Ecological Inventory Report

Pocumtuck Ridge
Deerfield, Massachusetts

Prepared by UMass Extension's
Natural Resource and Environmental Conservation Program

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THE DEERFIELD LAND TRUST

It is the farmer who must weave the greater part of the rug on which America stands.
-Aldo Leopold

For the Deerfield Land Trust

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In memory of Roberta Poland (1899-1989)

She botanized the Pocumtuck Ridge, lived on it, and loved it.

Index

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INTRODUCTION

The Pocumtuck Ridge in Deerfield, Massachusetts is an area of historical, cultural, scenic and ecological value. Its protection is a priority for the Deerfield Land Trust, the Town of Deerfield and the Massachusetts Department of Environmental Management. In spite of this, relatively few biological inventories have occurred north of the Mount Sugarloaf State Park. The last surveys of significance were conducted by Roberta Poland (1899-1989), a local botanist who, for nearly 50 years, maintained careful records of her botanical discoveries and deposited over 2000 specimens from the Ridge at the UMass Herbarium. Former Massachusetts State Botanist Bruce Sorrie also visited a portion of the ridge in 1991, but to our knowledge no additional work has occurred in the last decade.

Ecological inventories are useful because they can help identify and prioritize parcels for conservation based on their biological and ecological values. In 2002, in cooperation with UMass Extension and the University of Massachusetts, the Deerfield Land Trust secured a grant from the MA Department of Environmental Management's Greenways and Trails Program to conduct an ecological inventory of Pocumtuck Ridge north of the state park. The survey team consisted of Laurie Sanders, Kasey Rolih, Karen Searcy and Molly Hale. Using notes from Poland's collection, photointerpretation and ground-truthing, the boundaries of important natural communities were mapped, and the locations for more than a dozen plants, lichens and animals of conservation interest were relocated or discovered.

This report includes a summary of the Pocumtuck Ridge's natural plant communities, conservation issues related to each natural plant community type, and a list of recommended actions based on the survey findings. A preliminary checklist to the vascular flora of the Pocumtuck Ridge (Appendix 1) is based on the specimens collected by Roberta Poland and stored at the UMass herbarium.

Land Use Acreage

Category	Acreage
Forested Uplands	3659
Wetlands	50
Agricultural (pasture, crop)	154
Developed (Residential, Roads, Gravel Pits)	20
Powerline/Cultural Shrubland	83

Total acres mapped: 3936

SITE INFORMATION

The Pocumtuck Ridge Focus Area encompasses approximately 3936 acres in the eastern portion of Deerfield, MA (See Topographic Map). The prominent ridge forms a backdrop to South Deerfield, and is

bordered by agricultural fields and the Connecticut River on the east side and a mix of residential, agricultural and commercial uses on the west. The underlying bedrock is variable. Most of the ridge consists of the 200-million year old sedimentary rock known as Sugarloaf arkose, but isolated outcrops of volcanic basalt occur on the eastern side and along the ridge's northern extension. Surficially, the side slopes are covered with glacial till. Near the valley floor, the till is replaced by clays and silts that were deposited below Glacial Lake Hitchcock (13,000-17,000 ybp) and more recently, by the Connecticut River.

Of the 3936 acre survey area, 3659 (93%) is forested; the remaining land includes pasture and hayfields (154 acres), powerlines (86 acres), wetlands (50 acres), and developed areas (roads, powerlines, gravel pits and residential development) (103 acres). With respect to ownership, 935 acres have some level of protection; approximately 141 acres are controlled by the Town of Deerfield, while another 779 acres are protected by the state, area conservation organizations (Deerfield Land Trust, Valley Land Fund, Pocumtuck Stewards of the Land) or through the Massachusetts' Agricultural Preservation Restriction Program[1] (See Open Space Map). The remaining land (3231 acres) is held in private ownership, with roughly 540 acres owned by private schools. Currently 441 acres of the private land are enrolled in Chapter 61.

Prior to conducting field work, letters were sent to all the property owners, and although no owner responded to deny access, all "No Trespassing" signs were heeded and these areas were excluded from the field survey.

Why Care About Lichens?

Lichens are the result of a symbiotic association between a fungus, a green alga, and sometimes a third partner, a cyanobacterium. They are long-lived organisms that, in contrast to many vascular plants and non-lichenized fungi, lack a protective cuticle and so absorb airborne nutrients and pollutants over their entire outer surface.

Many lichens have high habitat and substrate specificities; for instance, some only grow on acidic substrates, while others only live on basic (pH neutral) surfaces; some species are found exlusively on exposed, sandy soil near the coast, others occur only on mossy rocks in mature, protected northern hardwood forests. Because of their habitat specificity and sensitivity to pollution (especially acid rain from sulfur dioxide), lichens are good indicators for habitat alteration and air quality. In New England, lichens with a cyanobacterial partner and fruticose (shrubby) lichens with green algal partners are especially susceptible to air pollution. Researchers believe that the lichen diversity in New England has been severely compromised by human activities during the last 300 years.

Although Massachusetts does not yet protect rare lichens through the Massachusetts Endangered Species Act, other states do. In addition, since 1994 the U.S. Forest Service has collected lichens on selected plots throughout the country and is using lichen abudance and diversity as a measure of forest health.

[1] The number of protected acres is slightly inflated because it includes some APR lands that extend beyond the boundary of the focus area.

METHODS

We visited the Pocumtuck Ridge Focus Area on seven separate field days in April, June, August, September, October and November 2002, for a total of 130 person hours. Our objectives were to map natural communities, discover new or historic locations for rare species, carry out targeted searches for lichens and rare plants, conduct searches for rare animals, identify potential vernal pools, and locate infestations of invasive species. Species in the following groups were recorded: plants, lichens, dragonflies and damselflies, and amphibians. No reptiles or tiger beetles were observed, and birds and mammals were not recorded. Location information from the Massachusetts' Natural Heritage and Endangered Species (NHESP) database was relied upon to re-locate historic records of species protected under the Massachusetts Endangered Species Act. Species that are maintained on the Massachusetts "Watch-List" were also targeted; the "Watch List" is a non-regulatory list of species that may be in decline in Massachusetts and may be added to the Massachusetts Endangered Species List in the future.

Natural communities were mapped according to the Natural Heritage Endangered Species Program's Draft Classification of the Natural Communities of Massachusetts (Swain & Kearsley July 2001; http://www.state.ma.us/dfwele/dfw/nhesp/nhclass.htm>). Natural community boundaries were based on ground-truthing, aerial photography interpretation, and information derived from GIS datalayers. Given the extent of the focus area, the natural commununity delineations could be futher refined and may have small inclusions of other natural community types. Maps identifying natural communities were generated using geographic information systems (GIS). A 1:5000 color black and white orthophoto flown in 1997 and a 1:12000 color infrared flown April 1999 were used as base maps for the natural community mapping and plant inventory. Digitized maps were created with the following datalayers: natural communities, vernal pools, permanently protected open space, Chapter 61 lands, BioMap core polygons, streams and ponds. Plant taxonomy follows Sorrie and Somers, 2001.

