

Appendix A

Eagle Heights Woods Management Plan

Proposed Process and timeline: revised 1/25/2013 rhj

TASKS	SCHEDULE	UPDATE
Define/verify the planning area.	First day	
Collect background information regarding the area and the issues: (from master plan and discussions with campus stakeholders)	Summer 2011	
Site Inventory and Analysis (from master plan and discussions) - look at vege in all seasons, info will be added to throughout the entire process	Summer 2011	
Use Analysis (from master plan and discussions)	Fall 2011	
List known issues / opportunities - from master plan and any others (collect input from FPM Staff, campus experts, P&I subcommittee, others)	Fall 2011	
Prepare information to present to stakeholders: [FPM Staff]	Jan/Feb 2012	
P & I Subcommittee Meeting: Pre-view planning process	Jan 31, 2012	
Preserve Committee Meeting: introduce planning process	Feb 14, 2012	
Stakeholder Meeting: collect thoughts & ideas, find out what is important to them.	Feb 21, 2012	
Summarize Stakeholder comments Write the <i>Draft Management Plan Outline</i>		
P&I Subcommittee Meeting: Review <i>Draft Management Plan Outline</i>	March 6, 2012	
Preserve Committee Meeting: progress report	Mar 13, 2012	
Write <i>Draft Management Plan</i>		
P&I Subcommittee Meeting: Review <i>Draft Management Plan</i>	Mar 20, 2012	Oct 31, 2012
Revise <i>Draft Management Plan</i>		
Post <i>Draft Management Plan</i> on website and invite stakeholder review comments E-mail link to all in attendance or given input	Mar 27, 2012	
P&I Subcommittee Mtg: review updated <i>Draft Management Plan</i>		Jan 30, 2013
Send draft Management Plan to Preserve Committee		Feb 7, 2013
Preserve Committee Meeting: Present <i>Draft Management Plan</i> and collect comments	April 10, 2012	Feb 14, 2013
Post Draft Management Plan on website for review		Feb 18, 2013
Stakeholder Meeting: Present <i>Draft Management Plan</i> and collect comments	April 10, 2012	Feb 26, 2013
Incorporate comments into <i>Proposed Management Plan</i>		
P&I Subcommittee Meeting: discuss comments on <i>Proposed Management Plan</i>	April 17, 2012	Feb 27, 28, 2013
Finalize <i>Proposed Management Plan</i>		
Post <i>Proposed Management Plan</i> on website for Committee and Public Review	May 1, 2012	March 7, 2013
Preserve Committee Meeting: Present <i>Proposed Management Plan</i> for action	May 8, 2012	March 14, 2013
Prepare <i>Final Management Plan</i>		
Post <i>Final Management Plan</i> on website	July 2012	April 2013

Appendix B

Description of Eagle Heights Woods from the UW Madison Campus Natural Areas Management Plan 1996 by Virginia Kline and Brian Bader:

Existing Vegetation

North slope:

Canopy – red oak, slippery elm, white ash, basswood.

Sub-canopy – slippery elm, white ash, black cherry, basswood. Patch of black locust near top. Shrub layer – grey dogwood, chokecherry, honeysuckle, buckthorn.

Ground layer – virginia creeper, poison ivy, moonseed vine, wild yam root, bloodroot, early meadowrue, solomon's seal, false solomon's seal, jack-in-the-pulpit.

East slope:

Canopy – white oak, red oak, white ash, basswood, slippery elm, shagbark hickory, black cherry.

Sub-canopy – box elder, black cherry, hackberry. Shrub layer – gray dogwood, honeysuckle, buckthorn, red-berried elder, highbush cranberry.

Ground layer – Virginia creeper, zig-zag goldenrod, enchanter's nightshade, solomon's seal, false solomon's, bloodroot, wild geranium, early meadowrue, virginia waterleaf.

South and west slopes:

Canopy – scattered large trees – black oak, white oak, black cherry, bur oak and to a lesser extent - red oak, slippery elm, white ash.

Subcanopy – white ash, black cherry, box elder, slippery elm, hackberry. Shrub layer – denser than north and east slopes – buckthorn, honeysuckle, gray dogwood, red-oiser dogwood, chokecherry, red-berreid elder, highbush cranberry.

Ground layer – virginia creeper, mayapple, solomon's seal, wild geranium, wild strawberry, woodland tick-trefoil, sweet joe pye weed, jack-in-the-pulpit.

Recommendations for Management

General: control erosion – discontinue bicycle use in preserve

General: remove honeysuckle, buckthorn & garlic mustard and other exotics as they suppress the native shrubs and ground layer

General: improve and maintain the trail system

General: leave standing and fallen dead trunks unless a risk

Appendix C

Update of Description of Eagle Heights Woods from the UW Madison Campus Natural Areas Management Plan 1996 by Susan Will-Wolf

Will-Wolf vegetation updates are in red and reflect Ecology 460 class data for woody plants (note: not expert taxonomists!).

Existing Vegetation

North slope:

Canopy – red oak, white oak, ~~slippery elm, white ash~~, basswood.

Sub-canopy – basswood, ~~slippery elm~~, green and white ash, sugar maple, box elder, black cherry, slippery elm, ~~basswood. Patch of black locust near top.~~

Shrub layer – gray dogwood, chokecherry, honeysuckle, buckthorn.

Ground layer – Virginia creeper, poison ivy, moonseed vine, wild yam, bloodroot, early meadowrue, solomon's seal, false solomon's seal, jack-in-the-pulpit.

East slope:

Canopy – white oak, red oak, ~~white ash~~, basswood, ~~slippery elm, shagbark hickory~~, black cherry.

Sub-canopy – box elder, black cherry, ~~basswood white ash~~, hackberry.

Shrub layer – gray dogwood, ~~chokecherry~~, honeysuckle, buckthorn, red ~~berried~~ elderberry, highbush cranberry.

Ground layer – Virginia creeper, zig-zag goldenrod, enchanter's nightshade, solomon's seal, false solomon's seal, bloodroot, wild geranium, early meadowrue, Virginia waterleaf.

South and SW to WSW~~west~~ slopes:

Canopy – scattered large trees – black oak, white oak, ~~black cherry~~, bur oak, ~~with some and to a lesser extent shagbark hickory, —red oak, slippery elm, black cherry~~, white ash.

Sub-canopy ~~—white ash, black cherry~~, box elder, black cherry, green and white ash, ~~slippery elm~~, hackberry.

