

# Iowa City Natural Areas

## Inventory, Management Needs and Assessment

February, 2016



CITY OF IOWA CITY

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## **Executive Summary**

Iowa City's natural areas need coordinated management and long-range planning. Qualified personnel with an understanding of ecology and ecosystem functions, prescribed fire methods and issues, invasive species identification and control, the ability to identify native plant, animal and insects and soil types are needed to oversee this effort. The City's natural areas are impacted by invasive species, several are in need of prescribed burning, two areas have required mitigation reporting and many of the areas need comprehensive species inventories and a current management plan. The City owns about 1000 acres of prairie, wetlands, and forested areas within 12 different properties. Of this acreage, 61% (484 acres) has been created or acquired by the Public Works Department (PWD) over the last 12 years for storm water management, well-head protection, or wetland mitigation projects. Seven of these areas were created as public works projects, including planting of 230 acres of prairie and wetlands as well-head protection at the Water Plant, development of 140 acres of Peninsula Parkland as well-head protection, 52 acres of constructed wetlands at Sycamore Greenspace as a storm water management project, and several wetlands built to fulfill wetland mitigation obligations. Neither the Public Works department or the Parks and Recreation Department have had funding for qualified personnel to focus on the management of these critical areas. The City has invested at least \$8 million dollars in purchase, construction, and maintenance in these areas and funding is necessary at this time to focus on the effort in controlling invasive species, inventorying vegetation and other activities necessary to properly manage these areas. If efforts towards coordinated maintenance are not increased, these areas are likely to lose significant portions of their functional, economic, recreational and aesthetic value.

Natural areas are vital to the City for a variety of reasons. Wetlands and forested areas along rivers and streams help reduce flood impacts, and prairie and forests absorb rainfall, deter runoff and reduce soil erosion. These areas also sequester atmospheric carbon and thereby contribute to the City's efforts to reduce greenhouse gasses. Local schools, organizations and families use many of these areas for outdoor educational, an especially important benefit to young children who are spending less time outdoors today. These areas also enhance the City's quality of life by providing recreational areas for citizens to walk, bike, bird watch or enjoy in other ways. A proactive effort by the City Administration to provide dedicated oversight for the management of

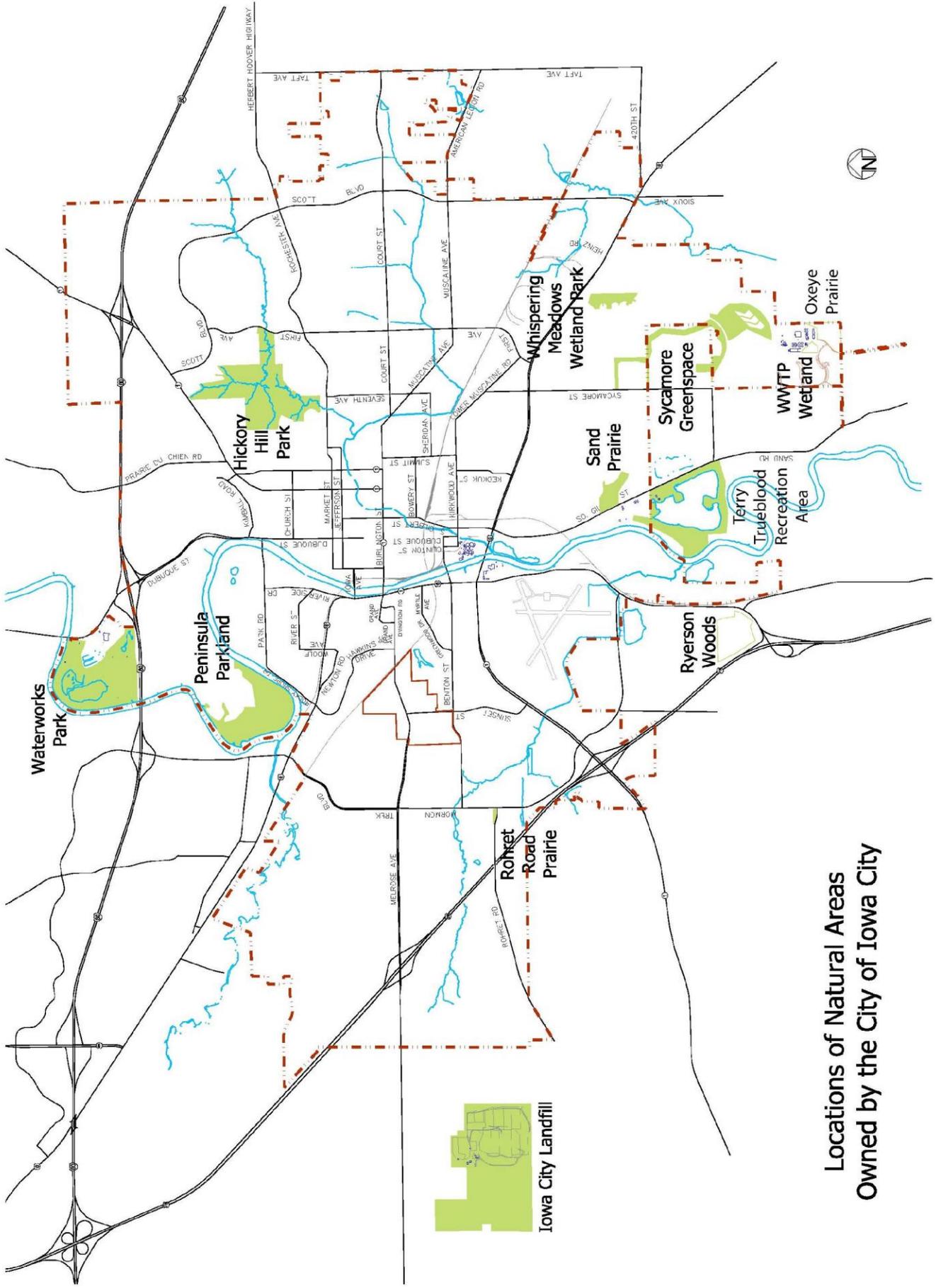
the City's natural areas will protect and enhance the City's investment in these areas and continue to make these valuable resources available to the citizens of Iowa City.

## **Introduction**

The City of Iowa City owns almost 1000 acres of natural areas consisting of prairie, wetlands, forest and riparian (along a stream or river) areas. This report assembles available information on these areas' location, size, condition, management plan status, vegetation type and other characteristics and considers how these areas can be best managed and maintained. The City's natural areas are under the management of either the Public Works or Parks and Recreation Departments and include native vegetation as well as constructed prairies and wetlands. Some of these areas are located geographically within city parks, while others are non-park natural areas (Table 1, Figure 1).

Over a hundred years ago, 83% of Iowa's land was covered with prairie vegetation while forests and wetlands occupied the remainder of the land (Figure 2). In a span of about 70 years, ending in about 1900, 97% of our state was converted to farmland. Because of this dramatic and rapid transformation very little of the original ecosystem exists, and what remnants have survived are unique and valuable resources to our community.

Johnson County's early historic landscape was also dominated by prairie prior to European settlement (Figure 3). Forests were present along most valleys where rivers or extensive wet areas protected them from fire. Wetlands and lakes were small and concentrated along valleys.