Natural Community Types Observed in the Pocumtuck Ridge Focus Area

Upland

1. Acidic Rocky Summit/Rock Outcrop (ARS)
2. Acidic Rock Cliff (ARC)
3. Circumneutral Rock Cliff (CRC)
4. Circumneutral Talus Forest/Woodland (CTF)
5. Acidic Talus Forest (ATF)
6. Oak-Hemlock-White Pine (OHW)
7. Successional White Pine Forest (SWPF)
8. Mixed Oak (MO)
9. Red Oak-Sugar Maple Transition (ROSM)
10. Cultural Grassland (CG)
11. Cultural Shrubland (CS)

Freshwater

1. Red Maple Swamp (RMS)
2. Circumneutral Hemlock-Hardwood Swamp (CHHS)
3. Vernal Pools (VP)
4. Shallow Emergent Marsh (SEM)
5. Shrub Swamp (SS)
6. Open Water (OW)

RESULTS & DISCUSSION

Eight species protected under the Massachusetts Endangered Species Act or currently Watch-Listed in Massachusetts were found, two rare lichens were detected, eight vernal pools were confirmed, and seventeen distinct natural community types were identified within the focus area (See Natural Communities Map). Of the natural communities, 11 are upland and 6 are wetland.

Although the natural community descriptions in the Swain and Kearsley's Classification of the Natural Communities of Massachusetts are generalized, the descriptions below are based on the species actually observed in Deerfield.

Upland Natural Communities

Acidic Rocky Summit/Rock Outcrop (ARS)
This community type is found in scattered locations on the eastern slope of the Pocumtuck Ridge and on the crest of the west-facing ridge, south from Pine Nook Road. The community type is characterized by broad swaths of open rock, patches of lichen and and moss, little vegetation and stunted trees. The soils are thin, acidic, and droughty. The most common herbaceous plants include little bluestem (*Schizachyrium scoparium*), poverty grass (*Danthonia spicata*), common hair grass (*Deschampsia flexuosa*), pale corydalis (*Corydalis sempervirens*) and cow wheat (*Melampyrum lineare*). Less frequently observed are rusty cliff fern (*Woodsia ilvensis*), bristly sarsparailla (*Aralia hispida*), sourgrass (*Rumex acetosella*), pussytoes (*Antennaria plantaginifolia*), bastard toadflax (*Comandra umbellata*), yarrow (*Achillea millefolium*), and common harebell (*Campanula rotundifolia*). Shrubs include sand cherry (*Prunus pumila var. susquehanae*), scrub oak (*Quercus ilicifolia*), huckleberry (*Gaylusaccia baccata*), low-bush blueberry (*Vaccinium pallidum*), and sweet low blueberry (*V. angustifolium*). Near the margins, where soils are deeper, chestnut oak (*Quercus prinus*), red oak (*Quercus rubra*), eastern hemlock (*Tsuga canadensis*) and white pine (*Pinus strobus*) are common.


Karen Searcy and Deborah Shriver look for plants on Little Pocumtuck Ridge, looking north.

The lichens were species that are typically found growing on exposed rocks, and include species of *Acarospora*, *Caloplaca*, *Lepraria, Physia, Xanthoparmelia*, several species of the reindeer lichens, *Cladina* and *Cladonia*, and the two common umbilicate lichens, *Umbilicaria mammulata* and *Lasalia papulosa*.

Radio Tower & Vicinity
The most abundant lichen on the exposed summit near the radio tower is *Cladonia uncialis*. Robust patches of *C. uncialis* cover the rocks and soil on level ground as well as on steep slopes below stunted chestnut oaks. One curious find here was two thalli of *Hypogymnia physodes* on old wood lying close to the soil. This species is moderately sensitive to air

pollution but is probably equally sensitive to a dry climate. Its presence in this rather xeric habitat may indicate a past environment that had more moisture and cleaner air.

Little Pocumtuck

On the open summits of Little Pocumtuck, the most abundant lichens are members of the genus *Stereocaulon*. *Xanthoparmelia* species and *Acarospora fuscata* are also common.

Conservation Notes

- Ridgetops like these are valuable for dragonflies, which use hilltops during their adult phase for foraging. Several rare species are found in the Connecticut River, and this area is likely used by many—if not all—of them.

- Although non-native species were present, none are species that are likely to threaten the ecology of this community type.

- Beyond the ecological value of these rocky balds, these areas are of geological, scenic and recreational interest. The main ridge, as well as Little Pocumtuck, both have trails that criss-cross their summits.

Acidic Rock Cliff (ARC)

Dry, acidic rock cliffs are found in many areas on the Pocumtuck Ridge; the longest, continuous belt occurrs just below the west-facing ridge and is composed of Sugarloaf arkose. Smaller acidic cliffs consisting of traprock are found on the east side of the Pocumtuck Ridge; these include the cliffs on Little Pocumtuck and innumerable small knobs of exposed bedrock to the south of Little Pocumtuck. On both the east and west sides the cliffs are nearly vertical and range between 5-30 feet in height. Most are too dry and shady to support many vascular plants. The few plant species that find a foothold, do so in the moister crevices; these include polypody (*Polypodium virginianum*), rusty cliff-fern (*Woodsia ilvensis*), common harebell, bristly sarsparailla, marginal fern (*Dryopteris marginalis*) and Virginia creeper (*Parthenocissus quinquefolia*).

Many of the lichens species found on acidic, sunny rock cliffs are the same as those on acidic rocky summits (see above). However, we found two areas that were of special interest with respect to lichens.

- On a sheltered, partly shaded vertical traprock face below the summit of Little Pocumtuck is a large patch of the fruticose lichen, *Ramalina intermedia*. Ramalinas are sensitive to air pollution and require humid conditions. They are also uncommon in southern New England, where forests are young and relatively dry. This site is in a narrow, protected valley and that, in combination with the moist rock, may explain its presence.

- Lichens are abundant and relatively diverse within the narrow band of sandstone cliffs that is hidden below the forest canopy. These cliffs, which occur in the

central portion of the west-facing slope, are stable, shady, and moist from groundwater seepage and appear to have a calcareous influence. The cliffs provide appropriate habitat for several unusual species, including the nitrogen-fixing lichens *Collema cf. fuscovirens*, *Leptogium cyanescens*, and *L. lichenoides,* and at least three species of *Peltigera (evansiana, neckeri,* and *polydactylon*). All are sensitive to air pollution and forest disturbance. *Peltigera neckeri* may be a new record for Massachusetts.

