

## Assessment of State Rare Plant Populations at Cove Point Wetland (Year 2017)

Submitted by Brent W. Steury, 9 October, 2017

Cove Point wetland is located in Calvert County, Maryland, northeast of Cove Point Road, on the Dominion Liquefied Natural Gas (LNG) property. It is separated from the Chesapeake Bay by a single low dune and a rip-rap breakwater. In 2007, a breach of the barrier dune resulted in the intrusion of brackish bay water into the freshwater marsh. This lasted until 2010 when the breakwater was constructed, the breach restored, and the marsh began to revert back to a freshwater system. Many of the state rare plant species, first documented in the marsh in 1996, were not found in the marsh during surveys in 2008 - 2010.

This 2017 report includes an assessment of the rare Maryland state listed plant species found in Cove Point Marsh. 2017 surveys were conducted on 23 June and 18 September. On 23 June the site was accessed on foot and on 18 September kayaks were used to conduct surveys. Erin Reilly of the University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory accompanied me to obtain GPS data for each rare plant population. Polygons were created around large populations with a near uniform coverage (for example *Carex hylinolespis*). The area, and maximum length and width of each polygon is recorded in Table I. For smaller populations or populations that did not allow for access due to soft, mucky substrates, a point was obtained and the estimated number of plants at or between points was recorded. As first noted during the 2015 surveys, an abundance of *Ludwigia repens* along shoreline areas of the wetland at Cove Point was observed. *Ludwigia repens* is native to the southeastern United States but has recently and rapidly extended its range northward. Brown and Brown (1984) reported *L. repens* from only one station in Wicomico County. A few plants of *L. repens* were first observed in Cove Point Marsh in 2014. In 2017, it continued to line the shoreline of the ponds in Cove Point Marsh and is a strong competitor for habitat with *Ammannia latifolia*, *Limnobiium spongia*, and *Fuirena pumila*. In 2017, for the first time since monitoring began in 1996, *Ludwigia leptocarpa* was found at Cove Point. Similar to *L. repens*, *L. leptocarpa* is native to the southern United States but has only recently arrived in Maryland. Brown (1984) did not record *L. leptocarpa* from Maryland and there are no Maryland specimens in the District of Columbia and Vicinity collection and the Smithsonian Institution, US National Herbarium (US). A voucher specimen was made of the flowering and fruiting *L. leptocarpa* found at Cove Point and is deposited in US (#170918.1; collected 18 September 2017). Unfortunately, battery power was lost on the GPS unit after recording point 29 on 18 September so points 30 – 45 listed in Table 1 and marked on Map I are based on visual estimates of their locations.

Assessment of State rare plant populations in 2017 at Cove Point Marsh.

### *Ammannia latifolia* (S2):

This species has rapidly, and abundantly, returned to Cove Point Marsh. It disappeared from the marsh with the brackish water intrusion in 2007, but was rediscovered in 2011 along the western shore of the marsh, adjacent to the upland area, on loosely consolidated, developing peat mats in two populations containing approximately 117 plants. In 2012 (20 September), thousands

of plants were observed along the entire shoreline of the marsh except along the southeastern edge. The population observed on 16 September 2013 was similar in extent to what was observed in 2012. In 2014, on 15 September, 20 non-contiguous patches were found. Sixteen of these contained between 30 and 500 plants. In 2015, the population remained robust, but was less common than observed in 2014, especially along the eastern shore of the ponds. This is probably due to the abundance of *Ludwigia repens* which grows in the same habitat. In 2015, six populations of *A. latifolia* were observed, the largest populations containing approximately 150, 100, and 50 plants. Most plants were in flower and fruit. In 2016, six populations were again observed. Most were in fruit and some in flower. One population along the western shore of the marsh contained 15 plants, three populations in the southeastern corner of the marsh contained 95, 1000, and 50 plants, and the other two populations found on islets near the center of the eastern edge and in the northeastern corner of the marsh contained 50 plants each. In 2017, seven populations were mapped (Table 1) containing an estimated 2080 plants. All were in fruit on 18 September.

*Carex hyalinolepis* (S2S3):

The three populations at Cove Point were observed on 13 June 2016. All populations remained stable in 2016 when compared to measurements in other recent years, however the population along the beachfront is now beginning to erode into the Chesapeake Bay. The beach at this location, which is just beyond where the rip-rap breakwater stops, is rapidly eroding through the beach dune and toward to marsh (see figure 1 showing *Carex hyalinolepis* population eroding into Chesapeake Bay.) The sandy dune that separates the marsh from the Chesapeake Bay is nearly absent at this location and is cutting into 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. This population is approximately the same extent as observed in 2014 and 2015. In 2016 however, no plants were observed in fruit, whereas in 2015, the maximum number of fruiting stems observed within a square meter of the population was 6.0 and the estimated average number of fruiting stems per square meter was 0.4.

