

# Floristic survey of Big Meadow, Greenwoods Conservancy, summer 2008

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## INTRODUCTION

Greenwoods Conservancy encompasses 1200+ acres in Burlington, NY. The Conservancy is owned by the Peterson Family Trust and protects a diversity of flora and fauna by means of a conservation easement.

Big Meadow (Figure 1) is a 10-acre meadow located within Greenwoods Conservancy, off of Cranberry Bog Road, which transects the property. The meadow has an undulating landscape surrounded by forest and a section of dirt road. Big Meadow is an old field that has not been managed in about 20 years. Owner Earle Peterson and the Biological Field Station have decided that a management system should be instated in an effort to re-establish a vegetative community meadow dominated by native plant species. SUCO faculty member, Dr. Adam Ryburn, has proposed three different treatments to help determine which will be most effective in native plant re-establishment and native plant diversity.

Burning and mowing will be the focus of the old field herbaceous vegetation management plan. There will be 2 ~100 x 100 meter sites for each treatment with a total of 6 sites (Figure 2). The treatments are as follows: no burn or mowing, high frequency burn and mow (prescribed burns and mowing occurring every 2-3 years), medium frequency burn and mow (prescribed burns and mowing occurring every 5-7 years). Two components will be tested by this regime. The overall efficiency of burning and mowing at restoring native plants will be determined, along with the long and short term impacts of different frequencies of burning and mowing.

The project entails an initial floristic survey (summer 2008) followed by a more extensive vegetation sampling in September 2008 for height, density, and percent cover. The initial prescribed treatments are anticipated for spring 2009, and annual vegetation samplings will occur September 2009 thru the end of the project.

The initial floristic survey of the management plan for Big Meadow, Greenwoods Conservancy, was collected the summer of 2008. The survey was administered to have a complete collection of all existing flowering vascular plants in the meadow. The vouchered specimens of the study area will provide a baseline for comparison after the treatments are applied. Soil samples were also taken to have a record of the pH. Knowing the previous pH values may be helpful in determining why or why not plant type and/or distribution have changed after the treatments.

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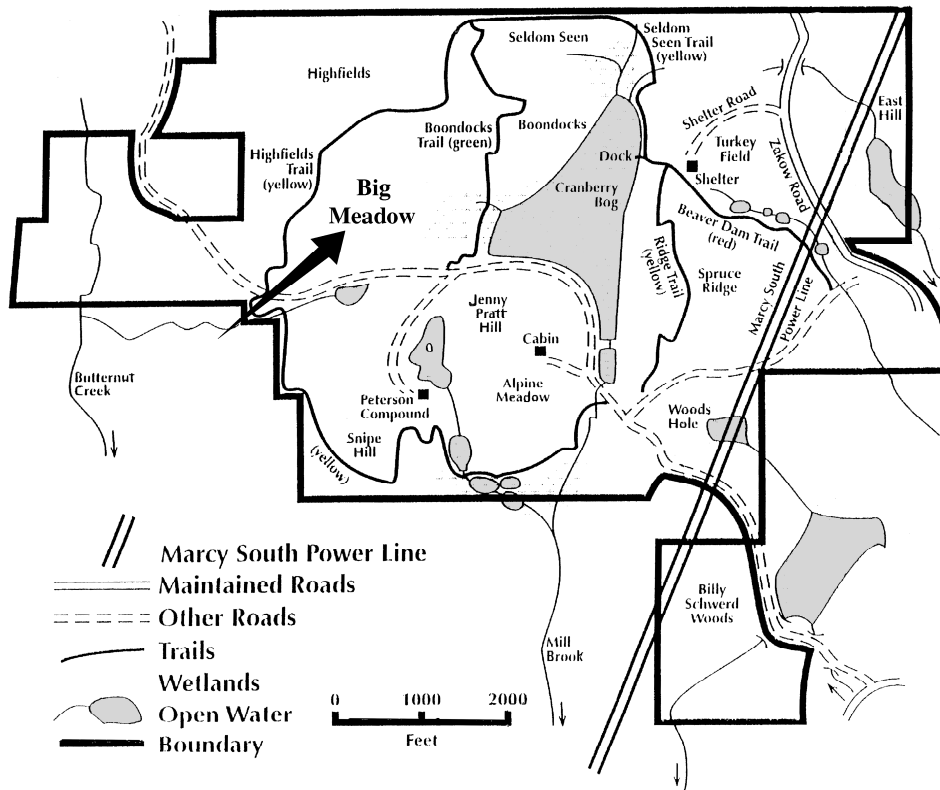


Figure 1. Map of Greenwoods Conservancy, Burlington, NY, highlighting the area of study, Big Meadow.