Conservation Notes

- Although no nests were found, ravens (*Corvus corax*) were regularly heard calling near the cliffs. Ravens have nested in Massachusetts with increasing frequency during the last twenty years, and the species is still tracked annually by MassWildlife. Of even greater interest is the presence of a pair of peregrine falcons (*Falco peregrinus*-Endangered) at the south end of Mount Sugarloaf during summer 2002. The pair have apparently established a territory where the cliffs are higher and more extensive. Although it is unlikely that the cliffs in the Focus Area would ever be used by peregrines for nesting, the surrounding forest may be used by these fast-flying raptors for hunting.

- Asiatic bittersweet was occasionally found in this habitat, but at present does not appear to be a serious problem.

- These areas are of geological, ecological and scenic interest.

<u>Circumneutral Rock Cliff (CRC)</u>

Circumnuetral rock cliffs occur along a discontinuous, north-south running traprock ridge that extends between Pine Nook Road and Keets Road. The word "circumneutral" refers to the pH of the rock, and means "close to neutral", or a pH of 6.0-7.0. Neutral soils and rocks have a greater ability to bind nutrients like calcium and phosphorus, which are essential for plant growth. Because of this, circumneutral soils and rocks have distinct and specific flora and lichen communities.

The elegant fronds of ebony spleenwort growing in a circumneutral, rocky nook on the Pocumtuck Ridge.

On the Pocumtuck Ridge, large sections of the circumneutral cliffs are too dry to support any plants or lichens. Moister areas, however, have a rich and interesting assemblage of plants and lichens. In terms of vascular plants, of greatest interest are the ferns. Within the rocky nooks one

finds clusters of the beautiful and delicate ferns known as ebony spleenwort (*Asplenium platyneuron*) and fragile fern (*Cystopteris fragilis*). Even more exciting to botanists are species that are much less common in the state, such as purple cliffbrake (*Pellaea atropurpurea*), walking fern (*Asplenium rhizophyllus*), blunt-leaved cliff fern (*Woodsia obtusa),* and wall-rue (*Asplenium ruta-muraria*-Threatened). Noteworthy herbaceous species in this area include rock pellitory (*Parietaria pensylvanica*-Watch Listed), round-leaved dogwood (*Cornus rugosa*) and square-stemmed goldenrod (*Solidago squarrosa*), and in open, drier areas the native bittersweet (*Celastrus scandens*). Other plant species found on the circumneutral cliffs include, in moister areas: blue-stemmed goldenrod (*Solidago caesia*), columbine (*Aquilegia canadensis*), Virginia creeper, and round-leaved harebell; and in drier areas: little blue stem, poverty grass, common hair grass, bluegrass (*Poa compressa*), wild rye (*Elymus* sp.), plantain-leaved pussytoes, silverrod (*Solidago bicolor)*, goldenrod (*S. arguta)*, red cedar (*Juniperus virginiana*), true solomon's seal (*Polygonatum pubescens*), huckleberry (*Gaylussacia baccata*), false honeysuckle (*Diervilla lonicera*), witch hazel (*Hammamelis virginiana*), and poison ivy (*Toxicodendron radicans*). Nearby trees include red oak, black birch (*Betula lenta*), yellow birch (*Betula alleghaniensis*), white ash (*Fraxinus americana*), hemlock, sugar maple (*Acer saccharum*), and basswood (*Tilia americana*).

Lichens, especially the cyanobacteria-containing macrolichens, are common on the moist, partly shady and protected bases of the cliffs. Water running down the rocks from above, and nutrients like calcium carried with it, create a higher pH environment suitable to cyanolichens. On the traprock cliffs near Keets Road, several species of cyanolichen were found; because sexual reproductive structures were lacking on many of these species, they have been tentatively identified as *Collema cf. tenax C. cf. fuscovirens, Leptogium cynaescens, L. lichenoides*, and the unusual *Peltigera ponojensis*.

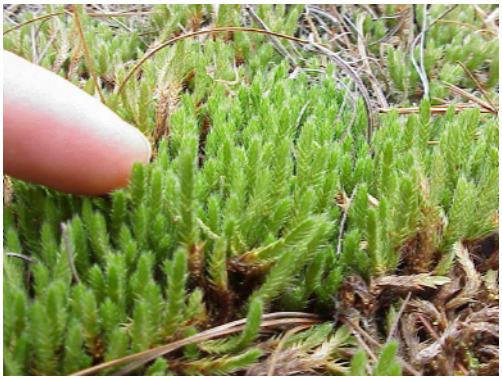
Among lichens, cyanolichens are somewhat peculiar because they can fix atmospheric nitrogen, an important ability in the nitrogen-limited forests of the northeast Nitrogen fixation is pH-sensitive and acidic precipitation from air pollution (acid rain, auto exhaust, etc) can severely inhibit the process. Cyanolichens, however, can partially compensate for poor air quality by growing on more neutral substrates. Nevertheless, the combination of air pollution, habitat alteration, and the lack of mature, humid forests in the Northeast has resulted in a loss of the region's diversity and abundance of lichens. Therefore, one of the most surprising aspects of the lichen flora on the Pocumtuck is its relative diversity of cyanolichens. The circumneutral rock outcrops, both on arkose sandstone and traprock within protected forest habitats, provide excellent refuge for cyanobacteria-containing lichens. These include *Collema subflaccidum*, *C. tenax*, *Coccocarpia palmicola, Leptogium cyanescens, L. lichenoides*, *Peltigera canina*, and *P. praetextata*. Most exciting was the discovery of the salted shell lichen, *Coccocarpia palmicola*, a diminutive species that has not been recorded for Massacusetts or New England for many decades and was believed to be extirpated from New England. Once recorded up and down the

Salted shell lichen, *Coccocarpia palmicola*, seen here under magnification, was believed to be extirpated from the New England, until its discovery on the Pocumtuck Ridge in 2002.

East Coast, the most recent New England record is from the 1920s, in South Haddam, Connecticut; the most recent record from the Northeast region is from 1988 in Fundy National Park, New Brunswick, Canada. *Coccocarpia palmicola* will grow on trees or shady, moss-covered rocks and is very sensitive to air pollution. In the Pocumtuck one small specimen grows on a shady, narrow, moss-covered traprock ledge with shallow soil; again, a protected environment.

The Isolated Outcrop

An isolated rock outcrop on the east-facing slope of the Pocumtuck Ridge was found to have a large population of Rock Spikemoss (*Selaginella rupestris*-Watch Listed), Carolina cranesbill (*Geranium carolinianum)*--a new county record!) and a rich array of lichens in the genus *Cladonia*. Curiously this site was scraped by heavy equipment in the distant past, which created the exposed rock conditions for this odd subset of plants and lichens.



Rock spikemoss (Selaginella rupestris), a watch-listed species, was found in one small area on the Ridge. The site is one of the largest known patches in the Connecticut River Valley.

