

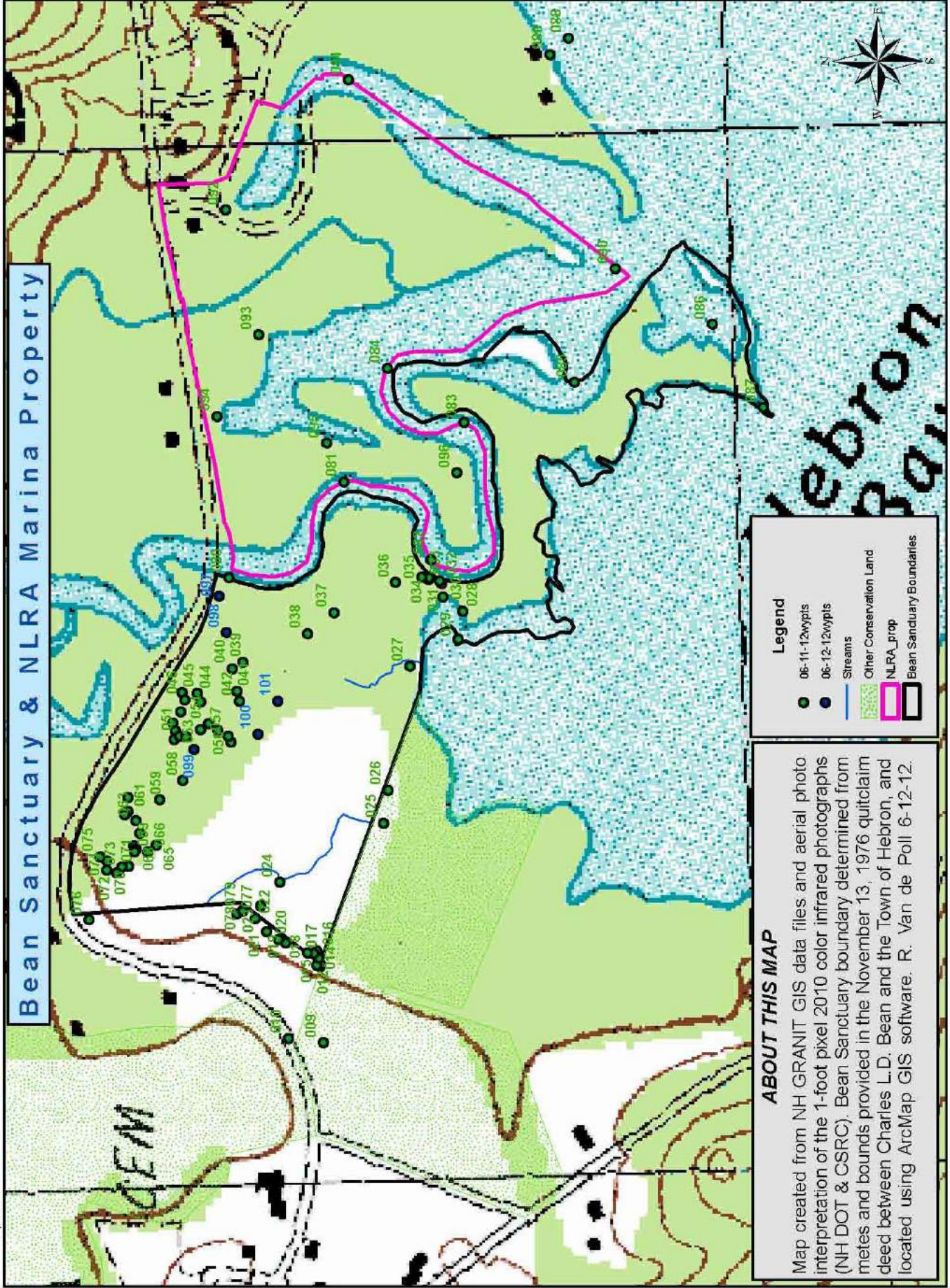
RAPID ECOLOGICAL ASSESSMENT
OF THE
CHARLES L. BEAN SANCTUARY
And the
NEWFOUND LAKE REGION ASSOCIATION MARINA PROPERTY
Hebron, NH



Prepared for
Hebron Conservation Commission

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Bean Sanctuary & NLRA Marina Property

Legend

- 06-11-12wypis
- 06-12-12wypis
- Streams
- Other Conservation Land
- NLRA_prop
- Bean Sanctuary Boundaries

ABOUT THIS MAP

Map created from NH GRANIT GIS data files and aerial photo interpretation of the 1-foot pixel 2010 color infrared photographs (NH DOT & CSRC). Bean Sanctuary boundary determined from metes and bounds provided in the November 13, 1976 quitclaim deed between Charles L.D. Bean and the Town of Hebron, and located using ArcMap GIS software. R. Van de Poll 6-12-12.



1,700 Feet

400 Meters

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SUMMARY

In June 2012, a two-day rapid ecological assessment (REA) was completed of the +/- 32.3-acre Town of Hebron Charles L. Bean Sanctuary and the +/- 29.4-acre Newfound Lake Region Association (NLRA) "Marina Property." The survey area for the Bean Sanctuary was determined through the use of the Hebron Tax Map and the November 1970 quitclaim deed as modified by agreement in November 1976, which describes the metes and bounds of the property and the excluded field area alongside North Shore Road. The NLRA Marina property location was determined from the "Plan Showing Property of the Newfound Lake Region Association" by the Barnard Survey Association dated February 2012.¹

Base map corrections were made in the field through the use of a hand-held Garmin 12 XL global positioning system unit with a precision of between 3.2 and 7.2 meters. The same locating device was used for determining wetlands and natural community boundaries. The latter followed the *Natural Communities of New Hampshire* (Sperduto and Nichols 2004), as modified by *The Nature of New Hampshire* (Sperduto and Kimball 2011). Wetlands were determined from a careful review of the 2010 1-foot pixel color aerial photographs (NHDOT), the aforementioned 2012 plan of the NLRA property that showed wetland boundaries, and on-site use of a Dutch soil auger while following wetland boundary determination protocols of the Army Corps of Engineers. A Canon SX20 digital camera was used to record salient natural resource features and as an aid in identifying invertebrate species.

The combined properties as mapped below contained 52.0 acres of wetlands (84.2%) with a predominance of floodplain forest and emergent marsh. With the exception of the fill materials on the NLRA property (3.89 acres), the predominant, associated upland areas were also floodplain forests and emergent uplands, specifically, the Silver Maple-Red Maple-White Floodplain Forest and the Bulblet Umbrella-Sedge Open Sandy Pondshore natural communities. The floodplain forest type is considered rare in the state (S1S2), as is the latter open emergent sandy pondshore (S2).

A total of 36.5 acres (N = 39 units) of the above natural communities were designated as candidate "exemplary natural communities" as defined by the NH Natural Heritage Bureau. Of particular note were some of the oxbow communities that have developed over the past several hundred years. One state-historic sedge (*Carex cephaloidea*) was located at the edge of one oxbow and a probable state-endangered pondweed (*Potamogeton pusillus*) was located in another oxbow pond. Except in the areas of fill and excavation around the former marina, the Cockermonth floodplain communities appeared relatively intact and aggrading into mature, mixed structure, functioning ecosystems.

A total of 243 plant species, 8 fungi, 21 mammals, 59 birds, 10 fish, 4 reptiles, 9 amphibians, and 71 invertebrates were recorded. Most were common riparian, lacustrine or wetland species, although some (e.g. rose chafer beetle) were upland disturbed habitat associates. Highlights among the wildlife species list, such as moose, bald eagle, yellow-billed cuckoo, Uhler's sundragon, and elegant spreadwing are described below. Brief recommendations are also given for the proper stewardship of both properties.

¹ Note that the above-cited tax map and deed agreement holds the property boundary to the edge of the Cockermonth River, whereas the 2012 Barnard survey holds the NLRA edge to the centerline of said river. Holding to the river centerline would add about 3 acres to the Bean Sanctuary.

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I. Overview & Methods

On April 5, 2012 the Hebron Conservation Commission agreed to secure the services of Ecosystem Management Consultants to conduct a rapid ecological assessment (REA) of the 30-acre Charles D. Bean Sanctuary along the northwest shores of Newfound Lake. Soon thereafter, the recently acquired 30-acre Newfound Lake Region Association's "Marina Property" was added to the REA study area. The generous donation of a conservation easement for the latter property by long-time NLRA supporters Linda and Andy McLane to the Lakes Region Conservation Trust has ensured the protection of this critical conservation area in perpetuity. Both properties lie adjacent to the mouth of the Cockermonth River where the latter empties into Newfound Lake in Hebron. Immediately to the west lies the Audubon Society's Hebron Marsh Sanctuary and to the northwest a potential additional conservation property along the Cockermonth River.

On June 11 and 12, 2012, a field reconnaissance was completed of both properties. The general route, as depicted by numbered GPS points on the attached map, included all of the Bean Sanctuary and most of the NLRA property on the first day, with an emphasis on the Cockermonth River proper and Hebron Bay on the second day. A hand-held Garmin 12XL GPS unit was used on both days, with a recorded precision of between 3.2 and 7.2 meters.¹ A Canon SX20 digital zoom camera was used to record salient natural resource features, especially invertebrates that could be identified using web resources in the office. The survey routes covered all major habitats except for the 1-acre exclusion area on the NLRA property, which was currently being cleared of old marina-related structures by two contractors.

Field surveys included the general recording of species, natural communities, ecosystem condition, topographic features, and soil-water condition (i.e. wetlands). For the latter, a 1.5-meter Dutch soil auger was used to ascertain soil morphology and soil wetness. Hydric soil determinations utilized guidance from the *New Hampshire State-wide Numerical Soils Legend. Issue # 8 and Field Indicators of Hydric Soils in the United States – A Guide for Identifying and Delineating Hydric Soils Version 7.0*. Woody vegetation was also characterized during the second field day using three (3) random variable plots in forested areas of the preserve properties. A BAF (10) prism was used for trees and visual inspection of understory species was used to determine sub-canopy dominance. A running tally of herbaceous species in each natural community type was kept, and selected collections were made of herbaceous plant species (see Appendix).

Wildlife sign was recorded as a running tally wherein no record was repeated during the second field day. Bird stations were tallied by vocalizing males and not by individual in order to provide an approximation of breeding bird frequency on the properties. Incidental records of sightings such as bald eagle and common loon were also kept. With the exception of ermine and moose, all records of mammals were made on the basis of sign. Records on the remaining groups were made on the basis of actual sighting (including aural observations). In the case of a number of invertebrates, identifications were tentatively recorded with confirmations made on the basis of photographs. For most groups the latter was accomplished using Marshall (2006), Peckarsky et al (1990), Glassburg (1993), Bland (1978), Milne (1980), and Nikula et al.

¹ Note that precision averaging on a hand-held, internal antenna GPS unit only provides an approximation of precision and that numbered points may vary from these distances.

(2003). For odonates, assistance was also provided by Ms. Pam Hunt of the NH Audubon Society. Plants were keyed out using Haines (2011) as well as Magee and Ahles (1999). Assistance for the two rare plants found on the properties was also provided by Mr. Bill Nichols of the NH Natural Heritage Bureau. Acknowledgments are also due Ms. Andrea Marshall who provided assistance with the plot work during the second field day.

II. Findings

The overall significance of the two properties relates to their position along the Cockermonth River at the edge of Newfound Lake. This area includes some of the least-developed part of the Newfound Lake shoreline, and, coupled with its diversity of aquatic ecosystems, provides regionally significant wildlife habitat and natural community diversity. The Cockermonth River is a fourth order stream at its mouth on Newfound Lake and is comprised of crystal clear, cold-running water. The temperature difference between the river and the lake was 8° C. on both days, with the river at 13.1° C. With depths of over 6 m (20 ft.), the bottom was clearly visible from the surface. A 45-minute dive of the river between the bridge and the final bend before Newfound Lake yielded very few plants or vertebrate organisms, largely on account of the cool temperatures, the velocity of flow, and the capacity of floodwater surges. Log-strewn, undercut banks were common and high quality habitat for coldwater fish such as salmon and brook trout was evident.

Nearly all of the two properties have been influenced by the Cockermonth River. Floodplain morphology is clearly evident in most areas northeast of Hebron Marsh proper. The meandering nature of this lower perennial stream system has created scour channels and levees, oxbow ponds, level high-floodplain forests, and extensive areas of herbaceous vegetation. The latter are thriving in fine-particulate, hydric to sub-hydric soils that were deposited post-glacially by the actions of riverine flooding. Hydrologic sequences established by these previous flood events have created a mosaic of natural communities that vary from deepwater emergent marshes and aquatic beds to graminoid-dominant emergent marshes, to scrub-shrub zones, to tall canopies of overstory maples. Natural community variation is extremely high and the mosaic of types is extremely dense in certain areas where sharp lines exist between plant structural types.

