

Landscape Unit #5

Summary Table for Landscape Unit #5

Site ID	Community ID	Community Type	Quality Ranking
53	06282001	Storm water Pond	NA
54	06282003	Oak Woodland	D
55	06282004	Oak Savanna	D
56	06282005	Open Water/Emergent Marsh	CD
57	06282006	Open Water/Emergent Marsh	CD
58	06282007	Old Field	NA
59	06282008	Mesic Oak Forest	D
60	06282009	Excavated Pond/Mixed Emergent Marsh	D
62	06282011	Conifer Plantation	NA
63	06282012	Conifer Plantation	NA
64	06282013	Excavated Pond	NA
65	06282014	Conifer Plantation	NA
66	06282015	Oak Woodland	D

Landscape Unit Rankings

Ecological Ranking: The most significant communities in this landscape unit are the wetlands, particularly the small rich fen. This landscape unit is given a low-moderate ecological ranking.

Wildlife Habitat Ranking: The wetland communities provide good quality wildlife habitat, especially those wetlands that are completely surrounded by forest or woodland. Although the quality of some of the wetlands is moderate, the lack of buffering and fragmentation lowers the use of these areas for wildlife. This landscape unit is given a wildlife habitat ranking of low-moderate.

Rare Features Ranking: As with L4 to the east, this landscape unit is given a rare features ranking of low to moderate. Although in general, this landscape unit has a low ranking due to lower quality natural communities, the wetlands in this area have the potential to support Blanding's Turtles, particularly those with hydraulic connections to wetlands to the east.

Stewardship Recommendations

1. Community 06282016 is a small rich fen that serves as the westerly terminus of interconnected wetlands draining to Lake Edith. This unique wetland has been invaded by nonnative shrubs and reed canary grass. Buckthorn should be cut in mid summer, with stumps treated to a basal application of an approved herbicide. Reed canary grass is difficult to control, but can be set back with a regimen of prescribed burns, mowing and herbicide application.
2. Wetlands 06282005 and 06282006 are moderate quality wetlands that could be further enhanced by protecting existing buffers and creating new buffers where none currently exist. Reed canary grass can be controlled through a program of herbicide treatment, prescribed burns and mowing. Once the reed canary is controlled, wet meadow grass and forbs should be reestablished.

Community Description

Community 06-28-20-01

Community 06-28-20-01 is a storm water pond wetland with an oak woodland community along the east side. The oak woodland component is dominated by large, 24-inch diameter bur oak, has a thick shrub layer dominated by buckthorn, and also includes some Tartarian honeysuckle, willow, and smaller bur oak. The ground layer of this wooded area mostly has herbaceous species such as enchanter's nightshade, white snakeroot, and burdock. The wetland portion of this area is a MNDOT wetland/wetland pond, covered with duckweed, and includes a wildlife island. Reed canary grass dominates the ground layer of the narrow emergent fringe bordering this pond with additional species such as broad-leaved cattail, wild mint, butter-and-eggs, bedstraw, water smartweed, water dock, and swamp milkweed.

Disturbance Indicators: This human created wetland exists between Hudson Road and I-94 in an industrial/residential area. A low diversity of invasive shrub and ground layer species dominate this community; therefore, the quality ranking assigned to this community is D.

Community 06-28-20-03

Community 06-28-20-03 is oak woodland dominated by large pin and bur oaks averaging 18 to 20 inches in diameter. This community also includes some pure patches of cottonwood, and includes some wet meadows dominated by reed canary grass. The shrub layer is patchy with such species as boxelder, elm, buckthorn, blackberry, white poplar, cottonwood, wild grape and Virginia creeper. The scattered wet meadows also include brome and common motherwort.

Disturbance Indicators: This community exists between Hudson Road and I-94 with another road running through the middle. Old fields surround it on the east, west, and south sides. This community is generally dominated by nonnative species; therefore, a quality ranking of D is given.

Community 06-28-20-04

Community 06-28-20-04 is a grazed over oak savanna dominated by large bur and pin oak. One of the 27-inch diameter bur oaks had 126 growth rings, indicating that larger oaks are at least 130 years old, with some of the larger trees probably exceeding 200 years of age. Buckthorn dominates the shrub layer accompanied by elm, gooseberry, green ash, hawthorn, Tartarian honeysuckle, boxelder, common elder, cherry, bur oak, and wild raspberry. Nonnative generally dominates the ground cover of this community, cool season grasses including reed canary grass, smooth brome and Kentucky blue grass. This community offers potential for oak savanna restoration since the species and growth form of oaks on the existing site provide a good restoration opportunity.

Disturbance Indicators: This community is located just south of Hudson road, is surrounded by old fields or agricultural land, and has evidence of recent logging in this area. We assigned a quality ranking of "D" for this community.

Community 06-28-20-05

Community 06-28-20-05 is an open water/mixed emergent marsh surrounded by a reed canary grass-dominated fringe. The open water portion is covered with herbaceous species such as duckweed, broad-leaved arrowhead, and pink weed. The fringe also includes graminoids such as soft-stem bulrush, rice cut grass, spike rush, river bulrush, and green bulrush. A gray tree frog was spotted along the fringe of this wetland.

Disturbance Indicators: This community exists within the previously described oak woodland community number 06-28-20-04, which is surrounded by agricultural or old fields. The reed canary grass-dominated fringe has been given a D quality ranking. The open water portion of this community is of higher quality, and has been given a C ranking.

Community 06-28-20-06

Community 06-28-20-06 is an open water/mixed emergent marsh. Duckweed, broad-leaved arrowhead, and pinkweed occur within the open water portion of this community. The wetland fringe consists of graminoids such as reed canary grass, broad-leaved cattail, soft-stem bulrush, rice cut grass, river bulrush, and wild millet. Several species of waterfowl were sighted in this community, including kingbirds, mallards, and wood ducks.

Disturbance Indicators: Old fields, residential areas, and agricultural land surround this community on most sides. The primary disturbance indicators include reed canary grass. This wetland is assigned a CD quality ranking.

Community 06-28-20-07

Community 06-28-20-07 is an old field.

Community 06-28-20-08

Community 06-28-20-08 is an oak forest that has succeeded from oak woodland. The canopy is dominated by scattered 18 inch-diameter bur and pin oak with a younger subcanopy of mesic species including boxelder, black cherry, and hackberry. Buckthorn dominates the shrub layer, along with green ash, gooseberry, black cherry, and Virginia creeper. The ground layer is fairly open, but contains herbaceous species such as sweet cicely, bedstraw, enchanter's nightshade, Jack in the pulpit, common burdock, and stinging nettle.

Disturbance Indicators: This area has recently been damaged by high winds, with a significant portion of canopy species damaged. As with many of the oak woodland-forest communities within the City of Afton, the invasive shrub buckthorn is present. This community is given a quality ranking of D due to invasive species and small, isolated size.

Community 06-28-20-09

Community 06-28-20-09 is an excavated pond surrounded by a mixed emergent fringe. The pond portion of this wetland is covered with pinkweed, water plantain, and water smartweed, with the fringe consisting of purple loosestrife and giant goldenrod, with graminoids such as reed canary grass, river bulrush, wild millet, soft-stem bulrush, and giant manna grass. There are two small clumps of bur oak woodland dominated by large 20-30 inch diameter trees, with a small patch of sand reed grass nearby. This community and the adjacent upland areas offer excellent opportunities for wetland restoration or mitigation projects.