Locations of Natural Areas  
Owned by the City of Iowa City

# Environmental Value of Natural Areas

Natural areas provide many essential functions including:

- Reducing floods and flood impacts
- Protection of water quality and areas around well heads
- Decreasing soil loss and erosion
- Improving soil quality and fertility
- Carbon sequestration
- Providing high-quality habitat for a variety of organisms
- Providing species diversity and protecting endangered or threatened species
- Increasing opportunities for a wide variety of outdoor activities for citizens of Iowa City
- Education opportunities

**Table 1.** Iowa City Owned Natural Areas: Acres & Vegetation Types

Location	Acres	Vegetation type		
		Prairie	Wetland	Forest or Riparian
Sycamore Greenspace	106	x	x	
Waterworks Park	230	x	x	x
Peninsula Parkland	140			x
Rorhet Road Prairie	1.3	x		
Terry Trueblood Recreation Area	207			x
Sand Prairie	38	x		
Whispering Meadows Wetland Park	18		x	
Hickory Hill Park	185	x	x	x
Ryerson Woods Park	49	x		x
Oxeye Prairie	22	x	x	
Wastewater Wetland	4	x	x	
Iowa City Landfill Wetland	35		x	x

**Total Natural Area Acreage: 1035.3**

## Value of Iowa City's Natural Areas

The table below is a summary of the purchases made by the City since 1985 of the land which is considered as City-owned natural areas. The total land value is estimated to be equivalent to approximately \$6 million. Of these properties, only three could be considered as having predominantly native vegetation (Sand Prairie, Ryerson Woods and Hickory Hill Park). Terry Trueblood Recreational Area has a few areas that could be considered native, although the property is an abandoned quarry and has been altered due to human activity. The remainder of the properties were specifically constructed as wetland or prairie ecosystems, many of which were initiated as Public Works projects. A total of 49% of the City-owned natural areas acres were constructed as specifically for projects such as well head protection at Waterworks Park, Sycamore Greenspace as a stormwater management project, and the wetland at the landfill as a wetland mitigation project. All of these properties have an economic value for the city, not only because of the land purchase, but also because of the construction costs, and the investment in seeding and planting these areas. The economic investment for these properties is only one reason to maintain these properties, but continued investment is necessary in order to keep the intended functions of these ecosystems operational.

**Table 2.** Economic Value of Iowa City's Natural Areas

	# of Acres	Actual Cost of Property	Year Purchased	Est. 2008 Value at \$6000/ac	Status	Construction Cost
Sycamore Greenspace*	52	\$776,000	2001	\$312,000	Constructed	\$1,833,000
Waterworks Park*	230	\$3,278,420	2003	\$1,380,000	Constructed	–
Peninsula Parkland*	140	\$1,346,100	1998	\$840,000	Constructed	–
Rorhet Road Prairie	1.3	\$0	1995	\$7,800	Constructed	\$4,000
Terry Trueblood Recreation Area	207	\$353,000	2006	\$1,242,000	Native	–
Sand Prairie	40	\$22,000	2005	\$240,000	Native	–
Whispering Meadows Wetland Park	18	\$0	1994	\$108,000	Constructed	\$126,000
Hickory Hill Park	185	–	1967	\$1,110,000	Native	–
Ryerson Woods Park	49	\$105,913	1985	\$294,000	Native	–
Oxeye Prairie*	22	\$40,615	1992	\$132,000	Constructed	\$5,000
WWTP Wetland*	4	\$7,384	1992	\$24,000	Constructed	\$8,000
Iowa City Landfill Wetland*	35	\$209,650	2008	\$210,000	In planning	–
<b>Total :</b>	<b>983.3</b>	<b>\$6,139,082</b>		<b>\$5,899,800</b>		<b>\$1,976,000</b>

\*Landfill calculated at \$5,990/ac

\*Peninsula calculated at \$9,615/ac

\*WWTP calculated at \$1,846/ac

\*Waterworks Park calculated at \$14,254/acre

**\*Public Works initiated: 484.3**

Percent of total: **49%**

at \$6000/ac "undevelopable land" avg

# Historic Vegetation

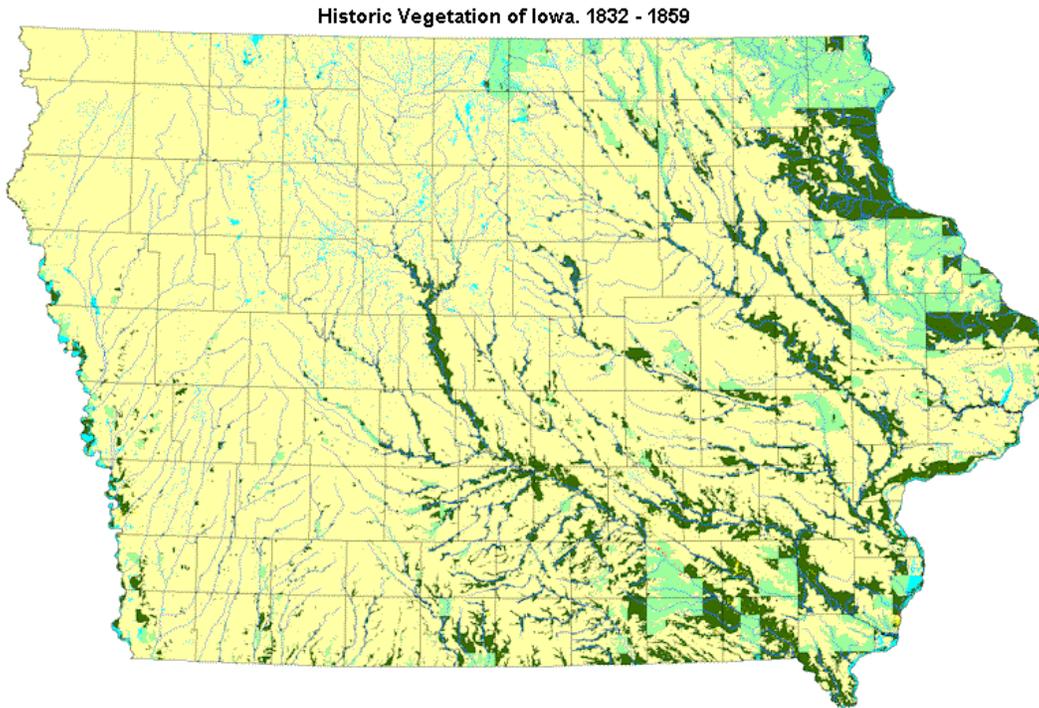
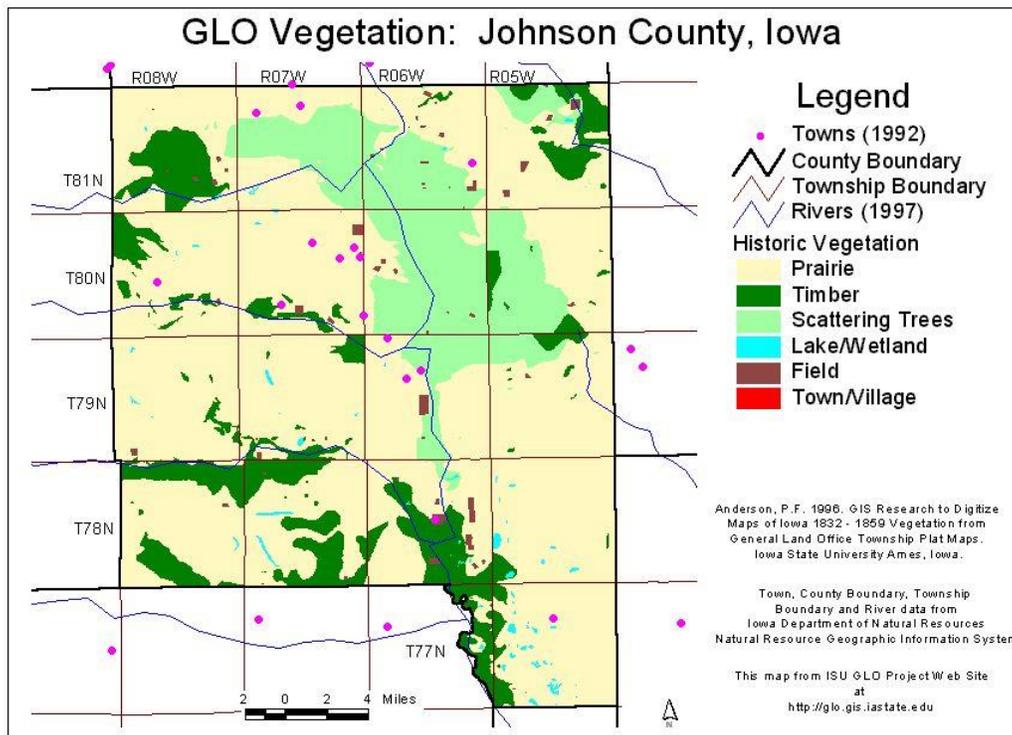


Figure 2. Historic Vegetation of Iowa, 1832-1859.

