

St. Olaf College

Local Ecology Research Papers

The Vegetation of St. Olaf: An Abstract

Heather Louis

1991

© Heather Louis, 1991

"The Vegetation of St. Olaf: An Abstract" by Heather Louis is licensed under a [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License](https://creativecommons.org/licenses/by-nc-nd/4.0/).

THE VEGETATION OF ST. OLAF: AN ABSTRACT

June-October 1991

Heather Louis

A variety of different plant communities exist in southern Minnesota. During July and August of 1991, I conducted a biological survey of the natural areas on the St. Olaf campus. Information from the survey may be used for management and developmental decisions, conservation and protection of natural resources, or for future research opportunities. Releve plots were used to obtain organized, descriptive baseline data. Different plant species were representative of different plant communities. Recommended future use of the sites and data include protection of the natural areas, studies of urban-rural gradients, and occasional monitoring to note changes in the composition of the plant communities.

INTRODUCTION

A wide variety of vegetation types are found in Rice County, Minnesota. Upland prairie, prairie wetlands, maple-basswood forests, and oak woodlands were all present in the county during the first public land survey of 1847-1907 (Wendt and Coffin 1988). Each community includes repeated groups of native plants and animals coexisting under similar environmental conditions (Converse 1990, Burkey 1989). The names that are used to identify particular community types describe the most prominent features of the habitat. These include vegetation, topography, hydrology, substrates, and soil (Burkey 1989). Disturbances control the vegetation present in an area (Grimm 1984). Today these historical communities are fragmented by agriculture and urban development (Converse 1990, Burkey 1989, McDonnell and Pickett 1990). Degradation, deforestation, and draining of wetlands contribute to the decline in the diversity and number of Minnesota's native species (Converse 1990, Burkey 1989). Remnants of tall-grass prairie exist along railroad right-of-ways and other lands unfit for agricultural crops. They contain limited numbers of

native prairie grasses, including *Andropogon gerardii* (big bluestem), and *Sorghastrum nutans* (Indian grass) (Wendt 1984). Remnants of the maple-basswood forests from the "Big Woods" are found in isolated woodlots. Selective logging and grazing has altered the original species composition and structure of these forests (Rusterholtz, 1989). Natural communities in urban areas include many intentionally and accidentally introduced organisms along with native species (McDonnell and Pickett 1990).

Currently, the Minnesota Department of Natural Resources (DNR) is conducting a biological survey of the state. This survey aims to identify and assess the status of the natural features and resources of Minnesota. Information from the survey may be used to preserve Minnesota's biological diversity and maintain well-functioning ecosystems. Functioning ecosystems are important to buffer the effects of pollution, protect water quality, prevent soil erosion, improve land values, and provide areas for outdoor recreation. The survey may also aid making decisions regarding development planning, management of an area, conservation practices, and future research opportunities (Converse 1990). Baseline data is useful in studying the impact and effects of urbanization and development and identifying changes in communities through time.

The St Olaf campus harbors a number of the diverse community types found in Rice county. During the summer of 1991 I conducted a biological survey of the natural areas on campus. This baseline data will be used for future decisions of management and conservation, as well as future opportunities for education and research at St Olaf.

MATERIALS AND METHODS

Six sites on the St Olaf campus were identified as natural areas and chosen for the study. The first four sites were characterized as maple-basswood forests. Site 1 and site 2 were eastern slopes found in Norway Valley. Site 3 was on level ground in the same forest. Site 4 was a western slope in Manitou woods. Site 5 was a prairie restoration. Site 6 was an emergent marsh and site 7 was an open water pond. Each site was visited early in the summer to gather preliminary information (Appendix B). This information included community type, identification of known dominants, land use of the site and adjacent areas, present condition of the site and a possible site rank. The rank was given according to the guidelines of the Minnesota DNR (Almendinger 1991, Rusterholtz 1989, and Wendt 1984). Ranks range from A to D according to the presence of disturbance from introduced species and management in the area. A indicates a natural pristine area while D stands for heavy disturbance and a low natural status.

In July and August, releves were completed at each site (Appendix D). Releves were conducted according to the guidelines of John Almendinger of the Minnesota Natural Heritage Program (Almendinger 1991). Relieve plots were chosen in areas of the sites that were characteristic of the hypothesized community type and characteristic of the area chosen to study. The location of each plot was noted on a map (Appendix A) and corners of plots marked with one meter tall colored re-bar for future study. The area of releve plots in wooded communities was 400 m² (20 m X 20 m) and the area of plots in treeless communities was 200 m² (10 m X 10 m). All of the plant species present in each plot were identified. Relieve sampling guidelines are provided in Appendix C. Diameter at Breast

Height (DBH) measurements were taken (in centimeters) on all trees larger than 7 cm in diameter. A tally of all saplings with DBH measurements between 2.5 and 7 cm was also recorded (Table 3, Appendix D). Slides were taken of the sites during the months of study.

Vegetation samples of fruiting and flowering species present within the releve plots and the surrounding study sites were collected for documentation. Unknown plants were also collected for later identification. All vouchers were deposited into the St Olaf Herbarium.