In 2016 the population of *Carex hyalinolepis* found in the southeastern corner of the wetland was approximately the same as observed in 2014 and 2015. However no fruiting stems were observed within the population in 2015 whereas in 2016 the maximum number of fruiting stems observed within a square meter of the population was 5.0 and the estimated average number of fruiting stems per square meter was 0.3. This population is more shaded than the other two.

In 2016 the population of *Carex hyalinolepis* found at the end of Webster Drive on the southeastern end of the marsh was approximately the same as observed in 2014 and 2015. In 2016 the maximum number of fruiting stems observed within a square meter of the population was 3.0, down from a count of 11.0 in 2015. The estimated average number of fruiting stems per square meter was 0.1, down from 0.7 in 2015.

In 2017, four populations were documented (Map 1). The population at the beach edge near the Chesapeake Bay was split into two close separate populations. The areas of these

populations measured 16 m<sup>2</sup>, 71 m<sup>2</sup>, 487 m<sup>2</sup>, and 596 m<sup>2</sup> (Table 1). The maximum number of fruiting stems per m<sup>2</sup> in each of these four populations was 0, 9, 5, and 3.

*Limnobiium spongia* (S1):

On 26 May 2011, for the first time since the breach of the barrier dune, a small population of this species was found along the southern edge of the marsh in two patches of not more than five plants each. By 14 June 2012 the population had expanded and measured 37.9 x 3.0 m. On 6 June 2013, the population had expanded to 74.9 x 1 m and two additional populations were found along the northern and western edges of the marsh. These two populations were approximately 1 x 1 m. In 2014, six patches of *L. spongia* were found in the marsh along the western and southeastern shores. As in other years, the largest patch was located along the southeastern shore and measured 70 x 1.5 m in 2014. In 2015 the *L. spongia* population remained approximately the same as it was in 2014. A large patch remained along the southeastern edge of the marsh and two smaller populations approximately 0.5 x 0.5 m were observed along the western shore. All plants were vegetative. In 2016, no *Limnobiium spongia* was found in the marsh. The site along the southeastern shore was dominated by a large patch of the native species *Hydrocotyle ranunculoides* and was very dry compared to the June 2015 survey, and the sites along the western shore were dominated by *Ludwigia repens* during the September survey. In 2017, *L. spongia* was not observed during surveys on 23 June or 18 September but was observed and photographed by Erin Reilly in the southeastern corner of the marsh (Map 1) on 27 July. An estimate of the population size was not obtained.

*Scutellaria galericulata* (S1):

On 10 June, 2011, nine plants of this species were observed over 3.0 x 2.0 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. On 14 June 2012, this population measured 1.0 x 1.0 m using GPS. A total of six plants were found, none were in flower or fruit. On 6 June 2013, this population measured 1.0 x 1.0 m using GPS. A total of six plants were again found and none were in flower or fruit. In 2014, three small non-flowering plants within an area of 0.5 x 0.5 m were observed on 11 June and no plants were found in September. *Phragmites australis* was cleared from around the area of this state rare plant population during the summer of 2014. In 2015, three plants were observed within an area of 0.5 x 0.5 m on 29 June. None of the plants were flowering. In 2016, two plants, only 7 cm tall were found. Neither plant was in flower or fruit. In 2017, three plants were found on the western side of the marsh (Map 1). The tallest plant was only 9 cm and the top had been grazed. None of the plants were observed in flower or fruit.

*Sesuvium maritimum* (S1):

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 apparently extirpated this species from the marsh. On 22 July 2011, only 8 plants were found, near where the main breach occurred. On 20 September 2012, *Sesuvium maritimum* was still persisting along the marsh dune ecotone near the Chesapeake Bay. The population measured 34.0 x 2.0 m using GPS. In 2013, 2014, 2015, 2016, and 2017 no plants of *Sesuvium maritimum* were observed in Cove Point Marsh.

*Zizaniopsis miliacea* (S1):