Yellow = prairie, Green (light and dark) = forest, Light blue = wetlands and water

Figure 3. Historic Vegetation of Johnson County.



## **Vegetation Community Functions**

### *Prairies*

Prairie vegetation was an important factor in the formation of the fertile Iowa soils that support today's agricultural economy. Prairie plants have very deep roots (up to 20 feet), which hold soil in place, soak up rainwater, aerate the soil and create habitat for an enormous number and variety of microorganisms and insects. This is a stark contrast to corn and soybeans, the dominant crops now growing on these soils, whose shallow root systems and cycle of planting and harvests have increased runoff, soil erosion and habitat loss. Iowa's native prairies contained around two to three hundred different plant species, varied in composition across the landscape, and created habitat to a great number of animals and insects.

### *Wetlands*

The state also had a large number of wetland areas prior to European settlement. Wetlands provide valuable water quality functions by cleaning and filtering stormwater runoff. They reduce flooding by providing areas for runoff storage. One acre of wetland can store one up to one and a half million gallons of floodwater. Wetlands also provide habitat for a great diversity of organisms, support diversity of plant species and are considered areas of high biological productivity. Although wetlands only occupy about five percent of the land area in the contiguous United States, they are home to 30 % of our plant species. Only about 11% of Iowa's original wetlands exist, the other 89% have been replaced by cropland and urban development.

### *Forests and Riparian Areas*

By the year 2000, Iowa had lost over two thirds of its original forested area. Today's Iowa forests are dominated by different species than those of the past. The elimination of natural fires, the introduction of invasive species, and disease have radically altered forest communities in the state. Today's forests are degraded and have become denser relative to native forests. Forests suppress soil erosion, increase water infiltration and provide habitats for a wide variety of plants and animals

Many riparian areas (areas along streams and rivers), are also forested and share similar problems. Riparian vegetation is adapted to flooding and accompanying flood sediment

accumulation. Riparian areas are important in reducing floodplain and channel bank erosion and flooding.

## **Insect and Animal Community Functions**

### *Insects*

Insects are potentially the most endangered group with Iowa's changing ecosystem, although they dominate species numbers compared to other organisms. They are probably the least understood group yet they pollinate many species of plants and act as a food source to other animals. There are 100 species of butterflies in Iowa and 40 of the species live only in prairie environments and many are dependent on specific host plants. Since only 0.1% of our native prairies exist, their habitat is so greatly reduced that butterflies are severely impacted. Nearly half of Iowa's butterflies are in peril of declining or disappearing and 32 species are listed as endangered, threatened or special concern species. Dragonflies and damselflies are thought to be declining tremendously and a few have already disappeared from Iowa. Native bee populations are also important, due to the decline of honeybee populations.

### *Reptiles and Amphibians*

Nearly a third of Iowa's 28 species of snakes are listed as endangered, threatened or a special concern species. Many other snakes have declined in numbers as well. Amphibians have been falling in numbers and increasing deformities have been found in their populations. Numbers of American toads were noted to have declined by one third by the late 1990's. Less than one third of Iowa's 76 amphibians and reptiles are predicted to disappear in the next 50-100 years, with the other two thirds expected to decline. One example of a protected reptile species is the ornate box turtle that was found in Sand Prairie in Iowa City.

### *Mammals*

Bison, elk, black bears, cougars, and grey wolves disappeared from Iowa in a few decades after 1800. Otter, bobcat, badger, coyote and beaver populations have been reduced significantly. Many of these animals have been reduced or eliminated as predator elimination or due to hunting or trapping. The mammals that have remained are generally smaller species that are not predators and do not threaten humans such as shrews, moles, mink, foxes, raccoons, skunks, rabbits, squirrels, muskrats, woodchucks, squirrels, and cottontail rabbits. Some mammals have increased in abundance with the development of agriculture including cottontails, spotted

skunks, opossums, the thirteen-lined ground squirrel and deer. Today mammals face habitat loss and fragmentation, cars, pollution, pesticides, and domestic predators.

### *Birds*

Of the 900 birds known in North America, over 400 bird species have been seen in Iowa. Birds benefit ecosystems by eating weed seeds, pollinating flowers, eating rodents and insect pests and dispersing seeds. But Iowa bird life may be in trouble as well. Several abundant birds declined or disappeared after European settlement. Sixteen of our most common birds have seen declines in recent years. Iowa declines are significantly higher than North America averages, and are thought to be due to decreased and fragmented habitats.

## **Natural Areas in Urban Settings**

In the past, natural areas were maintained by fire and other phenomena that human use of the landscape has stopped or significantly altered. Humans have introduced exotic species, suppressed fire, fragmented habitats, altered drainage patterns and created large amounts of impervious surfaces.

Natural areas promote education and civic involvement. Enthusiastic citizens have been responsible for the upkeep of Hickory Hill Park, have participated in stream bank clean ups and have created species lists for some of these areas. Iowa City residents are very interested in learning more about these areas and their willingness to volunteer can be a valuable asset to maintaining these areas. Volunteerism is on the rise and this might be one way to both connect the community with the outdoors and to undertake some of the work needed to maintain these areas.

Students from all ages, including students from the University of Iowa and the Iowa City Community Schools use these areas for outdoor education purposes as well. The term “nature deficit” is currently being used to refer to the lack of contact with nature children have today because of the increased time spent indoors and increased use of electronics. Experiencing nature within one’s own community is a very beneficial experience, especially for children, who will be the future caretakers of the environment. With the increasing cost of transportation it is becoming even more important to maintain the quality of our local natural areas.

The goal of natural area management is not to create pre-settlement conditions, but to restore and maintain areas that are vital to the function of our urban landscape. By doing so, we have not only a richer and more varied environment that benefits natural flora and fauna, reduces flooding impacts, improves surface and groundwater quality and increases educational and recreational opportunities for the city’s inhabitants.

## Management Plans

It is highly recommended that each City owned natural area have a management plan which is site specific and that each area is thoroughly assessed and evaluated for its condition and needed improvements. Each area needs a written plan which has specific goals for upcoming years, as well as a long term vision for the area.

Each management plan should include:

- Maps of site (location, aerial, topographic, soils, historic vegetation, areas of interest, areas needing improvement, location of invasive species, etc.)
- History of land use and prior maintenance
- Complete species inventory, vegetation, insects, mammals, birds (updated regularly)
- Invasive species specific to the site and plan for their removal (updated regularly)
- Prescribed fire plan, if necessary
- Timber stand improvement plan, if necessary
- Recommended methods to increase diversity or improve quality in other ways (updated regularly)
- List of management actions performed (updated yearly)

*Table 3. Management Information Available*

Location	Management Plan	Mitigation Report(s)	Species inventory	Burn Plan
Oxeye Prairie	Yes, 2008	–	Vegetation	Yes
WWTP Wetland	In Progress	–	Vegetation	Yes
Iowa City Landfill Wetland	Yes, 2013	Yes	–	–
Sycamore Greenspace	No	Yes, several	Birds	Yes
Waterworks Park	No	–	–	–
Peninsula Parkland	No	–	Vegetation (1995)	–
Rohret Road Prairie	No	–	–	–
Sand Prairie	Yes, 2005	–	Vegetation	Yes
Whispering Meadows Wetland Park	Yes, 1995	–	–	–
Terry Trueblood Recreation Area	No	–	Birds	–
Hickory Hill Park	Yes, 2003&2007	–	Vegetation, Birds	–
Ryerson Woods Park	In progress	–	Vegetation	–

## Management Methods

Maintenance practices for natural areas are intended to be implemented on a routine basis and are dependent on previous maintenance, and current conditions.