Shrub layer – denser than north ~~and~~ east, ~~and west/WNW~~ slopes – buckthorn, honeysuckle, gray dogwood, ~~raspberry, red oiser dogwood~~chokecherry, red ~~berried~~ elderberry, highbush cranberry.

Ground layer – Virginia creeper, mayapple, solomon's seal, wild geranium, wild strawberry, woodland tick-trefoil, sweet joe pye weed, jack-in-the-pulpit.

West to WNW slopes:

Canopy – white oak, black cherry, scattered red oak, Spreading oak wilt patch has left the canopy more open than other slopes.

Sub-canopy – box elder, black cherry, white and green ash, hackberry.

Shrub layer – red-osier, gray, and pagoda dogwood. honeysuckle, Evidence of moisture seeps about halfway upslope, making the lower slopes more moist.

Ground layer – Virginia creeper, zig-zag goldenrod, enchanter's nightshade, solomon's seal, false solomon's seal, bloodroot, wild geranium, early meadowrue, Virginia waterleaf.

Top:

Canopy – white oak, red oak, shagbark hickory, bur oak. Patch of black locust near top. Tree density slightly less than on slopes.

Sub-canopy – box elder, black cherry, white oak, green ash.

Shrub layer – buckthorn, honeysuckle, gray dogwood, raspberry, chokecherry.

Ground layer – Virginia creeper, enchanter's nightshade, solomon's seal, false solomon's seal, wild geranium, goldenrods, sedge spp, several species of native spring ephemerals and other summer herbs.

Native Vascular Plant Inventory of Eagle Heights Woods, Wally Bauman Woods and North Shore Woods

Joshua Sulman

July 25, 1998

This plant inventory includes the species seen during the period from late April to late July, 1998, on walks at weekly intervals through the western three sections of the Campus Natural Areas. Also included are some species seen other years and some not yet blooming at the end of July, but observed in a vegetative state.

The three areas observed were Eagle Heights Woods, Wally Bauman Woods, and the western part of North Shore Woods. Each section has a unique topography and microclimate resulting in different sets of plant communities and species for each area. Eagle Heights has a steep north-facing hillside and a shallower slope to the south, and is entirely wooded. The north-facing side is so steep in some areas that there are exposed rock ledges, with characteristic cliff plants on them. The cooler microclimate allows for plant species not found on the south face of the hill. The woods is a characteristic Southern Dry-Mesic Forest, with a tall canopy dominated by red oak. The top of Eagle Heights is drier with a canopy of mainly white oak, and a groundlayer characteristic of a Southern Dry Forest. The other sides of the hill grade between these two forest types, with some species found on some sides and not others. In the spring, plants of the same species bloom about a week earlier on the south slope than on the north slope of Eagle Heights.

Wally Bauman Woods continues in the Dry-Mesic Forest of the north side of Eagle Heights down toward the lake. The slope is not quite as steep as in Eagle Heights, but is still a good climb. Lake Mendota is about 150 feet lower than the top of Eagle Heights. There are some cliff-like areas of erosion along the shore with associated cliff species.

To the east into North Shore Woods, the forest grades into a Mesic Forest of mostly sugar maple. In the interior, the groundlayer is sparse except for a few spring ephemerals. Along the shore, there are hints that the area was once more open, with some open-grown oaks and savanna wildflowers. Near the parking lot, around the small beach and cliff are a number of interesting plant species not found in the rest of the three sections observed. The situations are associated with Shaded Cliff and Exposed Cliff communities. Along Lake Mendota Drive on the south side of North Shore Woods, there are plants that arrived there and had an advantage growing in the disturbance of the road embankment that are not found elsewhere in the areas observed.

Numbers following native and lower-case letters following non-native plant species correspond to the map, for local species.

W= Wally Bauman Woods

E=Eagle Heights Woods

N=North Shore Woods, the part west of the parking lot

Letters follow names of plants with a wide distribution in the specified areas. (These distributions may not be completely accurate!)