On 10 June 2011 this population measured 57.1 x 11.3 m with GPS. On 14 June 2012 it measured 54.0 x 10.2 m over an area of 588 m<sup>2</sup> using GPS. The maximum number of fruiting stems per square meter was nine. The estimated average number of fruiting stems per square meter was 0.4. On 6 June 2013 the population had noticeably depreciated and measured only 43.6 x 11.4 m over an area of 172.9 m<sup>2</sup>. The once contiguous population was nearly broken into three patches and for the first time since 1996 the number of plants was so few that individuals could be counted. A total of 179 plants were observed, 13 of these were in flower. In 2014, the population had recovered slightly from its all time low observed in 2013. On 11 June 2014, the population measured 50.3 x 8.5 m over an area of 227 m<sup>2</sup>. A total of 204 plants were counted, 9 of which were in flower. In 2015, on 29 June, a total of approximately 118 plants were observed. These were found in four small patches on the western side of the marsh and contained 7, 5, and two patches of 3 plants. Eight of these 18 plants were in flower. Most of the population was found along the southern side of the swamp and contained approximately 100 plants, none of which were in flower. In 2016, on 13 June, a total of approximately 183 plants were observed. These were found in four small patches that contained 18, 8, 5 and 2 plants. None of these 33 plants were in flower. Most of the population was found along the southern side of the swamp and contained approximately 150 plants, of which nine were in flower. The southern part of the population receives more light and currently is less encroached upon by *Phragmites australis*. *Phragmites australis* continues to impact the *Zizaniopsis miliacea* population and is commingled with it. Treating the *Phragmites australis* by hand with herbicide is highly recommended in this area. In 2017, on 23 June, a total of approximately 179 plants were observed. These were found in four small patches on the western side of the marsh (Map I). A total of 14 plants were in flower. Most of the population was found along the southern side of the swamp and contained approximately 150 plants, of which 11 were in flower. The southern part of the population continues to receive more light and is still less encroached upon by *Phragmites australis*. However, *Phragmites australis* continues to impact the *Zizaniopsis miliacea* population and is commingled with it. Treating the *Phragmites australis* by hand with herbicide is highly recommended in this area.

*Fuirena pumila* (S2S3):

On 16 September 2013 three patches of this species were observed in the marsh for the first time since the breach of the barrier dune in 2007. Each patch contained between 10 and 20 stems over areas less than 1.0 x 1.0 m. All stems were in fruit. In 2014, four patches containing

9, 25, 46, and 100 fruiting stems were observed. In 2015, one large patch approximately 8 x 8 m and containing approximately 250 fruiting plants was observed along the western shore of the marsh. In 2016, four populations were found. Three occurred in the northwestern corner of the marsh and one on the southwestern shore. These populations contained 100, 3000, 50, and 300 plants. All populations were in flower and fruit. *Fuirena pumila* grows slightly higher on the marsh shoreline than does *Ammannia latifolia*, *Sesuvium maritimum*, or *Limnobium spongia* and thus may be less affected by competition from *Ludwigia repens*. In 2017, nine populations of *Fuirena pumila* were mapped (Map 1) that contained a total of 11,865 plants in flower and fruit on 18 September (Table 1).

*Potamogeton pussillus* subsp. *tenuissimus* (S1):

In 2014, the state rare submerged aquatic plant *Potamogeton pussillus* was found for the first time since the flora of Cove Point marsh was first surveyed in 1996. This population was determined to be subspecies *tenuissimus*. It was observed to be, by far, the dominant submerged aquatic species found in the marsh. It was abundant in the open water areas of the wetland and probably covers at least two acres. It was observed in flower and fruit on 15 September 2014. Surprisingly, on 14 September, 2015, no plants of *Potamogeton pussillus* were found in Cove Point Marsh, although it may have been present and not fruiting as it was in 2014. Fruiting plants are readily distinguished, but when vegetatively entangled with *Ruppia maritima*, which was commonly observed in 2015 (although not observed in 2014), it can be easily overlooked. No plants of *Potamogeton pussillus* were observed in 2016. No plants of *Potamogeton pussillus* were observed in 2017.

**Table I**

Polygon #	Species	Area (m2)	Max Length (m)	Max Width (m)	# of Plants
1	Zizaniopsis mileacea	149.03	31	7	150
2	Carex hylinolepsis	16.04	10	2	Complete Coverage
3	Carex hylinolepsis	71.12	32	2	Complete Coverage
4	Carex hylinolepsis	487.23	38	22	Complete Coverage
5	Carex hylinolepsis	596.06	74	13	Complete Coverage
Point #					
2	Zizaniopsis mileacea				16
3	Zizaniopsis mileacea				9
4	Zizaniopsis mileacea				4
5	Scutellaria galericulata				3
21	Amannia latifolia				20
22-27	Fuirena pumila				1,000
28	Amannia latifolia				60
29	Fuirena pumila				50

30	<i>Fuirena pumila</i>				50
31	<i>Amannia latifolia</i>				500
32	<i>Ludwigia leptocarpa</i>				1
33	<i>Limnobiium spongia</i>				unknown
34	<i>Fuirena pumila</i>				25
35-36	<i>Fuirena pumila</i>				10,000
37-38	<i>Amannia latifolia</i>				200
39	<i>Amannia latifolia</i>				100
40	<i>Fuirena pumila</i>				50
41	<i>Amannia latifolia</i>				1,000
42	<i>Fuirena pumila</i>				100
43	<i>Amannia latifolia</i>				200
44	<i>Fuirena pumila</i>				90
45	<i>Fuirena pumila</i>				500

### Literature Cited

Brown, M. L. & R. G. Brown. 1984. *Herbaceous plants of Maryland*. Port City Press, Inc. Baltimore, Maryland.