Common procedures used to maintain these areas are:

- Removal of invasive species
- Selective tree and brush removal
- Burning
- Mowing
- Seed collection (for re-dispersal)
- Seeding and re-seeding
- Supplemental planting

Qualified personnel must first understand the basic principles of ecology and identify the floral and faunal species present to evaluate the current conditions of the site. This information is critical to evaluate what management practices should take place and also how these practices will affect these areas. A species inventory should be ongoing and updated frequently to identify any changes that will guide future management. The effect and benefit of each maintenance practice should be noted for each site. Management activities may change throughout time, depending on what practices are involved and how often they are implemented.

### *Removal of Invasive Species*

Invasive species are an issue in all the City's natural areas. These species can be either native or non-native and can take over a natural area, crowding out desired species. Invasive species out compete the desired species for nutrients, light, and water and can spread rapidly through areas if not monitored and managed. Invasive species can also include insects, such as the Emerald Ash Borer, Japanese Beetle, and other organisms in all biological categories. Below is a list of some of the numerous invasive plant species growing within Iowa City.

#### ***Invasive plant species observed in Iowa City natural areas:***

Reed Canary Grass	Burdock	Willows
Sweet Clover	Turf grass	Japanese Knotweed
Garlic Mustard	Cattails	Autumn Olive
Wild Parsnip	Honey Locust	Cottonwood
Poison Hemlock	Box Elder	Honeysuckles
Curly Dock	Thistles-several sp.	Multiflora Rose
Purple Loosestrife	Crown Vetch	Buckthorn
Poison Ivy	Birdfoot Trefoil	Queen Anne's Lace

Each of the above species needs to be correctly identified and then controlled appropriately. Control methods specific to each species can include mechanical removal, moving, using a pesticide or a combination of these methods. Some of these invasive species take much effort and several years to eradicate due to re-growth or large numbers of viable seeds which persist for years in the soil.

### *Tree and Brush Removal*

Tree and brush overgrowth can encroach into prairie areas and shade out vegetation that requires full sun. Wooded areas should be thinned out so trees are not crowded for space, light, and nutrients and so seedlings can grow. Tree species need to be identified and inventoried so that desirable trees may be selected over poorer quality species dependent on the area.

Shrubs can also invade and shade areas where sunlight is desired. Many invasive shrubs are present in Iowa including honeysuckle, multi flora rose, buckthorn, and autumn olive. These shrubs are not native and can multiply quickly and out compete desired native flora.

### *Burning*

Prescribed burning in natural areas is a well established practice in the Midwest to improve the quality of prairies and even wetland areas. Burning is one method to reduce trees and shrubs encroaching on prairies. Burning also decreases invasive grasses like brome while prairie grasses benefit from burning. Regular burning reduces weeds and invasive species while promoting desired native species.

Although burning can be very beneficial to native plantings, care must be taken not to burn too often. Some species such as insects, which cannot escape fire do not have adequate numbers to reproduce. Most natural areas are fragmented habitats without large areas for species to spread and move throughout. Less than one third of each natural area should be burned each year.

### *Mowing*

In areas newly seeded, mowing can be used to reduce the height of annual weeds while young prairie plants get established. Mowing should occur up to 5 times during a growing season the first season after planting. Annual weeds such as common ragweed, giant ragweed, and several

species of foxtail can be cut so as to not outcompete young prairie seeding. Also, some invasive species such as sweet clover can be cut before going to seed to stop the spread of more seed. Mowing can be any time during the growing season, but is difficult during wetter periods.

### *Seed Collection*

Desirable native species can be propagated and spread to other areas by seed collection. Plant species may have specific requirements for propagation such as time of year the seed is collected, how the seed is stored, and when seed is planted, but this is an inexpensive method to increase species diversity, especially in prairies and wetlands.

### *Seeding*

Seeding is used in both newly constructed areas as well as to increase desirable plants in areas already established. Where plant diversity is low, it can be increased by adding more prairie or wetland seed. Care must be taken to choose the correct seed mix, based on soil types and the moisture conditions of the specific site.

### *Supplemental Plantings*

Supplemental plantings may be desirable in areas that would benefit from increased diversity. Plantings can be of transplants from other areas or plugs purchased from a supplier of native species.

## Individual Site Status

Some of Iowa City’s natural areas originated within the Public Works Department, either as a mitigation requirement or for well head protection purposes. Other areas lie within already established parks. Public Works has been responsible for the management of those areas near the Wastewater Treatment Plant and the Landfill, but all other areas are under the management of the Department of Parks and Recreation (Table 3) provides a summary of available information about each area.

*Table 4. Available information for individual sites.*

Location	Created or Acquired	Originated by	Managed by	Mitigation Requirement	# of Acres for Mitigation	Conservation Easement
Sycamore Greenspace	2001	Public Works	Parks	Yes	13	Yes, Cell 4 privately owned
Waterworks Park	2003	Public Works	Parks	–	–	–
Peninsula Parkland	1998	Public Works	Parks	–	–	–
Rohret Road Prairie	1995	Public Works	Parks	–	–	–
Terry Trueblood Recreation Area	2006	Parks	Parks	Yes	8	–
Sand Prairie	2005	Parks	Parks	–	–	–
Whispering Meadows Wetland Park	1994	Parks	Parks	–	–	–
Hickory Hill Park	1967	Parks	Parks	–	–	–
Ryerson Woods Park	1985	Parks	Parks	–	–	–
Oxeye Prairie	1996	Public Works	Public Works	–	–	–
WWTP Wetland	2005	Public Works	Public Works	–	–	–
Iowa City Landfill Wetland	2008	Public Works	Public Works	Yes	5	–

## Sycamore Greenspace



**Type:** Wetland and Prairie Restoration, Wetland Mitigation (13 acres)

**Maintenance needed:** Enhancement

**Prior maintenance:** Mowing, shrub plantings, removal small cottonwoods and willows

**Managed by:** Parks & Recreation/Public Works/Lon Drake

**Management plan:** None

Sycamore Greenspace is a 52-acre storm water project constructed in 2001 as a pro-active solution to handle the storm water runoff of a suburban/agricultural neighborhood with a one square mile watershed. The project was divided in two main sections, a narrow corridor consisting of a chain of 22 one-acre intermittent wetlands which flow into a larger 30-acre series of crescent-shaped wetland cells, designed by Lon Drake and engineered by MMS Consultants. The project was not originally built as wetland mitigation, but later counted for mitigation for the Foster Rd. extension and the North Airport development. The fourth (southern most) cell in the project was added in 2005 as a mitigation project for improvements along North Dodge St. and the McCollister Road Extension. The Makada Buffer wetland just north of Lehman Ave. was added in 2008 as mitigation for Lower West Branch Rd. impacts. A 2 ½ mile paved trail was built in 2002, connecting Grant Wood school on the north to the soccer park on the south.

The area was planted with wetland plugs, transplants, and seeded with native prairie seed after completion and has had additional plantings in many of the years since construction. Although there is a wide diversity of nice species here, there are some invasive plants which have increased every year and need to be managed. Young willows and cottonwoods are a growing

problem. Reed canary grass has also been aggressive and occupies a much of the smaller wetland cells. Cattails have rapidly reproduced in some areas which are an indication of fertilizer pollution coming from the cropland uphill to the west of the larger cells.

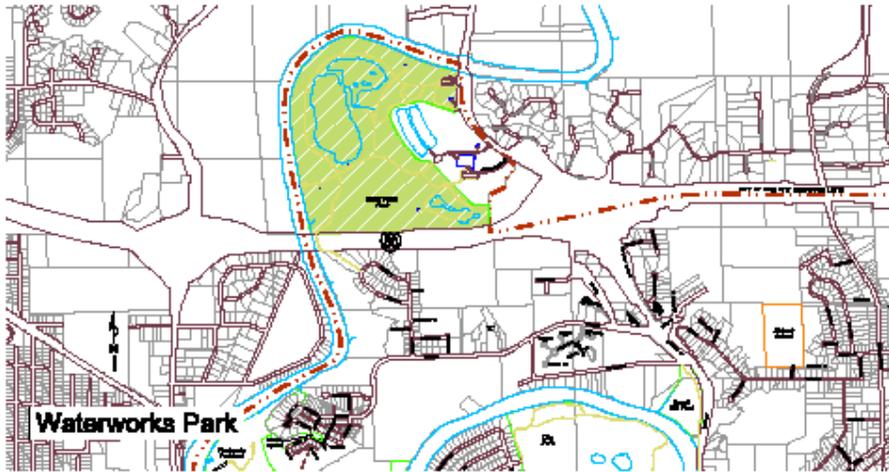
A large variety of animals have made a home here. There have been over 130 bird species, including sandhill cranes, that have been observed in the area and hundreds of waterfowl occupy the wetlands during migration season. Muskrats, frogs, and dragonflies are abundant here and many other animals have been seen at the wetland.

