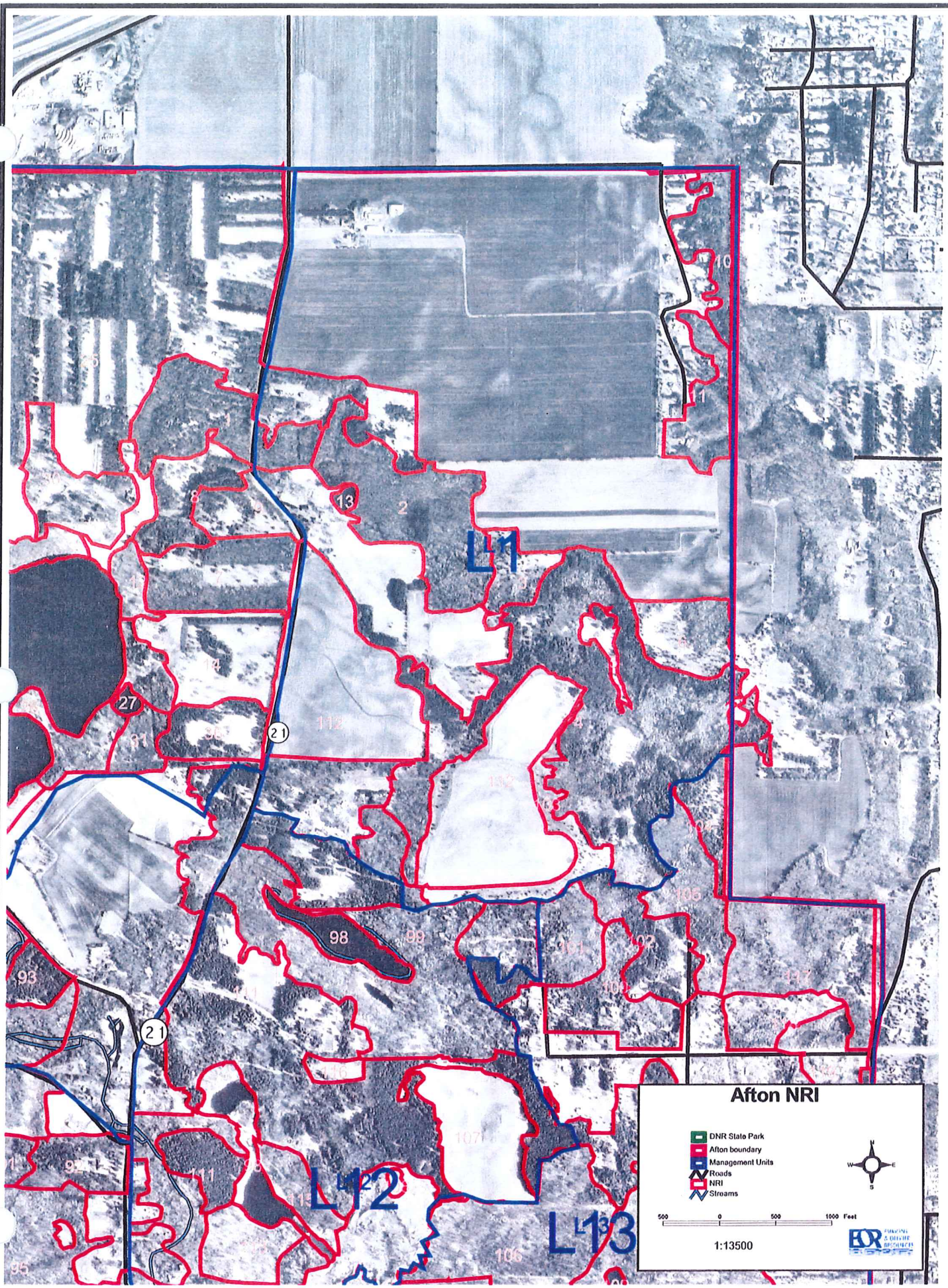
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Landscape Unit #1

Summary Table for Landscape Unit #1

Site ID	Community ID	Community Type	Quality Ranking
1	03282001	Mixed Deciduous/Coniferous Plantation	NA
2	03282002	Oak Woodland	D
13	03282003	Excavated Pond	NA
3	03282004	Old Field/Sand Gravel Prairie	NA
4	03282005	Conifer Plantation	NA
5	03282006	Sand Gravel Prairie	D
6	03282007	Sand Gravel Prairie	D
9	03282011	Old Pasture/Oak Savanna	NA
10	03282012	Conifer Plantation	NA
11	03282013	Black Locust Plantation	NA
103	10282006	Old Field	NA
112	10282016	Prairie Reclamation	NA

Landscape Unit Rankings

Ecological Ranking: This landscape unit is dominated by communities that are either human created, or of lower quality. The majority of this area encompasses old, abandoned nursery beds that today, still contain many of the woody species established as part of the original nursery. Other areas within this landscape unit include mixed coniferous/deciduous plantations, which are generally dominated by 12 to 14 inch red pine. This landscape unit includes some lower quality oak forest and woodland. Belwin Foundation has also completed several dry-mesic prairie reclamation projects. Because of the low diversity and quality of natural communities, this landscape unit is assigned an Ecological Ranking of low.

Wildlife Habitat Ranking: This Landscape Unit lacks diverse wildlife habitat. However, the establishment of prairie on the Belwin property will provide specialized habitat for wildlife species dependent on prairies. Although there are extensive areas of forest (mostly plantation), this forest is generally dominated by only a few canopy, shrub and groundcover species. The overall Wildlife Habitat Ranking is low to moderate.

Rare Features Ranking: There are no records of rare features for this Landscape Unit. The potential for rare features to occur is probably highest in the restored prairies on the Belwin property. The Rare Features Ranking is low.

Stewardship Recommendations

1. Community 03282011 contains pastured oak savanna with large, open grown bur oak. This site would provide an attractive restoration opportunity in a visible location.

2. This area is browsed heavily by deer, resulting in poor tree/shrub regeneration. The City may wish to encourage deer harvest, where public safety needs are not compromised.

3. Community 03-28-20-06 offers dry prairie restoration opportunities. Invasive woody shrubs should be cut and removed from the site. Early spring burns timed to remove cool season grasses may be used if conducted carefully to avoid overly hot fires that could kill existing prairie species and/or native seed banks.

Community Descriptions

Community 03-28-20-01

Community 03-28-20-01is an old tree nursery that has succeeded to mixed deciduous woodland. Common tree species include large, open grown bur oak, American elm, cottonwood and crab apple. Large fruiting buckthorns are quite prevalent throughout this community, along with patches of dense amur maple, eastern red cedar and pin oak. The ground layer is variable depending on tree and shrub density, but in general is characterized by old field/pasture vegetation including Kentucky blue grass, beard-tongue, bedstraw, and common ragweed.

Community 03-28-20-02

Community 03-28-20-02 is oak woodland. The canopy is dominated by large bur and red oaks and the subcanopy is composed predominantly of American elm and amur maple. The bur oak in this community average approximately 20 inches in diameter and are estimated to be about 146 years in age. The shrub layer is dominated by large fruiting buckthorn, prickly gooseberry, common elder, black cherry and boxelder. The ground layer includes woody vine species such as wild grape and Virginia creeper. Herbaceous groundcover species include enchanter's nightshade, sweet cicely, white snakeroot, wood nettle, yellow avens and hog peanut.

Disturbance Indicators: Based on the number of old cattle trails and degree of soil compaction, this community was probably grazed extensively in the past. Today, high numbers of deer continue to use this area resulting in heavy browsing and poor regeneration of native trees and shrubs. This condition is exacerbated by buckthorn invasion, which, unlike many native species, is capable of establishment on heavily compacted sites subject to grazing pressures. This community is assigned a quality ranking of D.

Community 03-28-20-03

Community 03-28-20-3 is an excavated farm pond. Old agricultural fields surround this pond on one side, with bur oak and pine forest on the other sides. The pond itself is covered with duckweed, with wild millet, rice cut grass and reed canary grass dominating the fringe area. Forb diversity and density is generally low, with Aster sp., wild mint, evening nightshade, blue vervain, water smartweed, wood nettle and beggar-ticks common species. Although this wetland is essentially an excavated pond, it provides important wetland habitat in an area otherwise devoid of wetlands. A Cope's gray tree frog was noted during the survey.

Community 03-28-20-04

Community 03-28-20-4 is an old field with sand prairie pockets on south-facing slopes. Scattered buckthorn, red cedar, smooth sumac, amur maple, and young red pine occur in patchy thickets. Open patches contain a diversity of species including Indian grass, little bluestem, bee balm, gray goldenrod, beard-tongue, brown-eyed Susan, blazing star, and goats beard. Kentucky blue grass and other invasive species such as smooth brome, and flowering spurge dominate the ground layer of this community. One interesting aspect of this community is an abundance of ant mounds on sandy exposed patches. These ant mounds are important to the ecology of sand-gravel prairies. The mounds provide microhabitat for some plant species and are important over wintering sites for snakes such as bull snakes, which burrow into these mounds during winter hibernation.

