh elder (NL)	4	1	--	5
<i>Limonium carolinianum</i>	sea lavender	--	2	1	3
<i>Limonium carolinianum</i> (NL)	sea lavender (NL)	--	--	1	1
<i>Suaeda maritima</i>	herbaceous seepweed	--	--	1	1
<i>Symphyotrichum tenuifolium</i>	perennial saltmarsh aster	--	--	1	1
<i>Atriplex patula</i>	spreading orache	--	1	--	1
<i>Juncus gerardii</i>	black grass	9	--	--	9
<i>Juncus gerardii</i> (NL)	black grass (NL)	9	--	--	9

Table M-1. (continued)

Cover Type		Site (no. of plots)			
Salinity Tolerance					
Species	Common Name	1 (51)	2 (50)	3 (50)	All (151)
<i>Solidago sempervirens</i>	seaside goldenrod	3	2	--	5
Medium Salinity Tolerance		3	3	--	6
<i>Baccharis halimifolia</i>	Eastern baccharis	2	1	--	3
<i>Elaeagnus umbellata</i>	autumn olive	--	1	--	1
<i>Lepidium species</i>	pepperweed species	1	--	--	1
<i>Schoenoplectus pungens</i> var. <i>pungens</i>	common threesquare	1	1	--	2
<i>Toxicodendron radicans</i>	poison ivy	1	--	--	1
Low Salinity Tolerance		17	7	4	28
<i>Phragmites australis</i>	common reed	17	7	3	27
<i>Phragmites australis</i> (NL)	common reed (NL)	15	5	4	24
<i>Pluchea odorata</i>	marsh fleabane	--	--	1	1
<i>Mikania scandens</i>	climbing hempvine	1	--	--	1
No Salinity Tolerance		2	2	--	4
<i>Elymus virginicus</i>	Virginia Rye Grass	1	--	--	1
<i>Parthenocissus quinquefolia</i>	Virginia creeper	--	1	--	1
<i>Smilax rotundifolia</i>	common greenbrier	--	1	--	1
<i>Smilax rotundifolia</i> (NL)	common greenbrier (NL)	1	--	--	1
<i>Solidago rugosa</i>	wrinkle-leaved goldenrod	--	1	--	1
<i>Teucrium canadense</i>	American germander	1	2	--	3
<i>Vitis rotundifolia</i>	muscadine Grape	1	--	--	1

Table M-1. (continued)

Cover Type		Site (no. of plots)			
Salinity Tolerance					
Species	Common Name	1 (51)	2 (50)	3 (50)	All (151)
Unknown Salinity Tolerance		8	4	3	15
Unknown algae	unknown algae	6	2	3	11
Dead shrub (NL)	dead shrub (NL)	2	1	--	3
<i>Lonicera</i> species	honeysuckle species	--	1	--	1
<i>Persicaria perfoliata</i>	mile-a-minute	--	1	--	1
<i>Rosa</i> sp.	rose spp.	1	--	--	1
Unknown Herbaceous	unknown herbaceous	1	1	--	2
Unknown plant	unknown plant	--	1	--	1
Unknown Grass	unknown grass	--	1	--	1
Non-Vegetation		34	46	44	124
water	water	25	29	29	83
bare ground	bare ground	18	27	25	70
Incidental Cover		31	31	23	85
Wrack & litter	wrack / litter	30	31	22	83
trash	garbage	2	1	1	4

Appendix N: Vegetation relative percent cover summarized by site

Table N-1. Relative percent cover of each species and cover type observed at WFE in 2015. Data were summarized by site and over all 151 plots. (NL) indicates standing non-living vegetation. “*” species is invasive or exotic (USDA 2015).