A total of 21 natural community types were identified on the two properties according to the *Natural Communities of New Hampshire* (Sperduto and Nichols 2004) and the *Nature of New Hampshire* (Sperduto and Kimball 2011). Among the 98 units mapped for the two properties (see map in the Appendix), the state-threatened Silver Maple-Red Maple-White Ash Floodplain Forest represented the highest percent (21.7 acres or 35%). This community has largely disappeared from the landscape in New Hampshire on account of agriculture, development, and dams. In a mid-successional state, the +/- 75 – 80 year-old forest on both properties has retained much of its natural structure in spite of the influences of North Shore Road, the former Newfound Marina, and associated development in the former floodplain area. Invasive species are present (mostly reed canary-grass), although not at the level that can be found in the badly degraded floodplain areas of the lower Connecticut and Merrimack Rivers.

As a testament to the intact nature of some of the Cocker mouth River ecosystem, at least five rare species were identified during the field surveys and two others have been reported in the recent past. Both bald eagle and common loon were observed to be using the delta area near Newfound Lake. American bittern was recorded from the Bean Sanctuary portion of Hebron Marsh and is likely a breeder there. Although not personally observed, osprey has also been regularly sighted in the vicinity. In terms of plants, one state-historic (i.e. not seen in the last 20 years or more) was observed near the northwestern corner of the Bean Sanctuary, thinleaf sedge (*Carex cephaloidea*). Another rare plant, small pondweed (*Potamogeton pusillus*), was tentatively identified from one of the oxbow ponds on the Bean Sanctuary. This state-endangered plant will require fruiting material in order to confirm its identification.

In all, a total of 243 species of vascular plants, 8 fungi, 21 mammals, 59 birds, 10 fish, 4 reptiles, 9 amphibians, and 71 invertebrates were recorded. Except for invertebrate species, this total represents about 50% of the species that could be observed on the two properties if a more protracted study were undertaken. Some of the highlights included an abundance of fresh (and old) moose sign, including the skull and bones of a juvenile. An ermine was also seen living in and around the old beaver mounds on the south edge of the Bean Sanctuary marsh. Besides the above-mentioned rare birds, the diversity of habitats spawned a total of 55 species at over 150 station locations (see attached tally). These included some unexpected surprises, including both yellow-billed and black-billed cuckoo, willow flycatcher, and bobolink. Based on the tally of the most common species – tree swallow, song sparrow, veery, yellow warbler, swamp sparrow, and red-winged blackbird, the predominance of wetland habitats was quite evident.



Among the remaining vertebrate groups, highlights included the observation of a 3 – 4 pound smallmouth bass at close range in Hebron Bay, an adult eastern painted turtle 15-foot deep in the Cocker mouth River, a 70+ pound snapping turtle in the old marina, and dozens of red-spotted newts in all stages of life. Previously reported species for the area included Atlantic salmon, eastern brook trout, and wood turtle. A *probable species* list is included in the Appendix although several other unlisted species may be found as well, especially in regards to fish that stray into Hebron Bay.

In terms of invertebrate species, only a casual accounting of common species was possible. Based on a greater familiarity with groups such as *Lepidoptera* and *Odonata*, certain groups contain more listed species than others. Pending confirmation by Ms. Pam Hunt, it appears that at least 3 new dragonfly species were added to the list for Hebron, which at present sits as 32 species.² Notable finds included

² For a complete list for the town, see <https://sites.google.com/site/nhdragonflysurvey/>

elegant spreadwing (*Lestes inaequalis*), Hagen’s bluet (*Enallagma hageni*), and Uhler’s sundragon (*Helocordulia uhleri*). Among the butterfly and moth group, notable observations included a plethora of the nymphula moth (*Elophila eckthlipsis*) among the emergent marsh grasses, an equivalent abundance of great spangled fritillary caterpillars on the adjacent dwarf shrubs, and the equally ubiquitous



viburnum leaf beetle (*Pyrrhalta viburni*) on nearly every arrowwood shrub in the area. The latter pest, a fairly recent arrival from Eurasia, has been decimating most viburnum species for over two decades in the Northeast. Another introduced species, rose chafer (*Macrodactylus subspinosus*), appears to also be in abundance this year on a wide variety of wetland shrubs (and not just roses!).

An increasingly common non-native snail, the Chinese mystery snail (*Cipangopaludina chinensis*), was found in low numbers along the shores of Hebron Marsh

Among plant species, the number of invasives and non-native, *non*-invasive species was relatively low. Just 12 species of non-natives were recorded, which helps indicate how intact the riparian ecosystem is in this area.³ The most significant species was reed canary-grass (*Phalaris arundinacea*), which was a dominant species in nearly all emergent marsh flats where bluejoint reedgrass was perhaps once dominant. Responding well to disturbance and nutrient inputs, this grass was found in all corners of both properties from saturated soils to areas inundated by six inches of water or more. While it does have limited food value for certain species of wildlife, its overall impact on wildlife (especially invertebrate) species is unknown.

In spite of the extensive areas of very high quality habitats on (particularly) the Bean Sanctuary and the NLRA property, some areas have been compromised in the past and may present disturbance-related ecosystem problems in the future such as those associated with reed canary-grass. For example, areas that have been cut-off by regular flooding, such as the white pine flats below the North Shore Road in the western part of the Bean Sanctuary, have begun to develop conditions that are non-riverine. The limitation of 25-flood events that replenish floodplain deposits, remove woody debris, and inhibit all but flood-tolerant plant communities has spawned a different *hydrarch succession* for these areas.⁴

The second vegetation sampling plot (Plot #2, GPS point 99) was perhaps the most dramatic with its prevalence of large, tall white pines, narrow ditch lines, and (now) upland



Above: beech and white pine are beginning to take over the floodplain area near North Shore Rd

³ As noted above, very little effort was spent surveying the highly disturbed, formerly developed portion of the marina, hence more non-native species likely exist than what was recorded.

⁴ For a definition of hydrarch succession, see Sperduto and Kimball (2011) page 215.

vegetation. Plot #1 at GPS #98 was also indicative of these changing conditions. Over one-third (35%) of the standing, red maple tree stems were dead, and beech, white pine, white ash and black cherry were dominant in the understory. With the blockage of flow provided by the road, this shift will likely continue into the foreseeable future. Further away from the influence of the road (i.e. at Plot #3 at GPS #101), the naturally occurring red maple-silver maple floodplain forest was more intact. Basal area in the latter sampling area exceeded 100 square feet per acre, and tree diameters averaged over 15 inches.⁵ Given the proximity of this area to the actively moving Cockermouth River, it is likely that this forest zone will attain a more classic, large tree canopy and open understory characteristic typical of old growth floodplain forests. Understory dominants in this area also reflect a more classic, floodplain



Sampling Plot #3 was located in a more typical, mid-successional silver maple-red maple floodplain forest

condition, with red maple, speckled alder, highbush blueberry, and winterberry holly in the shrub layer, and a variety of ferns, forbs, and graminoids in the dense herbaceous layer.⁶

The second-most evident alteration of the naturally occurring floodplain ecosystem at the mouth of the Cockermouth River was the alteration associated with the former Newfound Marina. Largely influencing the NLRA property (but also the lower Bean Sanctuary), the dredging of the old oxbow channel between the Newfound Marina site and Newfound Lake was observed to be both significant and long-lasting. Old excavated debris was visible

along the western shoreline of the canal and the fill materials at the head of the canal represented the only significant area of upland soils on both properties. Although a careful assessment of the filled, easement exclusion area was not conducted, a greater number of non-native and invasive species were observed in this locale. Aquatic plant diversity was much lower than the old oxbows in the western part of the NLRA property as well as the Cockermouth River nearby.



The wide expanse of dredged open water at the old marina is the likeliest site for milfoil invasion

III. Stewardship Recommendations

In terms of stewardship recommendations that may be influenced by the above-described disturbance regimes, as well as considerations for access, use, and special concerns, the following short list of concerns is offered:

⁵ Basal area equals the cross-sectional area of a tree at breast height (4.5 feet above the ground).

⁶ "Graminoids" include the three monocot groups - sedges, grasses, and rushes.

- 1) **Keep a careful watch in the old marina area for the presence of variable milfoil.** While not observed during the survey, the characteristics of this artificial embayment are perfect for the establishment of this noxious species. Regular surveys should be performed annually and proactive measures taken to ensure that any established plants get pulled, treated, or covered immediately.
- 2) **A comparable yearly survey should take place in the upland area of the old marina to ensure the elimination and control of upland or semi-aquatic invasive species.** As noted above, this area did not get a careful review, and it is possible that common invasive species such as bittersweet, honeysuckle, barberry, buckthorn, and purple loosestrife are already present. Given the significant effort that has taken place to restore this site to a usable and potentially natural landscape, early detection surveys would be greatly beneficial.
- 3) **A trail system into the far point of the Bean Sanctuary should be discouraged.** Most of the forested portion of this property is comprised of a mid-successional forested floodplain that has



Much of the Cockermonth River floodplain contains sensitive wetlands that could be damaged by foot traffic, including this floating oxbow peat mat

wet to sub-hydric, unstable soils that can erode and/or compact very easily. The wildlife species that were observed are very locale-sensitive and could be disrupted by even the slightest amount of traffic. The upland portion is also quite narrow for larger animals such as moose and deer and human activity could compromise their feeding and breeding behavior. This is especially true for the potential for this area to serve as a bald eagle nest site. In addition, the views gained by walking out to the point can more easily be obtained by water or by driving to the Hebron Town beach nearby.

- 4) **The NLRA property contains comparably inhospitable soils and vegetation to support any type of trail system.** Whereas a short boardwalk trail may ultimately prove valuable for education, any trail that attempts to traverse the point of land to the south would face the same problems described for the Bean Sanctuary under #3 above. Water trails should be encouraged as the best way to get around the property both during the growing season, and perhaps for the old marina property, in winter as well.

- 5) **The narrow sandy beach strand at the tip of the Bean Sanctuary should be designated as a “no landing” zone.** This very sensitive natural community, known as a Bulblet Umbrella-Sedge Open Sandy Pondshore, is represented by just five small areas totaling .07 acres. Besides containing



Waterfowl such as this family of common mergansers actively use the beach strand areas for resting

very fragile substrates that depend on natural disturbance regimes (namely wave-wash) to create a mosaic of graminoid and forb-dominated plants, they offer refugia for waterfowl and a potential nesting area for common loons. Given the “compromise” of having developed an adjacent sandy pondshore community for the Hebron Town Beach, these five areas should be left alone and posted to that effect.

- 6) **The snowmobile trail through the Bean Sanctuary should be carefully assessed for its utility and need as it clearly fragments this otherwise untouched area in winter and leaves lasting impacts in the saturated to inundated soils it traverses.** This trail appears to connect to the trail leading up Mt. Crosby and Bald Knob, although it is uncertain as whether an alternate route exists that would avoid the lower Cockermouth River altogether. This should be researched.



View from near NE corner of excluded field on the Bean Sanctuary. Although not visible from the ground in summer, the snowmobile trail runs right through this remote area, which even in winter offers an open refugium for eagles, coyotes, foxes, mink, otter, and possibly snowy owls. Motorized use should be carefully reviewed.



Both the Bean Sanctuary and the NLRA property offer excellent water recreation opportunities that for the most part are compatible with the sensitivity of the area. Until use becomes excessive or abusive, encouraging low-impact, non-motorized use of the waterways is suggested. Monitoring unwanted activities such as camping, fires, social trails, vandalism, and littering will be required on a regular basis, however.