Conservation Notes

At present there is no sign of human foot traffic in this area. Collecting of plants or rock quarrying are the greatest potential threats to these special areas. From an ecological perspective, this community type is one of the most significant on the Ridge.

Acidic Talus Forest (ATF)

This habitat is common on the talus slopes below Little Pocumtuck, near River Ferry Road/Pole Swamp Brook and all of the unnamed hills with talus slopes. Typically there is a gradient of vegetation; with exposed rocks at the top and gradually more trees and understory vegetation at the base (Swain and Kearsley, 2000). On the Pocumtuck Ridge, most of the Acidic Talus Forests are dominated by dense stands of hemlock, while a few support a mix of hemlock and deciduous trees (red oak, black birch, yellow birch and red maple). In hemlock-dominated areas, the acidity and shade severely limit the understory vegetation; in deciduous-dominated talus areas, ferns (Christmas fern (*Polystichum acrostichoides*), marginal shield fern (*Dryopteris marginalis*), lady fern (*Athyrium felix-femina*), intermediate fern (*Dryopteris intermedia*) are abundant as is Virginia creeper, maple-leaved viburnum (*Viburnum acerifolium*), and rock polypody. Near the drier, sunnier summits bracken fern (*Pteridium aquilinum*) and Pennsylvania sedge (*Carex pennsylvanica*) are commonly encountered. Many of the rocks in the talus slopes below the traprock cliffs are covered with lichens, especially *Cladonia* and the nitrogen-fixing species *Stereocaulon*.

Conservation Notes

- Although rarely encountered on the Pocumtuck Ridge, the non-native, invasive shrub known as winged euonymus (*Euonymus alatus*) was found on some of the

acidic talus slopes. When possible, these plants were removed by hand, but volunteer field crews could be asked to conduct surveys for this species and remove it when encountered.

- Many common mammals use this type of habitat for shelter, most notably porcupines, which are found occasionally on the Pocumtuck Ridge. Raccoons, skunks and opossums also take advantage of these areas. Fisher and bobcat may be present on the ridge, and probably take advantage of these areas for shelter and hunting.

Circumneutral Talus Forest/Woodland (CTF)
Circumneutral talus forest occurs on the slopes adjacent to the traprock ridges found between Pine Nook Road and River Ferry Road and along the ridge running south of Keets Road. Given its narrow width, this community type has been combined with Circumneutral Rock Cliffs on the Natural Communities map. The canopy ranges from open to closed and includes a mix of deciduous species and hemlock. Most common is a mix of sugar maple, hemlock, red maple (*Acer rubrum*), red oak, black birch, yellow birch and white ash (*Fraxinus americana*). In the sub-canopy striped maple (*Acer pensylvanicum*), mountain maple (*Acer spicata*), ironwood (*Carpinus caroliniana*), witch hazel, chokecherry (*Prunus virginiana*), American fly honeysuckle (*Lonicera canadensis*), purple-flowering raspberry (*Rubus odoratus*), hazelnut (*Corylus* spp.) and false honeysuckle are commonly observed. Herbaceous plants are diverse and characteristic of species that depend on fertile, neutral soils. These include herb robert (*Geranium robertianum*), blood root (*Sanguinaria canadensis*), spikenard (*Aralia racemosa*), round-lobed hepatica (*Hepatica americana),* wild ginger (*Asarum canadense*), Virginia creeper, poison ivy, red baneberry (*Actaea rubra*), white baneberry (*Actaea pachypoda),* enchanter's nightshade (*Circaea alpina*), horsebalm (*Collinsonia canadensis*), maidenhair fern (*Adiantum pedatum*), silvery spleenwort (*Deparia acrostichoides*), oak fern (*Gymnocarpium dryopteris*) and many sedges. In the upper drier areas, maidenhair spleenwort (*Asplenium trichomanes*) was also found. Of conservation interest was the discovery of two small stations of purple clematis (*Clematis*

Figure 1. Thirty species of ferns occur in a narrow band within the northern portion of the Pocumtuck Ridge:

1. Adiantum pedatum
2. Asplenium platyneuron
3. Asplenium rhizophyllum
4. Asplenium rutamuraria
5. Asplenium trichomanes
6. Athyrium felix-femina
7. Deparia acrostichoides
8. Botrychium virginianum
9. Cystopteris fragilis
10. Dennstaedtia punctilobula
11. Dryopteris cristata
12. Dryopteris goldiana
13. Dryopteris intermedia
14. Dryopteris marginalis
15. Gymnocarpium dryopteris
16. Matteucia struthiopteris
17. Onoclea sensibilis
18. Osmunda cinnamomea
19. Osmunda claytoniana
20. Osmunda regalis
21. Pellaea atropurpurea
22. Phegopteris connectilis
23. Phegopteris hexagonoptera
24. Polypodium virginianum
25. Polystichum acrostichoides
26. Pteridium aquilinum
27. Theypteris noveaboracensis
28. Thelypteris palustris
29. Woodsia ilvensis
30. Woodsia obtusa

occidentalis), a species of Special Concern in Massachusetts. Historically Roberta Poland found climbing fumitory (*Adlumia fungosa*-Threatened) in this area. It is likely that this delicate climbing vine is still present, but was missed during the survey.

Conservation Notes

Of the 52 species of ferns found in Massachusetts, thirty were encountered within the area defined by the circumneutral talus slopes, the adjacent circumneutral cliffs and the wetland areas to the immediate west. This area represents one of the richest sites for fern diversity in Massachusetts. Figure 1 includes a list of the ferns found within this area.

Mixed Oak (MO)

The mixed oak community type characterizes the top of the ridge and most of the forest on the west facing slopes. Red oak is dominant, but white oak (*Quercus alba*), red maple, black cherry (*Prunus serotina*), hemlock, white pine and black birch are abundant. On and near the ridge top chestnut oak and shagbark hickory (*Carya ovata/glabra*) are common components. The understory includes dense stands of mountain laurel (*Kalmia latifolia*) along with broad patches of low-bush blueberry, sweet low-blueberry and huckleberry. Maple-leaved viburnum is extremely common, sheep laurel (*Kalmia angustifolia*) is occasionally encountered, and in open, sunny areas, sweet fern (*Comptonia peregrina*) is abundant. Trailing arbutus (*Epigaea repens*), partridgeberry (*Mitchella repens*), wintergreen (*Gaultheria procumbens*), indian cucumber root (*Medeola virginiensis*), Canada mayflower (*Maianthemum canadense*), wild sarsaparilla (*Aralia nudicaulis),* and Christmas fern are common throughout the understory. In drier, exposed areas near the ridgetop common hair grass, Pennsylvania sedge, poverty grass, cow wheat, wintergreen, wild azalea (*Rhodondendron prinophyllum*), hop hornbeam (*Ostrya virginiana*) and pinweed (*Lechea intermedia*) are common.