RESULTS

Table 1 lists the presence of plant species in each releve plot. Table 3 shows basal area of trees and sapling/seedling counts in forest plots. All of the sites surveyed contained species considered indicative of the various community types (Almendinger 1990). The canopy of maple-basswood forests were dominated by sugar maple (*Acer saccharum*) and basswood (*Tilia americana*). Other trees present were American elm (*Ulmus americana*), hophornbeam (*Ostrya virginiana*), hickory (*Carya cordiformis*), hackberry (*Celtis occidentalis*), butternut (*Juglans cinerea*), and cottonwood (*Populus deltoides*). The understory was dominated by seedlings and saplings of canopy trees (Table 3). Site 5 was characterized as a floodplain forest or lowland hardwood forest. Tree species in this forest type can tolerate periodic soil saturation by water. Species common to this site included sugar maple, basswood, slippery elm (*Ulmus rubra*), bur oak (*Quercus macrocarpa*), boxelder (*Acer negundo*), hophornbeam (*Ostrya virginiana*), and green ash (*Fraxinus pennsylvanica*) (Table 3). Site 6 was an area of prairie restoration. Grasses that dominated this site were foxtail (*Setaria glauca*), big bluestem (*Andropogon gerardii*), Indian grass

(*Sorghastrum nutans*), and Canada wild rye (*Elymus canadensis*). Other vegetation that dominated the site included ragweed (*Ambrosia artemisiifolia*), horseweed (*Conyza canadensis* var. *canadensis*), black-eyed Susan (*Rudbeckia hirta*), hoary vervain (*Verbena stricta*), and daisy fleabane (*Erigeron strigosus*). Site 7 and site 8 were both wetlands. Throughout the summer the water level in site 7 fell (observation). The site was therefore characterized as an emergent marsh. It contained species of bulrush (*Scirpus acutus*, *Scirpus fluviatilis*, and *Scirpus validus*), species of sedge (*Carex* sp.), and spike rush (*Eleocharis* sp.). Site 8 was a small open water pond. Species in this site included submergent (*Zannichellia palustris* var. *major*) and rooted vegetation (*Carex* sp., *Scirpus validus*, *Juncus dudleyi*, *Leersia oryzoides*, *Eleocharis obtusa*) in standing water.

The level area in Norway Valley (site 3) and the western slope in Manitou Woods (site 4) had the highest species richness. Heath Creek (site 5), the open water pond (site 8) and the prairie restoration (site 6) showed intermediate values and the emergent marsh (site 7) and eastern slopes in Norway Valley (site 1 and 2) had the lowest values for species richness. The figures measuring species diversity (Table 1) showed a similar pattern. The level area in Norway Valley and western slope in Manitou woods had the highest diversity while the emergent marsh and eastern sloped forests showed the least diversity. However, all of the diversity values were similar.

Compositional overlap between sites was measured using Sorenson's dissimilarity ($1 - (2W/A+B)$) (Table 2). Sorenson's measure ranges from 1 if two sites lack any species, to 0 if the species composition of the sites is identical. Overall, the forested areas (sites 1-5) were most similar in species composition, the wetland areas (sites 7 and 8) were similar, and the

prairie area was different from all of the other sites. The forested sites had approximately half of their species in common. They had few or no species in common with the other sites. The site of prairie restoration shares few to no species with the other sites. The wetland areas share almost no species in common with the forests or the prairie. The wetland sites had about half of the same species present.

DISCUSSION

The forests, wetlands, and prairie on the St. Olaf campus contained different species representative of the various community types present in Rice County when it was first surveyed in the 19th century. This information can be utilized for different purposes. McDonnell and Pickett (1990) encourage ecological studies in urban areas to answer basic ecological questions, specifically, integrating humans as a component of ecosystems. Such studies may aid in management decisions of human dominated ecosystems. I recommend that management of these areas should focus on conserving the different plant communities present. Although I found all of the areas heavily used and highly disturbed, I believe their presence is an asset. The different communities contribute to greater species diversity on campus, promote well-functioning ecosystems, add to the beauty of the campus, and are available for educational studies.

Future research could include relevés done in spring. The information gathered from such a study would enhance the data collected in the summer and include forest spring ephemerals. Occasional monitoring of the sites could provide useful information on changes in community composition over time. In the absence of severe disturbance I expect the community structure to remain relatively stable, therefore, I

recommend monitoring 6-8 years in the future. This information could also be used to study the species composition along urban-rural gradients. Questions to consider may include limits on the regeneration of dominants, patterns of regeneration, differences in herbivory, or how the perceptions, values, and behaviors of humans affect community structure and composition (McDonnell and Pickett 1990).

REFERENCES

- Almendinger, J.C. 1991. A handbook for collecting releve data in Minnesota. Minnesota Natural Heritage Program Department of Natural Resources, Box 7, 500 Lafayette Road, St. Paul, Minnesota 55148. 85 pp.
- Barbour, M.G., J.H. Burk, and W.D. Pitts. 1980. Terrestrial Plant Ecology. The Benjamin/Cummings Publishing Company, Inc., London 604pp.
- Burkey, R. and E.C. Schauer. 1989. Protecting Minnesota's Biological Diversity 1979-1989. Minnesota Department of Natural Resources 15pp.
- Converse, C.K. 1990. Interim report 1990: Minnesota county biological survey. Department of Natural Resources-Biological Report No. 31 13pp.
- Grimm, E.C. 1984. Fire and other factors controlling the big woods vegetation of Minnesota in the mid-nineteenth century. Ecological Monographs 54:291-311.
- McDonnell, M.J. and S.T.A. Pickett. 1990. Ecosystem structure and function along urban-rural gradients: an unexploited opportunity of ecology. Ecology 71(4): 1232-1237.
- Rusterholtz, K.A. 1989. Old-growth forests in Minnesota: a preliminary report. Minnesota Department of Natural Resources-Biological Report No. 5 13pp.
- Wendt, K. 1984. Mesic blacksoil prairie element abstract. Minnesota Natural Heritage Program 4 pp.