Disturbance Indicators: This area contains many small pockets of low quality prairie with good restoration potential. The presence of invasive trees and shrubs; however, would require manual or mechanical removal and possibly, prescribed burns or herbicide treatment.

Community 03-28-20-05
Community 03-28-20-05 is a pine plantation dominated by 30 to 40 year old red and white pine, with average diameters of 8 to 10 inches. Within the southern portion of this plantation, red pine is larger and older, around 14 inches in diameter and approximately 65 years old. Most of the pine appears to have been planted to control soil erosion on slopes adjacent to agricultural fields. In recent years, portions of this plantation have been selectively thinned; however the overall density of trees is still fairly high (fully stocked). Throughout this plantation, there are numerous small openings and patches of oak woodland. Prairie grasses and forbs are present, although in generally low numbers within many of these openings. The oak woodland patches are generally characterized by pin oak and trembling aspen along with an assortment of "escapees, such as amur maple, Siberian elm and crabapple from nearby, abandoned tree nurseries. The ground layer under the pine is generally very sparse, consisting mostly of dense needle duff. Within the occasional openings, introduced grasses such as smooth brome are generally dominant.

Disturbance Indicators: Nonnative trees, shrubs, and groundcover species generally dominate this plantation. In particular, species such as spotted knapweed, pose major management challenges should this area be restored to native prairie and oak savanna. No qualitative ranking is assigned to this area.

Community 03-28-20-06
Community 03-28-20-6 is a low quality sand gravel prairie that grades into an old field to the south. Scattered red pine seedlings and prickly ash occur throughout the community. On the southwest-facing slopes, a low diversity of native prairie species occurs. Native species include Indian grass, little bluestem, bee balm, pale coneflower, beard-tongue, gray goldenrod and gray-headed coneflower. In many places, nonnative and/or invasive species such as Kentucky bluegrass, yarrow, spotted knapweed, and flowering spurge are dominant.

Disturbance Indicators: Cool-season grasses and weedy forbs dominate most of this community. Some encroachment of woody species such as prickly ash is also occurring. With effective control of invasive species, this site provides excellent restoration opportunities.

Community 03-28-20-07
Community 03-28-20-07 is a sand gravel prairie restoration. This area appears to have been cleared of invasive trees and shrubs, burned and then seeded to grasses and forbs. Many native prairie species were noted in this community. Dominant graminoids include little bluestem, three-awn grass, Indian grass and big bluestem. Forbs noted include whorled milkweed, gray goldenrod, bee balm, goatsbeard, pale coneflower, St. John's-wort, thimbleweed, and gray-headed coneflower. Although shrubs and trees were removed several years ago, these species are regenerating vigorously in some areas. Common shrub/tree species include prickly ash, smooth sumac, poison ivy, and amur maple. Invasive grasses and forbs include reed canary grass, and Canada thistle. While surveying this community, turkey vultures and rough-legged hawks were noted circling above.

Disturbance Indicators: This community is currently undergoing a prairie restoration. The quality ranking is D.

Community 03-28-20-11
Community 03-28-20-11 is an old pasture with scattered, large diameter bur oak trees and occasional patches of amur maple and other species associated with the adjacent tree nursery. Nonnative, cool season grasses such as smooth brome dominate the groundcover in this

community. The most significant feature of this area is the numerous, large diameter, open grown bur oak trees. Although no bur oak trees were cored, they are probably in the range of 200 years of age. This area would be an excellent candidate for an oak savanna restoration.

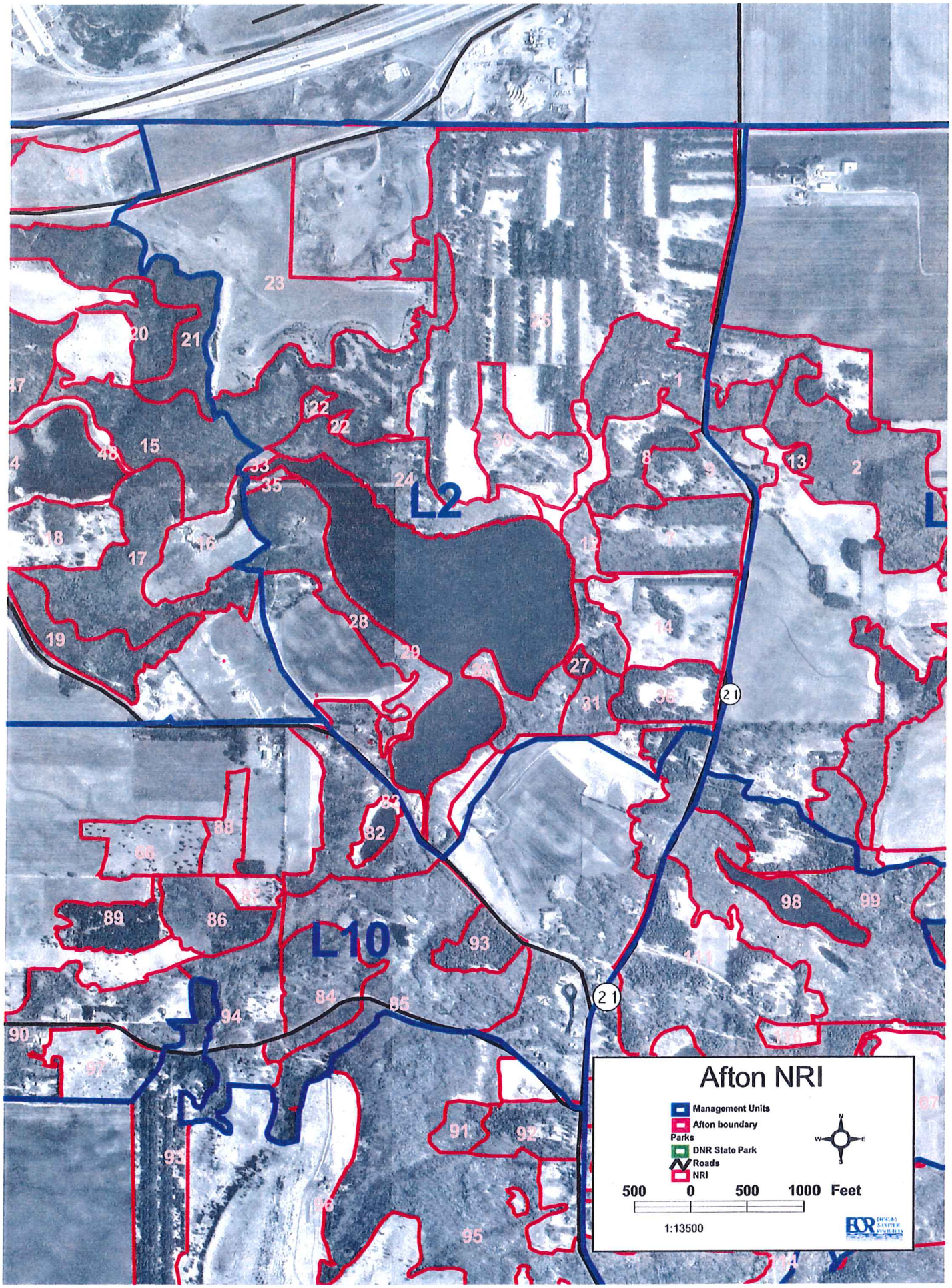
Community 03-28-20-12
Community 03-28-20-12 is a 50-year-old red pine plantation, with trees averaging 10 to 12 inches in diameter. The canopy also contains scattered American elm and eastern red cedar. Red-berried elder dominates the patchy shrub layer, with buckthorn, prickly ash, and prickly gooseberry, and wild grape also present. The ground layer is mostly bare, but does contain white snakeroot, clearweed, and wood nettle. This plantation appears to have been established to stabilize steep, erodible slopes.

Community 03-28-20-13
Community 03-28-20-13 is a black locust plantation with edges composed of mixed deciduous forest. Black locust dominates the upper canopy, with American elm, green ash, hackberry scattered throughout. Red cedar, red oak, and younger black locust compose the subcanopy, with buckthorn, amur maple, and wild grape composing the shrub layer. The groundlayer is quite bare, since upper canopy and shrub layers shade it out, but contains native species such as blue cohosh, white snakeroot, and enchanter's nightshade.