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Appendix A

Maps

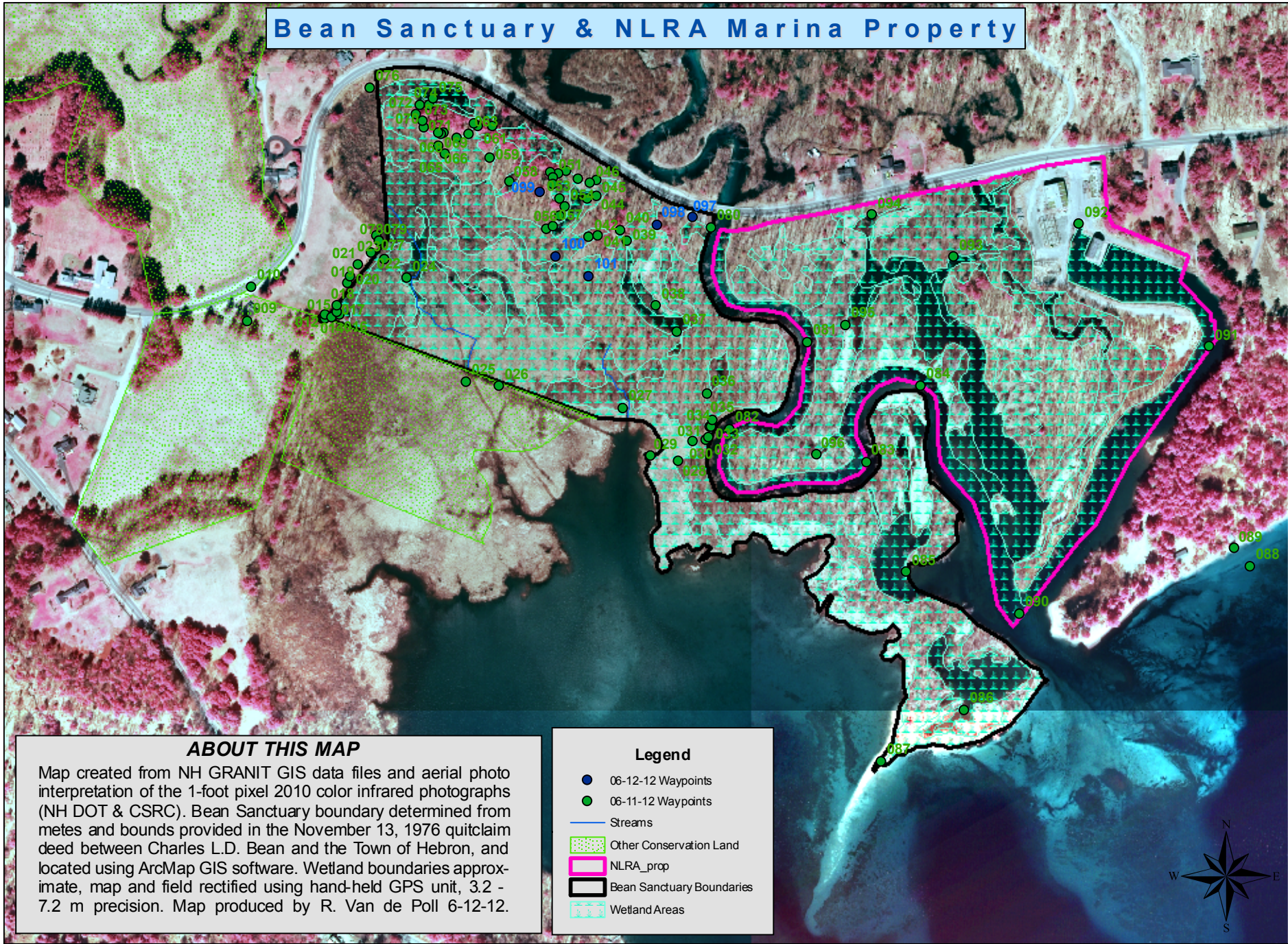
(1) Wetlands Map

A-1

(2) Natural Communities Map

A-2

Bean Sanctuary & NLRA Marina Property



ABOUT THIS MAP

Map created from NH GRANIT GIS data files and aerial photo interpretation of the 1-foot pixel 2010 color infrared photographs (NH DOT & CSRC). Bean Sanctuary boundary determined from metes and bounds provided in the November 13, 1976 quitclaim deed between Charles L.D. Bean and the Town of Hebron, and located using ArcMap GIS software. Wetland boundaries approximate, map and field rectified using hand-held GPS unit, 3.2 - 7.2 m precision. Map produced by R. Van de Poll 6-12-12.

Legend

- 06-12-12 Waypoints
- 06-11-12 Waypoints
- Streams
- Other Conservation Land
- NLRA_prop
- Bean Sanctuary Boundaries
- Wetland Areas



Bean Sanctuary & NLRA Marina Property

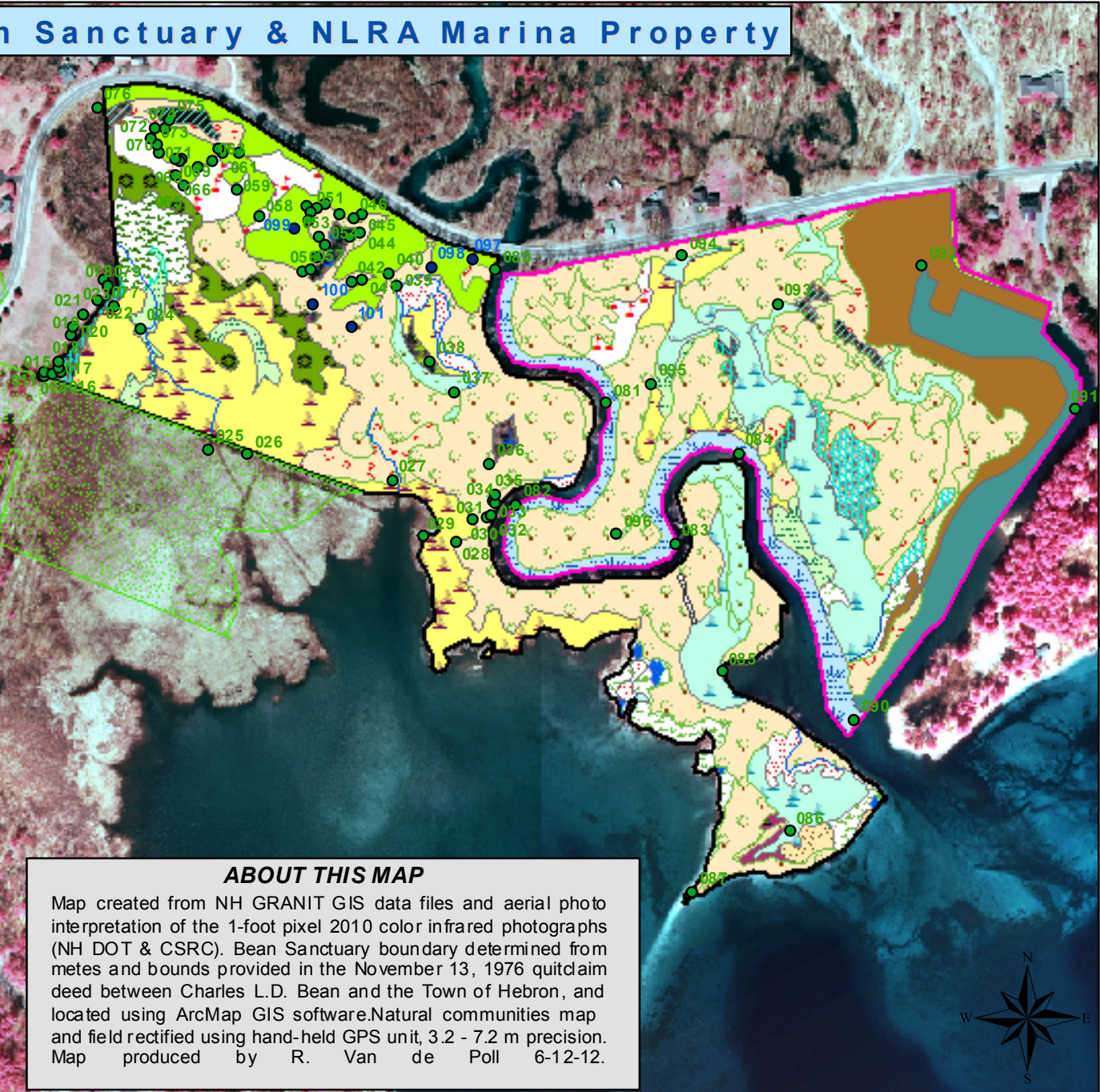
Legend

- 06-12-12 Waypoints
- 06-11-12 Waypoints
- Streams
- Other Conservation Land
- NLRA_prop
- Bean Sanctuary Boundaries

Natural Communities

Natural Community Type

- Alder Alluvial Shrubland
- Alder-Dogwood-Arrowwood Alluvial Thicket
- Alder-Dogwood-Arrowwood Shrub Thicket
- Alluvial Mixed Shrub Thicket
- Bulblet Umbrella-Sedge Open Sandy Pondshore
- Buttonbush Shrubland
- Cobble-Sand River Channel
- Deep Emergent Marsh-Aquatic Bed
- Deep Emergent Marsh/Aquatic Bed
- Excavated Ditch
- Excavated Waterway
- Fill materials
- Floodplain Vernal Pool
- Hemlock-Beech-Oak-Pine Forest
- Herbaceous River Channel
- Highbush Blueberry-Mountain Holly Wooded Fen
- Lower Perennial Stream
- Medium-depth Emergent Marsh
- Mixed Alluvial Shrub Thicket
- Mixed Tall Graminoid-Scrub Shrub Marsh
- Oxbow Marsh
- Red Maple Floodplain Forest
- Red Maple-Sensitive Fern Swamp
- Roadside fill
- Sedge Meadow Marsh
- Sugar Maple-Silver Maple-White Ash Floodplain
- Sweet Gale-Meadowsweet-Tussock Sedge Fen
- Sweet Gale-Speckled Alder Shrub Thicket
- Tall Graminoid Emergent Marsh
- Three-Way Sedge-Manna-Grass Mud Flat Marsh



ABOUT THIS MAP

Map created from NH GRANIT GIS data files and aerial photo interpretation of the 1-foot pixel 2010 color infrared photographs (NH DOT & CSRC). Bean Sanctuary boundary determined from metes and bounds provided in the November 13, 1976 quitclaim deed between Charles L.D. Bean and the Town of Hebron, and located using ArcMap GIS software. Natural communities map and field rectified using hand-held GPS unit, 3.2 - 7.2 m precision. Map produced by R. Van de Poll 6-12-12.



Appendix B

SPECIES LISTS

(1) Plants

B-1 to B-6

(2) Vertebrates & Invertebrates

B-7 to B-16

Vascular Plants of the Bean Sanctuary & NLRA Land - From Field Site Visits on 6/11 & 6/12 2012							
	"R1IND" = Region 1 Indicator as assigned by the Natioinal Wetlands Plant Committee; "E/T/W" = Endangered/Threatened/Watch as determined by the NH Natural Heritage Bureau (IND = Indefinite)						
Alien	Scientific Name	Common Name	Family Name	R1IND	Habit	E/T/W	
	<i>Abies balsamea</i>	Fir, Balsam	Pinaceae	FAC	T		
	<i>Acer pensylvanicum</i>	Maple, Striped	Aceraceae	FACU	S,T		
	<i>Acer rubrum</i>	Maple, Red	Aceraceae	FAC	T		
	<i>Acer saccharinum</i>	Maple, Silver	Aceraceae	FACW	T		
	<i>Acer saccharum</i>	Maple, Sugar	Aceraceae	FACU	T		
	<i>Acorus calamus</i>	Sweet Flag	Araceae	OBL	H		
	<i>Agrimonia gryposepala</i>	Groovebur, Tall Hairy	Rosaceae	FACU	H		
*	<i>Agrostis capillaris</i> (tenuis)	Bentgrass, Slender	Poaceae	UPL	H		
	<i>Agrostis gigantea</i>	Grass, Red Top	Poaceae	NI	H		
	<i>Agrostis perennans</i>	Bentgrass, Perennial	Poaceae	FACU	H		
	<i>Agrostis scabra</i>	Bentgrass, Rough	Poaceae	FAC	H		
	<i>Agrostis stolonifera</i>	Bentgrass, Spreading	Poaceae	FACW	H		
	<i>Alnus incana</i> ssp. <i>rugosa</i>	Alder, Speckled	Betulaceae	FACW+	S		
	<i>Ambrosia artemisiifolia</i>	Ragweed, Annual	Asteraceae	FACU	H		
	<i>Amelanchier arborea</i>	Serviceberry, Downy	Rosaceae	FAC-	S,T		
	<i>Amphicarpaea bracteata</i>	Hog-Peanut, American	Fabaceae	FAC	H		
	<i>Anemone quinquefolia</i>	Thimble-weed, Woodland	Ranunculaceae	FACU	H		
*	<i>Anthoxanthum odoratum</i>	Grass, Sweet Vernal	Poaceae	FACU	H		
	<i>Apios americana</i>	Potato-bean, American	Fabaceae	FACW	H		
	<i>Aralia nudicaulis</i>	Sarsaparilla, Wild	Araliaceae	FACU	H,DS		
	<i>Arisaema triphyllum</i> ssp. <i>triphyllum</i>	Jack-in-the-Pulpit, Swamp	Araceae	FACW-	H		
	<i>Aronia melanocarpa</i>	Chokeberry, Black	Rosaceae	FAC	S		
	<i>Asclepias incarnata</i>	Milkweed, Swamp	Asclepiadaceae	OBL	H		
	<i>Athyrium filix-femina</i> var. <i>angustum</i>	Lady Fern	Woodsiaceae	FAC	F		
*	<i>Berberis thunbergii</i>	Barberry, Japanese	Berberidaceae	FACU	S		
	<i>Betula alleghaniensis</i>	Birch, Yellow	Betulaceae	FAC	T		
	<i>Betula lenta</i>	Birch, Black	Betulaceae	FACU	T		
	<i>Betula papyrifera</i>	Birch, Paper or White	Betulaceae	FACU	T		
	<i>Betula populifolia</i>	Birch, Gray	Betulaceae	FAC	T		
	<i>Bidens cernua</i>	Beggar-Ticks, Nodding	Asteraceae	OBL	H		
	<i>Bidens frondosa</i>	Beggar-ticks, Devil's	Asteraceae	FACW	H		
	<i>Brachyelytrum aristosum</i> (=B. <i>erectum</i> var. <i>septem</i>)	Grass, Woodland	Poaceae	FAC-?	H		
	<i>Brasenia schreberi</i>	Watershield	Nymphaeaceae	OBL	H		
	<i>Bromus ciliatus</i>	Brome, Fringed	Poaceae	FACW	H		
	<i>Calamagrostis canadensis</i>	Reedgrass, Bluejoint	Poaceae	FACW+	H		
	<i>Callitriche palustris</i>	Water-starwort, Spiny	Callitrichaceae	OBL	H		
	<i>Cardamine pennsylvanica</i>	Bittercress, Pennsylvania	Brassicaceae	OBL	H		
	<i>Carex arctata</i>	Sedge, Drooping Wood	Cyperaceae	FACU?	H		
	<i>Carex atlantica</i> var. <i>atlantica</i>	Sedge, Prickly Bog	Cyperaceae	FACW+	H		
	<i>Carex atlantica</i> var. <i>capillacea</i>	Sedge, Eastern	Cyperaceae	FACW+	H		
	<i>Carex brunnescens</i> var. <i>brunnescens</i>	Sedge, Brownish Lowland	Cyperaceae	FACW	H		
	<i>Carex canescens</i>	Sedge, Hoary	Cyperaceae	OBL	H		
	<i>Carex cephaloidea</i>	Sedge, Thinleaf	Cyperaceae	FAC+	H	T	
	<i>Carex comosa</i>	Sedge, Bearded	Cyperaceae	OBL	H		
	<i>Carex crinita</i>	Sedge, Fringed	Cyperaceae	OBL	H		
	<i>Carex debilis</i>	Sedge, White-edge	Cyperaceae	FAC	H		
	<i>Carex deflexa</i>	Sedge	Cyperaceae	UPL	H	W	
	<i>Carex digitalis</i>	Sedge, Finger	Cyperaceae	UPL	H		
	<i>Carex echinata</i> (= <i>C. muricata</i>)	Sedge, Little Prickly	Cyperaceae	OBL*	H		
	<i>Carex echinata</i> var. <i>angustata</i> (= <i>C. angustior</i>)	Sedge, Little Prickly	Cyperaceae	OBL*	H		
	<i>Carex folliculata</i>	Sedge, Long	Cyperaceae	OBL	H		
	<i>Carex gracillima</i>	Sedge, Graceful	Cyperaceae	FACU*	H		
	<i>Carex intumescens</i>	Sedge, Bladder	Cyperaceae	FACW+	H		
	<i>Carex lacustris</i>	Sedge, Lakebank	Cyperaceae	OBL	H		
	<i>Carex lasiocarpa</i> ssp. <i>americana</i>	Sedge, Wire	Cyperaceae	OBL	H		
	<i>Carex leptalea</i>	Sedge, Bristly-stalk	Cyperaceae	OBL	H		
	<i>Carex lupulina</i>	Sedge, Hop	Cyperaceae	OBL	H		