Wendt, K. and B.A. Coffin. 1988. Natural vegetation of Minnesota.
Natural Heritage Program, Section of Wildlife, Minnesota
Department of Natural Resources 5pp.

TABLE 1: SPECIES PRESENT IN ST OLAF RELEVES
SPECIES RICHNESS
SPECIES DIVERSITY

	MB 1	MB 2	MB 3	MB 4	FF	PR	EM	PD
<i>Acer negundo</i>					*			
<i>Acer saccharum</i>	*	*	*	*	*			
<i>Achillea millefolium</i>						*		*
<i>Actaea rubra</i>		*						
<i>Agropyron repens</i>						*		
<i>Alisma subcordatum</i>							*	*
<i>Alisma triviale</i>							*	
<i>Ambrosia artemisiifolia</i>						*		
<i>Ambrosia trifida</i>						*		
<i>Andropogon gerardii</i>						*		
<i>Anenome canadensis</i>					*			
<i>Aquilegia canadensis</i>				*				
<i>Artisaema triphyllum</i>	*	*	*	*				
<i>Asarum canadense</i>					*			
<i>Asclepias syriaca</i>						*		
<i>Carex sp.</i>				*			*	*
<i>Carex tribuloides</i>								*
<i>Carya cordiformis</i>		*		*	*			
<i>Caulophyllum thalictroides</i>	*	*	*					
<i>Celtis occidentalis</i>		*						
<i>Circaea lutetiana</i>	*	*	*	*	*			
<i>Conyza canadensis</i>						*		
<i>Cornus alternifolia</i>	*	*			*			
<i>Cornus sp.</i>		*	*					
<i>Eleocharis obruca</i>							*	*
<i>Elymus canadensis</i>						*		
<i>Erigeron strigosus</i>						*		
<i>Fraxinus pennsylvanica</i>					*			
<i>Galium triflorum</i>		*		*	*			
<i>Glecoma hederacea</i>				*				
<i>Hydrophyllum virginianum</i>				*				
<i>Juglans cinerea</i>				*				
<i>Juncus dudleyi</i>								*
<i>Laporteia canadensis</i>		*						
<i>Leersia oryzoides</i>								*

	MB 1	MB 2	MB 3	MB 4	FF	PR	EM	PD
<i>Lemna minor</i>							*	*
<i>Leonurus cardiaca</i>					*			
<i>Oenothera sp.</i>						*		
<i>Ostrya virginiana</i>	*	*		*	*			
<i>Panicum virgatum</i>						*		
<i>Parthenocissus quinquefolia</i>	*	*	*	*	*			*
<i>Phalaris arundinacea</i>							*	*
<i>Picea abies</i>	*							
<i>Poa pratensis</i>								*
<i>Populus deltoides</i>				*				
<i>Prunus sp.</i>				*	*			
<i>Quercus macrocarpa</i>					*			
<i>Rhamnus cathartica</i>		*						
<i>Ribes americanum</i>		*						
<i>Ribes missouriense</i>		*	*	*	*			
<i>Rudbeckia hirta</i>						*		
<i>Salix sp.</i>								*
<i>Sambucus pubens</i>	*	*	*					
<i>Sanguinaria canadensis</i>		*		*				
<i>Scirpus cyperinus</i>							*	*
<i>Scirpus fluviatilis</i>							*	
<i>Scirpus validus</i>							*	*
<i>Setaria glauca</i>						*		
<i>Setaria viridis</i>						*		
<i>Silene latifolia ssp. alba</i>						*		
<i>Smilacina racemosa</i>	*			*				
<i>Smilax sp.</i>	*			*				
<i>Solanum dulcamara</i>	*	*						
<i>Stachys palustris</i>								*
<i>Thalictrum dioicum</i>				*				
<i>Tilia americana</i>	*	*	*	*	*			
<i>Ulmus americana</i>	*							
<i>Ulmus rubra</i>			*		*			
<i>Urtica dioica</i>		*						

	MB 1	MB 2	MB 3	MB 4	FF	PR	EM	PD
<i>Verbena hastata</i>						*		*
<i>Verbena stricta</i>								
<i>Viola sp.</i>				*	*			
<i>Zannichellia palustris</i>								
<i>Zanthoxylum americanum</i>					*			*
Species Richness	14	21	10	21	19	16	9	17
Diversity	2.64	3.05	2.30	3.05	2.94	2.77	2.20	2.83

MB=Maple Basswood Forest (Norway Valley East Slope MB 1 & MB 2 and Manitou Woods West Slope MB 4); FF=Flood Plain Forest; PR=Prairie Restoration; EM=Emergent Marsh; PD=Pond