Large whorled pogonia (*Isotria verticillata*) occurs in many areas of the oak forest on the Pocumtuck Ridge. The largest populations of this Watch-Listed species were found on the west-facing slope, where hundreds of individual stems were observed.

Of conservation interest is the extensive population of large whorled pogonia (*Isotria verticillata*-Watch Listed) on the Pocumtuck Ridge. It is found primarily on the gradual slopes in the central portion of the west-facing ridge, but was also observed in other areas. Large whorled pogonia is presently a watch-listed species in Massachusetts; hundreds of plants were observed on the Pocumtuck Ridge.

Conservation Notes

- Because of its dryness and acidity, this community type is likely to yield few state-listed plant or animal species. However, it is possible that a new station for the orange sallow moth (*Rhodecia aurantiago*), a threatened species, will be discovered on the drier, sunnier areas near the ridgetop. The larvae chew perfectly round entrance holes into the green seed capsules of smooth false foxglove and fern-leaved false foxglove (*Aureolaria* spp.), both of which were observed in this area. The caterpillars, which are active in September and early October, consume the immature seeds, and then overwinter as a pupa. The fruit capsules on these plants should be searched to see if a population of these moths occurs on the Ridge.

- Sections of the mixed oak forest near the top of the ridge are used by some species of dragonflies during their early adult phase. These insects can spend several weeks on hilltops, basking and foraging before returning to water to mate and lay eggs. Half a dozen rare species of dragonflies are known from the nearby Connecticut River, and it is likely that these ridges are used by them, as well as by more common species of dragonflies. In fact, the southern end of the Pocumtuck Ridge was identified as a priority area in the MA NHESP Biomap because of the hilltop habitat used by a rare dragonfly species known as the Cobra Clubtail (*Gomphus vastus*), a Species of Special Concern.

- Many of the slopes covered by this community type are gradual, and if access were available, would be suitable for building. Therefore, from a perspective of safeguarding the continuity of the ridge and its veil of contiguous forest, protecting these woods is important.

- Finally, the extensive oak forest here often produces an abundant crop of acorns, an important food source for many animals, from deer and bear to chipmunks and wild turkeys. The understory of blueberries is used by many forest birds, and the extent of this forest makes it important nesting habitat for songbirds, such as red-eyed vireos, scarlet tanagers, black and white warblers, ovenbirds, great crested flycatchers, robins and other non-migratory forest species.

Oak-Hemlock, with White Pine (OHW)

Oak-hemlock-white pine forests are the other dominant community type of the Pocumtuck Ridge. It is most common on the midslopes where the soils are rocky, shallow and well-drained. In moister areas, hemlock becomes dominant, while in drier areas the forest grades to oak, with scattered white pine or mixed oak. There is a gradual continuum in the forest's composition that varies depending on soil acidity, moisture, and past land use history.

Along with hemlock and white pine, the most common deciduous trees in the overstory are red oak, white oak, black birch, black cherry and red maple. Re-sprouts of American chestnut (*Castanea americana*) are common, but on the Pocumtuck Ridge beech (*Fagus grandifolia*) was

a rare associate. The shrub layer contains a mix of witch hazel, mountain laurel, low-bush blueberry, and maple leaved viburnum. Starflower (*Trientalis borealis*), wild oats (*Uvularia sessilifolia*), wintergreen, ground pine (*Lycopodium obscurum*), wild sarsaparilla, hay-scented fern *(Dennstaedtia punctilobula)*, bracken, woodland aster (*Aster divaricatus*), and Christmas fern are common in the understory.

In areas where timbering has occurred in recent years, gray birch (*Betula populifolia*) and white birch (*Betula papyrifera*) were present, as are large patches of hay-scented fern. In moister areas, interrupted fern, New York fern (*Thelypteris novaeboracensis*), whorled wood aster (*Aster acuminatus*) are common, and pink ladyslipper (*Cypripedium acaule*) are occasionally encountered. Sassafras (*Sassafras albidum*) is also a component of this community type, but is generally infrequent.

Conservation Notes

- Where this community occurs on or near the ridgetop, it is likely that it is used by hilltopping dragonflies. Several rare dragonfly species are found in the Connecticut River, and this area is likely used by many—if not all—of them.

- Many of the slopes covered by this community type are gradual, and if access were available, would be suitable for building. Therefore, from a perspective of protecting the continuity of the ridge and its contiguous forest, protecting these woods is important.

- A large area of discarded trash was discovered in one small section on the western side. See topographic map for location.

- Additional fieldwork in this community type would likely reveal inclusions of other natural community types (e.g. successional white pine forest, red oak-sugar maple transition, acid talus forest).

Successional White Pine Forest (SWPF)

Not far below the radio communication towers is a former field that has matured into a white pine stand. The land is owned by the Town of Deerfield and has been recently logged. Although it is still dominated by white pine, many deciduous species co-occur (red maple, red oak, white oak, black cherry, black birch). The shrub layer is variable, and reflects past land use alterations. Blackberry and raspberry mingle with more common woodland herbs, such as lady fern, Christmas fern, Canada mayflower , partridgeberry, and intermediate woodfern. Non-native honeysuckle (*Lonicera morrowii*), Asiatic bittersweet (*Celastrus orbiculatus*) and multiflora rose (*Rosa multiflora*) are found in this small habitat type.

Conservation Notes

Asiatic bittersweet, honeysuckle and multiflora rose are common here and could become a seed source for dispersal to other areas on the ridge.

Red Oak-Sugar Maple Transition (ROSM)

Purple-spotted coralroot, an infrequent orchid in Massacusetts, seeen here in the circumneutral soils within the red oak-sugar maple transition.

The red oak-sugar maple transition community type is found at the break in the slope on the western side of the ridge and along several of the stream corridors. The soils are more neutral and moister, and support a greater diversity of plant life. In addition to the two dominants, other common canopy trees include black birch, white oak, red maple and white ash. The herbaceous layer contains many species associated with rich mesic woods, especially along stream corridors. These include maindenhair fern, bloodroot, zigzag goldenrod (*Solidago flexicaulis*), perfoliate bellwort (*Uvularia perfoliata*), spikenard (*Aralia racemosa*), wild ginger, silvery spleenwort and the orchids, spotted coralroot (*Corallorrhiza maculata*) and rattlesnake plantain (*Goodyera pubescens*). The soils are not quite rich enough for some of the real gems found in rich mesic forests, such as ginseng (*Panax quinquefolius*-Special Concern) or large-leaved orchid (*Platanthera platyphylla).* Neither of these were ever recorded by botanist Roberta Poland during the 50 years she tramped these hillsides. Poland, however, did find several stations of yellow ladyslippers (*Cypripedium calceolus*), presumably in pockets of richer soils that would match a red oak-sugar maple transition forest. Her discoveries of yellow ladyslippers, along with Lily leaved Twayblade (*Liatris lilifolia)* and late flowering coralroot (*Corallorrhiza odontorhiza*—Special Concern) were on the east side of the Pocumtuck Ridge. None of these taxa were discovered during 2002, but it is likely that future searches may rediscover these historic and noteworthy populations.

