

**Assessment of State Rare Plant Populations at Cove Point Marsh and List of
Herbaceous Plant Species Observed
(Year 2011)**

Submitted by Brent W. Steury, 3 February, 2012

The 2011 survey was expanded to include the entire marsh at Cove Point. Cove Point Marsh is located in Calvert County, Maryland, northeast of Cove Point Road, on the Dominion Liquefied Natural Gas property. The swamp forests adjacent to the marsh were not surveyed in total; however rare plant populations known from swamp areas were assessed. Past versions of this report have only included surveys of the marsh area along the marsh / beach dune ecotone and in nearby swamp forests, because the yearly possibility of treating with herbicide the invasive *Phragmites* population in this area necessitated pinpointing rare plant populations to be avoided. 2011 surveys were conducted on 26 May, 10 June, 22 July, 2 and 15 September, and 19 October.

Species still listed as rare by the State of Maryland that have been routinely found during the last 15 years within this ecotone and swamp forest include *Carex hyalinolepis* (S2S3), *Scutellaria galericulata* (S1), and *Zizaniopsis miliacea* (S1). Additionally, during surveys on September 24, 2008 and June 9, 2009, two additional State listed species *Oldenlandia uniflora* (S3) and *Sesuvium maritimum* (S1), were found in Cove Point Marsh, after a breach of the barrier dune at Cove Point in 2007 converted the marsh from a freshwater system to a brackish water system. This breach was sealed in 2010 by the construction of a rip-rap breakwater off shore and replenishing the dune with imported sand. In 2011 the marsh is rapidly returning to a freshwater system, however much of the herbaceous plant diversity once found in the marsh has been lost due to the brackish water intrusion. This includes seven species of State listed plants *Bidens discoidea* (S3), *Eleocharis flavescens* (S1), *Eleocharis tortilis* (S3), *Fuirena pumila* (S2S3), *Lemna trisulca* (S1), *Potamogeton foliosus* (S1), and *Rhynchospora glomerata* (S3). Although *Rhynchospora glomerata* and *Eleocharis tortilis* are still known from low lying areas just outside Cove Point Marsh, they are now absent from the marsh. *Potamogeton foliosus* had not been observed in the marsh for many years, even prior to the brackish water intrusion, probably due to increasing sedimentation and drought at the site where it occurred. Additionally, *Oldenlandia uniflora* has not been relocated since the year it was discovered and *Sesuvium maritimum*, a brackish water species that was thriving in the marsh after the breach of the barrier dune, is now nearly extirpated since the construction of the breakwater. Other brackish water species that were colonizing Cove Point Marsh after the dune breach such as *Salicornia europaea* and *Spartina alterniflora* are now absent in the marsh, and *Aster subulatus*, abundant after the breach, is now very rare. *Spartina alterniflora* has been planted on the bay side of the dune as part of the dune restoration, and it is thriving there.

The inventory of herbaceous plants in Cove Point Marsh in 2011, since the marsh has largely reverted back to a freshwater system, relocated populations of four species of State listed plants, *Ammannia latifolia* (S2), *Fraxinus profunda* (S2S3), *Limnobium spongia* (S1), and *Polygonum densiflorum* (S1?), two of which, *Limnobium*

spongia and *Polygonum densiflorum*, had not been observed in the marsh for at least fifteen years. The population of *Fraxinus profunda*, which once provided shade for a number of other vascular plant species along the southeastern edge of Cove Point Marsh, was decimated by the brackish water intrusion and now survives as just a few, unhealthy, individuals.

The following State rare plants were located during the 2011 survey. Their population assessments are as follows:

Ammannia latifolia:

Surprisingly, this species, not observed since the brackish water intrusion, was found in abundance along the western shore of the marsh, adjacent to the upland area, on loosely consolidated, developing peat mats. On 15 September, the largest population, contained at least 100 plants, the smaller population contained at least 17 plants. Due to the quicksand like nature of the substrate, the length and width of the population could not be measured, but the larger population (most northerly) was estimated to have a maximum length and width of 7 m x 3 m and the smaller population to the south was estimated to be 3 m x 1.5 m. The maximum number of fruiting stems observed within a square meter of the population was estimated to be 30. All plants were in flower and fruit on 15 September. See attached map and GPS coordinates in Table I for locations of these populations.

Carex hyalinolepis:

The size of the two populations at Cove Point were measured with GPS on 26 May, 2011. The sandy dune that separates the marsh from the Chesapeake Bay is moving toward the marsh and is now on top of the *Carex hyalinolepis* population which in 2007 was observed along the marsh / dune ecotone and historically was found in Cove Point Marsh. Most of the *Carex hyalinolepis* population now occurs on the dune between the Chesapeake Bay and Cove Point Marsh. GPS measurements in 2011 show a length of 16.8 m and a width of 8 m for this population (see attached map). The maximum number of fruiting stems observed within a square meter of the population was 11. The estimated average number of fruiting stems per square meter was 0.3. A much larger population of *Carex hyalinolepis* at the end of Webster Drive on the southeastern end of the marsh discovered during the 2009 inventory measured 30.4 m x 14.3 m using GPS (see attached maps). The decline in the size of this population from 380 ft. x 102 ft measured in 2010 is certainly a factor of GPS inconsistency rather than any real decline in the plant population. The maximum number of fruiting stems observed within a square meter of the population was twenty-five. The estimated average number of fruiting stems per square meter was two. See attached map and GPS coordinates in Table I for locations of center points of these populations.