Community 10-28-20-06
Community 10-28-20-06 is an old field with conifer plantings. Nonnative grass and smooth brome dominate the ground layer, accompanied by prairie dropseed, timothy, and Indian grass. Other herbaceous species include spotted knapweed, white clover, heath aster, Canada goldenrod, rabbit's foot clover, stiff and gray golden rod, bush-headed prairie clover, and gray-headed coneflower. Scattered black locust, red cedar, and bur oak occur in the overstory among scattered planted red pines. The patchy shrub layer includes amur maple, red pine, red cedar, black locust, and buckthorn.

This community, although dominated by non-native and/or invasive species, also contains a fairly diverse herbaceous layer. An open area managed for prairie restoration surrounds it on one side, so this community will continue to contain planted prairie species.

Community 10-28-20-16
This community is a Belwin prairie restoration.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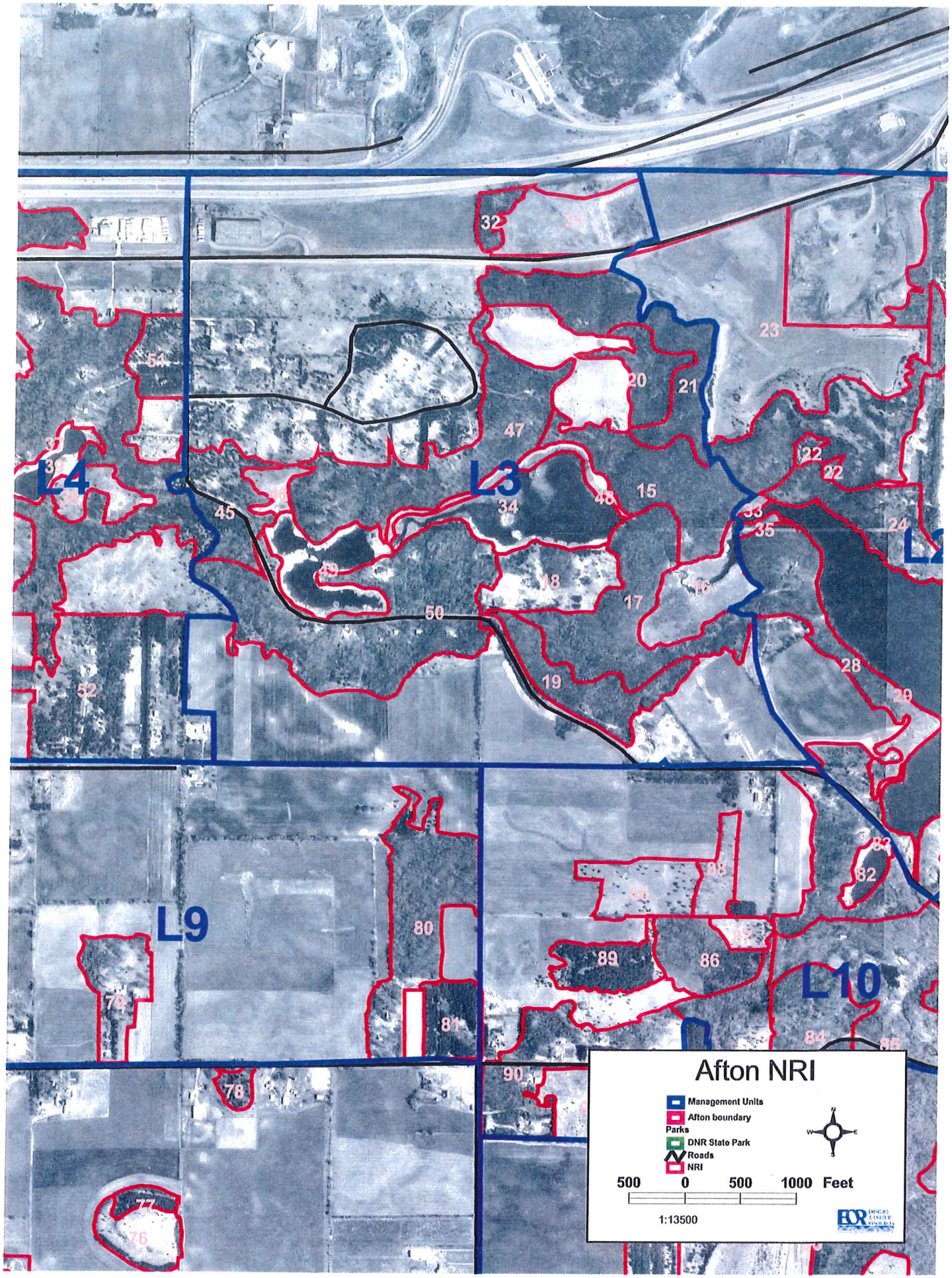

Afton NRI
Management Units
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Landscape Unit #2

Summary Table for Landscape Unit #2

Site ID	Community ID	Community Type	Quality Ranking
1	03282001	Tree Nursery/Deciduous Woodland	NA
14	03282008	Hay Field/Plantation	NA
7	03282009	Mixed Deciduous Forest	NA
8	03282010	Conifer Plantation	NA
9	03282011	Old Pasture	NA
12	03282014	Mixed Deciduous Forest	NA
15	04282001	Mesic Oak Forest	C
21	04282007	Oak Woodland/Savanna	D
22	04282008	Dry Prairie (sand gravel subtype)	C
23	04282009	Old Field	NA
24	04282010	Oak Woodland	D
25	04282011	Conifer Plantation	NA
26	04282012	Oak Woodland	D
27	04282013	Shallow Open Water Marsh	D
28	04282014	Oak Savanna	C
29	04282015	Lake Edith (shoreline fringe)	B
30	04282016	Pastured Oak Savanna	NA
31	04282017	Old Field	NA
33	04282019	Rich Fen	C

Landscape Unit Rankings

Ecological Ranking: This landscape unit contains several areas with moderate to good quality natural communities: most notably, the shoreline fringe of Lake Edith; two small, dry prairies north of Lake Edith, and an oak savanna on the east side of Lake Edith. The Ecological Ranking assigned to this landscape unit is moderate to high.

Wildlife Habitat Ranking: The interspersion of in lake, riparian and upland forest and prairie provides diverse habitat for a variety of wildlife. Lake Edith is also one of the few lakes locally, and therefore provides a habitat component for species such as waterfowl that may require larger water bodies, especially during spring and fall migrations. During our survey, considerable use of this area by fur bearing mammals, raptors, turtles, shorebirds and waterfowl was noted. This landscape unit is given a high Wildlife Habitat Ranking.

Rare Features Ranking: The oak woodland and prairies to the north of Lake Edith are mapped by the DNR County Biological Survey as part of Site #71. Although no records exist for rare plants and animals, several species of rare plants associated with dry prairie/oak savanna potentially could exist north of Lake Edith. The prairies also appear to serve as nesting sites for Blanding's Turtles (*Emydoidea blandingii*), a State Threatened Species. Other rare species potentially present include eastern hognose snake (*Heterodon platyrhinos*), blue racer (*Coluber constrictor*), both State Special Concern Species. The Rare Features Ranking for this landscape unit is high.

Stewardship Recommendations

1. The dry prairies and surrounding oak woodland/savanna (communities 04282008 and 04282007) offer an excellent restoration opportunity; however, these communities have significant encroachment of woody shrubs and trees. In addition, spotted knapweed, an invasive weed species along with introduced, cool season grasses such as Kentucky bluegrass are present on the prairies. Hand or mechanical removal of woody species and herbicide treatment of spotted knapweed will be necessary to restore this area. Once woody vegetation has been cut, spring or fall prescribed burns should be conducted. Discussions with staff of Belwin indicate that this area (now owned by Belwin) is slated for restoration.

2. The dry prairies appear to be used as nesting sites for Blanding's Turtles. Restoration work should be avoided on and near these prairies from May to early June to avoid disruption of nesting activities. It is also recommended that restoration activities be limited to only one of the two knobs containing prairie in any one year to avoid displacing species dependent on this habitat.

3. Community 04282014 provides an excellent opportunity for oak savanna restoration. Portions of this community may require some removal of woody species, while other portions may only require controlled burns.

4. Many of the wetland communities along the shores of Lake Edith are groundwater-dependent fens and seeps and are very sensitive to storm water impacts. Storm water management standards should limit discharges of storm water to minimize or avoid increases in either bounce or nutrient loading. Storm water management standards should provide for phosphorus removal and no change in magnitude or duration of bounce.

5. For existing residential development on Lake Edith, encourage landowners to maintain vegetated buffers along the shoreline.

6. For new development, require setbacks from the shore and bluff line in accordance with shore land zoning standards and encourage conservation easements and other measures to minimize disturbance to riparian vegetation. Removal of emergent and submerged aquatic vegetation should also be discouraged, as should removal of woody snags and trees leaning into the water. All of these contribute to wildlife habitat, protect against shoreline erosion and in the case of aquatic vegetation, contribute to improved water quality.