Native Species

- Acer negundo* (box elder) W, E, N
Acer rubrum (red maple) 1
Acer saccharum (sugar maple) W, N
Actaea rubra (red baneberry) W, E, N
Adiantum pedatum (maidenhair fern) W, E
Agrimonia gryposepala (agrimony) W, E, N
Amelanchier spicata (serviceberry) 2
Amphicarpa bracteata (hog peanut) W, E
Anemone virginiana (thimbleweed) W, E, N
Anemone quinquefolia (wood anemone) E
Apocynum sp. (dogbane) E
Aquilegia canadensis (columbine) W, E, N
Arabis hirsuta (hairy rock cress) 3 **needs verification**
Aralia nudicaulis (wild sarsaparilla) W, E, N
Aralia racemosa (spikenard) 4
Arisaema triphyllum (jack-in-the-pulpit) W, E, N
Asclepias exaltata (poke milkweed) 5
Aster spp. W, E, N
Athyrium filix-femina (lady fern) W, E
Betula papyrifera (white birch) 6
Carex cephalophora E
Carex convoluta W, E, N
Carex pennsylvanica (Pennsylvania sedge) E
Carex sprengelii 7
Carex needs verification
Carya ovata (shagbark hickory) W, E, N
Caulophyllum thalictroides (blue cohosh) E
Celastrus scandens (bittersweet) W, E
Celtis occidentalis (hackberry) W, E, N
Circaea quadrisulcata (enchanter's nightshade) W, E, N
Clematis virginiana (virgin's bower) 8 **needs verification**
Cornus alternifolia (alternate-leaved dogwood) W, E, N
Cornus racemosa (gray dogwood) W, E, N
Cornus rugosa (round-leaved dogwood) E
Corylus americana (hazelnut) E
Cystopteris fragilis (fragile fern) 9
Desmodium glutinosum (tick trefoil) W, E, N
Dicentra cucullaria (Dutchman's breeches) W, E, N
Diervilla lonicera (bush honeysuckle) 10 **needs verification**
Dioscorea villosa (wild yam) W, E
Dodecatheon meadia (shooting star) 11
Elymus canadensis (wild rye) 12
Elymus villosus (wild rye also) 13
Epilobium coloratum (willow-herb) 14
Erechtites hieracifolia (burnweed) E
Erigeron annuus (fleabane) W, E, N
Eupatorium purpureum (sweet joe-pye-weed) E
Eupatorium rugosum (white snakeroot) W, E, N
Fraxinus americana (white ash) W, E, N
Galium aparine (cleavers) E
Galium concinnum (bedstraw) E
Geranium maculatum (wild geranium) W, E, N
Geum canadense (white avens) W, E, N
Hackelia virginiana (stickseed) E
Helianthus strumosus (woodland sunflower) W
Hepatica acutiloba (sharp-lobed hepatica) W, E
Heuchera richardsonii (alum root) E, N
Hydrophyllum virginiana (virginia waterleaf) W, E, N
Impatiens pallida (pale touch-me-not) 15
Juglans spp. (walnut, butternut) W, E
Juncus tenuis (trail rush) W, E, N
Juniperus virginiana (red cedar) W, N
Lonicera prolifera (wild honeysuckle) E
Menispermum canadense (moonseed) E
Monarda fistulosa (wild bergamot) W, E, N
Monotropa uniflora (Indian pipe) W
Osmorhiza longistylis (sweet cicely) 17
Ostrya virginiana (ironwood) W, E, N
Oxalis stricta (yellow wood-sorrel) W, E, N
Parietaria pennsylvanica (pellitory) W, E, N
Parthenocissus vitacea (Virginia creeper) W, E, N
Pellaea atropurpurea (purple-stemmed cliffbrake) 18
Phytolacca americana (pokeweed) 19
Phryma leptostachya (lopseed) W, E, N
Pilea pumila (clearweed) E
Podophyllum peltatum (mayapple) W, E, N
Polygonatum biflorum (Solomon's seal) W, E, N
Polygonum virginianum (jumpseed) E
Populus grandidentata (bigtooth aspen) N
Populus deltoides (cottonwood) 20
Potentilla simplex (old-field cinquefoil) W
Prenanthes sp. (white lettuce) W, E, N (*Prunus* /
pennsylvanica (pin cherry) 21
Prunus serotina (black cherry) W, E, N
Prunus virginiana (choke cherry) W, E, N
Quercus alba (white oak) W, E, N
Quercus borealis (red oak) W, E, N
Quercus macrocarpa (bur oak) 22
Ranunculus abortivus (small-flowered buttercup) W, E, N
Ranunculus fascicularis (early buttercup) 23
Rhus radicans (poison ivy) W, E, N
Rhus typhina (staghorn sumac) 24
Ribes cynobasti (prickly gooseberry) W, E, N
Rosa blanda (meadow rose) 25
Rubus occidentalis (black raspberry) W, E
Sambucus pubens (red-berried elderberry) E
Sanguinaria canadensis (bloodroot) W, E, N
Sanicula gregaria (black snakeroot) 26
Scrophularia lanceolata (figwort) E, N
Smilax racemosa (false Solomon's seal) W, E, N
Smilax lasioneura (carrion flower) E
Solidago flexicaulis (zig-zag goldenrod) W, E, N
Thalictrum dioicum (early meadow rue) W, E, N
Tilia americana (basswood) W, E, N
Triosteum perfoliatum (tinker's weed) 27
Ulmus rubra (slippery elm) W, E, N
Uvularia grandiflora (bellwort) W, E, N
Verbena urticifolia (white vervain) W, E, N
Veronica sp. (speedwell) 28 **needs verification**

Veronicastrum virginicum (Culver's root) W,E
Viburnum lentago (nannyberry) E
Viburnum rafinesquianum (downy arrowwood) E
Viola papilionacea (common blue violet) W,E,N
Viola pubescens (downy yellow violet) W,E,N
Viola sororia (woolly blue violet) E
Vitis riparia (wild grape) W,E,N
Xanthoxylum americanum (prickly ash) 29

Non-native or "Other" Species

Acer platanoides (Norway maple) E
Alliaria petiolata (garlic mustard) W,E,N
Asparagus officinalis E,N
Catalpa speciosa E
Echinochloa crusgalli (barnyard grass) a
Epipactis helliborine b
Glechoma hederacea (creeping Charlie) E
Homo sapiens (human)
Leonurus cardiaca (motherwort) E
Lonicera tatarica (Tartarian honeysuckle) W,E,N
Morus alba (white mulberry) E
Nepeta cataria (catnip)
Pinus strobus (white pine) E
Prunella vulgaris (heal-all) W,E,N
Rhamnus cathartica (European buckthorn) W,E,N
Rhamnus frangula c
Ribes sativum (garden currant) d
Solanum dulcamara (deadly nightshade) W
Urtica dioica (stinging nettle) e
Viburnum lantana (wayfaring tree) f
Viburnum opulus W,E,N

Appendix E - part 1

Plant Inventory, Eagle Heights Mounds (July 13, 2010)

By Glenda Denniston

Latin name	Common name	Comments
Alliaria petiolata	Garlic mustard	(removed)
Anemone quinquefolia	Wood anemone	
Aquilegia canadensis	Wild columbine	
Arctium minus	Common burdock	
Arisaema triphyllum	Jack-in-the-pulpit	
Aster spp	Aster species	(will ID later)
Carex blanda	Common wood sedge	
Carex pensylvanica	Pennsylvania sedge	
Carex rosea	Curly-styled wood sedge	
Carex spp.	(other woodland sedge species)	(will ID later)
Circaea lutetiana canadensis	Enchanter's nightshade	
Cirsium arvense	Canada thistle	
Eupatorium rugosum	White snakeroot	
Dicentra cucullaria	Dutchman's breeches	(dormant)*
Dodecatheon meadia	Shooting star	(dormant)*
Fragaria virginiana	Wild strawberry	(previously)
Galium sp.	Bedstraw (not aparine)	(will ID later)
Geranium maculatum	Wild geranium	
Geum canadense	White avens	
Hydrophyllum virginianum	Virginia waterleaf	
Impatiens pallida	Yellow jewelweed	
Leonurus cardiaca	Motherwort	(circ. mound)
Nepeta cataria	Catnip	
Osmorhiza longistylis	Smooth sweet cicely	
Oxalis stricta	Yellow wood-sorrel	
Parthenocissus quinquefolia	Virginia creeper	
Phryma leptostachya	American lop-seed	
Podophyllum peltatum	May-apple	
Polygonatum biflorum	Smooth Solomon's seal	
Polygonum virginianum	Jumpseed	
Prunella sp.	Self-heal	(circ. mound)
Prunus virginiana	Choke cherry	
Ranunculus abortivus	Small-flowered buttercup	
Ranunculus hispidus	Bristly buttercup	
Ribes spp	Gooseberry	
Rubus allegheniensis	Common blackberry	
Rubus occidentalis	Black raspberry	
Sambucus racemosa	Red elderberry	
Sanguinaria canadensis	Bloodroot	(formerly)
Sanicula gregaria	Black snakeroot	