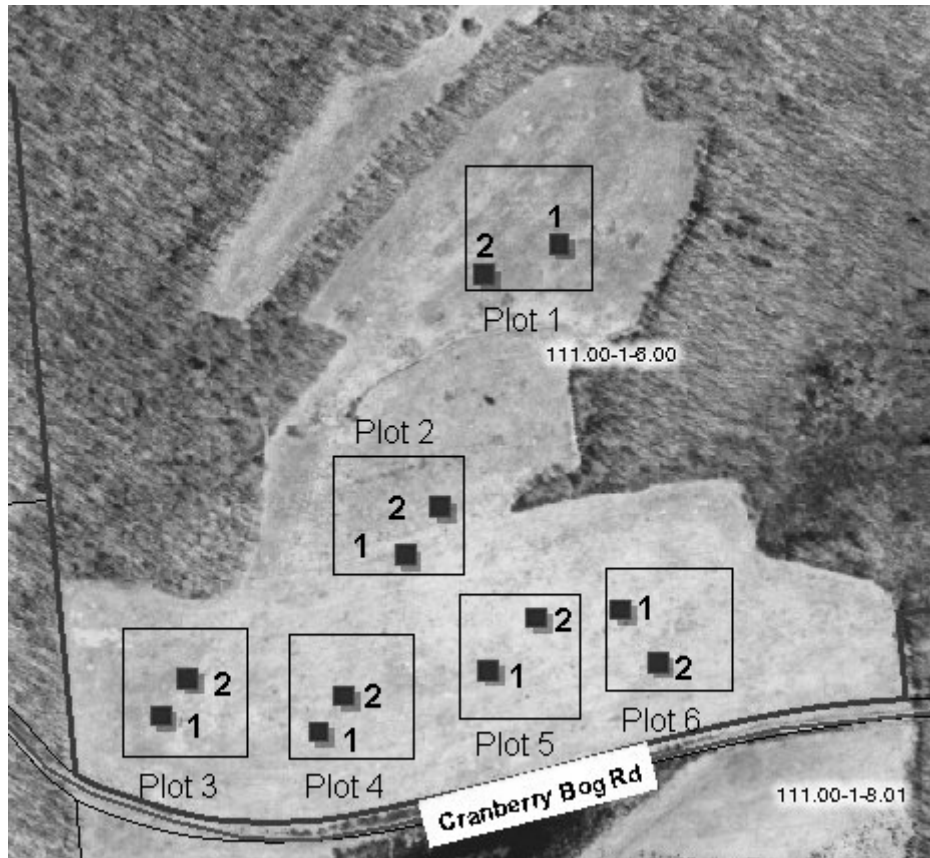


Figure 2. Aerial photo of Big Meadow at Greenwoods Conservancy. Open squares represent proposed plots for the different treatments; each representing ~ 100 x 100 meters. Dark squares within each plot represent the points of soil collection.

## METHODS

Flowering plant specimens from the entire meadow were taken on three days (6/23, 7/9, & 7/16). On the first sampling day, a specimen representative of each flowering species was identified, abundance noted, and pressed in the field. Field identification followed Clemants and Gracie (2006), Peterson and McKenny (1996), and Newcomb (1977). The abundance was determined visually and labeled as abundant, common, occasional, scattered, or rare. Only unique specimens, those that had not been previously found, were collected on the other two sampling days. The pressed specimens were then mounted and curated once completely dry (Frank and Perkins 1995-2008). Identification, family, and native status were determined in the lab, which were consistent with Mitchell and Tucker (1997) and revised to conform to Gleason and Cronquist (1991).