Community Description

Community 03-28-20-01

Community 03-28-20-01 is an old tree nursery that has succeeded to mixed deciduous woodland. Common tree species include large, open grown bur oak, American elm, cottonwood and crab-apple. Large fruiting buckthorns are quite prevalent throughout this community, along with patches of dense amur maple, eastern red cedar and pin oak. The ground layer is variable depending on tree and shrub density, but in general is characterized by old field/pasture vegetation including Kentucky blue grass, beard-tongue, bedstraw, and common ragweed.

Community 03-28-20-08
Community 03-28-20-08 is a hay field with an old pine plantation in the center. The 45-50 year old pine plantation includes Scotch, red, and Austrian pines with an average 15-inch diameter, and some scattered black locust. Ground species include St. John's-wort, common milkweed, and goats beard. Smooth brome, red clover, flowering spurge, Canada goldenrod and other invasive species dominate the ground layer. This community appears to have once been tree and shrub nursery beds, but has since been seeded to hayfield grasses and forbs.

Community 03-28-20-9
Community 03-28-20-9 is a mixed deciduous forest, approximately 50 years old. Cottonwood, silver maple, red oak, black cherry, black willow, black ash, basswood, quaking aspen, big-toothed aspen, and green ash dominate the canopy. The shrub layer is composed of buckthorn, amur maple, crab-apple, prickly gooseberry, and blackberry. Most of this community lacks groundcover, except for some patches of creeping Charlie, bedstraw, and wild grape. There are some open areas throughout the community that contain smooth brome, orchard grass, and clumps of big bluestem and Indian grass. The south boundary of this community, which is defined by the gravel access road into the old plantation from Stagecoach Trail, is bordered by rows of planted Norway spruce and Scotch pine.

Community 03-28-20-10
Community 03-28-20-10 is a conifer plantation/hayfield. Conifers in this plantation are predominantly Austrian pine.

Community 03-28-20-11
Community 03-28-20-11 is an old pasture with scattered, large diameter bur oak trees and occasional patches of amur maple and other species associated with the adjacent tree nursery. Nonnative, cool season grasses such as smooth brome dominate the groundcover in this community. The most significant feature of this area is the numerous, large diameter, open grown bur oak trees. Although no bur oak trees were cored, they are probably in the range of 200 years of age. This area would be an excellent candidate for an oak savanna restoration.

Community 03-28-20-14
This community is a mixed deciduous forest dominated by amur maple, eastern red cedar and buckthorn. This area is generally quite disturbed and contains virtually no native vegetation.

Community 04-28-20-01
Community 04-28-20-01 is a moderate quality mesic oak forest dominated by bur, red, and pin oak averaging from 12 to 20 inches in diameter. The canopy also contains smaller diameter basswood, green ash, and quaking aspen. The subcanopy and shrub layer are dominated by buckthorn, basswood, quaking aspen, green ash, black cherry, prickly ash, gray dogwood, black berry, prickly gooseberry, Tartarian honeysuckle, and Virginian creeper. Although the shrub layer is fairly diverse, buckthorn is generally dominant. The groundlayer is rich in species typical of mesic oak forests such as jack in the pulpit, red baneberry, golden ragwort, sweet cicely, false Solomon's seal, hog peanut, and wood sorrel.

A unique feature of this community is a small stream draining between wetland communities 05-28-20-14 and 04-28-20-02. This small stream is approximately ten feet in width and six inches deep. The stream has a moderate gradient and flows over a gravel/cobble substrate. Although the stream appears to have been excavated as an overflow for Lake Edith, it provides some excellent quality habitat for wildlife species associated with small woodland streams. This stream also

appears to be adequate for fish migration during higher water conditions and may make additional spawning habitat available for such species as northern pike.

Disturbance Indicators: Community 04-28-20-01 shows evidence of past grazing based on the presence of several barbed wire fences and an open grown canopy structure, which has in the absence of logging now grown in. The dominance of the shrub layer by thorny species is also suggestive of past logging. Today, the main threat to this community is buckthorn, which occupies, and often dominates, the groundcover, shrub and subcanopy layers. In spite of the buckthorn, this community contains a fair diversity of species and includes many large oak trees. This community is assigned a qualitative ranking of C.

Community 04-28-20-07

This community is located to the north of Lake Edith and is mapped as part of MNDNR MCBS site #71. Community 04-28-20-07 is a degraded oak woodland/savanna with numerous small prairie openings. The two largest prairie openings are mapped and described separately in this report as community 04-28-20-08. This community occurs in a steeply dissected landscape with numerous, eroded draws and steep hill slopes. Many of these eroded slopes have patches of exposed sand/gravel, with sparse vegetative cover. The entire community appears to have once been pastured based on the numerous fences and dominance of armed shrubs such as prickly ash and buckthorn. Some areas also appear to have been historically mined for gravel. The majority of community 04-28-20-07 is characterized by widely scattered bur and pin oak on hilltops with dense thickets of eastern red cedar, smooth sumac and prickly ash along hillsides and within ravines. Groundcover species include wild strawberry, bee balm, sweet cicely, white snakeroot, yellow avens, and pointed-leaved tick-trefoil Occasional small openings persist with dry prairie species present; however, most of the prairie species in these openings have been replaced by smooth brome and Kentucky bluegrass.

Disturbance Indicators: This community appears to have been heavily grazed in the past since it is dominated by thorny shrubs and exhibits low ground cover diversity. Invasive species noted include buckthorn, Tartarian honeysuckle, amur maple and eastern red cedar. This oak woodland is given a ranking of D.

Community 04-28-20-08

Community 04-28-20-08 includes two small, moderate quality sand-gravel prairies. These prairies are located on a steep, south facing bluff overlooking Lake Edith. These prairies along with portions of community 04-28-20-07 are mapped as MCBS site #71. At the time of MCBS survey (1987) it is likely that these prairies and numerous small openings extended over a much larger area than today. Today, these two prairies are the only significant remnants of this oak woodland/prairie complex.

The bluff, although not as high as many of the bluffs within the City, is one of the most scenic overlooks in the City with panoramic views of Lake Edith and the large wetland complex to the west. Dominant prairie grasses and forbs include little bluestem, prairie dropseed, plains muhly, hairy grama, switchgrass, side oats grama, big bluestem, gray goldenrod, silvery cinquefoil, whorled milkweed and heath aster. Located on a southwestern facing exposure, it contains scattered tree cover of red cedar, bur oak, and pin oak. Invasive species such as prickly ash, smooth sumac, Tartarian honeysuckle, and buckthorn compose the patchy shrub layer. During both the 1987 MCBS survey and our survey, numerous turtle nests were observed on these prairies. It is very possible that these prairies provide nesting sites for Blanding's Turtles, a State Threatened Species.

Disturbance Indicators: There is a significant presence of invasive species including Kentucky bluegrass, spotted knapweed and butter-and-eggs. In addition, woody species such as eastern red cedar, Tartarian honeysuckle, buckthorn and smooth sumac have encroached substantially on these prairies. During the MCBS survey of these prairies in 1987, many of the same disturbance indicators were noted; however, today they appear to be much more pronounced. These prairies were assigned a quality ranking of C during the 1987 MCBS survey. This ranking is still appropriate, although it probably applies to a much smaller area due to woody encroachment.

Community 04-28-20-09
Community 04-28-20-09 is an old field/active gravel pit that has been reclaimed and seeded to the commonly used MNDOT legume, bird's foot trefoil as well as smooth brome. Towards the south end of this area, there is a 50% covering of red, white and jack pine, with DBH generally less than 6 inches.

Community 04-28-20-10
Community 04-28-20-10 is oak woodland bordering the north side of Lake Edith. This community is characterized by scattered, open grown bur oak, averaging 10 to 16 inches in diameter. Clones of quaking aspen are scattered throughout, as well as planted red, white, and Jack pine in openings. Buckthorn, prickly ash, and Tartarian honeysuckle dominate the shrub layer, with a very sparse groundcover black snakeroot and wild ginger. The area adjacent to Lake Edith is often steeply south-facing.

Disturbance Indicators: This community is located west of open fields, residential area, and pine plantings. There is evidence of logging and grazing throughout the stand, which has created an opportunity for invasive shrub species to dominate the understory layers. Therefore this community has been given a ranking of D quality.