TABLE 2: SORENSON'S MEASURE OF DISSIMILARITY

	MB 1	MB 2	MB 3	MB 4	FF	PR	EM	PD
MB 1								
MB 2	0.429							
MB 3	0.417	0.419						
MB 4	0.543	0.524	0.613					
FF	0.636	0.550	0.586	0.500				
PR	1	1	1	1	1			
EM	1	1	1	0.933	1	1		
PD	0.935	0.947	0.926	0.895	0.889	0.879	0.462	

TABLE 3: BASAL AREA OF TREES IN RELEVES

<u>Tree species</u>	Site 1		Site 2		Site 3		Site 4		Site 5	
	<u>DBH</u>	<u>S/S</u>	<u>DBH</u>	<u>S/S</u>	<u>DBH</u>	<u>S/S</u>	<u>DBH</u>	<u>S/S</u>	<u>DBH</u>	<u>S/S</u>
<i>Acer negundo</i>	(\bar{x})								14.3	5
	(SD)								9.5	
	(n)								2	
<i>Acer saccharum</i>	22.7	4	20.7	13	28.7	12	7.5	26	15.5	12
	16.1		17		20.1				17.3	
	5		25		19		1		9	
<i>Carya cordiformis</i>							11	11		1
							4			
							9			
<i>Celtis occidentalis</i>			10.5							
			1							
<i>Fraxinus pennsylvanica</i>									8	8
									0	
									2	
<i>Juglans cinerea</i>							43.8			
							10.3			
							2			
<i>Ostrya virginiana</i>	15.5						18.4	7	8.7	20
							9.8		1	
	1						12		8	
<i>Picea abies</i>	67									
	1									
<i>Populus deltoides</i>							15.5			
							6.7			
							6			
<i>Prunus sp.</i>								1		2
<i>Quercus macrocarpa</i>									65	
									10.6	
									2	
<i>Tilia americana</i>	51	3	47.8	6	61	2	12.8	6	26	12
	13.2		8.9				3.6		21.7	
	5		6		1		4		11	
<i>Ulmus americana</i>	12.5									
	1									
<i>Ulmus rubra</i>								1	12.3	3
									3.9	
									2	

S/S= seedling and sapling count (DBH < 7 cm and > 2.5 cm)

 \bar{x} =mean Diameter at Breast Height (DBH) (cm)