Smilacina racemosa	False Solomon's Seal	
Smilax herbacea	Carrion flower	
Solanum dulcamara	Deadly nightshade	(circ. mound)
Solidago canadensis	Common goldenrod	(circ. mound)
Solidago flexicaulis	Zig-zag goldenrod	
Solidago ulmifolia	Elm-leaved goldenrod	
Taraxacum officinale	Common dandelion	(circ. mound)
Thalictrum dioicum	Early meadow-rue	(formerly)
Toxicodendron radicans	Poison-ivy	
Verbena urticifolia	White vervain	(circ. mound)
Viola soraria	Door-yard violet	
Vitis sp.	Wild grape	
Zanthoxylum americanum	Prickly-ash	(previous)

[several different mosses]

[Buckthorn, Shrub honeysuckle, Privet, Green Ash, and other woody saplings taking over]

NOTE:

The Eagle Heights mounds have experienced much soil disturbance over the years. Various individuals and groups have "cared for" the mounds in the past. Lilac, privet, pansies and other garden plants are among the plants that apparently were intentionally introduced by unknown individuals. A group of Boy Scouts is said to have done some weeding and also planting here in the past.

In 2002, Glenda Denniston did a major clearing of the mounds, removing all woody saplings and invasive and weedy herbs. At that time there was no stipulation against pulling plants from mounds. I made every effort, though, to keep soil disturbance to a minimum. I used no herbicides but instead cut some of the larger saplings at the base, returning periodically to cut re-sprouts. No erosion problems were observed following the weeding and cutting, and the violets, shooting stars, various sedges and other native forbs did well in the existing canopy shade after the shrubs were gone.

2004 and 2005 were the last years that I did cleared the mounds. This was because volunteers were told at that time that they could not disturb the earth in any way (I think an exception was made for Garlic mustard, but I don't remember). At any rate, since 2005, the weed problem has been getting progressively worse. I would strongly recommend cutting and treating the woody saplings and pulling the herbaceous weeds.

Photos of mounds in my files:

2002 photos:

0044, 0051: 5-31-02; 0122, 0123 on 6-13-02, during clearing of mounds.

1024: 6-21-02

0958, 0959, 0965: 8-4-02 Mound-clearing (Glenda Denniston)

0189 6-21-02 Clearing of Front linear mound (GD)

1472-1624 Clearing of Back linear mound in 2002 (GD, plus Tom Helgeson on several days)

2004 photos:

3426-3435: 10-4-04 Eagle Heights Woods mounds. Circular mound with Motherwort; Back linear mound: During woody plant removal

2005 photos:

0119 Vegetation on Front linear mound, 5-15-05

0122-0124 Circular mound, 5-15-05 Tom Brock's Field Trip

Appendix E - part 2

Plant Inventory, Eagle Heights Mounds (spring, 2011)

By Glenda Denniston

2 shady linear mounds

LINEAR MOUND #1

Note: vegetation density in little opening 10x the other areas

Undesirable woody ON mound

Woodbine

Honeysuckle (few)

Buckthorn

Undesirable woody ADJACENT TO mound

Viburnum lantana

Desirable herbaceous plants ON mound

Dodecatheon meadia (a patch) shooting star

Arisaema triphyllum (Jack in Pulpit)

Dentaria laciniata (Cutleafed toothwort)

Galium aparine

Dicentra cucularia (dutchmans breeches)

Carex sprengei

Carex blanda

Carex pennsylvanica group

Carex sp rosea

Polygonum (sp?)(knotweed)

Maianthemum racemosum (False Solomon`s seal)

Polygonatum biflorum (Solomon seal)

Ranunculus abortivus (little leaf buttercup)

Sanguinaria canadense (bloodroot)

Osmorhiza (sweet cicely)

Circaea (enchanters nightshade)

Oxalis seedlings

Allium (canadense?)

Unknown composites

Geranium maculatum

Anemone quinquefolia (1) (wood anemone)

moss

Desirable herbaceous plants adjacent to mound

Podophyllum peltatum (mayapple)

Trillium grandiflora

Desirable woody plants adjacent to, if not on mound

Sambucus Canadensis
Native woody saplings, seedlings
Lonicera dioica

LINEAR MOUND #2

Undesirable woody ON mound

Woodbine
Honeysuckle (few)
Buckthorn

Desirable plants ON mound

Mayapple
Dicentra
Impatiens
Geranium
Hydrophyllum
Polygonum
Viola (purple)
White Avena
Composite (sp) Oct 16 note: we could probably tell which one if we went up there NOW)
Zig zag Solidago
Parthenocissus
Circaea
Veronicastrum virginicum (2)(culvers root)
Sanguinaria
Smilax rotundifolia (common greenbriar)
Smilacina racemosa
Smilacina mayanthes
Dodecatheon
Agrimony
Thalictrum dioicum
Arisaema triphyllum (jack in pulpit)

CONICAL MOUND

Undesirable woody ON mound

Woodbine
Honeysuckle (few)
Buckthorn

Undesirable woody ADJACENT TO mound

Parthenocissus (woodbine)
Raspberry
Rhamnus (Buckthorn)
Honeysuckle
Privet

All trees
Ribes (currant)

Undesirable herbaceous ADJACENT TO mound

Burdock
Garlic mustard
Motherwort
dandelion

Desirable plants ON mound

Polygonum
Hydrophyllum virginiana
Solidago ulmifolia
Geum (Avens)
Impatiens pallid
Geranium maculatum
Arisaema triphyllum

Desirable plants adjacent to, if not on mound

Podophyllum
Solomon seal
Poison ivy
Uvularia
Smilacina

Appendix E - Part 3
 Spring 2012 Inventory of vegetation in areas cut in fall 2011

HERBACEOUS PLANTS

Survey Date: June 12, 2012

Plants are counted by root origin, not by number of stems.