Community 04-28-20-11
Community 04-28-20-11 is an abandoned plantation characterized by north-south running windrows of 10-16 inch red, scotch and Austrian pine along with scattered groves of eastern white cedar. In addition to these trees, numerous other woody horticultural species occur scattered throughout this area. Some of the more common hardwood species include amur maple, buckthorn and occasionally, large diameter bur oaks, remnants of the oak savanna and woodland that once occupied this site. In recent years, commercial thinning of the conifers has occurred, although these plantings still retain a good density. In areas located between the conifer wind breaks, which presumably is where nursery beds were once located, the ground cover is dominated by common grasses and forbs planted for hay crops. Some of the more common species include red clover, orchard grass, Kentucky blue grass, smooth brome and the invasive species, spotted knapweed.

Community 04-28-20-12
Community 04-28-20-12 is oak woodland with a discontinuous canopy dominated by red and pin oak. This community lies between the old nursery to the east and Lake Edith to the northwest. Within the subcanopy, smaller oak species along with quaking aspen, white poplar, and black cherry are dominant. The shrub layer is generally quite tall and dense, and dominated by buckthorn. Amur maple, prickly ash, and Tartarian honeysuckle also occur in the shrub layer. The ground layer is very sparse, with only white snakeroot present at the time of survey.

Disturbance Indicators: Other than oak species and a small number of other native trees and shrubs, this community is dominated by nonnative, invasive species including buckthorn, amur

maple, white poplar and Tartarian honeysuckle. This oak woodland is therefore assigned a quality ranking of D.

Community 04-28-20-13
Community 04-28-20-13 is a shallow, open water wetland separated from Lake Edith by a narrow (10-20 foot) strip of land. Near the middle of this strip of land is a small channel connecting this wetland to Lake Edith. This pond was likely an emergent marsh wetland at one time and was excavated out (for horticultural peat). Today, the pond is a shallow, open water wetland with floating leaf vegetation including yellow pond lily and duckweed. The edges of the pond are dominated by white poplar, buckthorn, reed canary grass, beggar-ticks and jewel weed. Although the wetland itself is not of high quality, it has good wildlife value, as evidenced by sightings of wood ducks, red-wing blackbirds, kingfishers, and turtles.

Disturbance Indicators: Although not verified, this wetland appears to be an excavated pond. There is very low species diversity both within the pond and within the shoreline fringe; therefore this community is given a D ranking.

Community 04-28-20-14
Community 04-28-20-14 is oak savanna/oak woodland. Large bur oaks (average 20 inch diameter) dominate the upper canopy. There are also planted or volunteer silver maple, crab-apple and green ash scattered throughout the community. The shrub layer consists of red cedar, buckthorn, Tartarian honeysuckle, black cherry, amur maple, American hazelnut, poison ivy, prickly ash, and Virginia creeper vine. Along several south-southwest facing slopes, there are open patches of prairie dominated by prairie grasses such as big bluestem, Indian grass, side oats grama and little bluestem. Common forbs noted include bee balm, leadplant, purple prairie-clover, beard-tongue, whorled milkweed, wood sorrel, sky blue aster, and dogbane. Within lower quality portions of this community, pasture grasses and forbs including smooth brome, orchard grass, and red clover are dominant in the ground cover.

Disturbance Indicators: This community is an abandoned pasture that has retained an oak savanna-like structure due to the effects of grazing and other activities that have minimized invasion by woody species. As a general rule, prairie species only dominate the most southerly facing slopes where conditions are dry enough to favor prairie species better adapted to the hot, dry growing conditions present on these sites. Elsewhere, pasture grasses and forbs dominate. Portions of this site might have a C quality; however, overall, this community is assigned a D ranking for quality. This is an excellent restoration site.

Community 04-28-20-15
Community 04-28-20-15 includes the open water portions of Lake Edith. The description presented here includes information provided by DNR Fisheries surveys for Lake Edith and onshore observations during our survey.

Lake Edith is a mesotrophic lake with low fertility and a maximum depth of 38 feet. The undisturbed shoreline areas contain both submerged vascular plant communities and floating-leaf vascular plant communities. In addition, there are scattered shoreline areas with emergent plant communities comprised of sedges, needle rush, arrowhead, hard stem bulrush, narrow leaf cattail, and blue flag. The submerged and floating leaf plant communities include northern milfoil, large leaf pondweed, contrail, narrow leaf pondweed, yellow water lily, flat stem pondweed, sago pondweed, bushy pondweed and wild celery. According to DNR Fisheries Surveys, bluegill abundance and size are good. Northern pike attaining large sizes are present. Black crappie is

fairly abundant, but tend to be small. Other major fish species include largemouth bass, yellow bullhead, yellow perch and carp.

Disturbance Indicators and Other Notes: The primary impacts to Lake Edith are lakeshore development and fragmentation of riparian habitat. Invasive species including narrow leaf cattail and reed canary grass dominate some shoreline fringe areas. There were no observable impacts from storm water during our survey. Undisturbed shoreline areas of Lake Edith are generally of high quality and are given a B quality ranking.

Community 04-28-20-16

Community 04-28-20-16 is a pastured oak savanna. Large diameter (greater than 20 inch DBH), open grown bur and pin oaks are scattered throughout, both as individual trees and in small clumps. Within the small clumps of oak trees, other tree species are present including trembling aspen and boxelder. Where a shrub layer is present, buckthorn is the dominant species. Open areas are a mixture of pasture species and prairie grasses and forbs. Prairie species present include big bluestem, little blue stem and side oats grama. Pasture species include Kentucky bluegrass, smooth brome, orchard grass, red clover, common plantain, goatsbeard, and common mullein. This area provides good habitat for wildlife, as evidenced by sightings of red-tail hawks, crows and wild turkeys.

Community 04-28-20-17

This area is an old field dominated by nonnative grasses and forbs

Community 04-28-20-19

Community 04-28-20-19 is a high quality rich fen that borders the northwestern shore of Lake Edith. This fen extends up to near the base of the sand-gravel prairies described as community 8. The upslope side of this fen consists of numerous groundwater seeps with vegetation dominated by black willow, sandbar willow, nannyberry, and gray dogwood shrubs. This transition area also contains some scattered eastern red cedar and buckthorn. Downslope of the shrubs, the fen is dominated by a rich diversity of grasses and forbs. Grass and sedge species include lake sedge, tussock sedge, bottle-brush sedge, Carex stipata, cattail, rice cut grass and soft-stem bulrush. Common forbs include beggar-ticks, common arrowhead, boneset, cardinal flower, jewel weed, bugle weed, swamp milkweed, duckweed, hoary vervain, and water dock. Although this fen is mapped as a small portion of Lake Edith shoreline, there are numerous pockets of rich fen scattered along other portions of Lake Edith shoreline. As with other wetland areas associated with Lake Edith, there is a strong groundwater influence at work, suggesting that lake Edith receives a significant portion of its water via groundwater discharge.

Disturbance Indicators: The primary disturbances include invasion by reed canary grass, cattail, buckthorn and eastern red cedar along the upslope edge of the fen boundary. This fen community is assigned a quality ranking of C due to the presence of invasive species and woody encroachment. There is; however, excellent diversity within this area.

Landscape Unit #3

Summary Table for Landscape Unit #3

Site ID	Community ID	Community Type	Quality Ranking
15	04282001	Mesic Oak Forest	C
16	04282002	Shrub Swamp/Rich Fen	B
17	04282003	Dry Oak Forest	D
18	04282004	Old Field	NA
19	04282005	Mesic Oak Forest	C
20	04282006	Lowland Hardwood Forest	D
21	04282007	Oak Woodland/Savanna	D
31	04282017	Old Field	NA
32	04282018	Oak Woodland	D
34	04282020	Open Marsh	C
45	05282009	Mixed Coniferous/Deciduous Woodland	NA
46	05282010	Old Field/Brushland	NA
47	05282011	Oak Woodland	D
48	05282012	Rich Fen/Emergent Marsh	BC
49	05282014	Deep Open Water Marsh	D
50	05282015	Mesic Oak Forest	CD

Landscape Unit Rankings

Ecological Ranking: This landscape unit includes several wetland communities of moderate to high quality along with two areas of moderate quality mesic oak forest. An ecological ranking of high is assigned to this landscape unit.

Wildlife Habitat Ranking: The wetland communities and adjacent oak forest and woodland provide excellent wildlife habitat; particularly for species associated with wetlands within forested areas. Examples include some amphibians, which require wetlands for reproduction, yet spend most of their life-cycle within forested areas. A moderate gradient reach of rocky stream flows between the wetland communities in this area and Lake Edith, providing a riparian corridor connection between Lake Edith and wetland complexes to the West. This landscape unit is given a high wildlife habitat ranking.

Rare Features Ranking:
Landscape unit #3 includes a shrub swamp/rich fen complex (community 04282002) and mesic oak forest (community 04282001) that are mapped on the *Natural Communities and Rare Features Map for Washington County,* MN DNR, 1990. The wetland complex, ranks as one of the highest quality wetlands in the City of Afton. Although no records exist, this wetland complex likely provides habitat for the Blanding's turtle. Blanding's turtles likely utilize the wetland as well as adjoining upland woodlands and prairies and may also utilize the small stream to move to other wetland areas to the west. This landscape unit is assigned a high rare features ranking.