Management Priorities:

- Removal of invasive species, especially cottonwood, willow, and reed canary grass
- Prescribed burning in prairie areas, planting of cell 4, maintaining trees and shrubs
- Add educational signage



## Waterworks Park



**Type:** Prairie and Wetland Restoration

**Maintenance needed:** Routine, burning, invasive species & shrub removal, wetland restoration

**Prior maintenance:** Some prescribed burning

**Managed by:** TBD

**Management plan:** None

This 230-acre park originated in 2003 and is located north of Interstate 80. Prior to its purchase, the site had active 18-acre sand pit operation and 60 acres in row crop. About 95 acres of the property is located within the floodplain and the majority of this area has been converted into restored prairie and wetland. The prairie was planted according to soil type, slope and other factors and consists of dry, dry/mesic, and mesic sections. This 2003 prairie planting included 26 flowering species and 5 native grasses. It is maturing successfully and has many nice species such as Ironweed (*Vernonia fasciculata*), Partridge pea (*Cassia fasciculata*), Prairie sage (*Artemisia ludoviciana*), Wild bergamont (*Mondara fistulosa*), Cup plant (*Silphium perfoliatum*) and Purple coneflower (*Echinacea purpurea*). Native grasses such as Big bluestem (*Andropogon gerardi*) and Side oats gramma (*Bouteloua curtipendula*) are doing well here also. Some invasive species are present and need to be removed, such as Sweet clover (*Melilotus sp.*), Queen Anne's Lace (*Daucus carota*) and foxtail (*Setaria sp.*). Funding for the restoration came from Pheasants Forever, Johnson Co. Heritage Trust, and Environmental Advocates and from a REAP grant provided by Johnson Co. Soil and Water Conservation District.

The two wetland areas were created within the prairie areas and Softstem bulrush and Arrowhead (*Sagittaria sp.*) are present, but also Eastern cottonwood (*Populus deltoids*), Sandbar willow (*Salix interior*) and Reed canary grass (*Phalaris arundinaceae*) starting to encroach into these areas.

Seventeen acres of timber exist on the property. The wooded areas include a riparian woodland area along the Iowa River and two upland forested areas: one in the southern part of the property along Interstate 80, and another on the east edge near Dubuque St. These areas are in need of timber stand improvement.

The park has about three miles of trails through the prairie, which are a part of the Iowa River Corridor Trail network which connects Napoleon Park in the south of town to the Coralville Reservoir, north of Iowa City. This trail goes under Interstate 80 and connects to Peninsula Parkland.

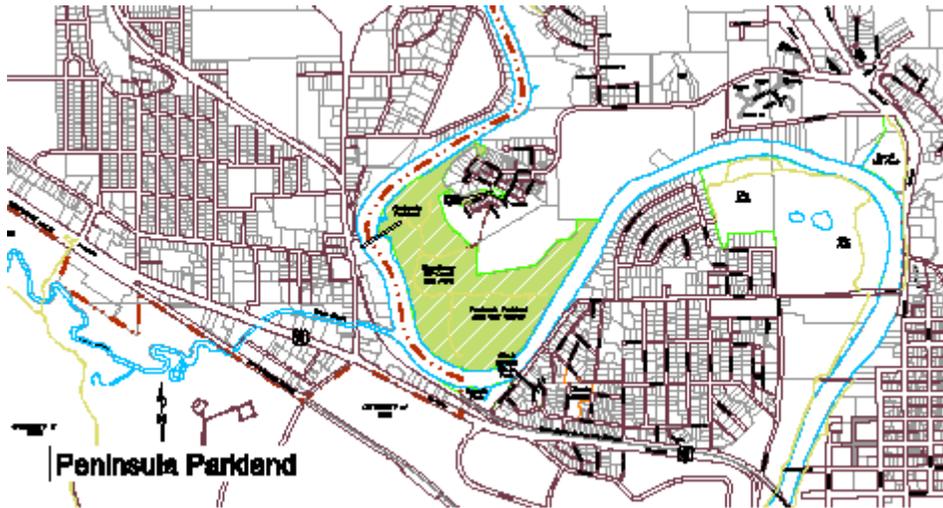
Management Priorities:

- Develop management and long term maintenance plan for the area
- Inventory flora and fauna species, make handout for tour groups
- Removal of invasive species especially reed canary grass and sweet clover
- Install educational signage

**Waterworks Park**



## Peninsula Parkland



**Type:** Riparian wooded area along river

**Maintenance needed:** Routine, mowing, invasive species removal

**Prior maintenance:** Unknown

**Managed by:** Parks and Recreation

**Management plan:** None

This park consists of 140 acres purchased in 1995 as a site for the City's water supply well fields. A concept plan was written by Conservation Design Forum in cooperation with several departments within the City and other agencies. It includes the vegetation history of the area, a vegetation species list, and goals for ecological restoration. One of the first objectives in this plan is to develop a long term management plan to restore the existing plant communities. The historic records show that in 1839, most of the vegetation of the park area was forested by a diversity of trees. Since that time it has been logged, turned into agricultural land, and overgrazed. In some areas, the trees remaining likely date from the time of European settlement and biodiversity still exists. Restoration of these areas is encouraged. This report includes a inventory of the floristic quality (FQI) by calculating the quality of each species present (each species having an assigned number called the coefficient of conservatism) and the total number of species found at the site (50 species were documented). The report states that sites with a Floristic Quality Index of less than 20 are considered severely degraded, while sites with FQI numbers greater than 45 have statewide significance. The FQI calculated for the flora at Peninsula Park was 22, which indicates that the area shows potential for restoration. This number

could be improved with restoration. This park has hiking and biking trails, a 12-acre off-lease dog park, and an 18-hole Frisbee golf course. The Concept Plan includes species and location suggestions for prairie construction at the site.

Management Priorities:

- Develop a management and long term maintenance plan for the area
- Restore native woodland, wetland, and prairie plant communities



## Rohret Road Prairie



**Type:** Prairie Restoration

**Maintenance needed:** Routine, mowing, burning invasive species and shrubs

**Prior maintenance:** Managed by mowing every 3 years

**Managed by:** Parks and Recreation

**Management plan:** None

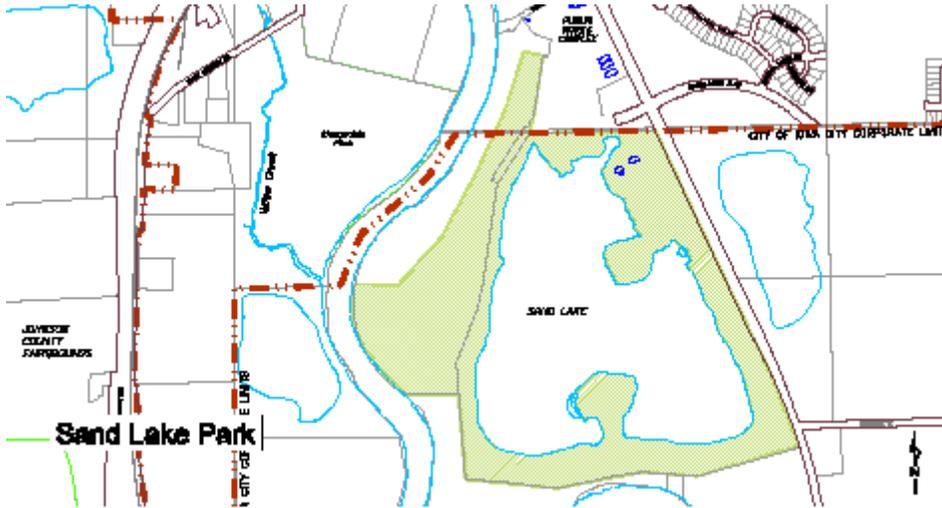
Rohret Road Prairie is a 1.3-acre prairie was planted in late October 1995 near the intersection of Rohret Road and Mormon Trek Blvd. This project initiated by the Iowa City Engineering Department in an effort to reduce maintenance expenses and improve the beauty and wildlife habitat of the urban environment. Engineer Rob Winstead worked on the project in cooperation with the Johnson County Roadside Vegetation Manager, Russ Bennett. The City worked in partnership with the state's Department of Transportation's Living Roadway Trust fund, and a state grant paid for the seed. Maintenance of the prairie has been less expensive than using sod, since the prairie does not require much mowing now that it is established. The prairie was planted with 50 varieties of prairie flowers and 5 prairie grasses with varieties which are shorter so not to block visibility. Varieties with long blooming periods were chosen and many varieties have been successful, creating an aesthetically pleasing urban prairie. Illinois bundleflower (*Desmanthus illinoensis*), Prairie dock (*Silphium terrebinthinaceum*), Wild quinine (*Parthenium integrifolium*), and Compass plant (*Silphium lacinatedum*) are just a few of the nice species that grow in this prairie.