Latin name		Common name	Location	Location
genus	species		B-C South	B South
			Plant counts	Plant counts
Arisaema	triphyllum	Jack-in-the-pulpit	57	38
Asteraceae	unknown spp	single heart-shaped leaf	1	
Circaea	lutetiana	enchanter's nightshade	45	4
Geranium	maculatum	wild geranium		18
Geum	canadense	white avens	11	3
Hydrophyllum	virginianum	Virginia waterleaf	6	
Impatiens	pallida	yellow impatiens	5	
Lactuca	sp.	Prickly lettuce	1	
Maianthemum	racemosum	False Solomon's seal		3
Sanguinaria	canadense	bloodroot	23	
Taraxacum	officinale	dandelion	1	
Thalictrum	dioicum	early meadow-rue		2
Percent of ground with moss:			1%	
Percent of plot covered by litter or bare ground:			70%	60%

Additional notes about plots below, right:

B-C South

West 1/3 of plot has more live ground cover than the rest. East 2/3 of plot has ash at some places in soil, and cinders in some places.

This plot is fairly shady: 70-80% canopy

B South

Dead tree B-6 has fallen, leaving a small tip-up hole a few feet SE of the S tail of the mound.

It has fallen across the cut plot, obscuring some of it.

This plot is sunny in spots: 50- 70% canopy

This plot is less than half the size of B-C South.

The narrow cut corridor E to the path was not included in the survey.

WOODY PLANTS

Survey Date: June 12, 2012

Shrub/vine seedlings/sprouts				
Latin name		Common name	Location	Location
genus	species		B-C South	B South
			Plant counts	Plant counts/estimates
Cornus	rugosa	gray dogwood	3	15
Lonicera	dioica	native vine honeysuckle	2	
Parthenocissus	quinquefolia	Woodbine	38	21
Prunus	virginiana	Choke cherry	8	
Rhamnus	cathartica	Buckthorn	108	~35
	resprouts only		12	
Smilax	herbacea	carrion flower	1	
Viburnum	acerifolium	maple-leaved viburnum	58	2

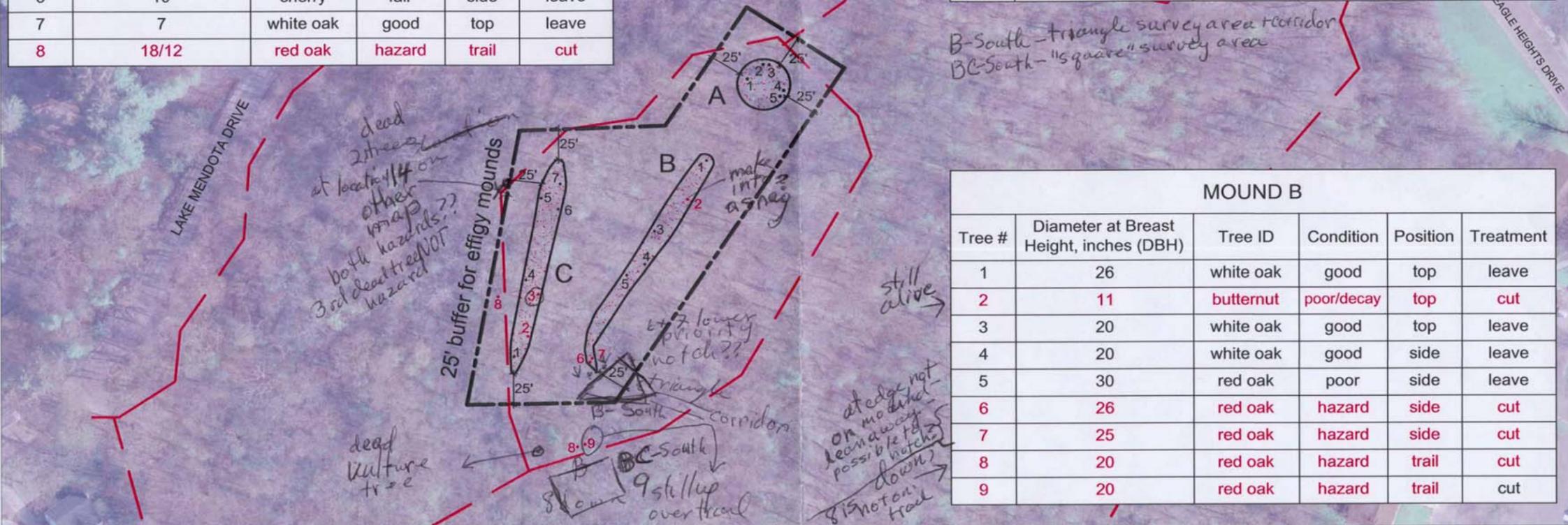
Tree seedlings

Latin name		Common name	Location	Location
genus	species		B-C South	B South
			Plant counts	Plant counts
Carya	ovata	shagbark hickory	1	
Celtis	occidentalis	hackberry	6	
Fraxinus	sp.	ash (prob. Green)	1	9
Prunus	serotina	black cherry	2	

MOUND C					
Tree #	Diameter at Breast Height, inches (DBH)	Tree ID	Condition	Position	Treatment
1	22	white oak	good	top	leave
2	19	white oak	hazard	top	cut
3	12	oak	hazard	side	cut
4	12	white pine	good	side	leave
5	8	black locust	good	side	leave
6	10	cherry	fair	side	leave
7	7	white oak	good	top	leave
8	18/12	red oak	hazard	trail	cut

MOUND A					
Tree #	Diameter at Breast Height, inches (DBH)	Tree ID	Condition	Position	Treatment
1	15/12/14	multistem green ash	fair	top	leave
2	8	black locust	fair	side	leave
3	15	black locust	fair	side	leave
4	9	hickory	good	side	leave
5	10	hickory	good	side	leave

MOUND B					
Tree #	Diameter at Breast Height, inches (DBH)	Tree ID	Condition	Position	Treatment
1	26	white oak	good	top	leave
2	11	butternut	poor/decay	top	cut
3	20	white oak	good	top	leave
4	20	white oak	good	side	leave
5	30	red oak	poor	side	leave
6	26	red oak	hazard	side	cut
7	25	red oak	hazard	side	cut
8	20	red oak	hazard	trail	cut
9	20	red oak	hazard	trail	cut



Notes
 Site boundaries established by Jenkins survey (2004)
 Mound outlines based on site visit by A. Rosebrough (2004)