Smaller units of this community type occur within the Mixed Oak and Hemlock-White Pine-Oak communities. More field work is required to further refine the boundaries of these smaller units. It is especially likely that examples of this community type will be found along the east-facing slope of the Ridge, adjacent to River Road.

Conservation Notes

- Although no rare plant species were found in this community type, it is worth investigating the Ridge further (a) to discover pockets of these richer sites within the larger matrices of Mixed Oak and Oak-Hemlock-White Pine, and (b) to search for stations of yellow ladyslipper, lily-leaved twayblade, and potentially American ginseng.

- Rare vernal pool species like Jefferson's salamander (*Ambystoma jeffersonianum*-Special Concern) and marbled salamanders (*Ambystoma opacum*—Threatened) would be expected to use this habitat when they are not at breeding ponds. In

addition to these rarities, many other animals take advantage of this habitat type, but none depend exclusively on it.

Cultural Grasslands/ Hayfields and Pastures

These habitats are principally found on ohe properties of the University of Massachusetts (former dairy farm), Arthur Rogers, Woolman Hill, Deerfield Academy (off of Keets Road) and in and around the Sportsman's Club.The Rogers' fields include both pasture and hayfield. In one hayfield, there is some wet meadow habitat, which appeared appropriate for Adder's Tongue Fern (*Ophioglossum pusillum*—Special Concern). Roberta Poland collected this species on the Ridge in a habitat she described as "my amphitheatre." A search for *Ophioglossum* was made in June 2002 in what we believe to be Poland's "amphitheatre", but we were unsuccessful. This date may have been too early in the fern's development, and future searches are recommended.

Conservation Notes

- The Rogers' fields, as well as many of the remaining grassland areas, are used for nesting by bobolinks and provide important nectaring areas for many species of butterflies. Nesting boxes in this area would attract bluebirds and tree swallows, and potentially great crested flycatchers and kestrels.

- The maintenance of this community type enhances the diversity of species found within the Pocumtuck Ridge focus area. Although many of the grasses are non-native, they are not aggressive invasive species and pose no risk to adjacent natural areas. These areas should be monitored for the spread of multiflora rose (already detected), Asiatic bittersweet (already detected), barberry (already detected), and black swallow-wort (*Cynanchum nigrum)* and European swallow-wort (*C. rossicum*). Swallow-wort is not yet present, but is found in many areas throughout the region and can seriously compromise the quality of these areas for forage and wildlife habitat. If possible, these species should be controlled.

Cultural Shrublands

Cultural shrublands are found along the powerline and on the abandoned ski slopes owned by Deerfield Academy. The vegetation on the ski slopes are the result of natural succession, while the powerline vegetation is periodically brush-hogged and herbicided. In both areas, the flora includes a mix of grasses and low shrubs (sweet fern, mountain laurel, blackberries and raspberries).

Conservation Notes

- The abandoned ski slope and powerline appear to be too narrow for early successional species like rufous-sided towhees. They may, however, serve as corridors for birds, mammals and certain insects.

- Off-road vehicles use some of the powerline areas and can create erosion problems near streams. These areas may also contain certain invasive, non-native

plant species. Due to time restrictions, invasive species were not monitored along these corridors.

Freshwater Wetlands

Circumneutral Hemlock-Hardwood Swamp (CHHS)
Just off River Ferry Road, a little west from the traprock ridge, lies a small hemlock-hardwood wetland with an unusual array of plant species. Aside from red maple and clusters of winterberry (*Ilex verticillata*), we found high-bush cranberry (*Viburnum trilobum*), black ash (*Fraxinus nigra),* several clusters of Goldie's fern (*Dryopteris goldiana*—Watch Listed) and swamp saxifrage (*Saxifraga pensylvanica*). All four taxa are typical of soils that are circumneutral. The other associates were more typical and included crested woodfern (*Dryopteris cristata*), spinulose woodfern (*Dryopteris carthusiana*), and golden ragwort (*Senecio aureus*). This site is worth another visit as interesting sedges may also be present. It did not appear to have the appropriate topography to also function as a vernal pool.

Red Maple Swamp (RMS)
A red maple swamp is found on property owned by Arthur Rogers. It can be subdivided into two areas: (1) a large, amphitheatre-shaped wetland to the north and (2) a red maple swamp bordering a small stream to the south.

Triangle grape fern, a diminutive species on the Massachusetts' Watch List, was found growing in moss near a small stream.

1.) The amphitheatre-shaped wetland is dominated by red maple and hemlock, with lesser components of yellow birch, white ash, white pine, and American elm (*Ulmus americana*). On higher hummocks, mountain laurel is common. In wetter soils grow spicebush (*Lindera benzoin*), highbush blueberry (*Vaccinium corymbosum*), common winterberry, and nannyberry (*Viburnum lentago*). The herbaceous layer is varied, in part due to past logging activities. Broad swaths of cinnamon fern (*Osmunda cinnamomea)*, sensitive fern (*Onoclea sensibilis*), royal fern (*Osmunda regalis*), marsh fern (*Thelypteris palustris*), false hellebore (*Veratrum viride*), spotted touch-me-not (*Impatiens capensis*), field horsetail (*Equisetum arvense*) and marsh horsetail (*Equisetum sylvaticum*). This site bears further investigation.

2.) The red maple swamp along the small, perennial stream supports a mix of species that prefer circumneutral soils. The overstory is dominated by red maple and hemlock, but yellow birch is widespread. The herbaceous layer includes long beech fern (*Phegoteris connectilis*), silvery spleenwort (*Deparia acrostichoides*), cinnamon fern, foamflower (*Tiarella cordifolia*), and many other wetland plants common to our region. Most notable

was the discovery of Triangle Grape Fern (*Botrychium lanceolatum*), a diminutive species that is currently Watch Listed in Massachusetts. In addition, the stream itself provides habitat to the Southern Pygmy Clubtail Dragonfly (*Lanthus vernalis*), another Watch-Listed species in Massachusetts. On June 20, 2002, we observed nine adults in light gaps near the stream, perching on speckeld alder (*Alnus incana*), spicebush, spotted Joe-Pye weed (*Eupatorium maculatum*) and other vegetation. Other dragonfly species found here include Delta Spotted River Cruiser (*Corduleagaster diastatops*), Ebony Jewelwing (*Calopteryx maculata*), and Eastern Pondhawk (*Erythemis simplicollis*). Other small streams on the ridge may also support southern pygmy clubtails.