Disturbance Indicators: Excavated material (dredged out of the wetlands to create open water) has resulted in fill being placed within the wetland fringe. Many of the invasive species, such as purple loosestrife and reed canary grass likely got their first hold within areas that dredge spoil was deposited. It is also likely that heavy equipment was contaminated with purple loosestrife, resulting in the establishment of this species. For these reasons, a quality ranking of D is assigned.

Community 06-28-20-11

Community 06-28-20-11 is a conifer plantation dominated by white spruce and red pine. These trees are approximately 25 years of age and average 6 to 10 inch diameter. As with many conifer

plantations, the ground layer varies from bare ground with needles, to scattered occurrences of smooth brome, Canada goldenrod, and common burdock.

Community 06-28-20-12

Community 06-28-20-12 is a conifer plantation consisting of scattered red pine, Scotch pine, and blue spruce, and also includes some scattered bur oak. The ground layer contains reed canary grass, smooth brome, and Canada goldenrod.

Community 06-28-20-13

Community 06-28-20-13 includes two dugout ponds with a reed canary grass dominated fringe.

Community 06-28-20-14

Community 06-28-20-14 is a conifer plantation dominated by 10 to 14 inch white, red, and Jack pines. These trees are approximately 25 years old with mostly bare groundcover.

Community 06-28-20-15

Community 06-28-20-15 is an oak-woodland with pockets of oak forest. The canopy is dominated by bur and pin oak. The subcanopy consists of boxelder, quaking aspen, black cherry, eastern red cedar, and Jack pine (planted). Buckthorn dominates the shrub layer, accompanied by prickly gooseberry, red oak, common elder, and Virginia creeper. The sparse ground layer is mostly depauperate.

Disturbance Indicators: This community is quite small and surrounded on all sides by either plantation or old-field. Except for the canopy layers, invasive species such as buckthorn have taken over much of the native shrub, grass and forb diversity. This community is assigned a ranking of D.

Landscape Unit #6

Summary Table for Landscape Unit #6

Site ID	Community ID	Community Type	Quality Ranking
60	06282009	Wet Meadow/Excavated Pond	D
61	06282010	Wet Meadow/Excavated Pond	D
67	07282001	Mixed Emergent Marsh	C
68	07282002	Conifer Plantation	NA
69	07282003	Brushland	NA
70	07282004	Deciduous Woodland	NA
71	07282005	Deciduous Woodland	NA
72	07282006	Oak Woodland	D

Landscape Unit Rankings

Ecological Ranking: This landscape unit consists mostly of patches of lower quality natural communities, plantation and old farm woodlots. The one exception is the complex of wetlands; which contain some moderate quality pockets of mixed emergent marsh. The overall ecological ranking is low.

Wildlife Habitat Ranking: With the exception of community 07282001, wildlife habitat is generally most suited to “habitat generalist species” that thrive within small patches or edges bordering residential homes and farm fields. The wildlife habitat ranking is low.

Rare Features Ranking: There are no known rare features records, nor are rare features likely to occur in this area, given the lack of habitat. The rare features ranking for this landscape unit is low.

Stewardship Recommendations

1. Community 07282001 is a moderate quality mixed emergent marsh that contains purple loosestrife. As already indicated, it appears that some control efforts are already underway. The DNR and or Watershed should be contacted to determine if any existing efforts are underway and if not, should initiate control measures. This wetland, along with a few small patches of purple loosestrife invasion to the north (across the road), is the only area of purple loosestrife noted in the City.

Community Description

Community 06-28-20-09

Community 06-28-20-09 is an excavated pond surrounded by a mixed emergent fringe. The pond portion of this wetland is covered with pinkweed, water plantain, and water smartweed, with the fringe consisting of purple loosestrife and giant goldenrod, with graminoids such as reed canary grass, river bulrush, wild millet, soft-stem bulrush, and giant manna grass. There are two small clumps of bur oak woodland dominated by large 20-30 inch diameter trees, with a small patch of sand reed grass nearby. This community and the adjacent upland areas offer excellent opportunities for wetland restoration or mitigation projects.

Disturbance Indicators: Excavated material (dredged out of the wetlands to create open water) has resulted in fill being placed within the wetland fringe. Many of the invasive species, such as purple loosestrife and reed canary grass likely got their first hold within areas that dredge spoil was deposited. It is also likely that heavy equipment was contaminated with purple loosestrife, resulting in the establishment of this species. For these reasons, a quality ranking of D is assigned.

Community 06-28-20-10

Community 06-28-20-10 is a dugout pond with a wet meadow fringe dominated by wild millet, cattail, and reed canary grass. This community is characteristic of a stormwater pond.

Disturbance Indicators: This pond is surrounded by residential area, and is located between 8th and 10th Streets. The dominance by invasive species led us to rank this community as having D quality.

Community 07-28-20-01

Community 07-28-20-01 is a moderate quality mixed emergent marsh. A lowland hardwood forest fringe surrounds the wetland margins, containing eastern cottonwood, boxelder, and American elm. The marsh itself contains a diversity of native species including broad-leaved arrowhead, duckweed, water smartweed, lake sedge, and Canada bluejoint grass, but is dominated by purple loosestrife with some reed canary grass and cattail.

Disturbance Indicators: This mixed emergent marsh shows signs of once being a high quality community. It is mostly surrounded by open fields, and has a road (10th Street) running along its northern border. The primary invasive species are purple loosestrife, reed canary grass and cattail. While conducting the survey, portions of the purple loosestrife appeared to have died back, possibly from release of weevils. There were several tags that appeared to denote the location of weevil releases.

Community 07-28-20-02

Community 07-28-20-02 is a conifer plantation.

Community 07-28-20-03

Community 07-28-20-03 is an upland brushland dominated by introduced species.