Vascular Plants of the Bean Sanctuary & NLRA Land - From Field Site Visits on 6/11 & 6/12 2012						
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Alien	Scientific Name	Common Name	Family Name	R1IND	Habit	E/T/W
	<i>Carex lurida</i>	Sedge, Lurid	Cyperaceae	OBL	H	
	<i>Carex projecta</i>	Sedge, Necklace	Cyperaceae	FACW	H	
	<i>Carex scoparia</i>	Sedge, Pointed Broom	Cyperaceae	FACW	H	
	<i>Carex stipata</i>	Sedge, Stalk-grain	Cyperaceae	OBL?	H	
	<i>Carex stricta</i>	Sedge, Uptight or Tussock	Cyperaceae	OBL	H	
	<i>Carex tenera</i>	Sedge, Slender	Cyperaceae	FAC	H	
	<i>Carex tribuloides</i>	Sedge, Blunt Broom	Cyperaceae	FACW+	H	
	<i>Carex tuckermanii</i>	Sedge, Tuckerman's	Cyperaceae	FACW?	H	
	<i>Carex utriculata</i>	Sedge, Beaked (Bottle-shaped)	Cyperaceae	OBL	H	
	<i>Carex vesicaria</i>	Sedge, Inflated	Cyperaceae	OBL	H	
	<i>Carex vulpinoidea</i>	Sedge, Fox	Cyperaceae	OBL	H	
	<i>Cephalanthus occidentalis</i>	Buttonbush	Rubiaceae	OBL	S	
	<i>Chamaedaphne calyculata</i>	Leatherleaf	Ericaceae	OBL	S	
	<i>Chamaepericlymenum</i> (= <i>Cornus</i>) <i>canadensis</i>	Bunchberry, Canada	Cornaceae	FAC-	H,DS	
	<i>Chelone glabra</i>	Turtlehead, White	Scrophulariaceae	OBL	H	
	<i>Chrysosplenium americanum</i>	Golden-saxifrage, American	Saxifragaceae	OBL	H	
	<i>Cicuta bulbifera</i>	Water-Hemlock, Bulbet-bearing	Apiaceae	OBL	H	
	<i>Clematis virginiana</i>	Virgin's-Bower, Virginia	Ranunculaceae	FACU-	WV	
*	<i>Convallaria majalis</i>	Lily-of-the-Valley	Convallariaceae	UPL?	H	
	<i>Coptis trifolia</i> (= <i>C. groenlandica</i>)	Goldthread	Ranunculaceae	FACW	H	
	<i>Cornus alternifolia</i>	Dogwood, Alternate-leaved	Cornaceae	FACU-?	S	
	<i>Cornus amomum</i>	Dogwood, Silky	Cornaceae	FACW	S	
	<i>Corylus cornuta</i>	Hazelnut, Beaked	Betulaceae	FACU-	S	
	<i>Dendrolycopodium obscurum</i> (= <i>Lycopodium</i> o.)	Clubmoss, Flat-branched Tree	Lycopodiaceae	FACU	F	
	<i>Dennstaedtia punctilobula</i>	Hay-scented Fern	Dennstaedtiaceae	UPL	F	
	<i>Dichanthelium</i> (= <i>Panicum</i>) <i>acuminatum</i>	Grass, Tapered Panic	Poaceae	FAC	H	
	<i>Dichanthelium</i> (= <i>Panicum</i>) <i>clandestinum</i>	Grass, Deer-tongue	Poaceae	FAC+	H	
	<i>Diphasiastrum digitatum</i> (= <i>Lycopodium flabellifolium</i>)	Running-pine, Southern	Lycopodiaceae	FACU?	F	
	<i>Doellingeria</i> (= <i>Aster</i>) <i>umbellatus</i>	Aster, Flat-Topped	Asteraceae	FACW	H	
	<i>Drosera rotundifolia</i>	Sundew, Round-leaved	Droseraceae	OBL	H	
	<i>Dryopteris carthusiana</i>	Woodfern, Spinulose	Dryopteridaceae	FAC+	F	
	<i>Dryopteris cristata</i>	Shield-fern, Crested	Dryopteridaceae	FACW+	F	
	<i>Dryopteris intermedia</i>	Woodfern, Evergreen	Dryopteridaceae	FACU	F	
	<i>Dulichium arundinaceum</i>	Sedge, Three-way	Cyperaceae	OBL	H	
	<i>Eleocharis acicularis</i>	Spikesedge, Least	Cyperaceae	OBL	H	
	<i>Eleocharis palustris</i> ssp. <i>palustris</i>	Spikesedge, Common	Cyperaceae	OBL	H	
	<i>Eleocharis tenuis</i>	Spikesedge, Slender	Cyperaceae	FACW+	H	
	<i>Elodea canadensis</i>	Water-weed, Broad	Hydrocharitaceae	OBL	H	
	<i>Elymus riparius</i>	Wild-rye, Riverbank	Poaceae	FACW	H	
	<i>Epilobium leptophyllum</i>	Willow-herb, Linear-leaf	Onagraceae	OBL	H	
	<i>Equisetum fluviatile</i>	Horsetail, Water	Equisetaceae	OBL	F	
	<i>Eriophorum tenellum</i>	Cotton Grass, Few Nerved	Cyperaceae	OBL	H	
	<i>Eupatorium maculatum</i>	Joe-Pye-Weed, Spotted	Asteraceae	FACW	H	
	<i>Eupatorium perfoliatum</i>	Boneset, Common	Asteraceae	FACW+	H	
	<i>Eurybia</i> (= <i>Aster</i>) <i>divaricata</i>	Aster, White Wood	Asteraceae	UPL	H	
	<i>Eurybia</i> (= <i>Aster</i>) <i>macrophylla</i>	Aster, Large-Leaved	Asteraceae	UPL	H	
	<i>Euthamia graminifolia</i> (= <i>Solidago</i> g.)	Fragrant-Golden-Rod, Flat-Top	Asteraceae	FAC	H	
	<i>Fagus grandifolia</i>	Beech, American	Fagaceae	FACU	T	
	<i>Fragaria vesca</i>	Strawberry, Wood	Rosaceae	FACU?	H	
	<i>Fraxinus americana</i>	Ash, White	Oleaceae	FACU	T	
*	<i>Galinsoga quadriradiata</i> (= <i>G. ciliata</i>)	Galinsoga	Asteraceae	UPL	H	
	<i>Galium palustre</i>	Bedstraw, Marsh	Rubiaceae	OBL	H	
	<i>Galium tinctorium</i>	Bedstraw, Stiff Marsh	Rubiaceae	OBL	H	
	<i>Galium triflorum</i>	Bedstraw, Sweet-scented	Rubiaceae	FACU	H	
	<i>Gaultheria procumbens</i>	Wintergreen	Ericaceae	FACU	H,DS	
	<i>Glyceria borealis</i>	Mannagrass, Boreal	Poaceae	OBL	H	
	<i>Glyceria canadensis</i>	Mannagrass, Canada	Poaceae	OBL	H	

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Alien	Scientific Name	Common Name	Family Name	R1IND	Habit	E/T/W
	<i>Glyceria grandis</i>	Mannagrass, American	Poaceae	OBL	H	
	<i>Glyceria melicaria</i>	Mannagrass, Melic	Poaceae	OBL	H	
	<i>Glyceria striata</i>	Mannagrass, Fowl	Poaceae	OBL	H	
	<i>Gratiola aurea</i>	Hedge-Hyssop, Golden	Scrophulariaceae	OBL	H	
	<i>Gymnocarpium dryopteris</i>	Fern, Oak	Woodsiaceae	UPL	F	
	<i>Hamamelis virginiana</i>	Witch-hazel, American	Hamamelidaceae	FAC-	S	
*	<i>Hieracium piloselloides</i> (= <i>H. florentinum</i>)	Hawkweed, Smooth or King Devil	Asteraceae	UPL	H	
	<i>Hydrocotyle americana</i>	Water Pennywort	Apiaceae	OBL	H	
	<i>Hypericum ellipticum</i>	St. Johnswort, Pale	Hypericaceae	OBL	H	
	<i>Hypericum mutilum</i>	St. Johnswort, Slender or Dwarf	Hypericaceae	FACW	H	
	<i>Ilex verticillata</i>	Winterberry, Common	Aquifoliaceae	FACW+	S	
	<i>Impatiens capensis</i>	Touch-me-not, Spotted	Balsaminaceae	FACW	H	
	<i>Iris versicolor</i>	Blue flag	Iridaceae	OBL	H	
	<i>Isoetes echinospora</i> ssp. <i>muricata</i> (= <i>I. m.</i>)	Quillwort, Spiny-spored	Isoetaceae	OBL	F	
	<i>Juncus arcticus</i> var. <i>balticus</i>	Rush, Baltic	Juncaceae	FACW+	H	
	<i>Juncus brevicaudatus</i>	Rush, Narrow Panicle	Juncaceae	OBL	H	
	<i>Juncus bufonius</i>	Rush, Toad	Juncaceae	FACW	H	
	<i>Juncus canadensis</i>	Rush, Canada	Juncaceae	OBL	H	
	<i>Juncus effusus</i>	Rush, Soft	Juncaceae	FACW+	H	
	<i>Juncus greenei</i>	Rush, Greene's	Juncaceae	FAC	H	
	<i>Juncus pelocarpus</i>	Rush, Brown-fruited	Juncaceae	OBL	H	
	<i>Juncus tenuis</i>	Rush, Slender	Juncaceae	FAC-	H	
	<i>Kalmia angustifolia</i>	Laurel, Sheep	Ericaceae	FAC	S	
	<i>Leersia oryzoides</i>	Cut-grass, Rice	Poaceae	OBL	H	
	<i>Lemna minor</i>	Duckweed, Lesser	Lemnaceae	OBL	H	
	<i>Lobelia inflata</i>	Indian Tobacco	Campanulaceae	FACU	H	
	<i>Ludwigia palustris</i>	Seedbox, Marsh	Onagraceae	OBL	H	
	<i>Lycopus uniflorus</i>	Bugleweed, Northern	Lamiaceae	OBL	H	
	<i>Lyonia ligustrina</i>	Maleberry	Ericaceae	FACW	S	
	<i>Lysimachia terrestris</i>	Loosestrife, Swamp (Candles)	Primulaceae	OBL	H	
	<i>Maianthemum canadense</i>	Mayflower, Canada	Convallariaceae	FAC-	H	
	<i>Maianthemum racemosum</i> ssp. <i>racemosum</i> (= <i>S. m.</i>)	False-Solomon's-Seal, Feather	Convallariaceae	FACU-	H	
	<i>Medeola virginiana</i>	Indian Cucumber Root	Liliaceae	FACU-?	H	
	<i>Mimulus ringens</i>	Monkey-Flower, Allegany	Scrophulariaceae	OBL	H	
	<i>Mitchella repens</i>	Partridgeberry	Rubiaceae	FACU	H,DS	
	<i>Muhlenbergia sylvatica</i>	Muhly, Forest	Poaceae	FAC+	H	
	<i>Myrica gale</i>	Sweet Gale	Myricaceae	OBL	S	
	<i>Nabalus</i> (= <i>Prenanthes</i>) <i>altissimus</i>	Rattlesnake-root, Tall	Asteraceae	FACU	H	
	<i>Najas gracillima</i>	Naiad, Thread-like	Najadaceae	OBL	H	IND
	<i>Nemophanthus mucronatus</i>	Holly, Mountain	Aquifoliaceae	OBL	S	
	<i>Nuphar variegata</i>	Cow-lily, Yellow or Spadderdock	Nymphaeaceae	OBL	H	
	<i>Nuttallanthus</i> (= <i>Linaria</i>) <i>canadensis</i>	Toadflax, Blue	Scrophulariaceae	UPL	H	
	<i>Nymphaea odorata</i> ssp. <i>odorata</i>	Waterlily, White	Nymphaeaceae	OBL	H	
	<i>Oclemena</i> (= <i>Aster</i>) <i>acuminatus</i>	Aster, Whorled	Asteraceae	FACU-?	H	
	<i>Onoclea sensibilis</i>	Fern, Sensitive	Onocleaceae	FACW	F	
	<i>Osmunda cinnamomea</i>	Cinnamon Fern	Osmundaceae	FACW	F	
	<i>Osmunda claytoniana</i>	Interrupted Fern	Osmundaceae	FAC	F	
	<i>Osmunda regalis</i> var. <i>spectabilis</i>	Royal Fern	Osmundaceae	OBL	F	
	<i>Ostrya virginiana</i>	Hop-Hornbeam	Betulaceae	FACU-	T	
	<i>Oxalis stricta</i> (incl. <i>O. europaea</i>)	Woodsorrel, Yellow	Oxalidaceae	UPL	H	
	<i>Panicum</i> sp.	Grass, Panic	Poaceae		H	
	<i>Parathypteris</i> (= <i>Thelypteris</i>) <i>noveboracensis</i>	Fern, New York	Thelypteridaceae	FAC	F	
	<i>Parthenocissus quinquefolia</i>	Virginia Creeper	Vitaceae	FACU	WV	
*	<i>Persicaria</i> (= <i>Polygonum</i>) <i>maculosa</i> (= <i>persicaria</i>)	Lady's Thumb	Polygonaceae	FACW	H	
	<i>Persicaria</i> (= <i>Polygonum</i>) <i>sagittata</i>	Tearthumb, Arrow-leaved	Polygonaceae	OBL	H	
	<i>Phalaris arundinacea</i>	Grass, Reed Canary	Poaceae	FACW+	H	
	<i>Phegopteris connectilis</i> (= <i>Thelypteris</i> p.)	Fern, Long Beech	Thelypteridaceae	FACU?	F	