Management Priorities:

- Develop a Management Plan for the prairie, including species list & burn plan
- Prescribed burning, can also be used as source for seed collection
- Removal of invasive species, especially sweet clover, ragweed, shrubs, reed canary grass, and shrubs
- Use the area as environmental education by signage



# Terry Trueblood Recreation Area



**Type:** Native forest, reconstructed prairie, constructed wetland

**Maintenance needed:** Routine, planting, mowing, burning

**Prior maintenance:** Mowing, overseeding, honeysuckle removal, mowing of clover

**Managed by:** Parks and Recreation

**Management plan:** None

This area is a 152-acre exhausted sand and gravel pit adjacent to the Iowa River which was acquired in 2006. The City has been developing the park since 2009 and has added a park lodge, trails, concessions and boat rentals. Fishing at the lake is enjoyed by the public year round. A 33-acre forested section between the river and the lake was recently purchased to expand the park, which will allow access to the river. The Parks Division has been active in enhancing native vegetation in the park by over seeding with prairie seed, planting native shrubs and maintaining existing native plantings. Plans are to continue to increase native vegetation in the park. McCollister Bridge was built since the purchase of the land, which allows easier access to the park from the west side of the Iowa River. Members of the Iowa City Bird Club believe this is one of the best birding sites in the area and have observed 153 of number species in the area, although development may reduce these numbers.

## Management Priorities:

- Develop a Forest Management Plan for the wooded section of the part
- Inventory flora and fauna species at the site
- Promote resource management during development to maintain as much native plant and animal habitat and species diversity as possible
- Use the area for environmental education of natural areas
- Add educational signage

Terry Trueblood Recreation Area



## Sand Prairie



**Type:** Native prairie

**Maintenance needed:** Enhancement, burning, tree removal, invasive species removal, replanting

**Prior maintenance:** Shrub cutting, burning

**Managed by:** Parks and Recreation

**Management plan:** 2005, Driftless Land Stewardship

Sand Prairie is a 38-acre prairie within the southern Iowa City limits. Due to public concern and neighborhood activism, the prairie was protected from development during the construction of Sandhill Estates. The presence of native prairie species and past aerial photographs strongly indicate that this is a native prairie remnant. It is currently in a very degraded state and is dominated by non-native grasses and encroaching trees. Aerial photographs show that in the 1960's only a few trees were growing on this property, but currently there is a dense stand of locust and other trees in a large section of the prairie. The prairie is located on a sand dune ridge, has very sandy soil, and there is evidence of sand excavation in the past. Many of the species remaining are thorny shrubs and trees due to the effects of past grazing. Much of the native vegetation has been eliminated, but it is possible that the soils on the site could still contain a native seed bank which might be restored by prescribed fire and increased sunlight. In 1998, 51 ornate box turtles (*Terrapene ornata*), were removed from the prairie prior to development of the area to avoid impact to their habitat. The turtles are a threatened species, so a permit was required for the relocation to Chichaqua Bottoms, a reconstructed prairie owned by Polk County Conservation Board. Their relocation was overseen by Tim Tompson, a wildlife biologist from

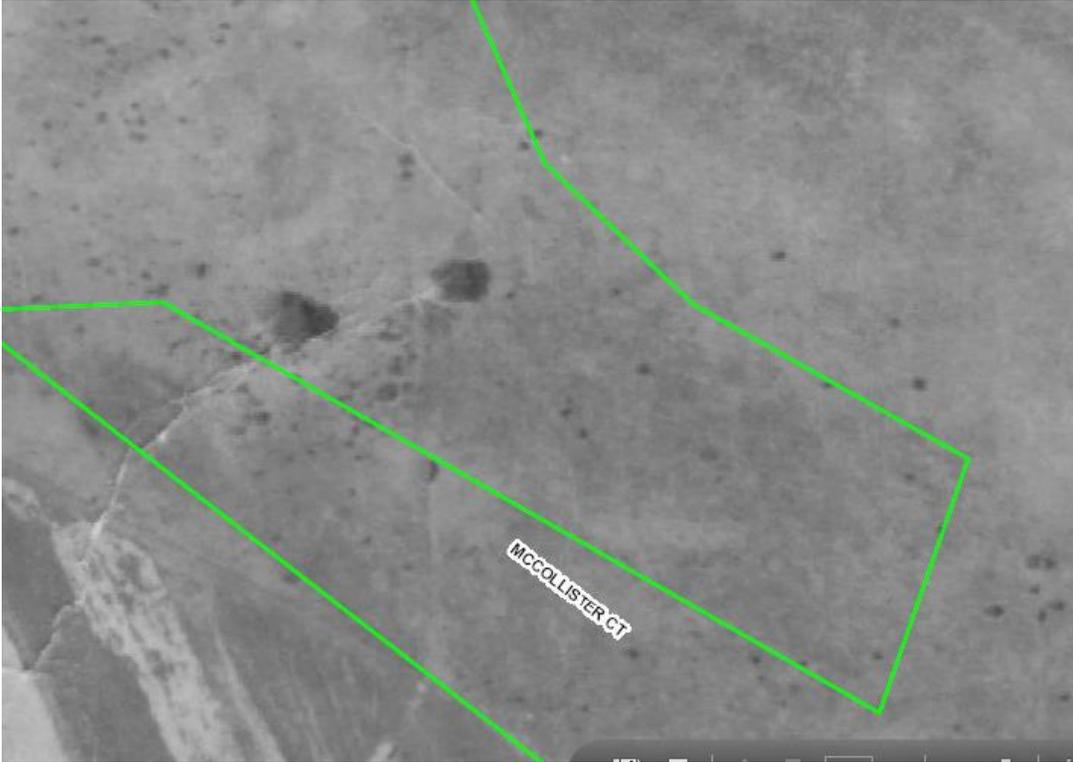
DNR. Drake University professors Tom Rosburg and Keith Summerville are involved in research on the turtles, which are now breeding in their new location. In 2005, a management plan was written by Driftless Land Stewardship in Wisconsin, which includes a plant species inventory and management recommendations. Some trees and brush were cut from the prairie in the summer of 2008, as recommended in the plan. Continued, concentrated effort is needed to restore this valuable prairie remnant, which could be a showcase for conservation of one of Iowa's most important disappearing natural landscapes. Currently, there are no signs to identify it to the public.