Community 07-28-20-04

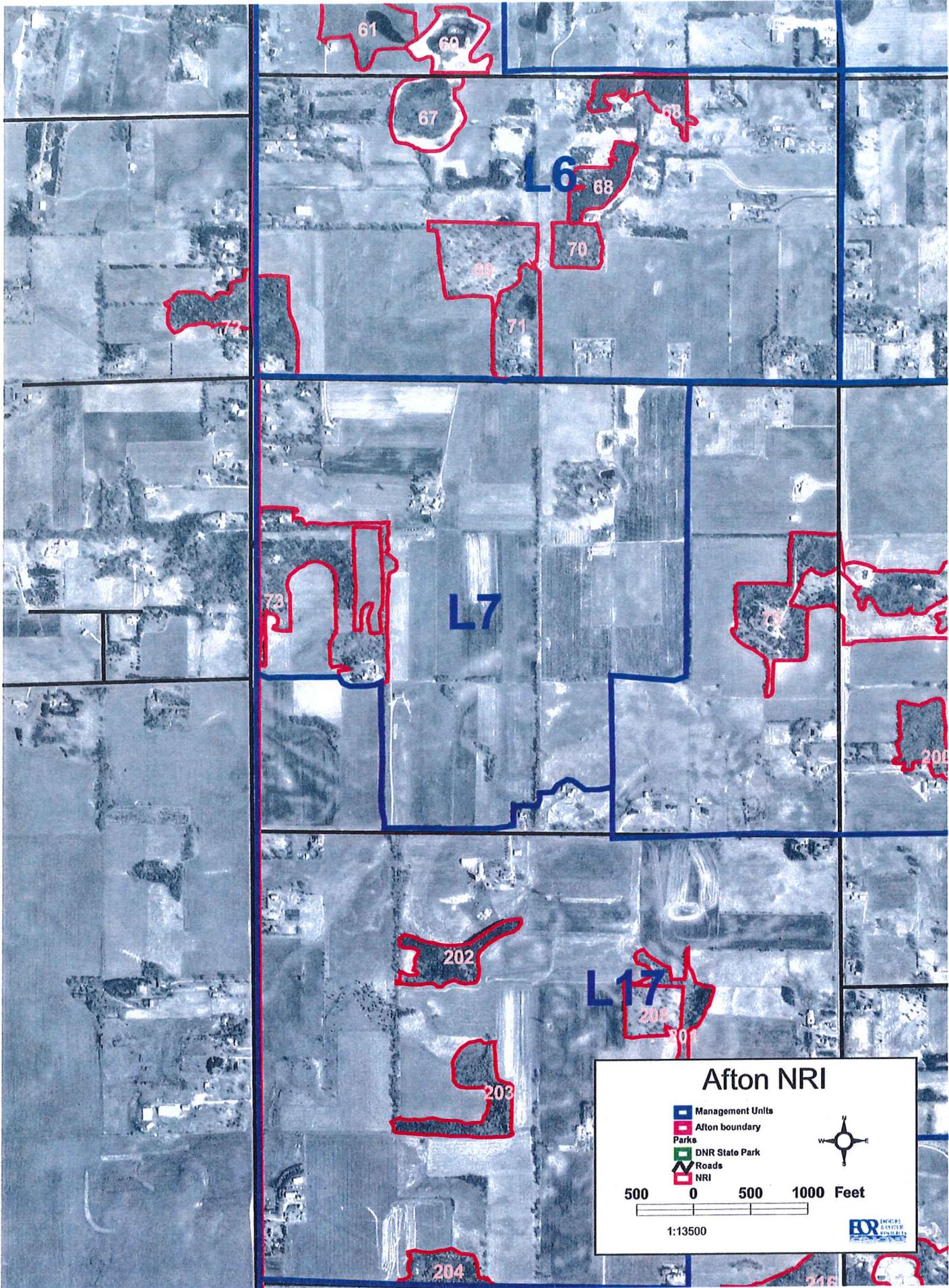
Community 07-28-20-04 is a disturbed deciduous woodland.

Community 07-28-20-05

Community 07-28-20-05 is a disturbed deciduous woodland.

Community 07-28-20-06

Community 07-28-20-06 is an oak woodland/brushland.

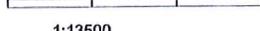


Afton NRI

- Management Units
- Afton boundary
- Parks
- DNR State Park
- Roads
- NRI

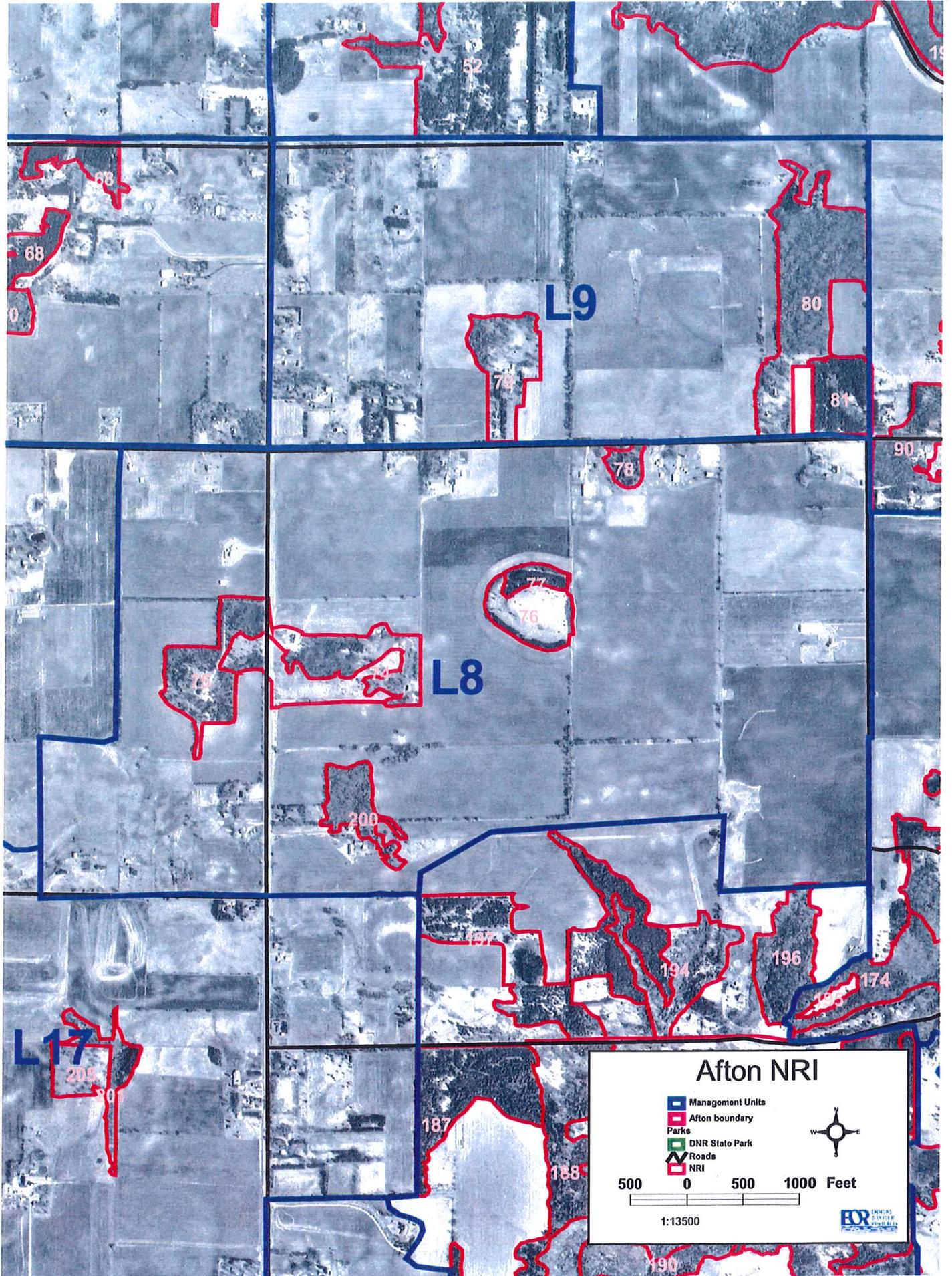


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Afton NRI

- Management Units
- Afton boundary
- Parks
- DNR State Park
- Roads
- NRI



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Landscape Unit #7

Summary Table for Landscape Unit #7

Site ID	Community ID	Community Type	Quality Ranking
73	07282007	Oak Woodland	D

Landscape Unit Rankings

Ecological Ranking: This landscape unit is dominated by agricultural land uses with only one sizable area of oak woodland. The ecological ranking is low.

Wildlife Habitat Ranking: Most of this area contains pasture and row crops. Wildlife associated with agricultural land uses would be present. Wildlife habitat values for this area are low.