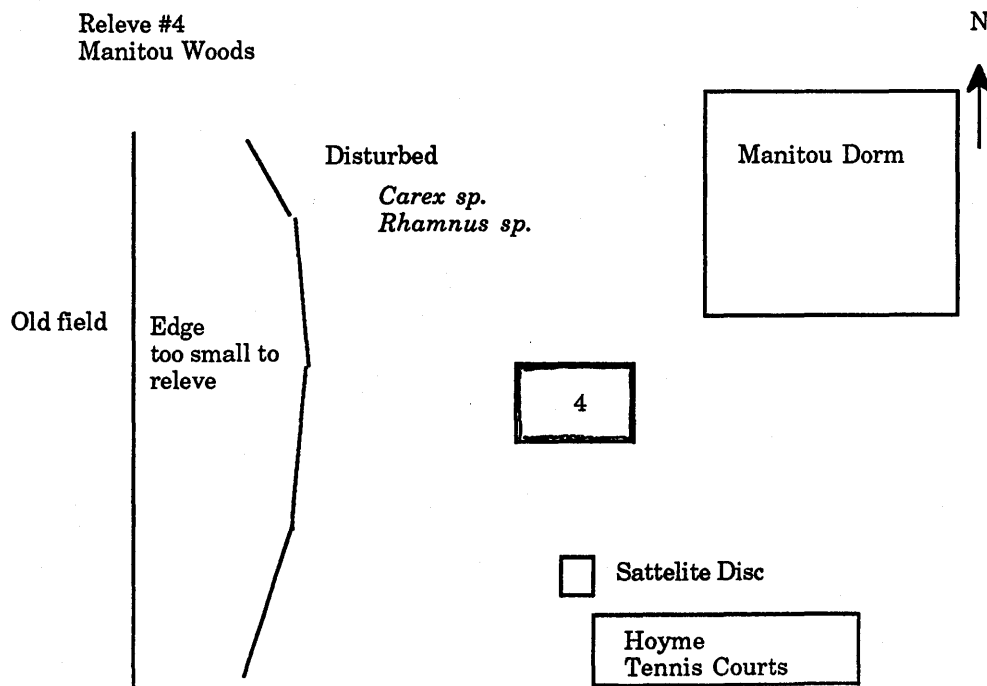
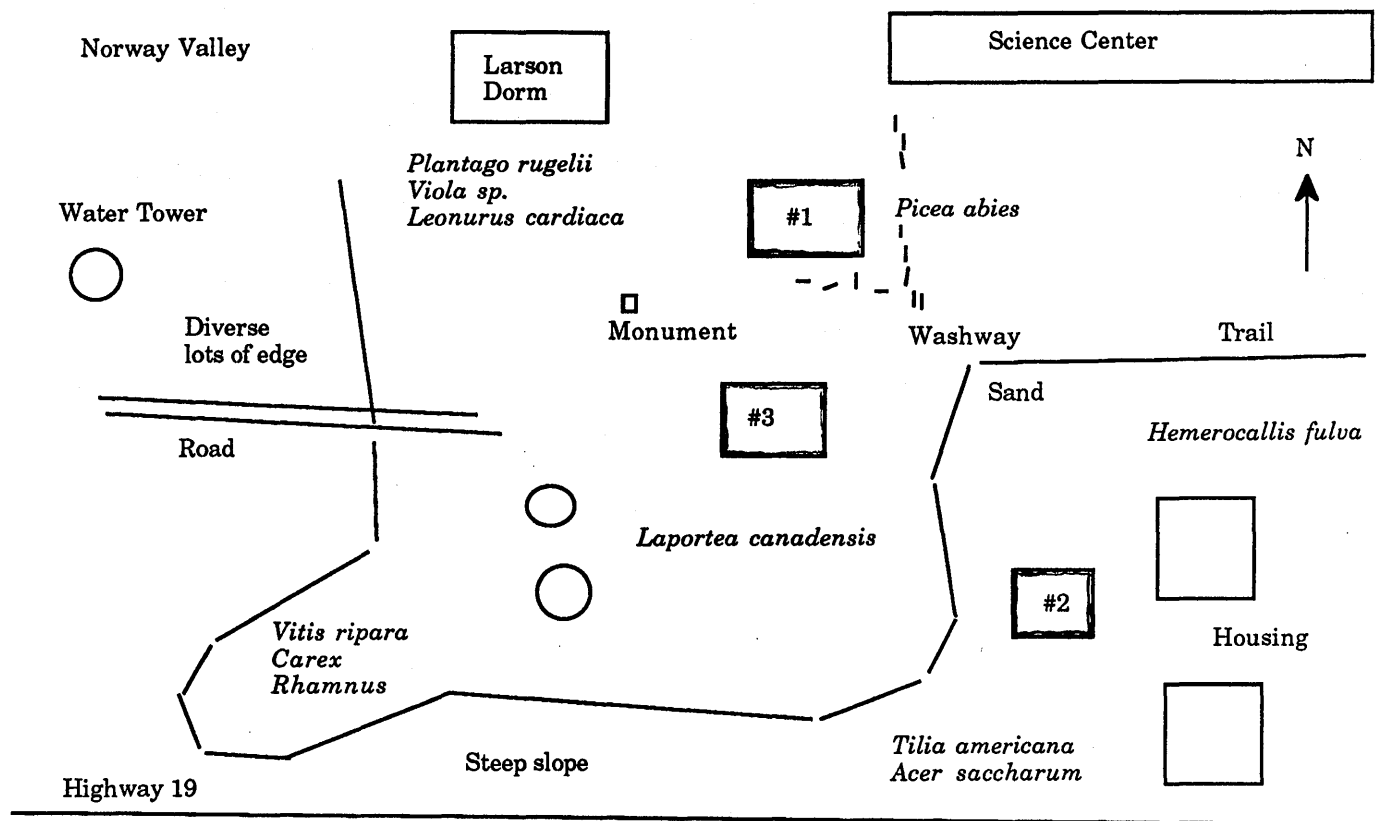
SD= standard deviation

n=number of trees measured (DBH > 7 cm)

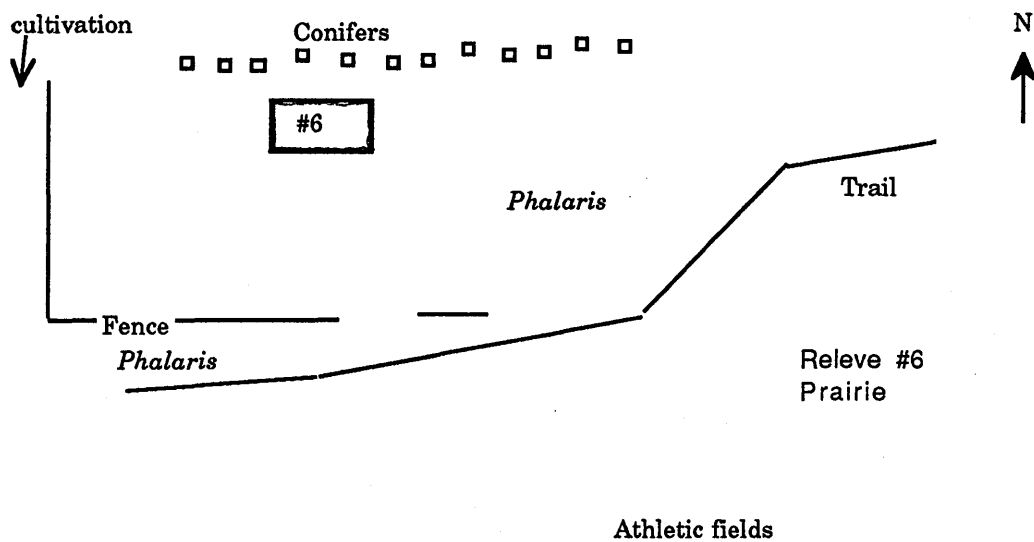
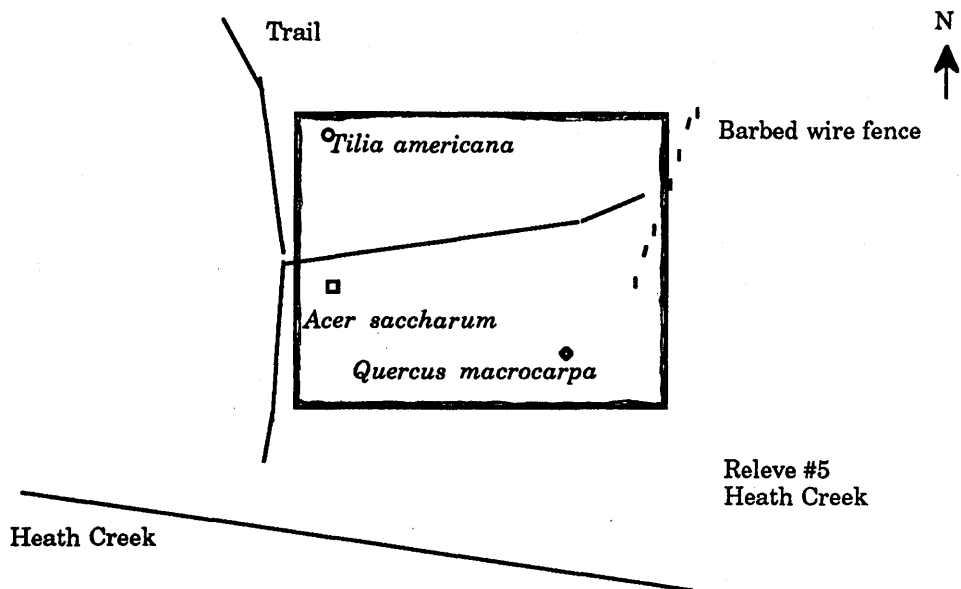
[illegible]