Stewardship Recommendations

1. This landscape unit contains some areas of interior forest and woodland that has not been fragmented by roads, residential development and associated infrastructure. Where feasible, maintain the interior areas by routing roads and other disturbances around these areas.

2. Maintain buffers of native vegetation around all wetlands, particularly the high quality shrub swamp/rich fen complex west of Lake Edith.

3. Avoid storm water impacts to the high quality shrub swamp/rich fen complex. (e.g., avoid increases in bounce and nutrient loading)

4. Buckthorn is generally found throughout the oak woodland and forest areas of this landscape unit. Where better quality pockets of oak forest are present (community 04282001), encourage landowners to control buckthorn through cutting, pulling and herbicide application.

Community Descriptions

Community 04-28-20-01

Community 04-28-20-01 is a moderate quality mesic oak forest dominated by bur, red, and pin oak averaging from 12 to 20 inches in diameter. The canopy also contains smaller diameter basswood, green ash, and quaking aspen. The subcanopy and shrub layer are dominated by buckthorn, basswood, quaking aspen, green ash, black cherry, prickly ash, gray dogwood, black berry, prickly gooseberry, Tartarian honeysuckle, and Virginian creeper. Although the shrub layer is fairly diverse, buckthorn is generally dominant. The groundlayer is rich in species typical of mesic oak forests such as jack in the pulpit, red baneberry, golden ragwort, sweet cicely, false Solomon's seal, hog peanut, and wood sorrel.

A unique feature of this community is a small stream draining between wetland communities 05-28-20-14 and 04-28-20-02. This small stream is approximately ten feet in width and six inches deep. The stream has a moderate gradient and flows over a gravel/cobble substrate.

Although the stream appears to have been excavated as an overflow for Lake Edith, it provides some excellent quality habitat for wildlife species associated with small woodland streams. This stream also appears to be adequate for fish migration during higher water conditions and may make additional spawning habitat available for such species as northern pike.

Disturbance Indicators: Community 04-28-20-01 shows evidence of past grazing based on the presence of several barbed wire fences and an open grown canopy structure, which has in the absence of logging now grown in. The dominance of the shrub layer by thorny species is also suggestive of past logging. Today, the main threat to this community is buckthorn, which occupies, and often dominates, the groundcover, shrub and subcanopy layers. In spite of the buckthorn, this community contains a fair diversity of species and includes many large oak trees. This community is assigned a qualitative ranking of C.

Community 04-28-20-02

Community 04-28-20-02 is an excellent quality shrub swamp that is mapped by the MNDNR Natural Heritage Program. This wetland is actually a complex of several different wetland community types with pockets of mixed emergent marsh, sedge meadow, rich fen, wet meadow and shallow, open water marsh dominated by floating-leaf macrophytes. This wetland complex is significant in that it is the best quality wetland, not associated with the St. Croix River, within the City of Afton. Common shrub species include bog birch, red osier dogwood and several species of willow. Buckthorn is present mainly near the wetland margins. Graminoids include cattail, tussock sedge, saw-beak sedge, lake sedge, bluejoint grass, and rice cut grass. Common

herbaceous species include water dock, water plantain, marsh marigold, sensitive fern, Joe-pye weed, duckweed, jewelweed, wood nettle, and bugle weed.

Disturbance Indicators: The primary disturbances include occasional buckthorn and the dominance by cattail in several areas. The generally undisturbed condition of the forest fringe provides an excellent buffer. This community is assigned a B ranking due to its overall diversity and quality.

Community 04-28-20-03
This community is located on sandy soil with rolling topography to the west of Lake Edith. Community 04-28-20-03 is an oak forest dominated by large, 20-inch diameter bur, pin, and red oaks along with smaller basswood, quaking aspen, and black cherry averaging 12 inches in diameter. The subcanopy is composed mostly of sapling-size basswood and boxelder. Dense buckthorn dominates the shrub layer, but is also accompanied by prickly gooseberry, prickly ash, gray dogwood, and Virginia creeper. There is virtually no groundcover except for small tree seedlings and a few herbs common on disturbed sites such as enchanter's nightshade.

Disturbance Indicators: An open field borders this community to its north, where heavy grazing occurs along the fence line. This community appears to have a much more intensive grazing history than 04-28-20-01 and is lower in overall diversity and quality. The groundlayer in this community is also depauperate, possibly due to the high density of buckthorn. This community is assigned a qualitative ranking of D.

Community 04-28-20-04
Community 04-28-20-04 is an old field dominated by nonnative grasses such as smooth brome. Trees and shrubs are beginning to encroach with approximately 10 % of the area covered by woody cover.

Community 04-28-20-05
Community 04-28-20-05 is a mesic oak forest dominated by large red oak. This community, although contiguous with community 04-28-20-03, occurs on a north-facing hillside, that is more shady and moist (i.e., more mesic) and exhibits a higher diversity of tree, shrub and groundcover species. A tree coring of a 21-inch DBH red oak indicated a high quality site (good tree growth) with larger red oaks averaging about 113 years of age. The subcanopy is composed of 12-14 inch diameter black cherry, red maple, American elm, green ash, boxelder and basswood. Dominant shrub species include Tartarian honeysuckle, and Virginia creeper. The groundcover is rich in mesic forest species and includes bloodroot, jack in the pulpit, maidenhair fern, enchanter's nightshade, wild geranium, bedstraw, lady fern, early meadow rue, white snakeroot, wood sorrel, and wild sarsaparilla.

Disturbance Indicators: Sioux Vista Drive and residential homesites border this community on the South. As is often the case, residential homes and driveways break up larger forested areas into small, isolated tracts. These isolated tracts are generally more susceptible to invasion by exotic species as well as insect, disease and wind damage. Recent summer storms have taken their toll on many of the larger trees, especially along Sioux Vista Drive. Although the windstorm has reduced the density of large mature trees, the numerous dead and down snags that have been created enhance wildlife habitat. This community is assigned a qualitative ranking of C.

Community 04-28-20-06
Community 04-28-20-06 is a low quality lowland hardwood forest dominated by large diameter (20+ inch) box elder and American elm, many of which have toppled over due to wind and old age. The shrub layer is mostly dominated by buckthorn with occasional red-berried elder shrubs. Ground cover species include wood sorrel, hog peanut, wood nettle, and sedge species.

Disturbance Indicators: Because much of the subcanopy and shrub layer are dominated by buckthorn and weedy forbs, such as wood nettle, very little regeneration of lowland hardwood trees is occurring. In spite of the low diversity within this community, the numerous dead/down tree snags provide significant wildlife habitat.

Community 04-28-20-07
This community is located to the north of Lake Edith and is mapped as part of MNDNR MCBS site #71. Community 04-28-20-07 is a degraded oak woodland/savanna with numerous small prairie openings. The two largest prairie openings are mapped and described separately in this report as community 04-28-20-08. This community occurs in a steeply dissected landscape with numerous, eroded draws and steep hill slopes. Many of these eroded slopes have patches of exposed sand/gravel, with sparse vegetative cover. The entire community appears to have once been pastured based on the numerous fences and dominance of armed shrubs such as prickly ash and buckthorn. Some areas also appear to have been historically mined for gravel. The majority of community 04-28-20-07 is characterized by widely scattered bur and pin oak on hilltops with dense thickets of eastern red cedar, smooth sumac and prickly ash along hillsides and within ravines. Groundcover species include wild strawberry, bee balm, sweet cicely, white snakeroot, yellow avens, and pointed-leaved tick-trefoil Occasional small openings persist with dry prairie species present; however, most of the prairie species in these openings have been replaced by smooth brome and Kentucky bluegrass.

Disturbance Indicators: This community appears to have been heavily grazed in the past since it is dominated by thorny shrubs and exhibits low ground cover diversity. Invasive species noted include buckthorn, Tartarian honeysuckle, amur maple and eastern red cedar. This oak woodland is given a ranking of D.

Community 04-28-20-17
This area is an old field dominated by nonnative grasses and forbs.

Community 04-28-20-18
This community is an oak woodland located along Highway 94. The quality and species composition are similar to community 01-28-20-07, which is located across Hudson Road.

Community 04-28-20-20
Community 04-28-20-20 is a cattail marsh with a large, central, open water area. The southern fringes of this wetland are generally dominated by reed canary grass and narrow-leaf cattail. The central portions of this community, while not surveyed (deep water), likely contain a mixture of submerged and floating leaf aquatic plants. This wetland outlets eastward via a small stream to Lake Edith.