Rare Features Ranking: There are no known rare features records, nor are rare features likely to occur in this area, given the lack of habitat. The rare features ranking for this landscape unit is low.

Stewardship Recommendations

There are no specific recommendations within this landscape unit for natural resources.

Community Description

Community 07-28-20-07

Community 07-28-20-07 is an oak woodland.

Landscape Unit #8

This landscape unit encompasses one of the best-known landmarks within the City of Afton – Bissell’s Mounds. Senior Plant Ecologist Barb Delaney visited these mounds and researched into the history of these unique landmarks. The “knobs” were known as Bissell’s Mounds when W.H.C. Folsom wrote *50 Years in the Midwest* in 1888 (pg. 46 and 358). The mounds marked a route used by early settlers to travel between Afton and St. Paul. They were named for Elijah Bissell who farmed near the mounds in the 1840’s. According to Folsom, the mounds and their surrounding terrace were prairie and savanna in the early 1800’s. Toward the St. Croix River, “the hills were crowned with groves of shrubby oak, amidst which, especially at the outlet of streams into the Lake (Lake St. Croix), the darker pines stood out boldly against the sky”. (From W.H.C. Folsom, 1888, pg. 32).

Summary Table for Landscape Unit #8

Site ID	Community ID	Community Type	Quality Ranking
74	08282001	Dry Prairie (Bedrock Bluff Subtype)	BC
75	08282002	Oak Woodland	D
76	08282003	Dry Prairie (Bedrock Bluff Subtype)	C
77	08282004	Conifer Plantation	NA
78	08282005	Juniper Scrub	NA
200	17282015	Disturbed Deciduous Woodland	NA

Landscape Unit Rankings

Ecological Ranking: This landscape unit ranks among the most unique areas of the City. The prairies found in this landscape unit rank among the top in Washington County. Although much of this landscape unit contains lower quality natural communities, the high quality and unusual character of Bissell's Mounds gives this landscape unit a high ecological ranking.

Wildlife Habitat Ranking: Bissell's Mounds provides locally unique wildlife habitat for species requiring dry rock outcrops, and loose, friable sand. Species found in this type of habitat include: prairie skink, garter snakes, plains pocket mouse and western kingbird. This landscape unit is assigned a high wildlife habitat ranking.

Rare Features Ranking: Much of this landscape unit is contained within MCBS Site #69. Bissell's Mounds is shown on the *Natural Communities and Rare Species, Washington County Map* (MN DNR, 1990). Although no other rare feature records exist for this area, potential habitat exists for a number of species that associate with dry prairie habitat. Animal species known to occur locally include: Blue Racer (*Coluber constrictor*), Five-lined Skink (*Emueces fasciatus*), Eastern Spotted Skunk (*Spilogale putorius*). Plant species known to occur locally include Kittenails (*Besseyia bullii*) and Hill's Thistle (*Cirsium hillii*). This landscape unit is given a high rare features ranking.

Stewardship Recommendations

1. Cut and remove woody species including smooth sumac, prickly ash, common buckthorn, eastern red cedar and pin oak from the prairies. All woody material should be taken off site and burned or otherwise, disposed of. Removing woody vegetation will help to keep controlled burns cooler, thus helping to protect prairie species sensitive to intense heat. Once woody vegetation is removed, conduct spring or fall burns to set back cool season introduced grasses and control reestablishment of woody trees and shrubs.
2. White and yellow sweet clover is present on the prairies. Where small patches occur, hand pull and/or control with prescribed burns.
3. When cutting buckthorn (and other woody species prone to sprouting) apply a basal application of herbicide (Garlon – 4) to cut stumps. This will help to reduce the number of sprouts following cutting. As a general rule, cutting and herbicide application is more effective during the active growing season (mid-summer).
4. Educate adjacent farmers about the impact of herbicide drift. Herbicide application should be done carefully and on calm days in adjacent agricultural fields.
5. If possible, obtain conservation easements on the land surrounding and including Bissell's Mounds. A corridor linking the east and west mounds could provide a critical connection between the two mounds and may provide enough habitat for rare animals that are now unable to move between the two mounds.
6. The top of the east mound contains mostly cool season, introduced grasses. This area makes an ideal prairie reclamation site and could serve as viewing area for the public to view the prairie to the west as well as the St. Croix River Valley to the east.

7. Soils on the prairies are very thin and erodible. Avoid disturbance (even foot traffic), particularly on the east prairie.

Community Description

Community 08-28-20-01

Community 08-28-20-01 comprises the Western portion of Bissel's Mounds and includes the two mounds that are bisected by Neal Avenue. The MNDNR Natural Heritage Program mapped this community along with the two mounds to east as part of MCBS Site #69. The mound east of Neal Avenue contains a surprisingly good quality native prairie (dry to mesic sand-gravel and bedrock-bluff subtypes). The unusual feature of this prairie is the presence of fescue (probably *Festuca ovina*), also referred to as sheep fescue. This grass, which is an introduced, Old World species, likely was brought over when the area was settled. In spite of the presence of sheep fescue, the native plant diversity is high within this prairie, and would rank as the most diverse native prairie within the City. For example, during the MCBS survey, over sixty species (mostly grasses and forbs) were documented within the prairies on this site. During our survey, prairie graminoids documented included porcupine grass, side oats grama, little bluestem and big bluestem. Prairie forbs present included gray-headed coneflower, wild bean, western ragweed, showy goldenrod, gray goldenrod, grass leaved goldenrod, common St. John's-wort, purple prairie clover, dotted blazing star, and aromatic aster. Species in the shrub layer include leadplant and wild rose and hawthorn. There is some woody invasion, including smooth sumac and red cedar in the shrub layer. However, based on the MCBS survey that was conducted in 1989, woody encroachment in this prairie does not appear to have increased significantly.

During the 1989 DNR MCBS survey, the prairie located on the mound west of Neal Avenue was considered to be the best quality prairie on Bissel Mounds (B-Quality). Unfortunately, this prairie was lost to development and all that remains is overgrown openings dominated by introduced grasses and a dense covering of eastern red cedar and buckthorn. Similarly, a small knob immediately to the east Neal Avenue was also lost to development.

Disturbance Indicators: As indicated already, this unique complex of dry prairies has been directly impacted by development. Except for the eastern-most mound, which seems to be holding its own against woody encroachment, little of the prairie that was surveyed only 10 years ago remains today. The small fragments that remain immediately to the east and west of Neal Avenue are almost totally gone due to woody encroachment of buckthorn, eastern red cedar and smooth sumac. In addition, introduced grasses and forbs such as sweet clover, Queen Anne's lace, Kentucky bluegrass and smooth brome generally dominate the margins of this entire site and appear to be encroaching. Overall, this complex of remnant prairies is assigned a quality ranking of C.

Community 08-28-20-02

Community 08-28-20-02 is an oak woodland dominated by bur and pin oaks, with a subcanopy composed of boxelder and black cherry. Shrub species include buckthorn, boxelder, common elder, and Virginia creeper. The ground layer includes rich herbaceous species such as sweet cicely, bedstraw, tick-trefoil, hog peanut, rattlesnake fern, and false Solomon's seal. This community is part of an area surveyed by the MNDNR Natural Heritage Program and identified as MCBS site 69 (Bissel's Mounds). This oak woodland borders the north and west sides of Community 08-28-20-01 and includes a few small, overgrown prairie openings.