Management Priorities:

- Prescribed fire to reduce non-natives and promote native species (burned in 2015 by Earthview Environment)
- Removal of trees and shrubs to restore sunlight to prairie, reseed for native diversity
- Removal of invasive species, especially downy brome (*Bromus tectorum*)



1960



2014



## Whispering Meadows Wetland Park



**Type:** Wetland Restoration with prairie plantings

**Maintenance needed:** Enhancement, burning, invasive species, shrub, and tree removal

**Prior maintenance:** Mowing, shrub cutting

**Managed by:** Parks and Recreation

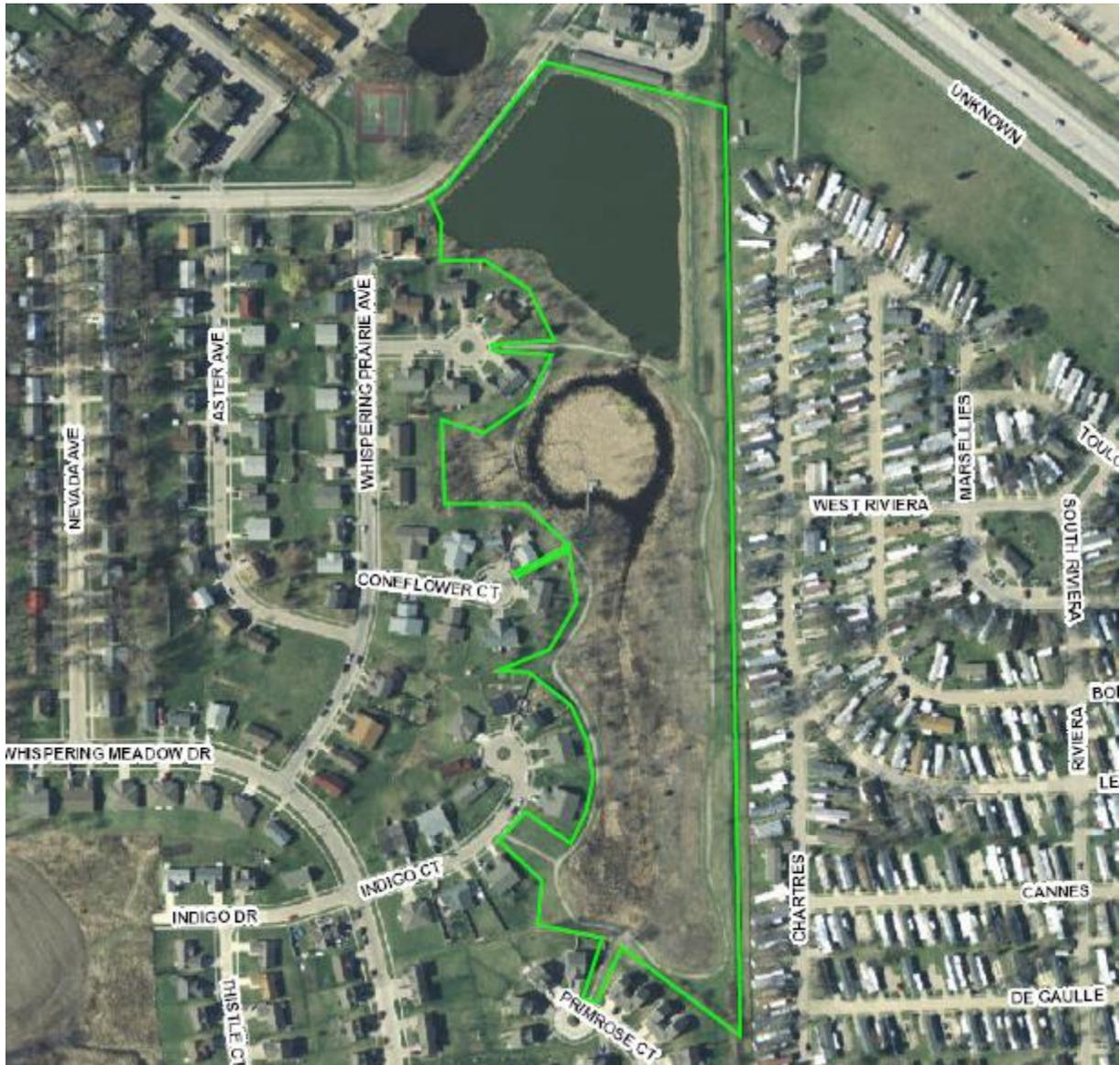
**Management plan:** 1995, Shive-Hattery

Whispering Meadows Wetland Park is a 17-acre park located east of the Whispering Meadows Development in the southeastern sector of Iowa City. In 1989 it was a poorly drained area in row crops containing small wetlands. It was a severely degraded, with a few wetland species present. In exchange for subdivision plat approval and permission to fill nearby wetland areas, CB Development agreed to donate 17 acres to the City for the development of a park. The U.S. Army Corps of Engineers conducted a wetland delineation and identified 3 jurisdictional wetlands in the site, but this site was evidently not constructed as part of mitigation. Lon Drake worked with the City to develop a concept plan for the site, and Shive-Hattery Engineers and Architects, Inc. developed construction plans and specifications for the park with significant modifications. The park was constructed in 1994 with three plant communities: wetland, wet meadow, and mesic prairie. The park was planted by CRM Ecosystems Inc./Prairie Ridge Nursery, and prairie seeding was completed by Olson Brothers Landscaping. The park contains a pond with a boardwalk, and a trail around the prairie area. There is a wide variety of wetland species vegetation in the park, but reed canary grass is also abundant. The butterfly garden and most of the original shrub plantings were lost due to lack of maintenance. Small patches of purple loosestrife appear occasionally at the north end, suggesting a small seed bank. Lon Drake

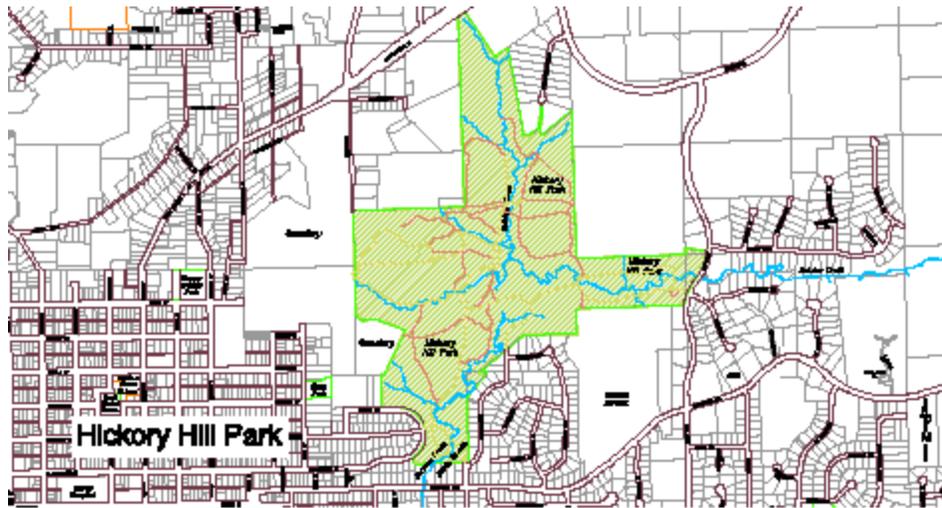
has been controlling the patches by digging them out. Trail maintenance has been a problem at this park and residents in the area complained of beavers taking down trees in the neighborhood in the process of building a lodge, but the lodge has been removed.

Management Priorities:

- Prescribed fire to reduce non-natives and promote native species
- Removal of invasive species, especially reed canary grass
- Trail maintenance



## Hickory Hill Park



**Type:** Native forest, 2 prairie restorations (1 acre & 6 acres in size)

**Maintenance needed:** Enhancement, garlic mustard removal, trail maintenance

**Prior maintenance:** Removal of invasive species, promotion of oak regeneration, burning, trail maintenance

**Managed by:** Parks and Recreation and Friends of Hickory Hill Park

**Management plan:** 2003, Karla Hirokawa, 2007, Mark Vitosh

Hickory Hill Park is a 185-acre wooded area located in the north eastern part of the city. It began as a 0.4-acre park in 1967 and the City has continued to expand the park's acreage over the years. Although the park is mostly forested, there are also two constructed prairies which lie within its boundaries, a 6-acre prairie planted in 2004 and a smaller, one-acre plot planted in prairie. A management plan was prepared in 2003 by Karla Hirokawa as a University of Iowa honors project. The plan includes a history of the park, and documents how the vegetation has changed over time. She recommended specific management for different areas of the park and also compiled a vegetation species list in 2002. She determined that 27% of the species present in the park are alien species and suggested that invasive shrub and herbaceous species should be removed.