Two samples of soil were taken from each estimated plot on 8/1/08. There were a total of 12 points that were sampled. A map of the arbitrarily labeled plots and the points are shown in Figure 2. The coordinates of each point were obtained with a Garmin Global Positioning System

(GPS) unit (Table 1). Samples were taken a foot down with a shovel. They were collected and kept in paper bags until processing in the lab. Distilled water was added to a small sample of the soil. It was stirred and left to settle for a few minutes. The pH was then measured with an electronic pH meter following the APHA, AWWA, and WEF standard methods (1992).

Plot	Point	N	W
1	1	42.43.130'	075.06.484'
	2	42.43.115'	075.06.525'
2	1	42.43.005'	075.06.570'
	2	42.43.021'	075.06.553'
3	1	42.42.940'	075.06.700'
	2	42.42.957'	075.06.686'
4	1	42.42.933'	075.06.617'
	2	42.42.950'	075.06.611'
5	1	42.42.959'	075.06.524'
	2	42.42.981'	075.06.500'
6	1	42.42.983'	075.06.454'
	2	42.42.961'	075.06.435'

Table 1. Coordinates of the soil collection points on Big Meadow.

## RESULTS and DISCUSSION

A total of 41 species were collected from Big Meadow, Greenwoods Conservancy over the summer of 2008. (Note: grasses and plants not flowering are not included in this survey) Representatives of 16 different families were found. Table 2 is a listing of all of the species. There were 28 alien species and 13 native species. Nine of the species were estimated as in rare abundance. Eight of those species are not native to the area. *Oenothera perennis*, little sun drops, was the only species that was native and rare. *Hieracium caespitosum* (yellow king-devil), *Solidago canadensis* (common goldenrod), and *Origanum vulgare* (wild marjoram, oregano) were estimated to be abundant; of these three, common goldenrod is the only native species. These abundance categories are not intended to serve as quantitative estimates for later comparison; they are a visual estimation made the day of collection. Abundance can change as the growing season continues and abundances were not reevaluated. The vegetation sampling scheduled for September 2008 will be more quantitative with height, density, and percent cover measurements being conducted. This survey will make identification easier for future samplers and will serve as a baseline of the past composition of the meadow, ready to be compared to new findings.

Table 3 lists the pH for the soil at each point. The mean soil pH for the 12 points was 5.64. The highest pH was at plot 6, point 2 with 6.23. Point 2 of plot 1 had the lowest pH of 5.09. The burning will most likely alter the pH, which may become more or less favorable to different species. The extent of the change in soil will depend greatly on the severity of the fire and its duration. There will most likely be an increase in the pH and available nutrients according to other studies (Certini 2005). The clearing of the area should allow for the dominant vegetation to colonize quickly and improve the quality of the soil.

It is difficult to predict the species composition at Big Meadow following management. There are other variables besides burning that simply can not be controlled, such as climate and topography. It has been found that plant composition can be highly variable and the result of burning on the vegetative community is not always what was desired (Quinlan et al. 2003). The best management plan for Big Meadow will be determined after treatment has commenced and a thorough analysis of regrowth has occurred.

Table 2. List of specimens collected at Big Meadow by family down to species. Included are the common name, abundance, native status, and collection date.