Disturbance Indicators: The western border of this community runs along Neal Ave., and the northern section borders agricultural land. Disturbance indicators include the presence of invasive shrubs such as buckthorn. We have assigned this community a D quality ranking.

Community 08-28-20-03

Community 08-28-20-03 is dry prairie, bedrock bluff subtype, located on the largest and most prominent mound of the Bissel's Mound formation. As with the mounds to the west, MNDNR Natural Heritage Program mapped this mound as part of MCBS site #69. This community includes a prairie along the west-southwest side of the mound where the flat top drops sharply to the agricultural fields below. It is only on the steep slopes, where the soil is thin with small rock outcrops, that prairie persists. On the flatter areas, both on top of the mound and near the bottom of the mound slope, nonnative bluegrass is dominant. Within the prairie graminoids such as side oats grama, little bluestem, big bluestem and prairie dropseed are dominant. Ground layer herbaceous species include bastard toad-flax, whorled milkweed, stiff goldenrod, leadplant, dotted blazing star, common mullein, aromatic aster, wild four-o'clock, gray-headed coneflower, gray goldenrod, purple prairie-clover, heath aster, dogbane, and bee balm. Native woody species include leadplant and ground cherry.

Disturbance Indicators: Disturbance indicators include invasive species such as blue grass and yellow toadflax. Invasive woody species include Siberian elm, prickly ash and eastern red cedar. Because this site is totally surrounded by agricultural land uses, herbicide drift could also potentially impact this prairie. The quality of this prairie is variable, with the best portions having a C quality.

Community 08-28-20-04

Community 08-28-20-04 is a conifer plantation, dominated by red pine and blue spruce. These trees were planted on the north-facing slope of the larger of the Bissel's Mounds. Other tree species present include Siberian elm, black cherry, and eastern red cedar. Prickly ash occurs as patches.

Community 08-28-20-05

This community occupies the smallest and eastern-most of the Bissel's Mounds. Although prairie openings likely exist on this site, it is typed here as a juniper-scrub due to the dominance by eastern red cedar and shrubs such as prickly ash. This area appears to have been heavily grazed in the past.

Community 17-28-20-15

Community 17-28-20-15 is farm woodlot dominated by mesic oak forest tree species.

Landscape Unit #9

Summary Table for Landscape Unit #9

Site ID	Community ID	Community Type	Quality Ranking
79	08282006	Pastured Oak Savanna	NA
80	09282020	Oak Woodland	D
81	09282021	Conifer Plantation	NA

Landscape Unit Rankings

Ecological Ranking: This landscape unit is dominated by agricultural land uses and a few areas of grazed oak savanna and woodland. The ecological ranking is low.

Wildlife Habitat Ranking: Most of this area contains pasture and row crops. Wildlife associated with agricultural land uses would be present. Wildlife habitat values for this area are low.

Rare Features Ranking: There are no known rare features records, nor are rare features likely to occur in this area, given the lack of habitat. The rare features ranking for this landscape unit is low.

Stewardship Recommendations

No recommendations for this landscape unit.

Community Descriptions

Community 08-28-20-06

This community is a pastured oak savanna dominated by large, open grown bur oak, with rows of conifer plantings along the west edge of the site (adjacent to the residential driveway). No ranking is assigned to this community.

Community 09-28-20-20

Community 09-28-20-20 is an oak woodland that has a long history of grazing.

Community 09-28-20-21

Community 09-28-20-21 is a conifer plantation dominated by 9-15 inch diameter red pine.

Landscape Unit #10

Summary Table for Landscape Unit #10

Site ID	Community ID	Community Type	Quality Ranking
82	09282001	Deep Open Water Marsh	C
83	09282002	Black Locust Plantation	NA
84	09282003	Oak Woodland	D
85	09282004	Oak Woodland	D
94	09282005	Lowland Hardwood Forest	CD
86	09282006	Mixed Hardwood/Conifer Plantation	NA
87	09282007	Old Field	NA
88	09282008	Oak Savanna/Pasture	NA
89	09282010	Conifer Plantation	NA
90	09282011	Oak Woodland	D
93	09282014	Conifer Plantation	NA
66	09282015	Old Field	NA
95	09282016	Oak Savanna/Woodland	CD
97	09282019	Old Field	NA

Landscape Unit Rankings

Ecological Ranking: Although this landscape unit is dominated by lower quality oak woodland and plantation, the extensive, contiguous area covered by woodland is significant. This landscape unit includes several moderate quality natural communities as well as some potentially good quality areas that were not surveyed (access denied). The ecological ranking is low to moderate.

Wildlife Habitat Ranking: The extensive woodland and plantation provides good quality wildlife habitat. In particular, the deep open water marsh and tributary to Valley Creek provide high quality riparian habitat. The wildlife ranking is moderate.

Rare Features Ranking: There are no known rare features records for this landscape unit. There is however; potential for species associated with Lake Edith and lower Valley Creek to travel along the tributary corridor. In addition, this area contains some large, contiguous woodland that may support some of the species documented to the east in Section 10 (see landscape unit #12). The rare features ranking for this landscape unit is moderate.