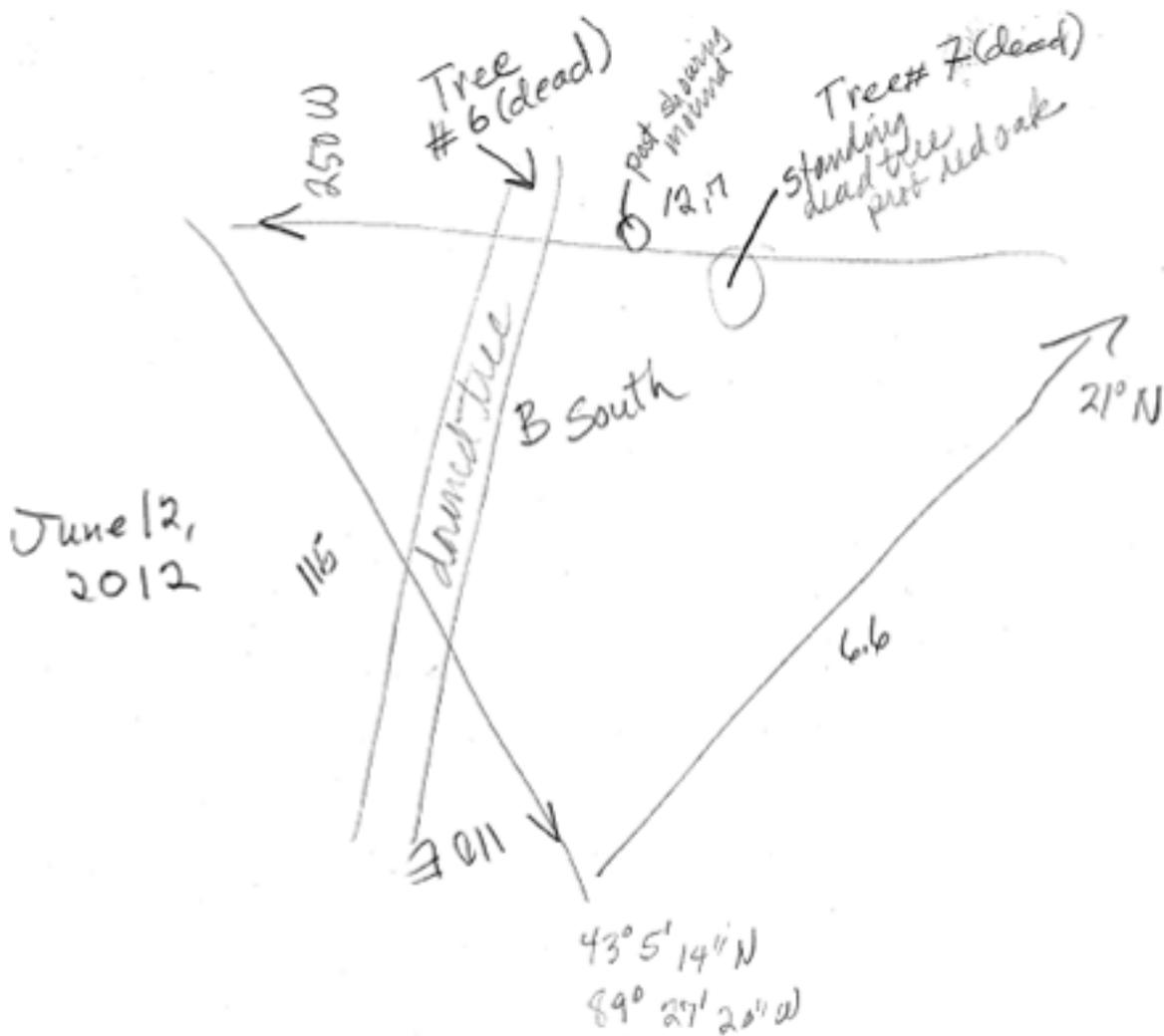
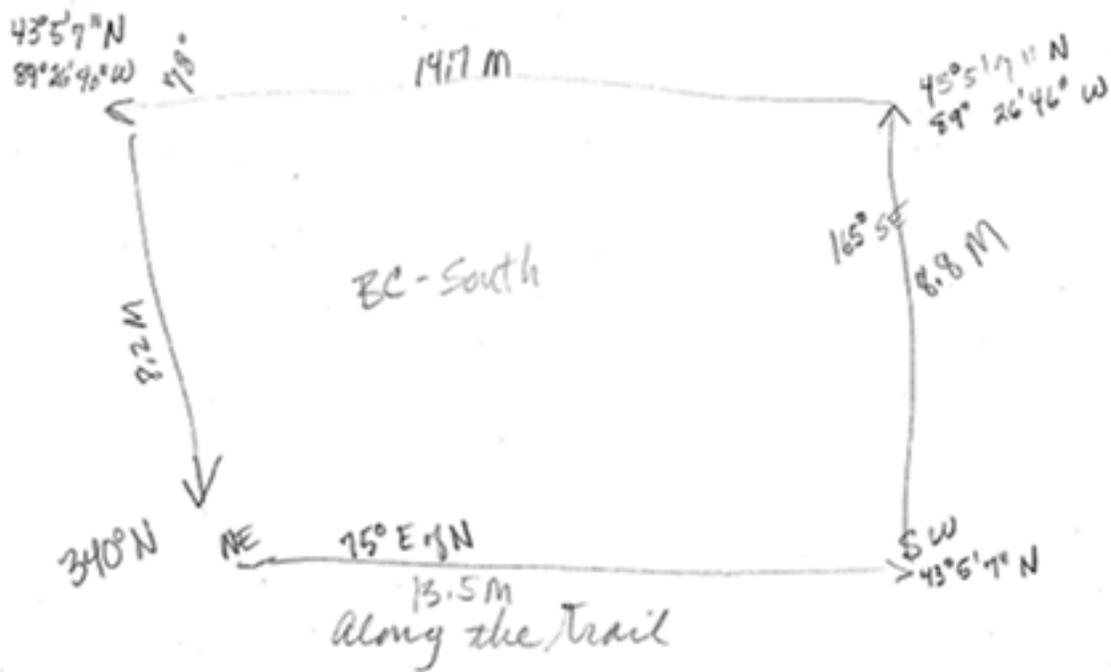
Legend

	Boundary of catalogued mound site
	Extant mound feature
	Existing unpaved path



 THE UNIVERSITY WISCONSIN MADISON	Project: Hazard Tree Removal Plan for Eagle Heights Mound Group 47 DA-130	Designed By: DFE Drawn By: RJR/JLB	Date: 10-31-2011 Scale: 1" = 80'-0"
	Drawing Title: Site Plan Building No.: N/A	O.S.M.: Revision: Date:	Sheet: <div style="font-size: 2em; font-weight: bold; text-align: center;">L-1</div>
File: L:\ACAD\PLANNING\Archaeological Sites\Native Am Mounds_sites\Eagle Heights\EH Mounds Tree Removal.dwg		610 Walnut Street 930 WARF Madison, Wisconsin 53726	
FACILITIES PLANNING AND MANAGEMENT Campus Planning & Landscape Architecture		1 of 1	

June 12, 2012



Appendix F

Planning & Implementation subcommittee recommendations for potential herbaceous seeding on the Eagle Heights Mounds.