Vascular Plants of the Bean Sanctuary & NLRA Land - From Field Site Visits on 6/11 & 6/12 2012						
Alien	Scientific Name	Common Name	Family Name	R1IND	Habit	E/T/W
	"R1IND" = Region 1 Indicator as assigned by the National Wetlands Plant Committee; "E/T/W" = Endangered/Threatened/Watch as determined by the NH Natural Heritage Bureau (IND = Indefinite)					
	<i>Picea glauca</i>	Spruce, White	Pinaceae	FACU	T	
	<i>Pinus strobus</i>	Pine, Eastern White	Pinaceae	FACU	T	
	<i>Polygonella articulata</i>	Jointweed, Sand	Polygonaceae	UPL	H	
	<i>Pontederia cordata</i>	Pickerel-weed	Pontederiaceae	OBL	H	
	<i>Populus grandidentata</i>	Aspen, Bigtooth	Salicaceae	FACU-	T	
	<i>Populus tremuloides</i>	Aspen, Quaking	Salicaceae	FACU	T	
	<i>Potamogeton epiphydrus</i>	Pondweed, Ribbonleaf	Potamogetonaceae	OBL	H	
	<i>Potamogeton natans</i>	Pondweed, Common Floating	Potamogetonaceae	OBL	H	
	<i>Potamogeton pusillus</i> (= <i>P. p.</i> var. <i>minor</i>)	Pondweed, Small	Potamogetonaceae	OBL	H	
	<i>Potentilla canadensis</i>	Cinquefoil, Dwarf	Rosaceae	FACU-	H	
	<i>Prunus pensylvanica</i>	Cherry, Fire	Rosaceae	FACU-	T	
	<i>Prunus serotina</i>	Cherry, Black	Rosaceae	FACU	T	
	<i>Pteridium aquilinum</i>	Fern, Bracken	Dennstaedtiaceae	FACU	F	
	<i>Quercus rubra</i>	Oak, Northern Red	Fagaceae	FACU-	T	
	<i>Ranunculus abortivus</i> L.	Buttercup, Subalpine (Kidneyleaf)	Ranunculaceae	FACW-	H	
*	<i>Ranunculus acris</i>	Buttercup, Tall	Ranunculaceae	FAC+	H	
	<i>Ribes lacustre</i>	Currant, Prickly	Grossulariaceae	FACW	S	
	<i>Rosa palustris</i>	Rose, Swamp	Rosaceae	OBL	S	
	<i>Rubus allegheniensis</i>	Blackberry, Allegheny	Rosaceae	FACU-	S	
	<i>Rubus dalibarda</i> (= <i>Dalibarda repens</i>)	Robin-run-away	Rosaceae	FAC	H	
	<i>Rubus hispidus</i>	Blackberry, Bristly (Dewberry)	Rosaceae	FACW	S	
	<i>Rubus pubescens</i>	Blackberry, Dwarf	Rosaceae	FACW	H	
	<i>Rubus setosus</i>	Blackberry, Setose	Rosaceae	FACW+	S	
*	<i>Rumex obtusifolius</i>	Dock, Bitter	Polygonaceae	FACU-	H	
	<i>Rumex triangulivalvis</i> (= <i>R. salicifolius</i> ssp. <i>t.</i>)	Dock, Willow or White	Polygonaceae	FAC	H	
	<i>Sagittaria latifolia</i>	Arrowhead, Broad-leaf	Alismataceae	OBL	H	
	<i>Salix discolor</i>	Willow, Pussy	Salicaceae	FACW	S	
	<i>Salix lucida</i> ssp. <i>lucida</i>	Willow, Shining	Salicaceae	FACW	S	
	<i>Salix nigra</i>	Willow, Black	Salicaceae	FACW+	T,S	
	<i>Salix sericea</i>	Willow, Silky	Salicaceae	OBL	S	
	<i>Sambucus nigra</i> ssp. <i>canadensis</i> (= <i>V. c.</i>)	Elder, American	Adoxaceae	FACW-	S	
	<i>Schoenoplectus</i> (= <i>Scirpus</i>) <i>subterminalis</i>	Bulrush, Subterminate	Cyperaceae	OBL	H	
	<i>Scirpus atrocinctus</i>	Bulrush, Blackgirdle	Cyperaceae	FACW+	H	
	<i>Scirpus expansus</i>	Bulrush, Woodland	Cyperaceae	OBL	H	
	<i>Scirpus microcarpus</i> (= <i>S. rubrotinctus</i>)	Bulrush, Small Fruited	Cyperaceae	OBL	H	
	<i>Sium suave</i>	Water-parsnip, Hemlock	Apiaceae	OBL	H	
	<i>Smilax herbacea</i>	Carrion Flower, Smooth	Smilacaceae	FAC	HV,H	
*	<i>Solanum dulcamara</i> L. var. <i>dulcamera</i>	Nightshade, Climbing	Solanaceae	FAC-	WV,S	
	<i>Solidago canadensis</i> var. <i>canadensis</i>	Goldenrod, Canada	Asteraceae	FACU	H	
	<i>Solidago flexicaulis</i>	Goldenrod, Zig-Zag	Asteraceae	FACU	H	
	<i>Solidago gigantea</i>	Goldenrod, Late	Asteraceae	FAC	H	
	<i>Solidago juncea</i>	Goldenrod, Early	Asteraceae	UPL	H	
	<i>Solidago rugosa</i> ssp. <i>rugosa</i>	Goldenrod, Wrinkled	Asteraceae	FAC	H	
	<i>Sparganium americanum</i>	Bur-reed, American	Sparganiaceae	OBL	H	
	<i>Sparganium</i> sp.	Bur-reed	Sparganiaceae	OBL	H	
	<i>Spinulum annotinum</i> (= <i>Lycopodium</i> a.)	Clubmoss, Stiff or Bristly	Lycopodiaceae	FAC	F	
	<i>Spiraea alba</i> var. <i>latifolia</i> (= <i>S. latifolia</i>)	Meadowsweet, Broad-leaf	Rosaceae	FAC+	S	
	<i>Spiraea tomentosa</i>	Steeplebush	Rosaceae	FACW	S	
	<i>Symphytotrichum</i> (= <i>Aster</i>) <i>cordifolium</i>	Aster, Heart-leaved	Asteraceae	UPL	H	
	<i>Symphytotrichum</i> (= <i>Aster</i>) <i>lanceolatum</i> ssp. <i>lanceolatum</i>	Aster, Panicked	Asteraceae	FACW	H	
	<i>Symphytotrichum</i> (= <i>Aster</i>) <i>lateriflorum</i>	Aster, Calico	Asteraceae	FACW-	H	
	<i>Symphytotrichum</i> (= <i>Aster</i>) <i>punicum</i> var. <i>punicum</i>	Aster, Swamp (Purple-stemmed)	Asteraceae	OBL	H	
	<i>Thalictrum pubescens</i> (= <i>T. polygamum</i>)	Meadow-rue, Tall	Ranunculaceae	FACW+	H	
	<i>Thelypteris palustris</i> var. <i>pubescens</i>	Fern, Marsh	Thelypteridaceae	FACW+	F	
	<i>Toxicodendron rydbergii</i>	Ivy, Poison	Anacardiaceae	FAC?	S	
	<i>Triadenum virginicum</i> (= <i>Hypericum</i> v.)	St. Johnswort, Marsh	Hypericaceae	OBL	H	
	<i>Trientalis borealis</i>	Starflower	Primulaceae	FAC	H	

Vascular Plants of the Bean Sanctuary & NLRA Land - From Field Site Visits on 6/11 & 6/12 2012						
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Alien	Scientific Name	Common Name	Family Name	R1IND	Habit	E/T/W
*	<i>Trifolium repens</i>	Clover, White	Fabaceae	FACU-	H	
	<i>Tsuga canadensis</i>	Hemlock, Eastern	Pinaceae	FACU	T	
	<i>Typha latifolia</i>	Cattail, Broad-leaf	Typhaceae	OBL	H	
	<i>Ulmus americana</i>	Elm, American	Ulmaceae	FACW-	T	
	<i>Utricularia intermedia</i>	Bladderwort, Flat-leaf	Lentibulariaceae	OBL	H	
	<i>Uvularia sessilifolia</i>	Bellwort, Sessile-leaf	Uvulariaceae	FACU-	H	
	<i>Vaccinium angustifolium</i>	Blueberry, Lowbush	Ericaceae	FACU-	S	
	<i>Vaccinium corymbosum</i>	Blueberry, Highbush	Ericaceae	FACW-	S	
	<i>Vaccinium myrtilloides</i>	Blueberry, Velvet leaf	Ericaceae	FAC	S	
*	<i>Veronica officinalis</i> var. <i>officinalis</i>	Speedwell, Common	Plantaginaceae	FACU-	H	
	<i>Viburnum dentatum</i> var. <i>lucidum</i> (= <i>V. recognitum</i>)	Arrowwood	Adoxaceae	FACW-	S	
	<i>Viburnum lantanoides</i> (= <i>V. alnifolium</i>)	Hobblebush	Adoxaceae	FAC	S	
	<i>Viburnum nudum</i> var. <i>cassinoides</i> (= <i>V. c.</i>)	Witherod	Adoxaceae	FACW	S	
	<i>Viola cucullata</i>	Violet, Marsh Blue	Violaceae	FACW+	H	
	<i>Vitis riparia</i>	Grape, River Bank	Vitaceae	FACW	WV	

**BEAN SANCTUARY & NLRA MARINA PROPERTY
WILDLIFE SPECIES LIST – ALL SPECIES with OBSERVATIONAL SIGN
[June 11 & 12, 2012]**

MAMMALS

(Taxonomy follows Zoological Record Volume 134)