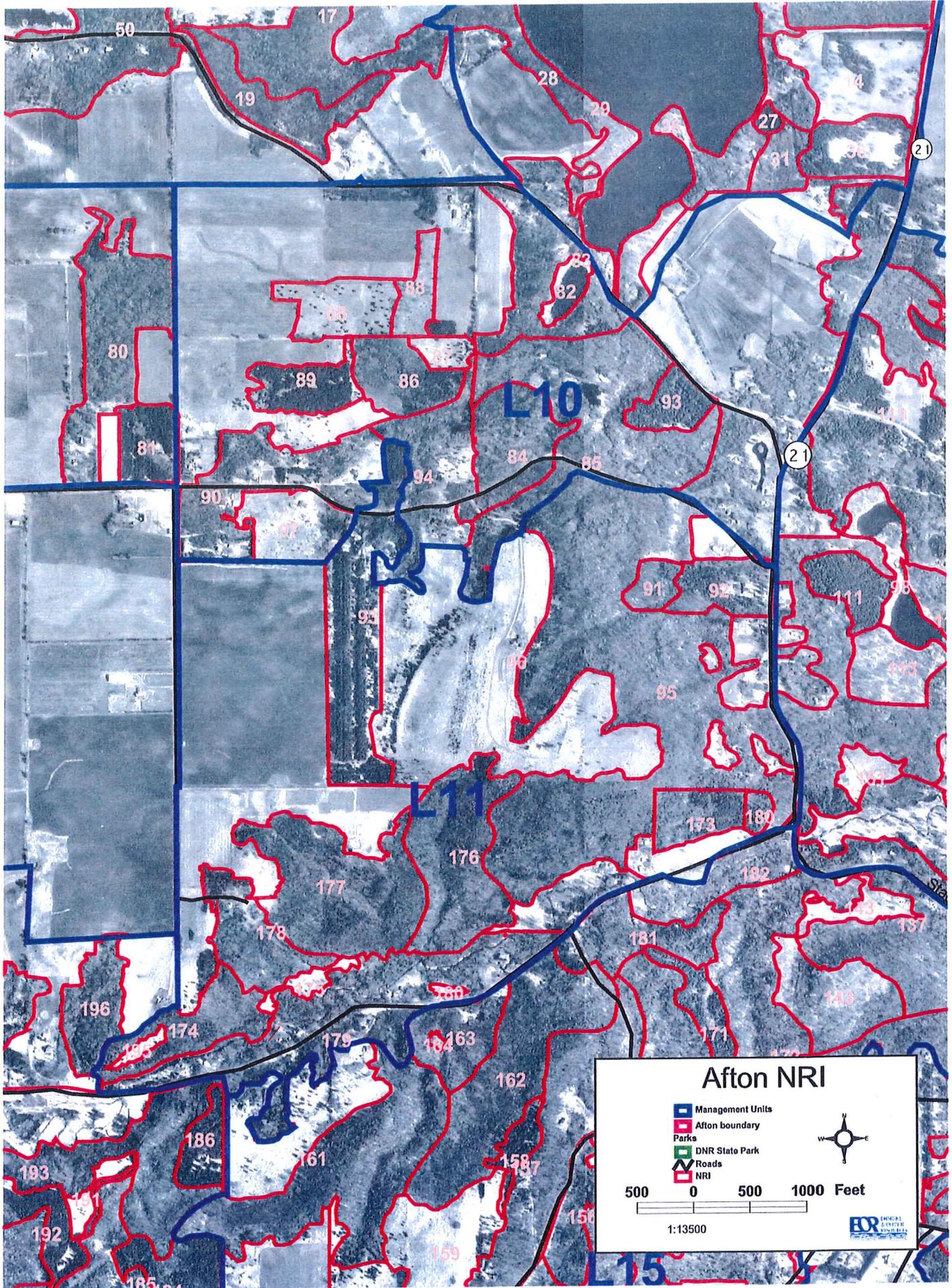
Stewardship Recommendations

1. Encourage landowners along the Lake Edith outlet stream (North Fork Valley Creek) to maintain riparian buffers along either side of the stream. The buffer should extend for a minimum of 50 feet either side of the stream and preferably 100 feet. Ideally, the stream buffer should be maintained as native vegetation of forest (lowland hardwood or oak forest).

Community Descriptions

Community 09-28-20-01

Community 09-28-20-01 is a deep, open water marsh with floating-leaf vegetation. The margins of this wetland contain a moderately diverse wet meadow and lowland hardwood forest fringe. The open water marsh area is dominated by duckweed and white water lily and submerged aquatic vegetation. The margins of the open water marsh transitions into a floating mat of wet



Afton NRI

- Management Units
- Afton boundary
- Parks
- DNR State Park
- Roads
- NRI



500 0 500 1000 Feet

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meadow that is dominated by reed canary grass, lake sedge, broad-leaved cattail, green bulrush, soft-stem bulrush, Canada bluejoint, and rice cut grass. Herbaceous species include beggar-ticks, smartweed and giant goldenrod. A lowland hardwood fringe composed of black willow, amur maple, buckthorn, boxelder, and American elm surrounds the wet meadow. The groundcover within this lowland hardwood fringe is dominated by reed canary grass, common burdock, wood nettle, and enchanter's nightshade.

Disturbance Indicators: As a general rule, this wetland is dominated by nonnative species. However, a fair diversity of wet meadow species is present and this wetland represents a good diversity of different wetland community types. The quality ranking for this wetland is C.

Community 09-28-20-02

Community 09-28-20-02 is a black locust forest with trees approximately 8 to 14 inches in diameter. Other trees in the canopy besides black locust include Chinese elm, butternut, red pine, and cottonwood. It is not clear whether if all of these trees were planted or if some may have seeded in from nearby plantations on their own. Dense buckthorn dominates the understory, along with prickly gooseberry, Tartarian honeysuckle, and black ash. The groundcover is mostly weedy, with species such as yellow avens, sweet cicely, common burdock, strawberry, and white snakeroot.

Community 09-28-20-03

Community 09-28-20-03 is an oak woodland dominated by large, open grown, bur oak and younger red oak averaging 15-inches in diameter on a south facing slope of dry sandy soil. The canopy also includes quaking aspen and basswood. Buckthorn dominates the shrub layer, along with Tartarian honeysuckle, red cedar, and a small occurrence of red maple, boxelder, and ironwood. The sparse herbaceous layer consists of sweet cicely, wood anemone, and common strawberry.

Disturbance Indicators: Invasive shrubs and weedy forbs are common within this woodland suggesting that this site is an old pasture, now grown over with woody shrubs and pioneer tree species. A ranking of D is assigned to this community.

Community 09-28-20-04

Community 09-28-20-04 is an oak woodland, which appears to be old pasture now grown over with woody shrubs and pioneer tree species. Large open grown bur oaks dominate the upper canopy. The subcanopy consists of paper birch, basswood, pin oak, and quaking aspen. Woody shrubs and young trees form a tall, dense shrub layer with eastern red cedar, buckthorn, Tartarian honeysuckle, prickly ash, prickly gooseberry, amur maple, ironwood and black cherry dominant species. The groundlayer consists of lady fern, Virginia waterleaf, wood nettle, sweet cicely, yellow avens, common motherwort, sweet scented bedstraw, and pointed-leaved tick-trefoil.

Disturbance Indicators: This community is assigned a D quality ranking due the dominance by nonnative and invasive woody shrubs and trees.

Community 09-28-20-05

Community 09-28-20-05 is a lowland hardwood forest composed of cottonwood, basswood, quaking aspen, red oak, elm, and black locust. Buckthorn dominates the shrub layer, and is accompanied by gooseberry and Tartarian honeysuckle. The ground flora consists of Virginia waterleaf, motherwort, sweet scented bedstraw, lady fern, yellow avens, stinging nettle, and white snakeroot. This community is located in a ravine complex, which drains east into Lake Edith, on a very sandy substrate.

Disturbance Indicators: This lowland hardwood forest has a low diversity of shrub and ground cover species and contains a significant amount of buckthorn. A quality ranking of CD is given.

Community 09-28-20-06

Community 09-28-20-06 is a mixed hardwood/conifer plantation dominated by black locust, green ash, red pine, and Jack pine. This site includes some fairly steep slopes and appears to have been reclaimed during the 1940-1950's, probably as a CCC project. Planted trees generally are 10 to 12 inches in diameter. Aspen and occasional bur oak fill in the edges and patches of this community. Other species in the subcanopy include boxelder and elm. 15 to 20 foot tall buckthorn dominates the shrub layer, along with prickly gooseberry, elm, green ash, Tartarian honeysuckle, and prickly ash. The ground layer is mostly shaded by the canopy and shrub layers, and includes species such as sweet scented bedstraw, yellow avens, sweet cicely, wood nettle, and St. John's-wort.

Disturbance Indicators: This area was recently damaged from a windstorm. As the trees on this site are blown over or begin to decline, buckthorn will take over, resulting in a poor vegetative cover for erosion control.

Community 09-28-20-07

Community 09-28-20-07 is an old field dominated by nonnative grasses with a <10% cover of scattered red cedar, Scotch pine, and black locust. Buckthorn and Canada thistle have invaded this area.

Community 09-28-20-08

Community 09-28-20-08 is a pasture that is currently grazed and dominated by nonnative grasses. Large, 20 to 25-inch diameter, open grown bur oak are scattered throughout, comprising a <20% tree canopy cover.

Community 09-28-20-10

Community 09-28-20-10 is a red pine plantation consisting of 12-inch diameter trees that are approximately 40 years old. The understory is mostly bare with needle duff, except for some buckthorn in the shrub layer.