Herbaceous plants

Latin name		Common name
genus	species	
Agrimonia	gryposepala	common agrimony
Allium	canadense?	wild onion
Anemone	quinquefolia	wood anemone
Carex	blanda	common wood sedge
Carex	pennsylvanica	Pennsylvania sedge
Carex	sf rosea	curly-styled wood sedge
Carex	sprengellii	sedge
Carex	spp.	sedge
Circaea	lutetiana	enchanter's nightshade
Dentaria	laciniata	Cutleafed toothwort
Dicentra	cucullaria	Dutchman's breeches
Dodecatheon	meadia	shooting star
Fragaria	virginiana	wild strawberry
Galium	aparine	bedstraw/cleavers
Galium	sp.	bedstraw
Geranium	maculatum	wild geranium
Geum	canadense	white avens
Hydrophyllum	virginianum	Virginia waterleaf
Maianthemum	racemosum	False Solomon`s seal
Maianthemum	stellatum	False Solomon`s seal
moss		several spp
Polygonatum	biflorum	Solomon's seal
Ranunculus	abortivus	little leaf buttercup
Ranunculus	hispidus	bristly buttercup
Sanguinaria	canadense	bloodroot
Viola	sororia	dooryard violet
Viola	sp.	purple violet

Appendix G

Hazard tree removals at Eagle Heights mound group

Prepared by D. Einstein
Historic and Cultural Resources Manager/Campus Planning and Landscape Architecture
Nov. 1, 2011 (v. 2 DRAFT)

Justification: Eight dead trees located in the Lakeshore Nature Preserve's Eagle Heights Woods pose a hazard to the integrity of the Indian burial mounds and the safety of visitors using the adjacent trail. Arborists designate "hazard trees" using the following definition: "A *tree* is considered *hazardous* if it has defects that may cause a failure resulting in property damage, personal injury or death." Ellen Agnew, certified arborist and grounds department supervisor, has determined that these trees meet this hazard definition.

The trees have been dead for several years and are decaying. Large branches have recently fallen across the mounds, and additional limbs will certainly drop in the future. It is likely that these trees may also topple and cause "tip-ups" (exposed root masses with associated pits and disturbed soil).

The "*UW-Madison Indian Burial Sites Management Policy*" (approved May 26, 2011, by the Campus Planning Committee) states that burial sites will be managed to "preserve the structural integrity of mounds." Furthermore, the university as property stewards for this site is required under the state burial sites preservation law (Wis. Stat. 157.70) to protect the mounds from disturbance—such as might occur from falling limbs and "tip-ups."

Tree locations: Five dead oaks on the mounds and three dead oaks near the adjacent walking trail have been identified as hazard trees. See attached map for specific locations.

Removal strategy: The optimal removal strategy would involve the use of a "bucket truck" in order to access and cut limbs to be lowered to the ground in a controlled descent. Constrained road access makes it impossible to bring a bucket truck to the site.

Due to the advanced decay state of the trees it would not be safe to use a tree climber to work up in the tree, to cut and lower limbs. The only safe option would be to drop the entire tree by cutting the main trunk at ground level. Dropping a large tree, with massive limbs attached, poses several challenges: the tree may "hang-up" in adjacent trees and the force of the tree hitting the ground may cause soil disturbance.

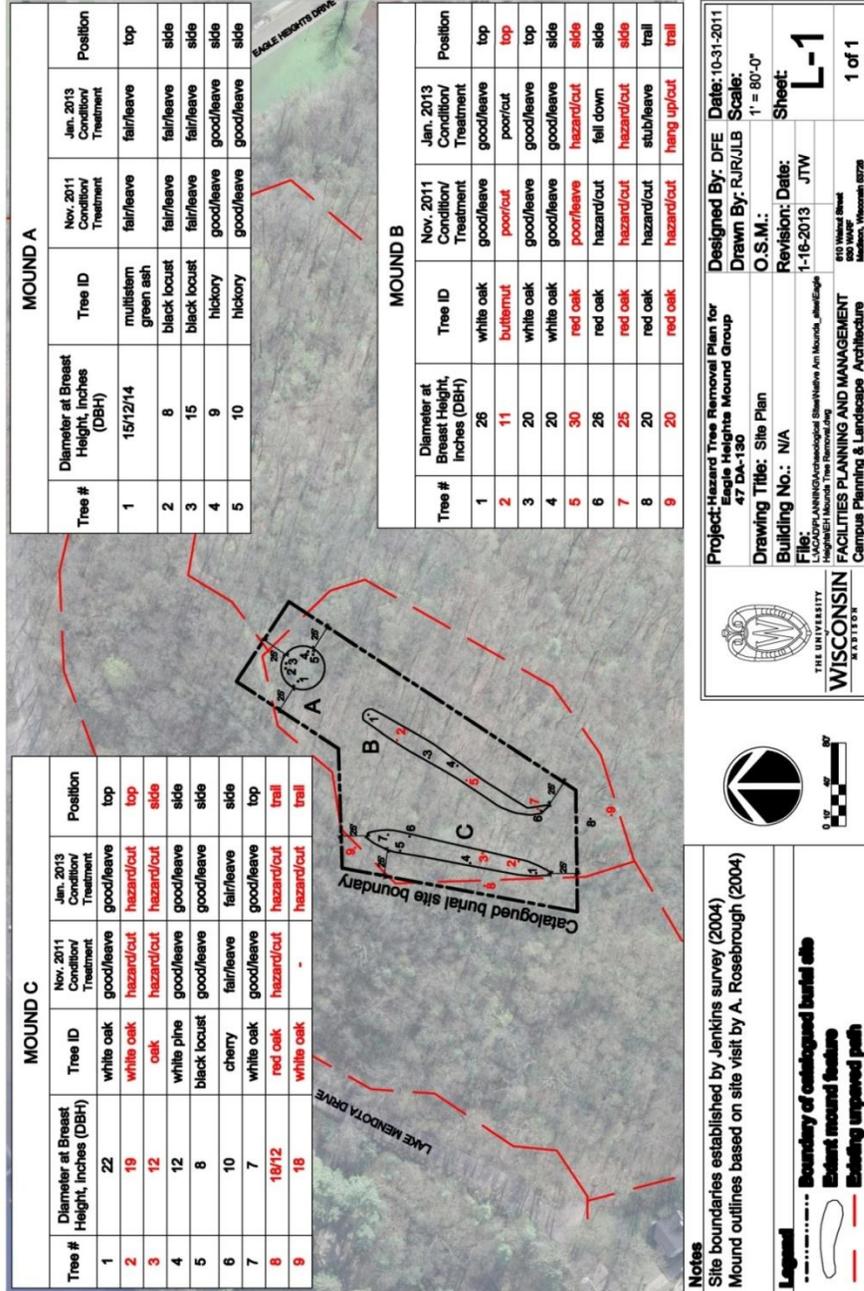
To avoid "hang-ups" the arborist may be required to remove additional trees in the fall zone. To avoid soil disturbance the trees will need to be felled ONLY under conditions where the ground is solidly frozen. It is likely that only small sized buckthorn and honeysuckle shrubs will need to be removed to safely remove the hazard trees. It is possible however, that a few additional small trees may be cut in the course of hazard tree removal. All efforts will be made to avoid removal of native trees in the drop zone.