Disturbance Indicators: The portions of this wetland that lie adjacent to Indian Trail appear to have been dredged to create open water. Where dredging has been done, the spoil material appears to have been deposited within the wetland fringe and encouraged the spread of reed canary grass and narrow-leaf cattail. This cattail marsh is given a C quality ranking.

Community 05-28-20-09
Community 05-28-20-09 is a large-lot residential area with a 50% canopy cover of deciduous and coniferous trees. This area is dominated by scattered white pine averaging 14-inches in diameter. The approximate age of white pine is 43 years, based on a count of 39 growth rings. Other dominant tree species include boxelder, American elm, green ash, quaking aspen, cottonwood, and red pine. These trees seem to be the same age as planted white pine, and have an average of 20-inch diameters. A scattered shrub layer consists of prickly ash, buckthorn, Tartarian honeysuckle, blackberry, and smooth sumac. Ground flora consists of Kentucky bluegrass, smooth brome, yarrow, asters, gray goldenrod, daisy fleabane, white snakeroot, Canada goldenrod, and lady fern.

Community 05-28-20-10
Community 05-28-20-10 is an old field/brushland. 7 to 10-foot tall white pine are scattered throughout the area, as well as red cedar, green ash, and pin oak. The shrub layer is dominated by smooth sumac, buckthorn, dogwood, wild rose, prickly ash, and Virginia creeper. Ground flora species include asters, mullein, yarrow, Canada goldenrod, bee balm, bush-headed prairie clover, northern bedstraw, Canada thistle, and common milkweed. Although this area contains low native species diversity, it provides good habitat for species such as white tail deer that favor brushy, semi-open areas.

Community 05-28-20-11
Community 05-28-20-11 is an oak woodland with some scattered pockets of mesic oak forest. The canopy is dominated by large, 25 to 30 inch diameter bur and pin oaks. The subcanopy, which consists of much smaller and younger trees, includes such species as pin oak, red oak, basswood, quaking aspen, red cedar, buckthorn, black cherry, American elm, and amur maple. The shrub layer contains small number of native species with buckthorn generally dominant. Shrub species present include American hazelnut, prickly ash, moonseed, black cherry, prickly gooseberry, and Tartarian honeysuckle. The ground cover is generally depauperate, with small numbers such species as white snake root, Virginia stickseed, northern bedstraw, sweet cicely, yellow wood-sorrel, violets. On some of the more mesic areas, species indicative of higher quality, such as red baneberry, occur.

Disturbance Indicators: Invasive species such as buckthorn and Tartarian honeysuckle dominate the shrub layer. As a result, little tree regeneration is occurring on this site. This community is also subject to soil erosion due to the lack of sufficient ground cover on the steep, erodible soils that occur on this site. This community is assigned a quality ranking of D.

Community 05-28-20-12
Community 05-28-20-12 is an excellent quality wetland complex composed of a mixed emergent marsh and rich fen. The slopes along the wetland fringe contain rich fen seepage areas dominated by such graminoids as broad-leaved cattail, lake sedge, tussock sedge, soft-stem bulrush, Canada bluejoint grass, green bulrush, wool grass, giant reed grass, and spike rush. Common forbs include swamp milkweed, jewel weed, arrowhead, tear thumb, water dock, Joe-pye weed, boneset, mint, giant goldenrod, beggar-ticks, swamp thistle and monkey flower. The mixed emergent marsh areas are generally dominated by cattail, lake sedge and *Carex stipata.* This community holds very high wildlife value due to its high floral diversity, mix of open water and shallow emergent areas and occasional mud flat areas along the emergent marsh fringe. A copes gray tree frog was documented in this area as well as plentiful sign of fur-bearing mammals.

Disturbance Indicators: Reed canary grass within the transition fringe of this wetland. Invasive shrubs, while not within the wetland, occur along the edges. Due to the relatively high diversity of this wetland, a quality ranking of BC is given.

Community 05-28-20-14

Community 05-28-20-14 is a deep open water marsh with an emergent marsh/wet meadow fringe. Most of this wetland is comprised of open water with patches of narrow-leaf cattail. The primary vegetation within the open water areas of the wetland is duckweed. The wetland fringes contain emergent marsh dominated by cattail and occasional soft-stemmed bulrush and spikerush. Also contained in the fringe area are some black willow, broad-leaved cattail, soft-stem bulrush, tussock sedge, and jewel weed. Reed canary grass is abundant within the wet meadow fringe. The open pond area offers good habitat for wildlife.

Disturbance Indicators: This pond appears to be excavated, especially along the southern and western edges near Indian Trail Road. This wetland is given a D ranking due to the presence of reed canary grass and probable history of dredging.

Community 05-28-20-15

Community 05-28-20-15 is a mesic oak forest. This community occurs along a steep, north-facing slope above Indian Trail. This mesic oak forest is dominated by widely scattered, large diameter bur oak, red oak and pin oak with alternating patches of quaking aspen, paper birch, and younger red oak. Also mixed in are cottonwood, American elm, white pine and black cherry. Buckthorn dominates both the subcanopy and shrub layers. Other shrub species include boxelder, red oak, black cherry, paper birch, black cherry and white pine regeneration. Shrub species include hawthorn, gray dogwood, Tartarian honeysuckle, prickly ash, bramble, American hazelnut, dogwood, and red cedar. Vine species include wild grape, Virginia creeper, and poison ivy. Although the groundcover mostly consists of young buckthorn, other species include lady fern; white snakeroot, enchanter's nightshade, yellow avens, Pennsylvania sedge, and common strawberry are present.

Disturbance Indicators: This community is divided by Indian Trail Road, and is somewhat fragmented by large lot development. Recent windstorms have resulted in considerable blowdown, especially where the canopy is more exposed near opening created by residential homes and driveways. Invasive shrubs such as buckthorn and Tartarian honeysuckle are currently common within this community and will likely increase considerably due to the openings caused by tree blowdown. For these reasons, this community has been given a CD quality ranking.

Landscape Unit #4

Summary Table for Landscape Unit #4

Site ID	Community ID	Community Type	Quality Ranking
37	05282001	Oak Woodland	D
38	05282002	Old Field	NA
39	05282003	Excavated Wetland/Wet Meadow	D
40	05282004	Excavated Wetland/Wet Meadow	D
41	05282005	Old Field/Wet Meadow	D
42	05282006	Lowland Hardwood Forest	D
43	05282007	Deep Open Water Marsh	D
44	05282008	Oak Woodland	CD
51	05282016	Conifer Plantation	NA
52	05282018	Conifer Plantation	NA

Landscape Unit Rankings

Ecological Ranking: The majority of this landscape unit contains lower quality oak woodland/forest and mostly wetlands that have been excavated. There are; however, some larger tracts of forest with moderate quality interior areas. The ecological ranking assigned to this landscape unit is low-moderate.