SUMMER 1991

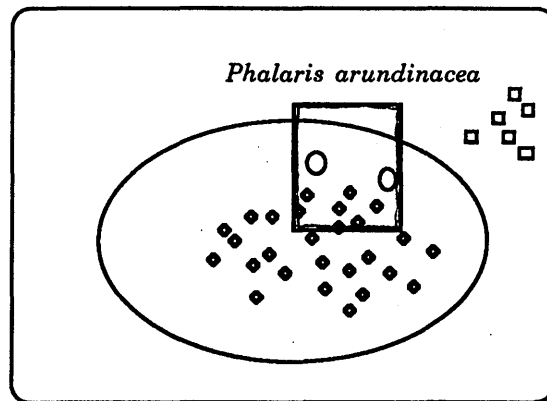
RELEVÉ SITES ROUGH MAPS



NOT SCALED

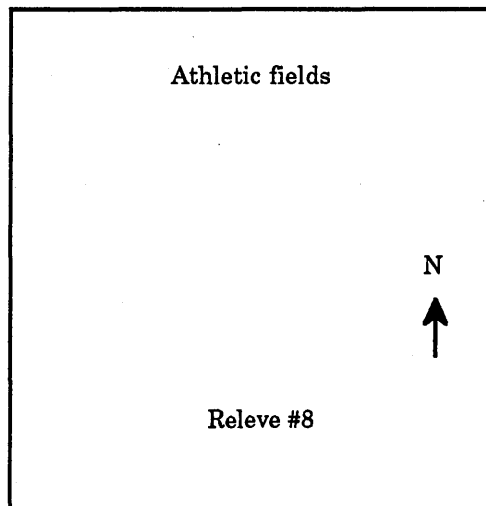
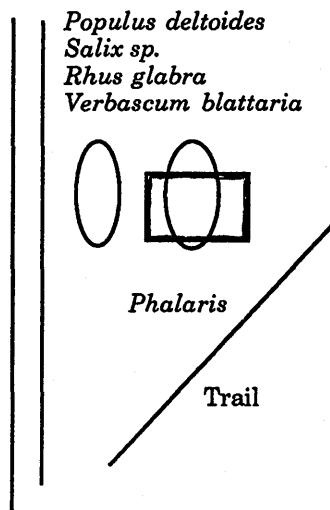


Releve #7



- *Scirpus cyperinus*
- ◆ *Alisma sp.*
- *Solidago canadensis*

Dumping Road



APPENDIX B

Preliminary Information
Norway Valley
Releve Plot #1
6/28/91

Plot size: 20m X 20m

Community Type: Maple Basswood Forest

Vegetation:

Herbs and Vines	Shrubs	Trees
<i>Circaea lutetiana</i>	<i>Sambucus pubens</i>	<i>Acer saccharum</i>
<i>Smilacina racemosa</i>		<i>Tilia americana</i>
<i>Caulophyllum thalictroides</i>		<i>Picea abies</i>
<i>Arisaema triphyllum</i>		<i>Ostrya virginiana</i>
<i>Solanum cf. dulcamara</i>		
<i>Parthenocissus quinquefolia</i>		

Bryophytes

Land Use: Forest with a footpath surrounded by the Science Building, Larson Residence Hall, Hilleboe-Kittlesby Residence Hall, Spanish House and private homes. Water towers are found within the forest with a maintenance road to reach them. Flowers have been planted here in the past by a number of people. Jeff Bailey's map of the forest may have some clues to what was planted where.