Smaller red maple-dominated swamps occur within the focus areas, but were not delineated. One occurs above Pole Swamp Brook, near Pine Nook Road, and several small pockets are found on the west side of the ridge, along a topographic bench at the base of the slope leading to the rock cliffs. Ground water breaks out at the surface in these areas, and a mix of wetland species can be found. Additional reconnaissance is required to delineate the extent and boundaries of these areas. At present they have been lumped with Hemlock-White Pine-Oak assemblages or Red Oak-Sugar Maple Transition.

Conservation Notes
The stream associated with wetland #2 may also be large enough to support wood turtles (*Clemmys insculpta*-Special Concern). It would be valuable to return next summer to document the number of the southern pygmy clubtails, a species that depends on small, clean streams in its larval stage. Of note, Asiatic bittersweet was common along certain sections of this stream.

<u>Shallow Emergent Marsh (SEM)</u>
The only shallow emergent marsh within the study area occurs at the headwaters of Clapp Pond. It was detected through aerial photography but was not inspected in the field due to "No Trespassing" signs.

It is likely that the vegetation includes a variety of common species: tussock sedge (*Carex stricta*), wool grass (*Scirpus cyperinus*), marsh Fern, marsh St. Johnswort (*Triadenum virginicum*), candlewick rush (*Juncus effusus*), swamp candles (*Lysimachia terrestris*), reed canary grass (*Phalaris arundinacea*), red maple, winterberry and speckled alder.

Conservation Notes
This is the only emergent marsh within the focus area, and therefore, in all likelihood, increases the diversity of species. Shallow emergent marshes can provide habitat for spotted turtles, painted turtles, snapping turtles, garter and ribbon snakes, red-wing blackbirds, song sparrows, common yellowthroats, herons, cottontails, muskrats and mink. This area may also support breeding areas for Fowler's and American toads.

Shrub Swamp (SS)

A single buttonbush dominated shrub swamp was observed on the east side of the ridge. The area appears to function much like a woodland vernal pool, but had no standing open water at the time it was surveyed. The surrounding canopy was dominated by red maple, black gum and scattered hemlock.

Conservation Notes

Because of varying hydrology, it is likely that this shrub swamp also functions as a vernal pool. Although no larval marbled salamander larvae were found in October 2002, this site appears to be suitable for this rare species as well as other amphibians. This site might be used by box turtles (*Terrapena carolina*-Special Concern) but is probably too shrubby to provide good habitat for spotted turtles (*Clemmys guttata*-Special Concern). This site may provide breeding habitat for state-listed four-toed salamanders (*Hemidactylium scutatum*-Special Concern).

Open Water/Ponds (OW)

Within the study area are four manmade ponds that hold water year-round; (1) Clapp Pond at the south end, (2) an unnamed pond near Keets Road, (3) an unnamed pond on land owned by Woolman Hill, and (4) an unnamed pond on land owned by Arthur Rogers.

The largest of these is Clapp Pond, which is surrounded by a mix of red maple, hemlock, and white pine. Black cherry, black birch and witch hazel are also common. In a rocky nook, on the pond's eastern boundary the forest includes several large trees, many exhibiting bark characteristics suggesting that they are quite old. The understory varies depending on hydrology and light. While some areas are dominated by species associated with shady, dry acid woods (Southern Ground-Cedar (*Diphasiastrum digitatum)*, ground pine, partridgeberry (*Mitchella repens*), Canada mayflower, bracken, sweet lowbush blueberry, sheep laurel (*Kalmia angustifolia*)); other areas with more light and moisture are dominated by species like sensitive fern, royal fern, cinnamon fern, monkey flower (*Mimulus ringens*), touch-me-not (*Impatiens capensis*), and mad-dog skullcap (*Scutellaria lateriflora*). Winterberry and alder are common along the ponds shorelines, and water willow (*Decodon verticillata*) is common in its shallow waters.

The pond on Keets Road is also surrounded by a mix of deciduous species (oak, red maple, birch), as well as an occasional black willow (*Salix nigra*) on the boundary. In deeper areas water willow is abundant, while the mudflats include a mix of grasses, tickseed sunflowers (*Bidens* sp.) and other species common in open, moist conditions. The northern pond is adjacent to two other manmade depressions, all three of which were used in the past as farm ponds. The two adjacent ponds dry out, and fingernail clams were found in abundance, indicating that they function as vernal pools. A single spotted salamander was found in October in the middle pond, but no marbled salamander larvae or adults were observed in any of these ponds. Future investigations, however, are warranted.

The ponds on the Woolman Hill and Rogers' lands were not investigated.

Conservation Notes
These open water ponds should be monitored for water chestnut (*Trapa natans*), an aggressive floating aquatic that has been detected in many quiet water bodies within the Connecticut River Valley. The ponds on Rogers and Woolman Hill should be investigated to see if they function as vernal pools, and if so, if Jefferson's salamanders (Special Concern) and marbled salamanders (Threatened) are present. These open water areas provide habitat for many species of dragonflies and damselflies, frogs and turtles and water birds (great blue herons, green herons, wood ducks). Northern watersnakes are likely to use these areas. Clapp Pond has fish species, and therefore does not meet the criteria for a vernal pool.

Vernal Pools
Twelve sites were identified and mapped as potential vernal pools by the MA Division of Fisheries and Wildlife. Of these, eight were investigated during this survey and all appear to function as vernal pool habitat. Five of the investigated pools are natural, the other three are man-made.

- Natural Ponds
  Fairy shrimp, spotted salamander egg masses and wood frog tadpoles were observed in the shallow woodland pools on the UMass property. Fingernail clams were found in the woodland pools near River Ferry Road. The shrub swamp (described earlier) appears to function as a vernal pool as well. A sixth natural vernal pool occurs on the Rogers property along Pine Nook Road.

  The UMass ponds dry annually, are dominated by herbaceous vegetation, and lack trees; the ponds near River Ferry Road probably act as a single vernal pool and are wooded (black gum (*Nyssa sylvatica*), red maple). The Rogers' pool is a small depression that fills with groundwater and lacks vegetation. It is surrounded by forest and lies near the base of a small traprock ridge and talus slope.

- Manmade Ponds
  Two ponds occur near Keets Road, while the third is in the forest, just south of Deerfield Academy's abandoned ski slopes. The Keets Road ponds have fingernail clams, and wood frog larvae was observed in the third pool. All three ponds may also provide breeding habitat for spring peepers, American toads, Fowler's toads, gray treefrogs, spotted salamanders, Jefferson's salamanders and marbled salamanders.

Conservation Notes
All of the vernal pools were investigated for marbled salamanders in the fall 2002. This threatened species was observed within the focus area in 1995. Although no marbled salamanders were found during the survey, future investigations are warranted. In addition, the four additional areas identified as potential vernal pools in the GIS datalayer that were not investigated during 2002 should be inspected to determine if they function as vernal pool habitat.