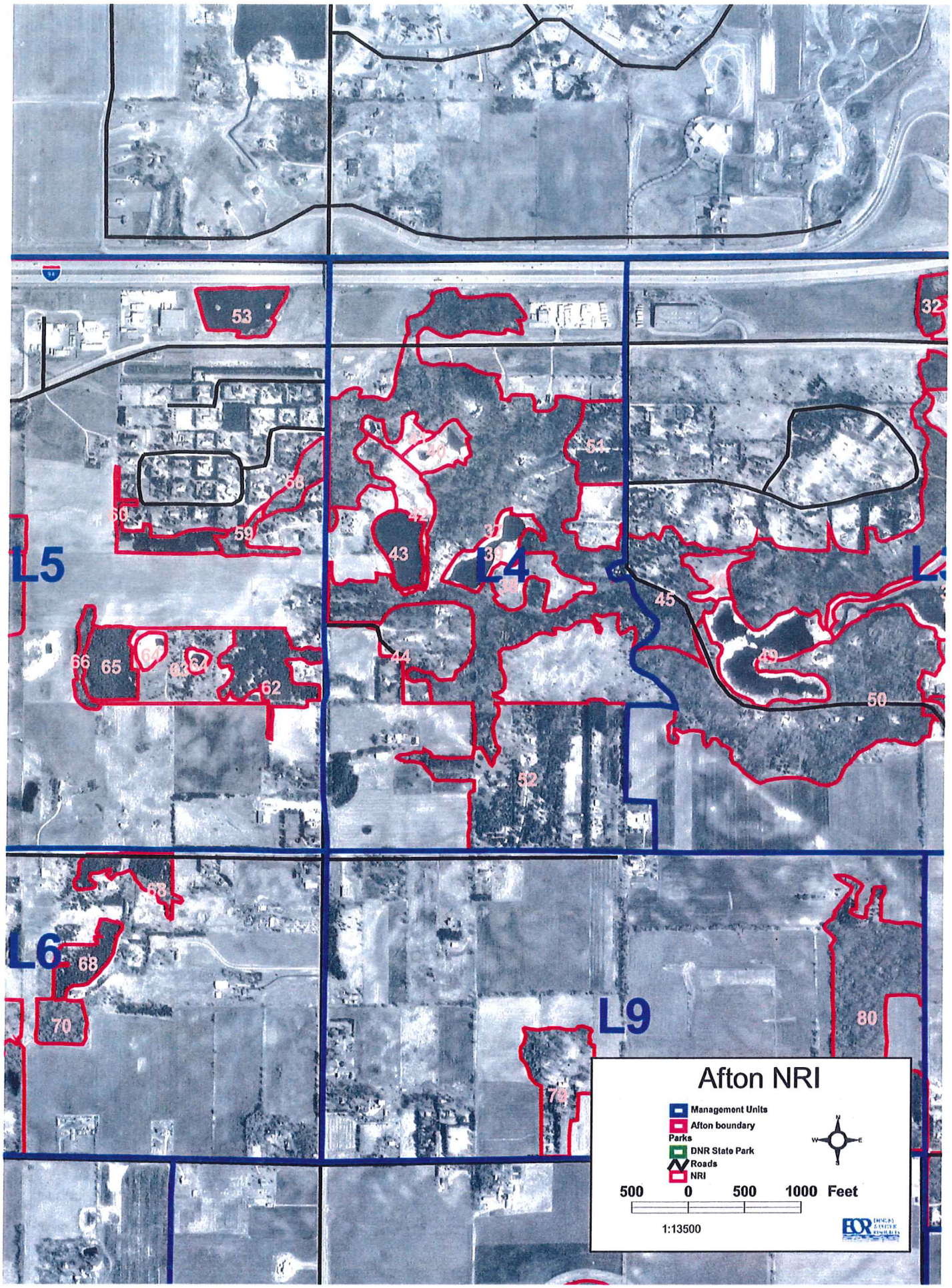
Wildlife Habitat Ranking: This landscape unit includes some larger areas of contiguous forest as well as moderate quality woodland/forest bordering wetlands. This area provides good habitat for "habitat generalist species" that thrive where urban/agricultural land uses interface with forest, woodland and wetland. The upland forest areas provide good habitat for such species as whitetail deer and wild turkey. The wetlands, although generally of lower quality provide habitat for waterfowl, shorebirds, reptiles and amphibians. Landscape unit L4 is assigned a moderate wildlife habitat ranking.

Rare Features Ranking:
No rare features are known from this landscape unit. There is however; some potential for Blanding's turtles to use the wetland areas, since these wetlands are connected to the better quality wetlands located to the east in L3. Because the quality of natural communities is generally low and unique habitats lacking, landscape unit L4 is assigned a rare features ranking of low.

Stewardship Recommendations

1. Wetlands in this landscape unit offer good wetland restoration/reclamation potential. Emphasis should be placed on restoring native plant diversity as well as limiting storm water impacts.

2. As with other nearby forest areas, further fragmentation should be avoided if possible. Examples would include routing roads to avoid forested areas and constructing new homes within existing fields while preserving nearby forest areas as open space.



Afton NRI
Management Units
Afton boundary
Parks
DNR State Park
Roads
NRI
500 0 500 1000 Feet
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L5
L4
L6
L9
53
32
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58
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80

Community Descriptions

Community 05-28-20-01

Community 05-28-20-01 is low quality oak woodland-brushland. Scattered, large diameter (average 18 inches) bur and pin oak dominate the upper canopy. Based on tree cores taken during the survey, the oak is estimated to be approximately 112 years old. This community also has a pronounced subcanopy of pin oak, quaking aspen, American elm, and younger oaks. Buckthorn, eastern red cedar, black cherry, prickly gooseberry, American hazelnut, and Virginia creeper, dominate the shrub layer. Groundcover species are mostly absent due to the dense shrub and canopy layers.

Disturbance Indicators: As with many woodland areas in the City of Afton, this community was likely grazed for many years resulting in park-like woodland with scattered, open grown bur oak and patches of thorny shrubs resistant to grazing. Open areas would likely have been dominated by introduced, cool season grasses and weedy forbs. Today, the open areas have mostly filled in with deciduous trees, and the patches of thorny shrubs, which took hold, remain as dense thickets. More recently, this large woodland has become more and more fragmented from residential lots and associated roads, utilities and disturbances such as firewood cutting. These impacts have favored the spread of invasive species such as buckthorn. This community is assigned a quality ranking of D.

Community 05-28-20-02

Community 05-28-20-02 is an old field that has largely succeeded to brushland. Scattered throughout, are occasional American elm trees. Major shrub species include smooth sumac, prickly ash, box elder, American hazel, gray dogwood, and red raspberry.

Community 05-28-20-03

Community 05-28-20-03 is an excavated pond with a wet meadow fringe. The open water portion of the wetland is covered with algae and occasional water plantain. Reed canary grass dominates the wet meadow fringe, but is mixed with wild millet, fowl manna grass, fox sedge, spike rush, smartweed, beggar-ticks, and blue vervain. This community offers good wildlife habitat, as evidenced by sightings of deer and raccoon.

Disturbance Indicators: This pond appears to have been excavated and lacks the gradual side slopes necessary to support a diverse assemblage of native species. The presence of excessive algae and duckweed suggests that nutrients from fertilizers and other sources are possibly discharging via storm water into this wetland. This wetland is given a D quality ranking.

Community 05-28-20-04

Community 05-28-20-04 is an excavated pond with wet meadow fringe. Duckweed dominates the open water portion of this community, and reed canary grass dominates the wet meadow fringe. Other species noted includes plantain, water horehound, beggar-ticks, and smartweed. This wetland probably provides breeding habitat for frogs, which are numerous near this community.

Disturbance Indicators: Like Community 05-28-20-03, this community appears to have been excavated with steep slide slopes. As is often the case with excavated ponds, invasive species such as reed canary grass tend to increase. This wetland is given a D quality ranking.

Community 05-28-20-05
Community 05-28-20-05 is an old field with patches of wet meadow-shrub wetland. Scattered black willow, cottonwood, green ash, boxelder, quaking aspen, and American elm occur as patches. A 20-30% shrub cover consists of nannyberry, buckthorn, amur maple, American hazelnut, gray dogwood, and blackberry. Wet meadow areas contain a mixture of grasses and forbs including smooth brome, reed canary grass, prairie cord grass, umbrella sedge, spike rush, blue flag, swamp milkweed, common burdock, stinging nettle, Canada thistle, marsh cinquefoil, Canada goldenrod, and butter-and-eggs.

Disturbance Indicators: This community contains numerous dugout ponds that are connected by ditches, possibly impacting wetland hydrology. Reed canary grass, smooth brome, burdock, stinging nettle and Canada thistle are all considered invasive plant species and suggest a history of disturbance from wetland excavation and grazing. This community is assigned a quality ranking of D. This area offers excellent opportunities for wetland restoration.

Community 05-28-20-06
Community 05-28-20-06 is a lowland hardwood forest dominated by an upper canopy of 10 to 15 inch diameter black willow, cottonwood, and boxelder. A low shrub layer contains sandbar willow, blackberry and wild grape. The groundcover layer consists of reed canary grass, giant goldenrod, and stinging nettle.

Disturbance Indicators: Like other nearby ponds, the pond bordering this wetland community appears to have been extensively excavated. This along with other potential disturbances has encouraged the spread of reed canary grass. The quality ranking is D.

Community 05-28-20-07
Community 05-28-20-07 is a deep, open water marsh dominated by duckweed, coontail, and pondweed. A grassy fringe surrounding the open water contains river bulrush, reed canary grass, tussock sedge, smartweed, swamp milkweed, and scattered black willow trees.

Disturbance Indicators: This wetland appears to be at least partially excavated and generally has low species diversity. The quality ranking for this wetland is CD.

Community 05-28-20-08
Community 05-28-20-08 is oak woodland dominated by large, 20 to 25 inch diameter bur and pin oaks, with clusters of quaking aspen. Red oak and American elm comprise the subcanopy, and buckthorn dominates the shrub layer. Other shrub species include prickly gooseberry, blackberry, round leaved dogwood, black cherry, Virginian creeper, and the introduced shrub, amur maple. Because of the generally dense shrub layer, the ground cover is sparse with occasional lady ferns.

Disturbance Indicators: This oak woodland contains good size trees and occasional pockets of native shrubs. The quality of this woodland is adversely impacted by invasive species such as buckthorn and amur maple. A quality ranking of CD is assigned.

Community 05-28-20-16
Community 05-28-20-16 is a conifer plantation.

Community 05-28-20-18
Community 05-28-20-18 is a conifer plantation.