<u>Code</u>	<u>Scientific Name</u>	<u>Common Name</u>	<u>Observational Sign</u>
Artiodactyla - Cervidae			
Aa	Alces alces	Moose	track, browse, barking, beds, scat Skull & bones
Ov	Odocoileus virginianus	White-tailed deer	sighting, track, browse, scat, rub
Carnivora - Canidae			
Cl	Canis latrans sp.	Eastern coyote	track, scat
Vv	Vulpes vulpes	Red fox	track, scat, roadside den
Uc	Urocyon cinereoargenteus	Gray fox	track, excavation of turtle nest
Carnivora - Mustelidae			
Me	Mustela erminea	Ermine or Short-tailed weasel	sighting
Mv	Neomustela vison	Mink	track, scat
Lc	Lutra canadensis	River Otter	scent post
Carnivora - Procyonidae			
Pl	Procyon lotor	Raccoon	track, scat, claw marks
Carnivora - Ursidae			
Ua	Ursus americanus	Black bear	claw marks, scat
Insectivora - Soricidae			
Bb	Blarina brevicauda	Short-tailed shrew	tunnels, odor
Insectivora - Talpidae			
Pb	Parascalops breweri	Hairy-tailed mole	tunnels & mounds
Ccr	Chondylura cristata	Star-nosed mole	tunnels
Lagomorpha - Leporidae			
La	Lepus americanus	Snowshoe Hare	browse, scat
Rodentia – Castoridae			
Cc	Castor canadensis	beaver	old bank lodge, old browse, excav.
Rodentia - Erethizontidae			
Ed	Erethizon dorsatum	Porcupine	den, track, browse, scat, urine
Rodentia - Cricetidae			
Pero	Peromyscus sp.	Deer/white-footed mouse	track, scat
Mpe	Microtus pennsylvanicus	Meadow vole	tunnels, browse
Oz	Ondatra zibethicus	Muskrat	scat
Rodentia - Sciuridae			
Ts	Tamias striatus	Eastern chipmunk	sighting, track, chew marks, tunnels

Th *Tamiasciurus hudsonicus* Red squirrel sighting, track, chew marks, midden

PROBABLE SPECIES

Lr	<i>Lynx rufus</i>	Bobcat
Ed	<i>Erethizon dorsatum</i>	Porcupine
Pl	<i>Peromyscus leucopus</i>	White-footed mouse
Pm	<i>Peromyscus maniculatus</i>	Deer mouse
Ni	<i>Napeozapus insignis</i>	Woodland jumping mouse
Zh	<i>Zapus hudsonicus</i>	Meadow jumping mouse
Gsp	<i>Glaucomys spp.</i>	Flying squirrel
Ml	<i>Myotis ludovicianus</i>	Little brown myotis
Epf	<i>Eptesicus fuscus</i>	Big brown bat
Ls	<i>Lasionycteris noctivagans</i>	Silver-haired bat

BIRDS

HEBRON - Bean Sanctuary and NLRA Marina Property - June 11-12, 2012					
(Includes all probable species in area)					
Scientific Name	Common Name	AOU Code	6/11	6/12	TOTAL
<i>Gavia immer</i>	Common Loon	COLO	1		1
<i>Gavia stellata</i>	Red-throated Loon	RTLO			0
<i>Podilymbus podiceps</i>	Pied-billed Grebe	PBGR			0
<i>Podiceps auritus</i>	Horned Grebe	HOCR			0
<i>Podiceps grisegena</i>	Red-necked Grebe	RNGR			0
<i>Phalacrocorax auritus</i>	Double-crested Cormorant	DCCO			0
<i>Botaurus lentiginosus</i>	American Bittern	AMBI	1		1
<i>Ardia herodias</i>	Great Blue Heron	GBHE			0
<i>Ardea alba</i>	Great Egret	GREG			0
<i>Butorides virescens</i>	Green Heron	GRHE			0
<i>Nycticorax nycticorax</i>	Black-crowned Night-Heron	BCNH			0
<i>Chen caerulescens</i>	Snow Goose	SNGO			0
<i>Branta canadensis</i>	Canada Goose	CAGO	1		1
<i>Branta bernicla</i>	Atlantic Brant	ATBR			0
<i>Aix sponsa</i>	Wood Duck	WODU	5	1	6
<i>Anas rubripes</i>	American Black Duck	ABDU	1		1
<i>Anas platyrhynchos</i>	Mallard	MALL	2		2
<i>Anas discors</i>	Blue-winged Teal	BWTE			0
<i>Anas crecca</i>	American Green-winged Teal	AGWT			0
<i>Aythya collaris</i>	Ring-necked Duck	RNDU			0
<i>Melanitta nigra</i>	Black Scoter	BLSC			0
<i>Melanitta perspicillata</i>	Surf Scoter	SUSC			0

Bean Sanctuary & NLRA Marina Property Rapid Ecological Assessment

Melanitta fusca	White-winged Scoter	WWSC				0
Bucephala albeola	Bufflehead	BUFF				0
Bucephala clangula	Common Goldeneye	COGO				0
Lophodytes cucullatus	Hooded Merganser	HOME				0
Mergus merganser	Common Merganser	COME		1		1
Cathartes aura	Turkey Vulture	TUVU				0
Pandion haliaetus	Osprey	OSPR				0
Haliaeetus leucocephalus	Bald Eagle	BAEA		1		1
Circus cyaneus	Northern Harrier	NOHA				0
Accipiter striatus	Sharp-shinned Hawk	SSHA				0
Accipiter cooperii	Cooper's Hawk	COHA				0
Accipiter gentilis	Northern Goshawk	NOGO				0
Buteo lineatus	Red-shouldered Hawk	RSHA				0
Buteo platypterus	Broad-winged Hawk	BWHA		1		1
Buteo jamaicensis	Red-tailed Hawk	RTHA				0
Falco sparverius	American Kestrel	AMKE				0
Falco columbarius	Merlin	MERL				0
Falco peregrinus	Peregrine Falcon	PEFA				0
Bonasa umbellus	Ruffed Grouse	RUGR				0
Meleagris gallopavo	Wild Turkey	WITU				0
Rallus limicola	Virginia Rail	VIRA				0
Porzana carolina	Sora	SORA				0
Fulica americana	American Coot	AMCO				0
Pluvialis squatarola	Black-bellied Plover	BBPL				0
Charadrius vociferus	Killdeer	KILL				0
Tringa melanoleuca	Greater Yellowlegs	GRYE				0
Tringa solitaria	Solitary Sandpiper	SOSA				0
Actitis macularia	Spotted Sandpiper	SPSA				0
Calidris pusilla	Semipalmated Sandpiper	SESA				0
Calidris minutilla	Least Sandpiper	LESA				0
Limnodromus griseus	Short-billed Dowitcher	SBDO				0
Gallinago gallinago	Common Snipe	COSN				0
Scolopax minor	American Woodcock	AMWO	1			1
Larus philadelphia	Bonaparte's Gull	BOGU				0
Larus delawarensis	Ring-billed Gull	RBGU				0
Larus argentatus	Herring Gull	HEGU				0
Larus marinus	Great Black-backed Gull	GBBG				0
Sterna hirundo	Common Tern	COTE				0
Chlidonius niger	Black Tern	BLTE				0
Columba livia	Rock Dove	RODO				0
Zenaidura macroura	Mourning Dove	MODO	1	1		2

Bean Sanctuary & NLRA Marina Property Rapid Ecological Assessment

<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo	BBCU		1		1
<i>Coccyzus americanus</i>	Yellow-billed Cuckoo	YBCU	1	1		2
<i>Otus asio</i>	Eastern Screech Owl	EASO				0
<i>Bubo virginianus</i>	Great Horned Owl	GHOW				0
<i>Strix varia</i>	Barred Owl	BAOW				0
<i>Aegolius acadicus</i>	Northern Saw-whet Owl	NSWO				0
<i>Chordeiles minor</i>	Common Nighthawk	CONI				0
<i>Caprimulgus vociferus</i>	Whip-poor-will	WPWI				0
<i>Chaetura pelagica</i>	Chimney Swift	CHSW				0
<i>Archilochus colubris</i>	Ruby-throated Hummingbird	RTHU		1		1
<i>Ceryle alcyon</i>	Belted Kingfisher	BEKI	1			1
<i>Melanerpes carolinus</i>	Red-bellied Woodpecker	RBWO				0
<i>Sphyrapicus varius</i>	Yellow-bellied Sapsucker	YBSA		1		1
<i>Picoides pubescens</i>	Downy Woodpecker	DOWO	2	1		3
<i>Picoides villosus</i>	Hairy Woodpecker	HAWO	2			2
<i>Colaptes auratus</i>	Northern Flicker	NOFL	1			1
<i>Dryocopus pileatus</i>	Pileated Woodpecker	PIWO	1			1
<i>Contopus borealis</i>	Olive-sided Flycatcher	OSFL				0
<i>Contopus virens</i>	Eastern Wood-Pewee	EAWP				0
<i>Empidonax alnorum</i>	Alder Flycatcher	ALFL	2	1		3
<i>Empidonax traillii</i>	Willow Flycatcher	WIFL	1			1
<i>Empidonax minimus</i>	Least Flycatcher	LEFL		1		1
<i>Sayornis phoebe</i>	Eastern Phoebe	EAPH	2			2
<i>Myiarchus crinitus</i>	Great Crested Flycatcher	GCFL	1	2		3
<i>Tyrannus tyrannus</i>	Eastern Kingbird	EAKI	1	1		2
<i>Eremophila alpestris</i>	Horned Lark	HOLA				0
<i>Lanius excubitor</i>	Northern Shrike	NSHR				0
<i>Vireo solitarius</i>	Blue-headed Vireo	BHVI				0
<i>Vireo flavifrons</i>	Yellow-throated Vireo	YTVI				0
<i>Vireo gilvus</i>	Warbling Vireo	WAVI	1			1
<i>Vireo philadelphicus</i>	Philadelphia Vireo	PHVI				0
<i>Vireo olivaceus</i>	Red-eyed Vireo	REVI	5	2		7
<i>Cyanocitta cristata</i>	Blue Jay	BLJA	2			2
<i>Corvus brachyrhynchos</i>	American Crow	AMCR	3	2		5
<i>Corvus corax</i>	Common Raven	CORA				0
<i>Progne subis</i>	Purple Martin	PUMA				0
<i>Tachycineta bicolor</i>	Tree Swallow	TRES	11			11
<i>Stelgidopteryx serripennis</i>	No. Rough-winged Swallow	NRWS				0
<i>Riparia riparia</i>	Bank Swallow	BANS				0
<i>Petrochelidon pyrrhonota</i>	Cliff Swallow	CLSW				0
<i>Hirundo rustica</i>	Barn Swallow	BARS	1			1

Bean Sanctuary & NLRA Marina Property Rapid Ecological Assessment

Poecile atricapillus	Black-capped Chickadee	BCCH	4	1		5
Poecile hudsonicus	Boreal Chickadee	BOCH				0
Baeolophus bicolor	Tufted Titmouse	ETTI		1		1
Sitta canadensis	Red-breasted Nuthatch	RBNU	1			1
Sitta carolinensis	White-breasted Nuthatch	WBNU	1			1
Certhia americana	Brown Creeper	BRCR		1		1
Thryothorus ludovicianus	Carolina Wren	CAWR				0
Troglodytes aedon	House Wren	HOWR	1			1
Troglodytes troglodytes	Winter Wren	WIWR				0
Regulus satrapa	Golden-crowned Kinglet	GCKI				0
Regulus calendula	Ruby-crowned Kinglet	RCKI				0
Poliptila caerulea	Blue-gray Gnatcatcher	BGGN				0
Sialia sialis	Eastern Bluebird	EABL				0
Catharus fuscescens	Veery	VEER	6	3		9
Catharus minimus	Gray-cheeked (Bicknell's) Thrush	BITH				0
Catharus ustulatus	Swainson's Thrush	SWTH				0
Catharus guttatus	Hermit Thrush	HETH	1			1
Hylocichla mustelina	Wood Thrush	WOTH				0
Turdus migratorius	American Robin	AMRO	1			1
Dumetella carolinensis	Gray Catbird	GRCA	5	1		6
Mimus polyglottos	Northern Mockingbird	NOMO				0
Toxostoma rufum	Brown Thrasher	BRTH				0
Sturnus vulgaris	European Starling	EUST				0
Anthus rubescens	American Pipit	AMPI				0
Bombycilla cedrorum	Cedar Waxwing	CEWA	3			3
Bombycilla garrulus	Bohemian Waxwing	BOWA				0
Vermivora pinus	Blue-winged Warbler	BWWA				0
Vermivora peregrina	Tennessee Warbler	TEWA				0
Vermivora ruficapilla	Nashville Warbler	NAWA				0
Parula americana	Northern Parula	NOPA	1			1
Dendroica petechia	Yellow Warbler	YEWA	7	2		9
Dendroica pensylvanica	Chestnut-sided Warbler	CSWA				0
Dendroica magnolia	Magnolia Warbler	MAWA				0
Dendroica tigrina	Cape May Warbler	CMWA				0
Dendroica caerulescens	Black-throated Blue Warbler	BTBW				0
Dendroica coronata	Myrtle Warbler	MYWA				0
Dendroica virens	Black-throated Green Warbler	BTGW				0
Dendroica fusca	Blackburnian Warbler	BLAC				0
Dendroica pinus	Pine Warbler	PIWA	1	1		2
Dendroica discolor	Prairie Warbler	PRWA				0
Dendroica palmarum	Palm Warbler	PAWA				0