Family	Genus	Species	Common Name	Abundance	Status	Collection Date
Ranunculaceae	<i>Ranunculus</i>	<i>acris</i>	Tall Buttercup	occasional	alien	6/23/2008
Betulaceae	<i>Alnus</i>	<i>incana</i>	Speckled alder	occasional	native	7/16/2008
Caryophyllaceae	<i>Silene</i>	<i>vulgaris</i>	Bladder campion	rare	alien	7/9/2008
	<i>Stellaria</i>	<i>graminea</i>	Common stitchwort	rare	alien	7/9/2008
Polygonaceae	<i>Rumex</i>	<i>acetosella</i>	Red sorrel	common	alien	6/23/2008
	<i>Rumex</i>	<i>crispus</i>	Curled dock	rare	alien	7/9/2008
Clusiaceae	<i>Hypericum</i>	<i>punctatum</i>	Spotted St.John's-wort	scattered	native	7/9/2008
Malvaceae	<i>Malva</i>	<i>alcea</i>	Vervain mallow	scattered	alien	7/9/2008
Rosaceae	<i>Fragaria</i>	<i>virginiana</i>	Common strawberry	scattered	native	6/23/2008
	<i>Potentilla</i>	<i>intermedia</i>	Downy Cinquefoil	rare	alien	6/23/2008
	<i>Potentilla</i>	<i>simplex</i>	Cinquefoil	scattered	native	6/23/2008
	<i>Rosa</i>	<i>multiflora</i>	Hedge-rose	scattered	alien	6/23/2008
	<i>Spiraea</i>	<i>latifolia</i>	Meadowsweet	common	native	7/9/2008
Fabaceae	<i>Lotus</i>	<i>corniculatus</i>	Bird's-foot trefoil	occasional	alien	7/9/2008
	<i>Trifolium</i>	<i>aureum</i>	Hop Clover	rare	alien	6/23/2008
	<i>Trifolium</i>	<i>hybridum</i>	Alsike clover	rare	alien	7/9/2008
	<i>Trifolium</i>	<i>pratense</i>	Red clover	scattered	alien	6/23/2008
	<i>Vicia</i>	<i>cracca</i>	Cow vetch	common	alien	6/23/2008
Onagraceae	<i>Oenothera</i>	<i>perennis</i>	Little sundrops	rare	native	7/9/2008
Asclepiadaceae	<i>Asclepias</i>	<i>syriaca</i>	Common milkweed	common	native	6/23/2008
Lamiaceae	<i>Clinopodium</i>	<i>vulgare</i>	Wild Basil	occasional	alien	7/9/2008
	<i>Origanum</i>	<i>vulgare</i>	Wild marjoram, Oregano	abundant	alien	7/9/2008
	<i>Prunella</i>	<i>vulgaris</i>	Self-heal	common	alien	6/23/2008
Scrophulariaceae	<i>Linaria</i>	<i>vulgaris</i>	Butter-and-eggs, toadflax	rare	alien	7/9/2008
	<i>Veronica</i>	<i>chamaedrys</i>	Germander speedwell	rare	alien	6/23/2008
	<i>Veronica</i>	<i>officinalis</i>	Common speedwell	occasional	alien	6/23/2008
Rubiaceae	<i>Galium</i>	<i>mollugo</i>	white bedstraw	occasional	alien	6/23/2008
Caprifoliaceae	<i>Lonicera</i>	<i>morrowii</i>	Fly honeysuckle	occasional	alien	7/16/2008
	<i>Viburnum</i>	<i>dentatum</i>	Southern arrowwood	occasional	native	7/16/2008
Asteraceae	<i>Achillea</i>	<i>millefolium</i>	Common yarrow	occasional	alien	6/23/2008
	<i>Anaphalis</i>	<i>margaritacea</i>	Pearly-everlasting	common	native	7/16/2008
	<i>Centaurea</i>	<i>nigra</i>	Black knapweed	occasional	alien	7/9/2008
	<i>Chrysanthemum</i>	<i>leucanthemum</i>	Ox-eye daisy	scattered	alien	6/23/2008
	<i>Cirsium</i>	<i>vulgare</i>	Bull Thistle	scattered	alien	7/9/2008
	<i>Erigeron</i>	<i>annuus</i>	Fleabane, sweet scabious	scattered	native	6/23/2008
	<i>Hieracium</i>	<i>aurantiacum</i>	Devil's paintbrush, orange hawkweed	occasional	alien	6/23/2008
	<i>Hieracium</i>	<i>caespitosum</i>	Yellow king-devil	abundant	alien	6/23/2008
	<i>Rudbeckia</i>	<i>hirta</i>	Black-eyed susan	occasional	native	6/23/2008
	<i>Solidago</i>	<i>canadensis</i>	Common,Canada goldenrod	abundant	native	7/16/2008
	<i>Tragopodon</i>	<i>pratensis</i>	Goatsbeard	occasional	alien	6/23/2008
	Iridaceae	<i>Sisyrinchium</i>	<i>montanum</i>	Blue-eyed grass	occasional	native

Table 3. pH readings of the soil from 12 points on Big Meadow.

Plot	Point	pH
1	1	5.16
	2	5.09
2	1	5.51
	2	5.31
3	1	5.91
	2	5.51
4	1	5.76
	2	5.52
5	1	6.02
	2	5.91
6	1	5.70
	2	6.23

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