SUMMARY

The Pocumtuck Ridge Focus Area contains a valuable mix of upland and freshwater wetland communities, supports at least eight vascular plants and animals being tracked by MA NHESP and one rare and several unusual lichens. Its largely unbroken forest provides valuable stopover habitat for migrating songbirds during both spring and fall, and is habitat for many mammals, reptiles and amphibians, and invertebrates. What's more, its trails provide recreational opportunities and the views of the Valley and foothills of the Berkshires from the summit are spectacular.

The upland communities, most notably the circumneutral cliffs and talus, are of high quality and have not been significantly degraded by invasive exotic species or fragmentation by roads, driveways and development. The upland areas help buffer the Ridge's wetland habitats, thereby protecting water quality and quantity. They also provide important habitat for certain wildlife species (e.g. spotted salamanders, wood frogs, etc) that depend on both wetlands and uplands during their life cycle.

Although scant, the ridge's freshwater wetlands are valuable to many plant and animal species. Of greatest interest are the small streams that provide habitat for an the southern pygmy clubtail dragonfly and the vernal pools, which provide habitat for a host of wetland plant and animal species, including the state-listed Marbled Salamander.

Based on this preliminary survey, the following actions are recommended:

- Protect the circumneutral ledges and surrounding forests. This is especially important for lichens as sudden changes in the adjacent forest canopy would alter the humid, shady, and protected microenvironment required by these ecologically sensitive species.

- Protect vernal pool habitats.

- Protect the gradual slopes to maintain the ridge's forest continuity, which benefits migratory songbirds that require contiguous, unfragmented forest to breed successfully.

- Maintain open hayfields and pasture areas to encourage grassland bird habitats. Adopt mowing regimes that are conducive to these species.

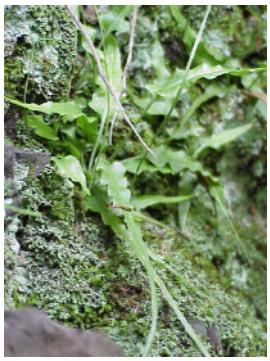
- Conduct targeted rare species surveys for selected vascular plants, amphibians (Jefferson's salamander, marbled salamander), reptiles (spotted turtle, box turtle) dragonflies, damselflies, butterflies and moths would likely turn up additional state-listed species.

- Control the spread of multiflora rose in pasture areas. Monitor and manage the presence of other non-native, invasive species along forest edges and in more sensitive natural areas (e.g. vernal pools).

- Clean-up the dump in the wooded area on the western slope.
- Restrict off-road vehicle access.

State-listed and Watch-listed Species Reported from Pocumtuck Ridge Focus Area Deerfield, MA

Endangered, Threatened & Special Concern Species		**Status**
Adlumia fungosa	Climbing Fumitory-T	Historical Record
Ambystoma opacum	Marbled Salamander-T	Historical Record
Asplenium rutamuraria	Wall Rue-T	Observed 2002
Clematis occidentalis	Purple Clematis-SC	Observed 2002
Corallorrhiza odontorhiza	Autumn Coralroot-SC	Historical Record
Morus rubra	Red Mulberry-E	Historical Record
Ophioglossum pusillum	Adder's Tongue Fern-T	Historical Record
Watch-Listed Species		
Botrychium lanceolatum	Triangle Grape Fern	Observed 2002
Dryopteris goldiana	Goldie's Fern	Observed 2002
Isotria verticillata	Large Whorled Pogonia	Observed 2002
Lanthus vernalis	Southern Pygmy Clubtail	Observed 2002
Parietaria pensylvanica	Rock Pellitory	Observed 2002
Selaginella rupestris	Rock Spikemoss	Observed 2002



Walking Fern
(*Asplenium rhizophyllum*)

Purple Cliff Brake
(Pellaea atropurpurea)

Natural Community Mapping
GIS Data Layers
December 2002
Natural Resource and Environmental Conservation Program—UMass Extension, Amherst, MA

Images	**Source**
Mosaic.sid	Black&White Orthophotos, 1:5000, MassGIS
USGS.sid	USGS Topographic Maps, MassGIS

Shapefiles

Pocumtuck Focus Area	UMass Extension
Natural Communities	UMass Extension based on descriptions by MA NHESP
Protected Open Space	Derived from MassGIS Open Space Layer and parcel maps provided by the town of Deerfield
Chapter 61 Lands	Derived from MassGIS Open Space Layer and parcel maps provided by the town of Deerfield
Vernal Pools	UMass Extension and MassGIS
Streams	MassGIS
Ponds	MassGIS
BioMap Core	MassGIS/MA NHESP

A vernal pool on the Pocumtuck Ridge.

Roberta Poland
1899-1989

Mrs. Poland taught mathematics and physics at Deerfield Academy at a time when few females were members of the Academy's faculty. Mrs. Poland retired from teaching in 1968. Her husband died in 1977. She continued to live in Deerfield and was known for the nature walks she guided every Sunday afternoon for years. She died February 26 at the age of 89.

Mrs. Poland had taught previously at Abbott Academy, the girls' school which merged with Andover. She had a B.A. from Swarthmore and a master's from University of Pennsylvania.

Her husband Burdett accepted a faculty position at Deerfield in 1942 to teach chemistry. She stayed at Abbott one year longer as head of the science department, before joining the Deerfield faculty in 1943.

Roberta Poland died Sunday, February 26, 1989. She was nearly ninety years old and had been retired from the Deerfield faculty twenty years. For most of those years, Roberta Poland and Helen Boyden, both science teachers, were the only two female members of the faculty.

Although Roberta taught physics she was by avocation a botanist, and botany is what she did full-time after her retirement. You may have seen her, an old woman with arresting white hair carrying a stick, a large plastic picnic bag for plant specimens, clippers, and a trowel, prowling the road edges in search of elusive species. By the time of her death she had collected more than 8,000 different plants in the town of Deerfield. There is probably no other town in Massachusetts and possibly New England whose flora have been inventoried so completely. And there are many specimens in her Deerfield collection that have already disappeared from the landscape.

Roberta was a quiet woman of remarkable achievement. She collected up until the year of her death and she was delighted by plants until the day she dies. Ever cheerful and forward-looking, continually absorbed in her ongoing exploration of the world, Roberta Poland was a woman whose ninety years were all abundantly worth living.

This tribute was penned for the Deerfield Academy magazine by Lyn Mattoon, a good friend and apprentice to Roberta Poland. Lyn frequently accompanied Roberta on her Deerfield walks.

Appendix 1:

Preliminary Checklist to the Flora of the Pocumtuck Ridge, Deerfield, MA

From specimens collected by Roberta Poland (1899-1989) at the UMass Herbarium, University of Massachusetts, Amherst, MA

(See attached spreadsheet)