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<i>Dendroica castanea</i>	Bay-breasted Warbler	BBWA				0
<i>Dendroica striata</i>	Blackpoll Warbler	BLAW				0
<i>Mniotilta varia</i>	Black-and-white Warbler	BAWW				0
<i>Setophaga ruticilla</i>	American Redstart	AMRE	2			2
<i>Seiurus aurocapillus</i>	Ovenbird	OVEN		3		3
<i>Seiurus noveboracensis</i>	Northern Waterthrush	NOWA				0
<i>Seiurus motacilla</i>	Louisiana Waterthrush	LOWA				0
<i>Oporornis philadelphia</i>	Mourning Warbler	MOWA				0
<i>Geothlypis trichas</i>	Common Yellowthroat	COYE	6			6
<i>Wilsonia pusilla</i>	Wilson's Warbler	WIWA				0
<i>Wilsonia canadensis</i>	Canada Warbler	CAWA				0
<i>Piranga olivacea</i>	Scarlet Tanager	SCTA				0
<i>Pipilo erythrophthalmus</i>	Eastern Towhee	EATO				0
<i>Spizella arborea</i>	American Tree Sparrow	ATSP				0
<i>Spizella passerina</i>	Chipping Sparrow	CHSP	1			1
<i>Spizella pusilla</i>	Field Sparrow	FISP				0
<i>Poecetes gramineus</i>	Vesper Sparrow	VESP				0
<i>Passerculus sandwichensis</i>	Savannah Sparrow	SAVS				0
<i>Ammodramus savannarum</i>	Grasshopper Sparrow	GRSP				0
<i>Passerella iliaca</i>	Fox Sparrow	FOSP				0
<i>Melospiza melodia</i>	Song Sparrow	SOSP	9	1		10
<i>Melospiza lincolni</i>	Lincoln's Sparrow	LISP				0
<i>Melospiza georgiana</i>	Swamp Sparrow	SWSP	5	1		6
<i>Zonotrichia albicollis</i>	White-throated Sparrow	WTSP				0
<i>Zonotrichia leucophrys</i>	White-crowned Sparrow	WCSP				0
<i>Junco hyemalis</i>	Slate-colored Junco	SCJU				0
<i>Calcarius lapponicus</i>	Lapland Longspur	LALO				0
<i>Plectrophenax nivalis</i>	Snow Bunting	SNBU				0
<i>Cardinalis cardinalis</i>	Northern Cardinal	NOCA	1			1
<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak	RBGR				0
<i>Passerina cyanea</i>	Indigo Bunting	INBU		1		1
<i>Dolichonyx oryzivorus</i>	Bobolink	BOBO	1			1
<i>Agelaius phoeniceus</i>	Red-winged Blackbird	RWBL	4	1		5
<i>Sturnella magna</i>	Eastern Meadowlark	EAME				0
<i>Euphagus carolinus</i>	Rusty Blackbird	RUBL				0
<i>Quiscalus quiscula</i>	Common Grackle	COGR	1			1
<i>Molothrus ater</i>	Brown-headed Cowbird	BHCO				0
<i>Icterus galbula</i>	Baltimore Oriole	BAOR	3			3
<i>Pinicola enucleator</i>	Pine Grosbeak	PIGR				0
<i>Carpodacus purpureus</i>	Purple Finch	PUFI				0

Carpodacus mexicanus	House Finch	HOFI				0
Loxia curvirostra	Red Crossbill	RECR				0
Loxia leucoptera	White-winged Crossbill	WWCR				0
Carduelis flammea	Common Redpoll	CORE				0
Carduelis pinus	Pine Siskin	PISI				0
Carduelis tristis	American Goldfinch	AMGO	3			3
Coccothraustes vespertinus	Evening Grosbeak	EVGR				0
Passer domesticus	House Sparrow	HOSP				0
		COUNT	48	28		59
		SUM	119	36		155

<u>Code</u>	<u>Scientific Name</u>	<u>Common Name</u>	<u>Obs. Type</u>
FISH			
ATS	Salmo salar	Atlantic salmon	(report)
EBT	Salvelinus fontinalis	eastern brook trout	(report)
CWS	Catostomus commersoni	common white sucker	adult (dead)
LCH	Couesius plumbeus	lake chub	adults & juveniles
ECP	Esox niger	chain pickerel	juveniles
BND	Rhinichthys atratulus	blacknose dace	adults
SMB	Micropterus dolomieu	smallmouth bass	juveniles, adult
LMB	Micropterus salmoides	large-mouth bass	adult
YP	Perca flavescens	yellow perch	juvenile, adults
CSF	Lepomis gibbosus	pumpkinseed sunfish	adults
REPTILES			
Css	Chelydra serpentina	snapping turtle	adult
Cpp	Chrysemmys picta picta	eastern painted turtle	eggs, adults
Gi	Glyptemmys insculpta	wood turtle	(report)
Ts	Thamnophis sirtalis sirtalis	eastern garter snake	adult
AMPHIBIANS			
Nv	Notophthalmus viridescens	red-spotted newt	efts, adults
Pci	Plethodon cinereus	redback salamander	adults
Ba	Bufo americanus	eastern American toad	adults

Hv	<i>Hyla versicolor</i>	gray treefrog	adults
Pcr	<i>Pseudacris crucifer</i>	northern spring peeper	adults
Lca	<i>Lithobates catesbeiana</i>	bullfrog	larvae, adults
Lcl	<i>Lithobates clamitans</i>	green frog	larvae, juveniles, adults
Ls	<i>Lithobates sylvatica</i>	wood frog	juvenile, adults
Lp	<i>Lithobates palustris</i>	pickerel frog	adults

Probable Species

Am	<i>Ambystoma maculatum</i>	spotted salamander
Df	<i>Desmognathus fuscus</i>	northern dusky salamander
Eb	<i>Eurycea bislineata</i>	northern two-lined salamander
Ns	<i>Nerodia sipedon sipedon</i>	northern water snake
Ov	<i>Opheodrys vernalis vernalis</i>	smooth green snake
Lt	<i>Lampropeltis triangulum</i>	eastern milk snake
LND	<i>Rhinichthys cataractae</i>	longnose dace
FF	<i>Semotilus corporalis</i>	fallfish
CC	<i>Semotilus atromaculatus</i>	creek chub

INVERTEBRATES

Oligochaeta

Lumbriculus variegatus aquatic worm adult

Hirudinea

Herpobdella stagnalis leech adult

Gastropoda

Pseudosuccinea columella freshwater snail adult
Cipangopaludina chinensis Chinese mystery snail adult

Amphipoda

Crangionyx beach amphipod adult
Hyalella azteca scud adult

Cyclopoidea

Cyclops sp. Cyclops copepod adult

Hydrachnidia

Hydrachna water mite adults

Ephemeroptera

Heptageniidae mayfly adult

Odonata

Calopteryx maculata ebony jewelwing adults
Lestes disjunctus northern spreadwing adult
Lestes inaequalis slender spreadwing adults

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<i>Argia fumipennis</i>	variable dancer	adults
<i>Enallagma civile</i>	familiar bluet	adults
<i>Enallagma ebrium</i>	marsh bluet	adults
<i>Enallagma hageni</i>	Hagen's bluet	adults
<i>Enallagma vesperum</i>	evening bluet	adult F.
<i>Ischnura verticalis</i>	eastern forktail	adults
<i>Nehalennia irene</i>	sedge sprite	adults
<i>Aeshna verticalis</i>	green-striped darner	adult
<i>Anax junius</i>	common green drainer	adults
<i>Gomphus spicatus</i>	dusky clubtail	adults
<i>Cordulegaster maculata</i>	twin-spotted spiketail	adults
<i>Didymops transversa</i>	stream cruiser	adults
<i>Helocordulia uhleri</i>	Uhler's sundragon	adult
<i>Erythemis simplicicollis</i>	eastern pondhawk	adults
<i>Ladona julia</i>	chalk-fronted corporal	adults
<i>Leucorhinnia frigida</i>	frosted whiteface	adults
<i>Leucorhinnia hudsonica</i>	Hudsonian whiteface	adults
<i>Leucorhinnia intacta</i>	dot-tailed whiteface	adults
<i>Libellula incesta</i>	slaty skimmer	adults
<i>Libellula pulchella</i>	twelve-spotted skimmer	adult
<i>Pachydiplax longipennis</i>	blue dasher	adult
<i>Plathemis lydia</i>	common whitetail	adults
<i>Sympetrum sp.</i>	meadowhawk	adult
Plecoptera		
<i>Allocaonia sp.</i>	stonefly	adult
Hemiptera		
<i>Gerris ramigena</i>	water strider	adults
Coreidae	leaf-footed bug	adult
Coleoptera		
Carabidae	ground beetle	adult
<i>Agabus sp.</i>	predaceous diving beetle	adults
<i>Dineutus sp.</i>	large whirligig beetle	adults
<i>Gyrinus</i>	whirligig beetle	adults
<i>Elodes sp.</i>	marsh beetle	adult
<i>Macroductylus subspinosus</i>	rose chafer	adults
<i>Cantharus sp.</i>	soldier beetle	adult
<i>Photurus sp.</i>	firefly beetle	adult
<i>Melanotus communis</i>	common click beetle	adult
<i>Harmonia axyridis</i>	Eurasian lady beetle	adult
<i>Pyrrhalta viburni</i>	viburnum leaf beetle	adults
Neuroptera		
<i>Chrysoperla sp.</i>	common green lacewing	adult
Trichoptera		
<i>Limnephilus</i>	northern casemaker	larvae
<i>Pycnopsyche</i>	northern casemaker	larvae
Lepidoptera		
<i>Pipilo canadensis</i>	Canadian tiger swallowtail	adults
<i>Pipilo glauca</i>	Eastern tiger swallowtail	adult
<i>Speyeria cybele</i>	great spangled fritillary	larvae

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Euphydryas phaeton	Baltimore	adult
Polygonia interrogationis	question mark	adult
Coenonympha tullia	common ringlet	adults
Cicronis pegala	common wood nymph	adult
Ancyloxypha numitor	least skipper	adults
Gypsonoma adjuncta	Olethreutine moth	adult
Orthotaenia undulana	gray leafroller	adults
Syndemis afflictana	dusky gray-and-black leafroller	adults
Elophila icciusalis	pondside pyralid moth	adults
Elophila eckthlipsis	nymphula moth	adults
Campaea perlata	pale beauty	adult
Ledaea perditalis	lost owlet	adult

Diptera

Gonomyia sp.	crane fly	adult
Platycheirus quadratus	flower fly	adults
Panorpa helena	scorpion fly	adult

Aranae

Dolomedes triton	six-spotted fishing spider	adults
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FUNGI

Agrocybe dura
Cerrena unicolor
Ganoderma applanatum
Megacollybia rodmani
Mycena alcalina grp.
Oxyporus popullinus
Sphaerobolus stellatus
Trichaptum bifforme

APPENDIX C

SELECTED PLANT SPECIMENS

- (1) **Carex cephaloidea**
- (2) **Carex tuckermanii**
- (3) **Glyceria borealis**
- (4) **Isoetes echinospora**
- (5) **Potamogeton cf pusillus**