Since the construction of the breakwater, the area of dune containing the *Carex hyalinolepis* population is quickly eroding (probably because it is at the southern end of

the constructed breakwater) and Eastern red-cedar and Tree-of-heaven that had been growing on this area of dune since 1996, are now up-rooted.

It is unknown whether the *Carex hyalinolepis* population on the dune will be able to survive in the much drier conditions since it is a species generally found in marshes. The population at the end of Webster Drive seems secure. Most of the plant species currently associated with the *Carex hyalinolepis* population on the dune are species typically found in dry upland sites such as *Rubus*, *Lonicera japonica*, *Toxicodendron radicans*, and *Vitis labrusca*. Some stems of *Phragmites* that were also found within the *Carex hyalinolepis* population are probably plants that were in the marsh in 2007, but are now covered by the dune.

Fraxinus profunda:

As recently as 2005, this species formed a large contiguous population along the southeastern shore of Cove Point. Under the once shady canopy of these trees also existed a number of other State listed species such as *Bidens discoidea*, *Lemna trisulca*, *Limnobia spongia*, and *Polygonum densiflorum*. The breaches of the dune in 2006 and 2007 and the associated brackish water influx decimated this population of trees. Now only a few scattered individuals survive, and they are all in poor health.

Limnobia spongia:

A small population of this species was found along the southern edge of the marsh on 26 May, 2011. It had not been observed since it was first found near this same site in 1996. At that time 1000 plants were reported from five sites. In 2011, two patches of not more than five plants each were observed. All plants were vegetative. See attached map and GPS coordinates in Table I for locations of these populations.

Polygonum densiflorum:

One population (17 plants) of this species was found on 15 September along the southeastern edge of the marsh on the hummock of a now dead *Fraxinus profunda*. It had not been observed since it was first found in this area in 1996, when 75 stems were reported from one site. All 17 plants were in flower and fruit. See attached map and GPS coordinates in Table I for the location of this population.

Scutellaria galericulata:

On 10 June, 2011, nine plants of the species were observed over 3 m x 2 m along the boardwalk at Cove Point Marsh. No plants were observed in flower or fruit. On 2 September, 2011, no plants were observed in this same area, despite routinely being found in September on numerous previous surveys. The large mats of peat that were deposited on the eastern end of the population during hurricane Isabelle in 2005 have changed the microtopography and probably the hydrology of this site to the species detriment. In 1996, 300 stems were observed in the population. For the first time, a

second population (3 stems) was found at Cove Point on 26 May, 2011, at the northern most edge of the marsh. Unfortunately, in August, 2011, tropical storm Irene deposited about 0.5 m of sand on this population and it was not found on any subsequent site visits. See attached map and GPS coordinates in Table I for locations of these populations.

Sesuvium maritimum:

During the 2009 survey, a large population (estimated to occupy nearly an acre of the marsh) of *Sesuvium maritimum* a State endangered (S1) species was found for the first time at Cove Point. *Sesuvium maritimum* is a brackish water species. The construction of the breakwater and subsequent conversion of the marsh back to a freshwater system has nearly extirpated this species from the marsh. On 22 July, 2011, only 8 plants were found, near where the main breach occurred. It is unlikely that these plants will persist during the transition back to a freshwater marsh. See attached map and GPS coordinates in Table I for the location of this population.

Zizaniopsis miliacea:

This population was measured on 10 June, 2011. The maximum length measured with GPS was 57.1 m x 11.3 m. This is a decline from the 255 ft. x 80 ft. measurements taken in 2010 and could be a factor of GPS readings, however the population has been shrinking along its northeastern edge. The maximum number of fruiting stems per square meter was three. The estimated average number of fruiting stems per square meter was 0.6. See attached map and GPS coordinates in Table I for the location of this population. *Phragmites australis* was thick on the north and east sides of the *Zizaniopsis miliacea* population and is commingled with it. Treating the *Phragmites* by hand with herbicide is recommended in this area.

Table I.

-76.39819	38.3901	<i>Sesuvium maritimum</i>
-76.38997	38.38781	<i>Carex hyalinolepsis</i>
-76.39193	38.38238	<i>Carex hyalinolepsis</i>
-76.39184	38.38254	<i>Limnobium spongia</i>
-76.39223	38.38217	<i>Limnobium spongia</i>
-76.39631	38.38577	<i>Ammannia latifolia</i>
-76.39837	38.38883	<i>Ammannia latifolia</i>
-76.39117	38.38407	<i>Polygonum densiflorum</i>
-76.40021	38.39176	<i>Scutellaria galericulata</i>
-76.40176	38.39324	<i>Scutellaria galericulata</i>
-76.4009	38.3922	<i>Zizaniopsis miliacea</i>

The following is a list of the 51 herbaceous plant species observed in Cove Point Marsh in 2011. It is followed by a list of seven woody species that are clearly components of the “marsh” flora since they are surrounded by herbaceous marsh plants.