Cover Type		Relative Cover %			
Salinity Tolerance		Site (No. of Plots)			
Species	Common Name	1 (51)	2 (50)	3 (50)	All (151)
Vegetation		80.9	80.2	72	77.6
High Salinity Tolerance		73.7	71.7	66.4	70.6
<i>Spartina alterniflora</i>	saltmarsh cordgrass	22.9	30.5	27.5	27
<i>Spartina alterniflora</i> (NL)	saltmarsh cordgrass (NL)	21.1	21.8	21	21.3
<i>Spartina patens</i>	salt meadow cordgrass	4.5	5.3	9.1	6.3
<i>Spartina patens</i> (NL)	salt meadow cordgrass (NL)	1.8	2	2.8	2.2
<i>Distichlis spicata</i>	spikegrass	8.1	5.5	2.6	5.4
<i>Distichlis spicata</i> (NL)	spikegrass (NL)	5.2	2.2	0.8	2.7
<i>Iva frutescens</i>	marsh elder	3.5	1.2	0.2	1.6
<i>Iva frutescens</i> (NL)	marsh elder (NL)	0.5	0.8	--	0.4
<i>Salicornia sp.</i>	glasswort species	1.7	1.1	1.7	1.5
<i>Salicornia sp.</i> (NL)	glasswort species (NL)	0.1	0.1	0.1	0.1
<i>Juncus gerardii</i>	black grass	3.1	--	--	1.0
<i>Juncus gerardii</i> (NL)	black grass (NL)	0.9	--	--	0.3
<i>Limonium carolinianum</i>	sea lavender	--	0.8	0.5	0.4
<i>Limonium carolinianum</i> (NL)	sea lavender (NL)	--	--	< 0.05	< 0.05
<i>Solidago sempervirens</i>	seaside goldenrod	0.3	0.2	--	0.2
<i>Atriplex patula</i>	spreading orache	--	< 0.05	--	< 0.05

Table N-1. (continued)

Cover Type		Relative Cover %			
Salinity Tolerance		Site (No. of Plots)			
Species	Common Name	1 (51)	2 (50)	3 (50)	All (151)
<i>Suaeda maritima</i>	herbaceous seepweed	--	--	< 0.05	< 0.05
<i>Symphyotrichum tenuifolium</i>	perennial saltmarsh aster	--	--	< 0.05	< 0.05
Medium Salinity Tolerance		0.8	1.6	--	0.8
<i>Elaeagnus umbellata</i>	autumn olive	--	1.2	--	0.4
<i>Baccharis halimifolia</i>	eastern baccharis	0.7	0.2	--	0.3
<i>Schoenoplectus pungens</i> var. <i>pungens</i>	common threesquare	< 0.05	0.2	--	0.1
<i>Lepidium species</i>	pepperweed species	< 0.05	--	--	< 0.05
<i>Toxicodendron radicans</i>	poison ivy	< 0.05	--	--	< 0.05
Low Salinity Tolerance		1.9	3.7	2.9	2.8
<i>Phragmites australis</i>	common reed	1.5	3	1.8	2.1
<i>Phragmites australis</i> (NL)	common reed (NL)	0.4	0.7	0.9	0.7
<i>Pluchea odorata</i>	marsh fleabane	--	--	0.2	0.1
<i>Mikania scandens</i>	climbing hempvine	< 0.05	--	--	< 0.05
No Salinity Tolerance		0.4	1.6	--	0.7
<i>Teucrium canadense</i>	American germander	0.2	1.2	--	0.5
<i>Elymus virginicus</i>	Virginia Rye Grass	0.2	--	--	0.1
<i>Parthenocissus quinquefolia</i>	Virginia creeper	--	0.2	--	0.1
<i>Solidago rugosa</i>	wrinkle-leaved goldenrod	--	0.2	--	0.1
<i>Smilax rotundifolia</i>	common greenbrier	--	< 0.05	--	< 0.05
<i>Smilax rotundifolia</i> (NL)	common greenbrier (NL)	< 0.05	--	--	< 0.05
<i>Vitis rotundifolia</i>	muscadine Grape	< 0.05	--	--	< 0.05

Table N-1. (continued)

Cover Type		Relative Cover %			
Salinity Tolerance		Site (No. of Plots)			
Species	Common Name	1 (51)	2 (50)	3 (50)	All (151)
Unknown Salinity Tolerance		4.1	1.6	2.7	2.8
Unknown algae	unknown algae	3.3	1.0	2.7	2.3
Dead shrub (NL)	dead shrub (NL)	0.7	< 0.05	--	0.2
<i>Persicaria perfoliata</i>	mile-a-minute	--	0.2	--	0.1
Unknown Grass	unknown grass	--	0.2	--	0.1
<i>Lonicera</i> species	honeysuckle species	--	< 0.05	--	< 0.05
<i>Rosa</i> sp.	rose spp.	< 0.05	--	--	< 0.05
Unknown Herbaceous	unknown Herbaceous	< 0.05	< 0.05	--	< 0.05
Unknown plant	unknown plant	--	< 0.05	--	< 0.05
Non-Vegetation		14.8	15.4	25.0	18.5
water	water	12.1	10.4	19.6	14.1
bare ground	bare ground	2.7	5.0	5.4	4.4
Incidental Cover		4.3	4.4	3.0	3.9
Wrack & litter	wrack / litter	4.2	4.2	2.8	3.7
trash	garbage	< 0.05	0.2	0.2	0.2

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