Carex cephaloidea (Dewey) Dewey

Thin-leaved Sedge

Cyperaceae

Rich Floodplain soils

Cockermouth River

Bean Sanctuary

Hebron, NH

6-11-12

coll & ID RVP

FACT

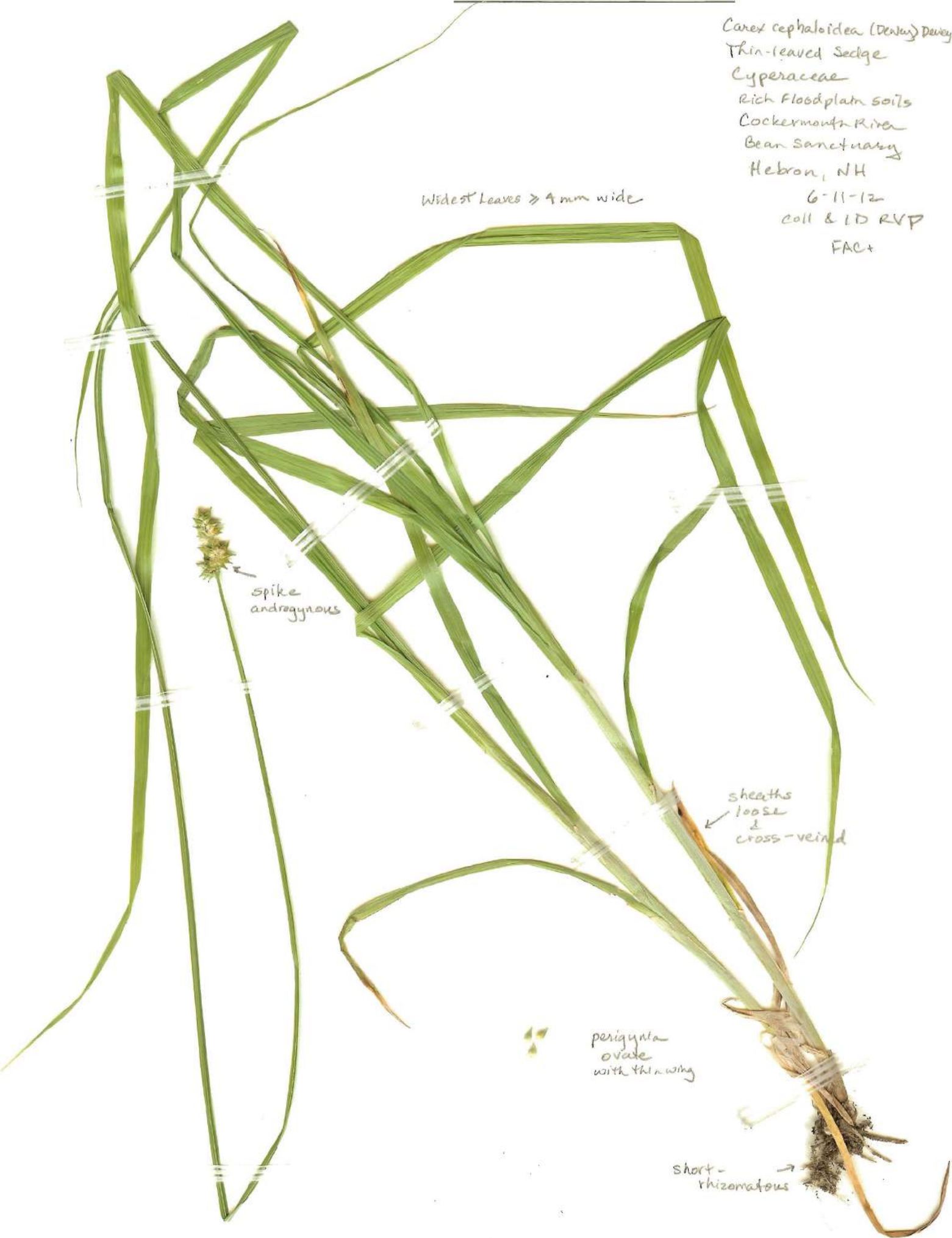
Widest Leaves ≥ 4 mm wide

spike
androgynous

sheaths
loose
&
cross-veined

perigynia
ovate
with thin wing

short-
rhizomatous



Carex tuckermanii Dewey

Tuckerman's Sedge

Cyperaceae

riverine floodplain
near vernal pool

Cockermouth River

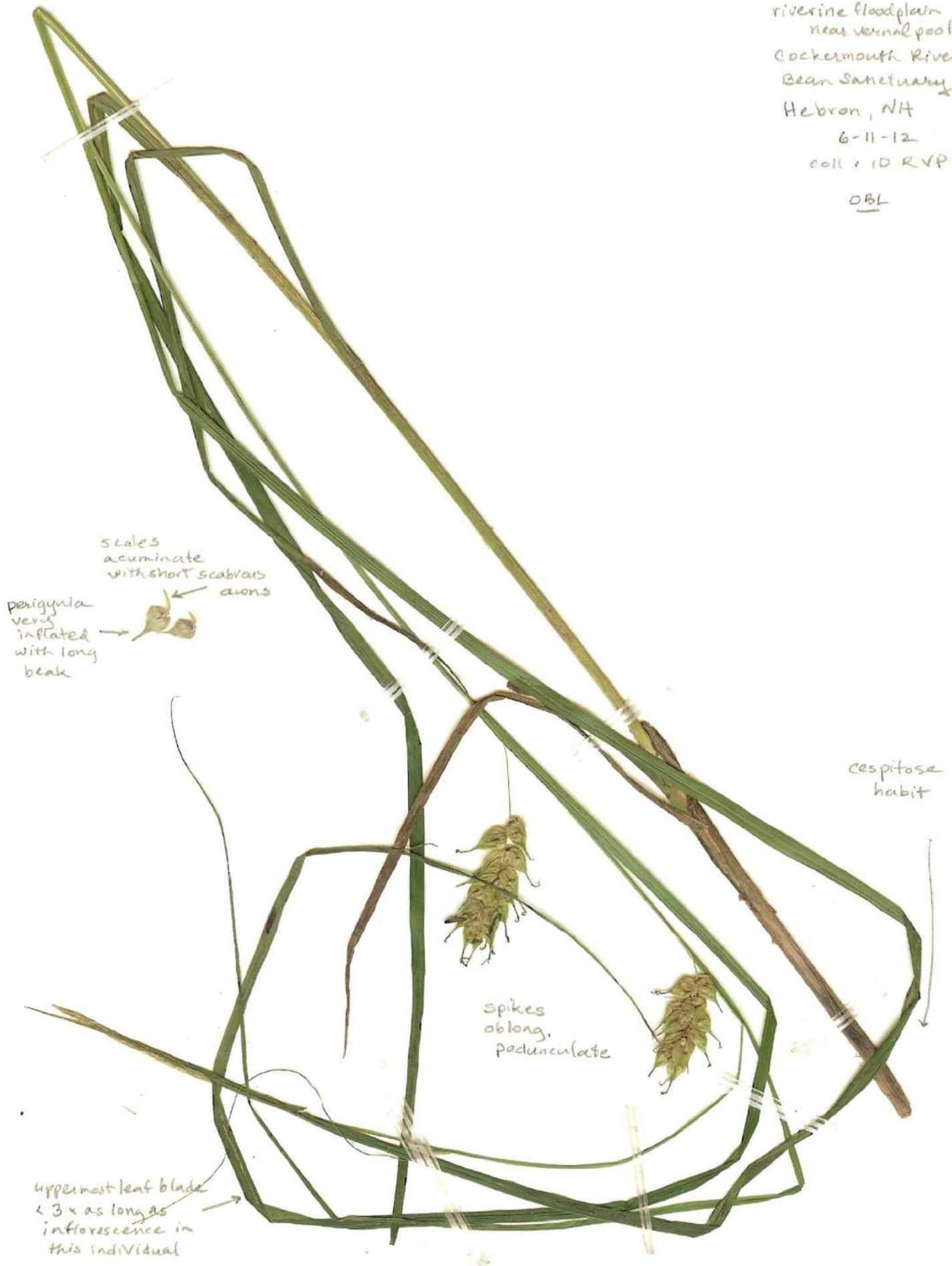
Bean Sanctuary

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OBL



Glyceria borealis (Nash) Batchelder

Northern Manna Grass

Poaceae

Inundated flowage above

Newfound Lake

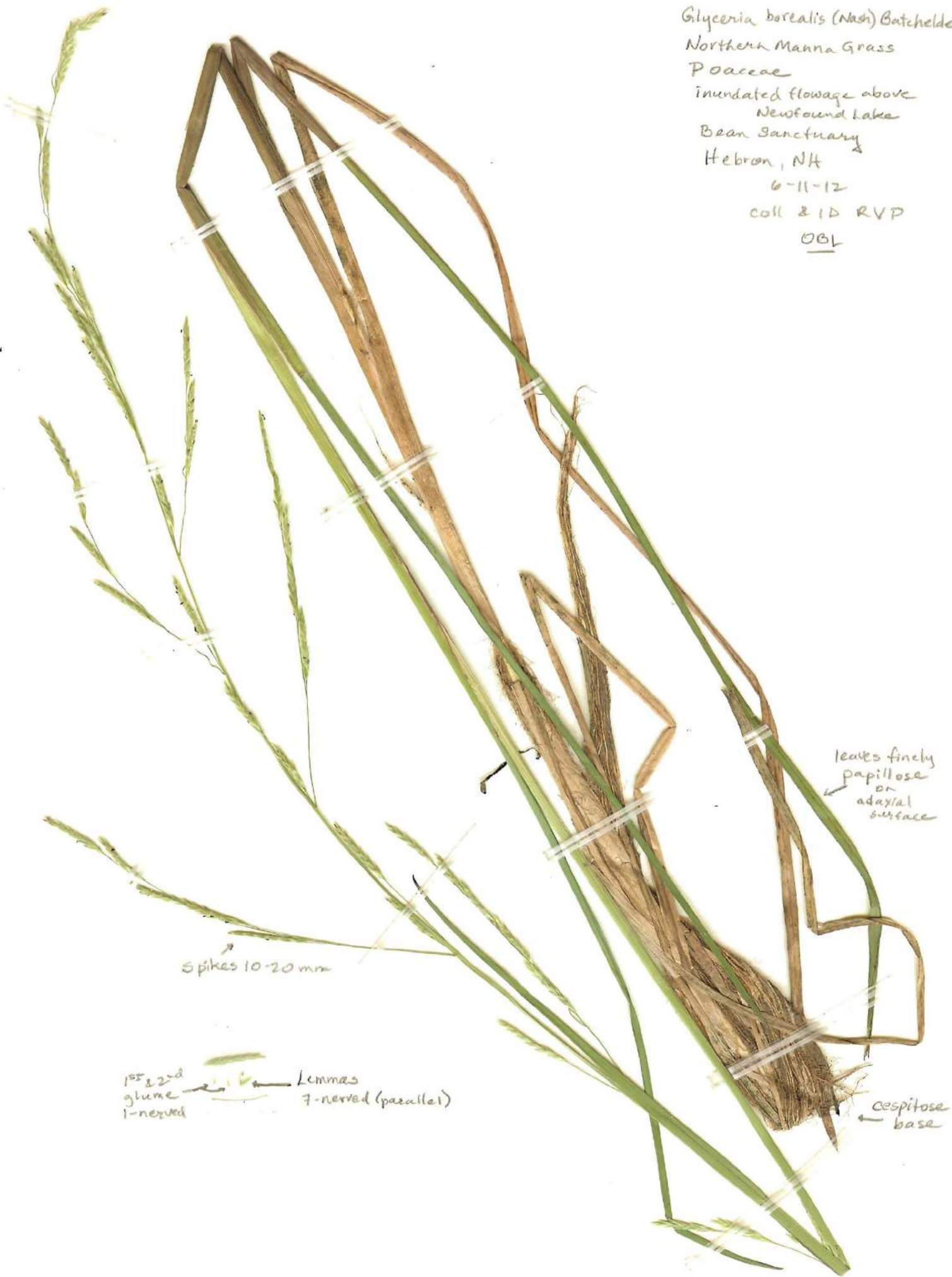
Bean Sanctuary

Hebron, NH

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OBL



leaves finely
papillose
on
adaxial
surface

Spikes 10-20 mm

1st & 2nd
glume
1-nerved

Lemmas
7-nerved (parallel)

caespitose
base

Isoetes echinospora Durieu
ssp. *muricata* (Duis) A & D Love
spiny-spined quillwort

Isoetaceae

shallow lake margin
Bean Sanctuary, Newfound
Lake

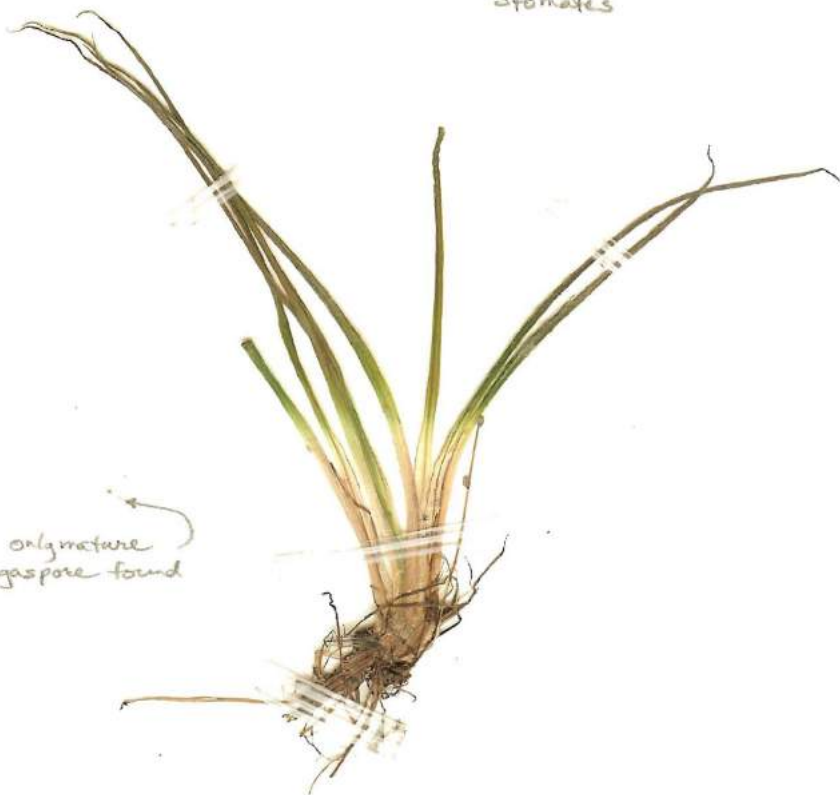
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Coll & ID RVP



immature
megaspores
beneath
vellum



only mature
megaspore found

Note: deciduous
leaves with
stomates

Potamogeton cf. pusillus L.
Small Pondweed

Potamogetonaceae

Shallow water marsh

Southern Charles Bean Sanct.

Hebron, NH

6-11-12

coll #10 RVP

OEL

Leaves < 2.5 mm wide
acute to apiculate tips.

3 veins
with lacunae

stipules free, but
surrounding stem

short rhizomes