Five species (*Amaranthus cannabinus*, *Endolepis dioica*, *Calystegia sepium*, *Cyperus odoratus*, and *Eleocharis parvula*) found in 2011 were not found in the marsh during surveys in 1996. Since the wetland swamps were not surveyed in 2011, a direct comparison between the species richness found in Cove Point wetlands in 1996 and 2011 could not be made. It is recommended that the swamp flora be inventoried in 2012 so that it can be combined with the 2011 survey results and a comparison of the change in vascular flora richness between 1996 and 2011 can be made, pre and post the brackish water intrusion. In 1996, 178 vascular plant species were found in the wetlands of Cove Point Marsh (swamps and marsh). Thus, 120 additional species should be located in the swamps associated with Cove Point Marsh, or the species richness of the flora has been decreased since brackish water inundated the marsh.

Herbaceous plants of Cove Point Marsh (2011)

Family	Genus	Species	Common Name
Amaranthaceae	Amaranthus	cannabinus	water-hemp
Apiaceae	Hydrocotyle	verticillata	whorled pennywort
Apiaceae	Ptilimnium	capillaceum	atlantic mock bishopsweed
Araceae	Peltandra	virginica	arrow arum
Asclepiadaceae	Asclepias	incarnata	swamp milkweed
Aspleniaceae	Thelypteris	palustris	marsh fern
Asteraceae	Aster	subulatus	annual salt-marsh aster
Asteraceae	Pluchea	odorata	salt-marsh fleabane
Campanulaceae	Lobelia	cardinalis	cardinal flower
Chenopodiaceae	Endolepis	dioica	orache
Clusiaceae	Triadenum	walteri	walter's st. john's-wort
Convolvulaceae	Calystegia	sepium	hedge bind-weed
Cyperaceae	Carex	alata	winged sedge
Cyperaceae	Carex	hyalinolepis	shoreline sedge
Cyperaceae	Carex	lurida	yellow-green sedge
Cyperaceae	Cyperus	flavescens	yellow sedge
Cyperaceae	Cyperus	odoratus	fragrant galingale
Cyperaceae	Eleocharis	parvula	small spikerush
Cyperaceae	Scirpus	pungens	common threesquare
Cyperaceae	Scirpus	robustus	saltmarsh bulrush
Cyperaceae	Scirpus	validus	great bullrush
Fabaceae	Apios	americana	groundnut
Hydrocharitaceae	Limnobium	spongia	american frogbit
Iridaceae	Iris	versicolor	northern blue flag
Lamiaceae	Lycopus	americanus	american water-horehound
Lamiaceae	Scutellaria	galericulata	marsh skullcap
Lamiaceae	Teucrium	canadense	american wood sage
Lemnaceae	Spirodela	polyrhiza	great duckweed
Lythraceae	Ammannia	latifolia	koehne's ammannia
Lythraceae	Decodon	verticillatus	swamp loosestrife
Malvaceae	Hibiscus	moscheutos	rose mallow
Malvaceae	Kosteletzkya	virginica	seashore mallow
Poaceae	Distichlis	spicata	salt-grass

Poaceae	Echinochloa	walteri	walter's spine grass
Poaceae	Leersia	oryzoides	rice cutgrass
Poaceae	Leptochloa	fascicularis	feather grass
Poaceae	Panicum	dichotomiflorum	spreading witch-grass
Poaceae	Phragmites	australis	common reed
Poaceae	Setaria	magna	salt-marsh foxtail grass
Poaceae	Spartina	patens	saltmeadow cordgrass
Polygonaceae	Polygonum	arifolium	halberd-leaved tearthumb
Polygonaceae	Polygonum	densiflorum	dense-flowered smartweed
Polygonaceae	Polygonum	punctatum	dotted smartweed
Polygonaceae	Rumex	verticillatus	water-dock
Pontederiaceae	Pontederia	cordata	pickerelweed
Primulaceae	Lysimachia	terrestris	bulbil loosestrife
Rubiaceae	Galium	tinctorium	marsh bedstraw
Saururaceae	Saururus	cernuus	lizards tail
Typhaceae	Typha	angustifolia	narrow leaved cattail
Urticaceae	Boehmeria	cylindrica	false nettle
Verbenaceae	Phyla	lanceolata	fog fruit

Woody Plant of Cove Point Marsh (not including swamp forests)

Family	Genus	Species	Common Name
Aceraceae	Acer	rubrum	red maple
Asteraceae	Baccharis	halimifolia	groundsel tree
Asteraceae	Iva	frutescens	low-tide bush
Myricaceae	Myrica	pensylvanica	northern bayberry
Oleaceae	Fraxinus	profunda	pumpkin ash
Pinaceae	Pinus	taeda	lobolly pine
Rubiaceae	Cephalanthus	occidentalis	buttonbush