Community 09-28-20-11

Community 09-28-20-11 is an oak woodland dominated by young pin oak and paper birch. The canopy includes red oak, quaking aspen, black cherry, boxelder, and cottonwood, together comprising a <20% tree cover. Buckthorn and other invasive shrubs dominate the shrub layer, including smooth sumac, wild raspberry, and prickly ash, along with black cherry and American plum. The understory layer consists of Kentucky bluegrass, smooth brome, Canada goldenrod, field toadflax and yellow avens.

Disturbance Indicators: This community was probably grazed in the past. Since grazing was discontinued, thorny and invasive shrubs have become dominant. A D-quality ranking is assigned.

Community 09-28-20-14

Community 09-28-20-14 is red pine plantation with trees averaging 9-15 inches in diameter.

Community 09-28-20-15

Community 09-28-20-15 is an old field.

Community 09-28-20-16

No access provided. Based on photo interpretation, Community 09-28-20-16 appears to be a CD-quality oak savanna-woodland.

Community 09-28-20-19

Community 09-28-20-19 is an old field succeeding to brushland.

Landscape Unit #11

Summary Table for Landscape Unit #11

Site ID	Community ID	Community Type	Quality Ranking
91	09282012	Mixed Deciduous/Coniferous Plantation	NA
92	09282013	Conifer Plantation	NA
93	09282014	Conifer Plantation	NA
95	16282021	Oak Savanna/Woodland	D
96	09282017	Old Field/Brushland	NA
173	16282020	Bedrock-Bluff Prairie/Oak Savanna Restoration	NA
174	16282022	Oak Woodland	D
175	16282023	Old Field	NA
176	16282024	Dry Oak Forest	C
177	16282025	Deciduous Woodland	NA
178	16282026	Mesic Oak Forest	CD
179	16282027	Floodplain Forest	C
180	16282028	Conifer Plantation	NA
195	17282010	Dry Prairie (Bedrock Bluff Subtype)	C

Landscape Unit Rankings

Ecological Ranking: This landscape unit contains a large contiguous area of oak forest and woodland as well as a large section of floodplain forest along Valley Creek. Most of the communities in this area are of moderate to low quality and appear to have been extensively grazed in the past. A large section of this area near the Lake Edith outlet was not surveyed due to lack of access, so overall quality is based on what is visible from photo interpretation. The ecological ranking for this landscape unit is moderate.

Wildlife Habitat Ranking: This landscape unit contains a good diversity of different wildlife habitat types including wetland, forest/woodland and prairie. The Valley Creek corridor is particularly important as fish and wildlife habitat. This corridor includes a meandering reach of Valley Creek that is in many places well buffered by floodplain forest. The floodplain forest provides thermal protection to the fish and invertebrate community by providing shade during the warm summer months. In addition, this reach contains considerable woody debris within the stream channel. Woody debris helps to support the aquatic food chain by creating a greater diversity of instream habitat (e.g., pool scours) as well as serving as both a food source and substrate for production of aquatic plants. The Valley Creek Corridor also provides a high direct link to the St. Croix River Valley, thus providing a dispersal route for a variety of mammals, birds, reptiles and amphibians. This landscape unit is given a high wildlife habitat ranking.

Rare Features Ranking: Several bedrock bluff prairies are shown on the *Natural Communities and Rare Species, Washington County Map* (MN DNR, 1990). Although no records exist for rare plants or animals within this landscape unit, the probability is high that species known to occur in adjoining areas occupy this landscape unit. This landscape unit is assigned a rare features ranking of high.

Stewardship Recommendations

1. Cut and remove woody species including smooth sumac, prickly ash, common buckthorn, eastern red cedar and pin oak) from the prairies. All woody material should be taken off site

and burned or otherwise, disposed of. Removing woody vegetation will help to keep controlled burns cooler, thus helping to protect prairie species sensitive to intense heat. Once woody vegetation is removed, conduct spring or fall burns to set back cool season introduced grasses and control reestablishment of woody trees and shrubs.

2. Bedrock bluff prairies are very sensitive to even foot travel due to the steep slopes and shallow, friable soils. Avoid trails, roads or other disturbances to the prairies.
3. Belwin has done an excellent job of restoring the presettlement oak savanna and prairie once common in Afton. Private landowners adjacent to Belwin restoration sites may wish to consider extending management efforts to their own property where it abuts Belwin restoration areas.
4. Encourage landowners along Valley Creek to maintain as wide a riparian buffer as possible. If the riparian area is currently sod or other cultural vegetation, consider reestablishing native floodplain forest trees, shrubs and groundcover grasses and forbs. This vegetation will not only improve fish and wildlife habitat but will help mitigate the effects of streambank erosion.
5. Leave dead and down trees in the stream channel to provide for fish and wildlife habitat.

Community Descriptions

Community 09-28-20-12

No access provided. Based on photo interpretation, this community is a mixed black locust-conifer plantation.

Community 09-28-20-13

No access provided. Based on photo interpretation, this community is a conifer plantation.

Community 09-28-20-14

Community 09-28-20-14 is red pine plantation with trees averaging 9-15 inches in diameter.

Community 09-28-20-17

Community 09-28-20-17 is an old field succeeding to brushland.

Community 16-28-20-20

The MNDNR Natural Heritage program mapped this area as part of MCBS Site #64. This community was identified as bedrock bluff prairie dominated by side-oats grama, hairy grama, *Mulenbergia cuspidata* and Prairie dropseed along with a low diversity of native forbs. During the 1988 survey, this community was given a C quality ranking by DNR Ecologists.

This community occurs on a rocky, very steep (30 to 40%) southwest-facing slope on sandy soil, over sandstone that is often exposed, especially near the top of the hillslope. Based on conversations with Belwin Staff, woody species, particularly eastern red cedar, were removed to reestablish native goat prairie and oak savanna. The slope is covered with sprouting buckthorn and black cherry regeneration. Common ground layer species included horse-gentian, aromatic aster, gray goldenrod, little bluestem, Indian grass, Canada wild rye, Kentucky bluegrass, and smooth brome. Scattered, desirable oak savanna species, including bur oak, pin oak and trembling aspen were retained and presently occur as scattered individual trees. These residual

trees, many of which are small, knarled and of open grown form, provide a good example of what many of the presettlement oak savanna communities must have looked like.

Assuming that follow-up herbicide treatments and prescribed burns are scheduled, this restoration project could provide an excellent example of dry oak savanna/goat prairie at a highly visible location.

Community 16-28-20-21

The MNDNR Natural Heritage Program mapped this area as being part of MCBS site 64. During the DNR survey, ecologists described the crest of the ridge as bedrock bluff prairie patches within juniper, aspen, and oak woodland. Community 16-28-20-21, which includes the MCBS mapped bedrock bluff prairie, is mapped as an oak woodland/savanna located on a steep, southwest-facing ridge of sandy soil over limestone/sandstone outcrop. Near the crest of this ridge, there are numerous openings where smooth bedrock is present. Historically, this ridge probably contained oak savanna on the middle slopes and goat prairie on the top of the slope. Today, numerous, small prairie openings dominated by graminoids are scattered along the crest of the ridge. Elsewhere the community is a dense thicket of mostly oak and eastern red cedar. The canopy species include widely scattered, large-diameter bur oak averaging 14 to 20 inches in diameter. Other scattered species in the canopy include pin oak, paper birch, American elm, black cherry, red maple, and white pine. Beneath the trees noted above, eastern red cedar are dominant, along with occasional patches of trembling aspen. Buckthorn almost completely dominates the shrub layer, and is accompanied by occasional tree regeneration, including bur oak grubs. Ground layer vegetation is mostly bare under the buckthorn and cedar, except in the small prairie openings. These prairie patches include little bluestem, side oats grama, Indian grass, prairie dropseed, plains muhly grass and dotted blazing star. At the time of the survey, it was difficult to ascertain the true diversity of forbs, however during previous DNR surveys, forb diversity was noted as being poor. The ridge top within this community includes one of the best vistas within the City, providing spectacular views of Valley Creek below.