Condition: The forest is disturbed, especially along the footpath and edges. Evidence includes disturbance species such as *Rhamnus*., *Hemerocallis fluva*, *Solanum dulcamara*, *Sambucus pubens*, *Leonurus cardiaca*, *Plantago rugelii*, and species of mints. Natural disturbances are evident from tree falls. Cut stumps and logs indicate that sometimes human intervention has been used to clear the path. Large trees are present within the forest as well as native forest species. Overall forest rank: C.

Remarks: Releve done with young scholar, Eric. The plot was chosen for its large trees, the slope, and the Norway Pine stand found at the bottom of the incline. The canopy is dominated by *Tilia americana* and *Acer saccharum*. *Sambucus pubens* dominates the shrub layer. The herb layer is not diverse.

Topography: Eastern slope about 45 degrees. At the foot of the slope a ditch is eroded by water travel south in the past.

Preliminary Information
Norway Valley
Releve Plot #2
7/2/91

Plot size: 20m X 20m

Community Type: Maple-Basswood Forest

Vegetation:

Herbs and Vines	Shrubs	Trees
<i>Arisaema triphyllum</i> (FR)	<i>Sambucus pubens</i>	<i>Tilia americana</i>
<i>Circaea lutetiana</i>	<i>Acer saccharum</i>	<i>Acer saccharum</i>
<i>Laportea canadensis</i>	<i>Cornus</i> sp.	
<i>Smilax</i>		
<i>Carex</i>		
Unknown vine not flowering yet		

Bryophytes

Land Use: See #1

Condition and Rank: See #1

Remarks: Plot on a slope with large trees. The plot was chosen to determine DBH measurements on the larger trees in the forest. The site is very close to the footpath through Norway Valley and has an easy view of the private houses. Trash on the ground includes a child's ski pole and bricks covered with moss. Dead trees are on the ground, cut and fallen. The canopy is dominated by *Acer saccharum*. The ground layer is somewhat diversely covered with seedlings and broadleaf deciduous species.

Topography: East slope of approximately 45 degrees.

Preliminary Information
Norway Valley
Releve Plot #3
7/2/91

Plot size: 20m X 20m

Community Type: Maple-Basswood Forest

Vegetation:

Herbs and vines	Shrubs	Trees
<i>Circaea lutetiana</i>	<i>Sambucus pubens</i>	<i>Acer saccharum</i>
<i>Arisaema triphyllum</i>	<i>Ribes</i> sp.	<i>Tilia americana</i>
"berries on a stem"	<i>Ulmus</i> sp.	
	<i>Rhamnus cathartica?</i>	
	<i>Cornus alternifolia?</i>	
	<i>Cornus</i> sp.	

Bryophytes

Land Use: See #1.

Condition and Rank: See #1.

Remarks: The plot is located off the beaten path. Lots of dead trees present. Ground layer not as diverse as it is along the path, therefore fewer invaders are probably present to gain better information on vegetation more characteristic of Maple-Basswood forests. The herb layer is very sparse. The canopy is dominated by *Acer saccharum*. The diversity of the area seems to be found in the shrub layer.

Topography: Relatively level ground above an east facing slope. The plot has a 10-15 degree southern slope.

Preliminary Information
Manitou Woods
Releve Plot #4
7/2/91

Plot size: 20m X 20m

Community Type: Maple-Basswood Forest

Vegetation:

Herbs and vines	Shrubs	Trees
<i>Thalictrum</i> sp.	<i>Carya cordiformis</i>	<i>Ostrya virginiana</i>
<i>Circaea lutetiana</i>	<i>Acer saccharum</i>	<i>Acer saccharum</i>
<i>Viola</i> sp.	<i>Tilia americana</i>	<i>Juglans cinerea</i>
<i>Smilacina racemosa</i> (FR)	<i>Ribes</i> (very small)	<i>Tilia americana</i>
<i>Smilax</i> sp.		standing snags
<i>Carex</i> sp.		
<i>Sanguinaria canadensis</i> var <i>canadensis</i>		
<i>Parthenocissus quinquefolia</i>		
<i>Galium triflorum</i>		
<i>Hydrophyllum virginianum</i> var. <i>virginianum</i>		
unknowns		

Bryophytes

Land Use: The plot is west of Manitou Residence Hall and south of Skoglund Athletic Center. Hoyme Hall tennis courts and a satellite dish are on the south side of the woods. A dirt road goes through the western edge of the site. Area used by students as a party spot, lots of left over trash is the evidence.

Condition and Rank: The northern section of the woods is dominated by *Carex* and graminoids especially along the roadside. Overall the northern section of the woods looks most disturbed. The woods have more diversity than Norway Valley, this may be an indicator of disturbance. Lots of edge on this site. Rank: CD

Remarks: Dead wood. Lots of diversity in the canopy. The subcanopy is dominated by *Ostrya virginiana* and *Acer saccharum*. The herb layer is more diverse than Norway Valley but still sparse.

Topography: Western slope about 25-30 degrees.