Wood Clean-up: Trees trunks will be cut at ground level. Major limbs will be cut such that the main trunk rests on the ground. Major limbs that do not pose a safety hazard will remain attached to the main trunk. Woody material within five feet of the edge of the mound will be removed and scattered in adjacent areas.

Removal crew: Arborists from the Physical Plant grounds crew will fell the trees and buck limbs necessary to getting the main trunk to lie on the ground. Preserve staff and their contractors will be

responsible for removing small diameter shrubs/trees to establish a safe tree “drop zone.” The Historic and Cultural Landscape Resources manager will work with all parties to assure that the burial mound site is appropriately protected.

Site restoration: In order to prevent soil erosion on the mound as result of the tree removals, Preserve staff may need to re-seed the area with appropriate ground cover plants or install bio-degradable erosion control mulch or mats.



Appendix H Oak Woodland and Red Oak-Mixed Forest Descriptions

The southern oak forest/oak woodland community is widespread in southern Wisconsin. Differences between oak forest and oak woodland are primarily the density of oak trees and the resulting canopy closure but also include the type of oaks and other tree species present. Differences are the result of soil type—moisture and available nutrients, the slope of the land and its orientation to the mid-day sun (aspect), and fire history, current use as a management tool, and frequency.

Oak woodlands are fire shaped communities. This forest type has been in decline since fire suppression started at the time of settlement. Oaks make up 60-90 percent of the canopy. Indicator tree species are black, white, bur, and red oak and black cherry. The tree canopy is 30-90 percent closed. Because the tree canopy is somewhat open some of the trees have an “open-grown” form, although this form is less pronounced than an open-grown savanna tree because there isn’t enough sunlight to support fully developed lower branches. The oak trunks in an oak woodland are taller than those that grow in oak savanna and the majority of the branches are in the upper half of the tree where they receive more sunlight. The branches frequently take on a twisted, open, spreading appearance. Shrubs are common in oak woodlands however frequent fire (historically) prevented them from becoming tall or dense. Wildflowers and grasses create a dense groundlayer. Spring blooming species are less common here than in more mesic forests in favor of summer or fall blooming species. Relatives of open prairie species such as *Helianthus strumosus* (pale-leaved woodland sunflower), *Aster lateriflorus* (calico aster), *Aster shortii* (Short’s aster), *Asclepias exaltata* (poke milkweed), and *Elymus villosus* (silky wild rye) are abundant. Oak woodlands also have some species normally associated with moist prairies such as *Veronicastrum virginicum* (Culver’s root) and *Dodecatheon meadia* (shooting star) which can tolerate light shade.

Red oak-mixed forests develop where deeper more nutrient rich soils favor a mix of oaks and moist-soil tree species. Red and white oak dominate, along with red maple and shagbark hickory on drier sites and sugar maple and basswood on moister sites. This forest type expanded greatly with fire suppression after settlement which allowed red oak seedlings and saplings to reach maturity. American elm, white ash, and sugar maple also benefitted from fire suppression. However infrequent burning and grazing kept these forests from being completely dominated by sugar maple and other shade tolerant species. Occasional fire is essential in this community to allow for oak regeneration and to prevent it from becoming a sugar maple dominated community. The tree canopy is 70-100 percent closed, although there are often gaps caused by disease, wind, and tree mortality. Oak trees that develop in the shade of a forest have a form referred to as “forest-grown” in which there are few if any lower branches because there isn’t enough light to support their growth. Because young trees grow upward towards the sun, their trunks are relatively tall and slender. Southern oak forests have abundant shrubs and oak saplings in the midstory. Characteristic species in southern red oak-mixed forests include *Aster sagittifolius* (arrow-leaved aster), *Sanguinaria canadensis* (bloodroot), *Elymus hystrix* (bottlebrush grass), *Carex pensylvanica* (Pennsylvania sedge), *Thalictrum dioicum* (early meadow rue), *Cornus racemosa* (gray dogwood), *Podophyllum peltatum* (Mayapple), *Arisaema triphyllum* (jack in the pulpit), *Solidago ulmifolia* (elm-leaved

goldenrod), *Geranium maculatum* (wild geranium), *Maianthemum racemosum* (false solomon's seal), and *Viburnum rafinesquianum* (downy arrow-wood).

The division between the oak woodland and oak forest is purely arbitrary. Oak woodland will dominate well-drained sites, on south and west slopes of hills, or on thin soils on hilltops and ridges. They frequently adjoin oak savanna on the dry side and red oak forest or sugar maple-basswood forest on the protected (from fire) side with transitional areas between all.

Taken from:

The Tallgrass Restoration Handbook, Eds. Stephen Packard and Cornelia Mutel, 1997.

Wisconsin's Natural Communities, Randy Hoffman, 2002.

Vegetation of Wisconsin, John Curtis, 1959.