Disturbance Indicators: Despite the presence of bedrock bluff prairies, the majority of this site is dominated by buckthorn and eastern red cedar. The remaining prairie openings have low species diversity and in a few years, will likely be lost to woody encroachment. Restoration of this site is highly recommended! The quality ranking for this community is D.

Community 16-28-20-22

Community 16-28-20-22 is an oak woodland-brushland dominated by 8 to 10-inch diameter bur oak, paper birch, basswood, and American elm. This community exists on a very steep south-facing slope of thin, sandy soil over limestone outcrop and talus. Large areas within this community contain dense, impenetrable thickets of eastern red cedar. The shrub layer consists of round leaved dogwood, buckthorn, chokecherry, poison ivy, and amur maple. The ground cover layer is mostly absent due to the dense shrub layer.

Disturbance Indicators: This community is assigned a quality ranking of D due to the presence of invasive shrubs and trees.

Community 16-28-20-23

Community 16-28-20-B is an old field dominated by nonnative grasses.

Community 16-28-20-24

Community 16-28-20-24 is a dry oak forest dominated by red oaks with average diameters of 12 inches. This community borders a large ravine that is generally stable. A small trail runs up the

grade of this ravine. Patches of quaking and big-toothed aspen clones are scattered throughout the community as well. Subcanopy species include paper birch, black locust, and butternut. Buckthorn dominates the shrub layer, accompanied by prickly gooseberry, red maple, prickly ash, black cherry, green ash, and Tartarian honeysuckle. Ground layer herbaceous species are not as sparse as on some of the comparably dry sandy oak forests in this area and include common pyrola, white snakeroot, sweet scented bedstraw, and pointed-leaved tick-trefoil. Ground layer species also include a graminoid cover of Pennsylvania sedge.

Disturbance Indicators: Ground layer flora is fairly diverse despite the persistence of invasive species such as buckthorn, prickly ash, and Tartarian honeysuckle. Black locust, which was planted to the west of this community is present in a few places; however is not currently invading this community. This community includes some fairly large red oak trees. We have assigned a quality ranking of C.

Community 16-28-20-25

Community 16-28-20-25 is a 50 to 60 year old mesic woodland dominated by quaking aspen, basswood, American elm, and black cherry. Buckthorn, green ash, prickly gooseberry, and red cedar comprise the shrub layer. The south portion of this community transitions into almost pure black locust. Ground layer vegetation consists of Pennsylvania sedge, tick-trefoil, white snake root, common strawberry, and common pyrola.

Community 16-28-20-26

Community 16-28-20-26 is a mesic oak forest with a diverse mixed canopy of 12 to 18 inch diameter pin oak, black cherry, elm, basswood, and paper birch. Shrub layer species include buckthorn, black cherry, amur maple, round leaved dogwood, Tartarian honeysuckle, prickly ash, and poison ivy. Scattered ground layer graminoids include muhly grass and Pennsylvania sedge, mixed with herbaceous species such as yellow avens and bur cucumber.

Disturbance Indicators: This community lies just south of some agricultural fields, and includes some residential areas. The shrub layer has traditionally contained many native species, and over the years has become dominated by invasive species such as buckthorn, Tartarian honeysuckle, prickly ash, and amur maple. For these reasons we assigned a CD quality ranking.

Community 16-28-20-27

Community 16-28-20-27 is a floodplain forest composed of black willow, silver maple, paper birch, American elm, cottonwood, black cherry, and black ash. The shrub layer consists of buckthorn, Tartarian honeysuckle, wild raspberry, common elder, and young butternut trees. A fairly diverse ground layer includes herbaceous species such as Virginia waterleaf, tick-trefoil, dame's rocket, lopseed, white snake root, motherwort, violets, creeping charlie, and wood fern. Ground species also include graminoids such as Virginia wild rye, wood reedgrass, and sedges.

This community includes riparian areas along Valley Creek dominated by wet meadow vegetation. Some of the species present include giant manna-grass, rice cut-grass, *Carex stricta*, and probably early spring species associated with seepage areas such as marsh marigold and skunk cabbage. This floodplain forest provides excellent riparian habitat for Valley Creek in the form of thermal protection, vegetation hanging over the bank and from numerous, woody debris that contribute to pool development, macroinvertebrate substrate and overhead cover.

Disturbance Indicators: Valley Creek Trail Road bisects the center of this community. There are also some residential areas scattered throughout this community. The shrub layer of this area may have been historically dominated by more native species, and has come to include more

invasive species over the years. However, the ground layer has retained a fairly high species diversity, and therefore we have assigned this community a C quality ranking.

Community 16-28-20-28

Community 16-28-20-28 is a conifer plantation dominated by red pine averaging 9-15 inches in diameter.

Community 17-28-20-10

Community 17-28-20-10 is a good quality dry-mesic prairie (bedrock bluff subtype) that was identified by the MNDNR Natural Heritage Program as MCBS Site #66. This prairie ranks as the best quality prairie along Valley Creek and is probably only second in quality to the Bissell's Mounds or Belwin gravel pit prairie, which is located in Section 15. The description provided here is taken from excerpts of the 1987 MCBS survey and from survey work completed as part this project.

This prairie community is located on a gently sloping hilltop and steep, south-facing bluff overlooking Valley Branch Creek. This is one of the more visible prairies within the City of Afton and can be viewed while driving down Valley Creek Trail. The upper portion of the prairie is somewhat mesic and dominated by little blue stem, prairie dropseed, hairy grama, porcupine grass, big bluestem and Indian grass. The lower portion of the prairie is much steeper with a very thin covering of soil over bedrock, eventually giving way to all bedrock outcrop. This portion of the prairie is much dryer and contains brushy patches of eastern red cedar, buckthorn and smooth sumac. There are numerous, small prairie openings scattered among the brush with a thin covering of little blue stem, plains muhly, and side oats gramma. This prairie was not surveyed at a time when the full compliment of forbs could be inventoried but some of the species noted include heath aster, silky aster, aromatic aster, gray goldenrod, hoary puccoon, butterfly milkweed, leadplant and prairie bush clover.

Disturbance Indicators: Since the 1987 DNR Survey, this prairie appears to have deteriorated due to invasion by woody shrubs and introduced grasses. Canada bluegrass and smooth brome, although not dominant throughout the prairie, have encroached on the edges and would eventually take this prairie over. In addition, smooth sumac, common buckthorn and eastern red cedar are slowly encroaching, especially on the lower slopes. Because of the thin, easily erodible soils, this site is very sensitive to even human foot traffic. This community was given a B quality ranking during the 1987 DNR survey. We have downgraded the quality ranking to C due to the extent of invasive species.