Preliminary Information
Heath Creek
Releve Plot #5
7/11/91

Plot size: 20m X 20m

Community Type: Floodplain Forest

Vegetation:

Herbs and Vines	Shrubs	Trees
<i>Circaea lutetiana</i>	<i>Zanthoxylum americanum</i>	<i>Acer saccharum</i>
<i>Anemone canadensis</i>		<i>Acer nugundo</i>
<i>Leonurus cardiaca</i>		<i>Quercus macrocarpa</i>
<i>Asarum canadense</i>		<i>Fraxnis pennsylvanica</i>
<i>Viola sp.</i>		

Land Use: Footpaths for hiking and skiing. Trash cans in the area for students to clean up after themselves. South of a cultivated field and north of the construction site of a new building.

Condition and Rank: The area is very disturbed with *Rhamnus*, graminoids, and mint species. The trees are all sapling size or young second growth. Only a few large trees cover the canopy. The seedling and herb layer is almost absent in some areas and very shrubby in other areas.
Rank: D

Remarks: The plot was chosen next to Heath Creek. The creek is rather low on water, only about a foot deep. Three large trees are in the plot, *Acer saccharum*, *Tilia americana*, and *Quercus macrocarpa*. The subcanopy is dominated by *Ostrya virginiana* and *Acer saccharum*. Herbs and seedlings are parklike in the plot area of the ground layer, possibly covering less of the area because of a footpath crossing the plot and along the north side of the plot. A barbed wire fence enters the northwest edge of the plot.

Topography: On the north bank of a small creek. No slope in the plot but the area is at the bottom of a small 30 degree slope.

Preliminary Information
Prairie
Releve Plot #6
7/9/91

Plot size: 10m X 10m

Community Type: Prairie

Vegetation:

Ambrosia artemisiifolia
Ambrosia trifida
Verbascum thapsus
Melilotus officinalis
Melilotus alba
Asclepias syriaca
Achillea millefolium
Silene latifolia ssp. *alba*
Tragopogon dubius
Phalaris arundinacea
Elymus canadensis
Agropyron repens
Setaria glauca

Heliopsis helianthoides
Ratibida pinnata
Monarda fistulosa
Verbena sp.
Oenothera (pods)
Rudbeckia hirta

Baptisa australis
Hieracium (small dandylions)
Panicum virgatum var. *virgatum*

Land Use: Set aside for prairie restoration. This area was burned this spring and seeded. Need to find out what was in the seed mix. North of Skoglund athletic fields.

Condition and Rank: Some prairie plants present. A lot of *Phalaris* to walk through to get to the site. At the moment I would not rank the prairie high but it has potential.

Remarks: The area does not have many prairie species yet. It is surrounded by a monoculture of *Phalaris*.

Topography: The releve is on the top of a small hill. A southern, western and eastern slope of no more than 10 degrees surrounds the plot.

Preliminary Information
Wetland pond
Releve Plot #7
7/11/91

Plot size: 10m X 10m

Community Type: Pond

Vegetation:

Herbs and Vines	Shrubs	Trees
<i>Phalaris arundinacea</i>		<i>Salix nigra</i>
<i>Solidago canadensis</i>		<i>Populus deltoides</i>
<i>Scirpus acutus</i>		
<i>Sagittaria latifolia</i>		
<i>Alisma</i> sp.		
<i>Lemna</i> sp.		

Land Use: The pond is just north of the Skoglund athletic fields. The field is mowed very close to the area. Ducks and a white egret were using the pond when I came to take a picture of the area.

Condition and Rank: The area does not seem to be very diverse, dominated by *Phalaris*. *Solidago canadensis*, a disturbance species is also present on the edge of the site. The area of open water is small. Rank: CD

Remarks: Lots of birds present in the site and angry with me for entering. Hummocks of grass were present on the trek toward the pond but the water was very low, mostly present in the pond but the ground between the hummocks was muddy. The area of open water is probably 35-40m in length.

Topography: Low land.

Preliminary Information
Wetland pond
Releve Plot #8
6/21/91
7/1/91

Plot size: 10m X 10m

Community Type: pond

Vegetation:

Herbs and Vines	Shrubs	Trees
<i>Potentilla recta</i>		<i>Salix sp.</i>
<i>Scirpus lineatus (or atrocinctus?)</i>		
<i>Alisma sp.</i>		
<i>Carex sp.</i>		
<i>Agrostis stolonifera var. major</i>		
<i>Eleocharis ovata</i>		
<i>Achillea millefolium</i>		
<i>Stachys palustris?</i>		
<i>Phleum pratense</i>		
<i>Erigeron strigosus</i>		
<i>Phalaris arundinacea</i>		
water plants		

Land Use: Small deep pond just west of Skoglund athletic fields. Located west of the pond is an area St Olaf uses as a dumping ground for soil and rock from construction. Along the side of this dumping road there is a diverse number of herbs, shrubs and trees. Birds and dragonflies present.

Condition and Rank: Lots of *Phalaris* present in the site, the pond is very small but the vegetation seems to be more diverse than the larger pond.

Rank: CD

Remarks: The water is lower than it was when the area was visited in June, although the water is deeper than that of the larger pond. Water plants are present. *Populus deltoides* and *Salix sp.* are present on the side of the slope just off the dumping road.

Topography: Low land. The dumping road shoots up alongside the western edge of the site.