A General Forest Management Plan was prepared in 2007 by Mark Vitosh, District Forester of Iowa DNR/Forestry Bureau, for the Friends of Hickory Hill Park. He also divided the park into several areas, recommends specific management of each area and notes the invasive species problems in each area including garlic mustard (*Alliaria petiolata*) and non-native shrubs such as multi-flora rose (*Rosa multiflora*), exotic honeysuckle (*Lonicera sp.*), and autumn olive

(*Elaeagnus umbellata*). He states that oaks are not regenerating in the park because of shading from dense vegetation. Aerial photographs from the 1930's show that the area had a scattering of trees, but was not the dense forested area it is today. He recommended creating openings around the oak trees to establish an area for acorns to sprout and regenerate the oak population. Prescribed burning, which must be undertaken with great care in area with mature trees, or mechanical removal of the understory vegetation can be two useful methods to reduce undesirable vegetation in areas of dense growth.

A landscape history on the park was written by Chris Bair of the Iowa Valley Resource and Conservation District of the Iowa DNR. This report is available to the public and is posted on the Friends of Hickory Hill web site, as is Mark Vitosh's Forestry Management Plan at: <http://www.hickoryhillpark.org/>.

Friends of Hickory Hill Park is a citizen-based group which has been very involved in the upkeep of the park. The group began in 2000 and has done an excellent job in working with the City of Iowa City to maintain and manage the park by organizing the community in garlic mustard pulls, clearing areas around large oak trees, removing invasive shrub species, and maintaining existing hiking trails. The group has also raised funds to acquire adjacent lands for preservation and public use. City has benefited greatly from cooperating with this group. Their effort had made Hickory Hill Park one of the City's better maintained natural areas.

The City coordinated with Bur Oak Land Trust recently in the obtainment of Pappy Dickens Preserve, 16.5 acres adjacent to Hickory Hill Park, which provides a mixed-hardwood woodland as a buffer to the park. The preserve is managed by Friends of Hickory Hill Park.

Management Priorities:

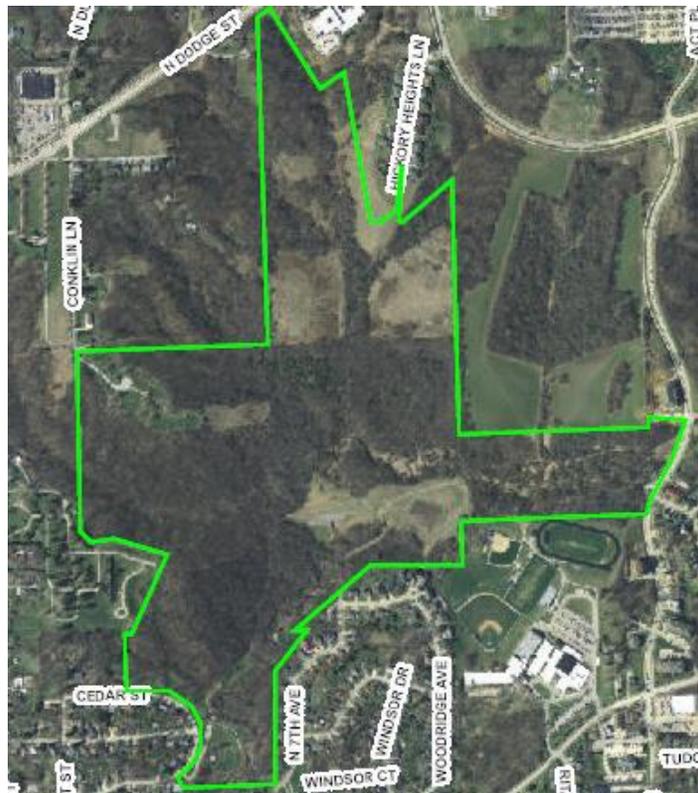
- Removal of invasive species, especially garlic mustard and non-native shrubs
- Promotion of oak regeneration by clearing vegetation around existing oak trees
- Plan for prairie maintenance by burning, etc.
- Trail maintenance



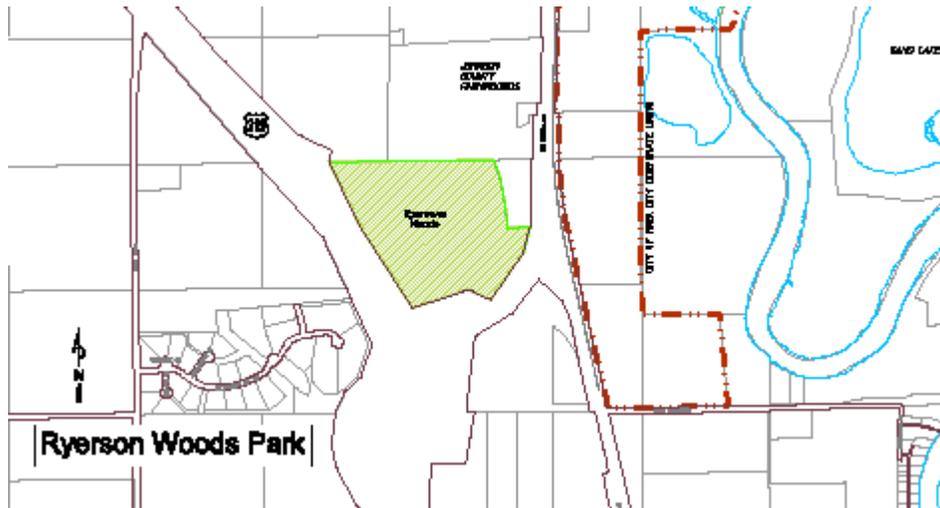
1930



2014



## Ryerson Woods Park



**Type:** Native forest

**Maintenance needed:** Enhancement, removal of invasive honeysuckle

**Prior maintenance:** Trail maintenance, removal of honeysuckle

**Managed by:** Parks and Recreation

**Management plan:** In progress, Diana Horton

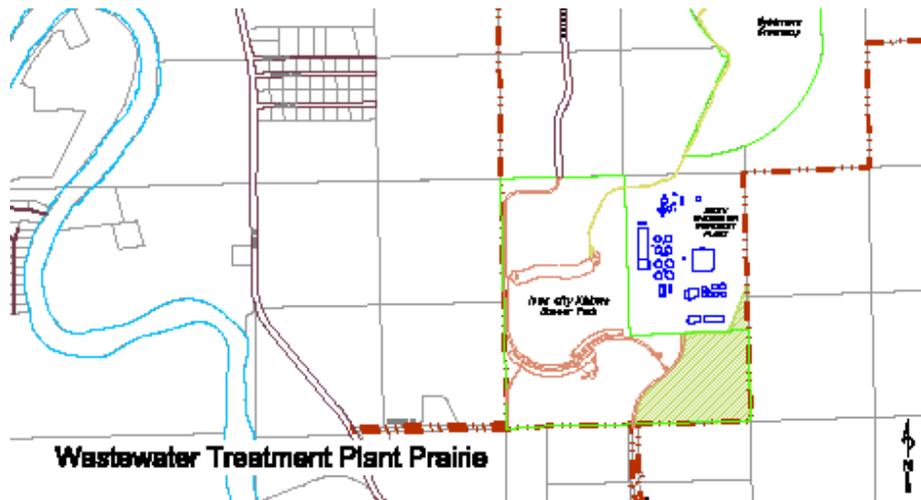
Ryerson Woods Park is 49-acre forested park located just south of the city limits near the Johnson County Fairgrounds. The park was acquired by City in 1985 from the Iowa Law School Foundation. Aerial photographs from the 1930's through the present show that the vegetation density of the park has not dramatically changed through time. Several large white oak (*Quercus alba*) trees are present on the east edge of the park and several nice species of woodland wildflowers such as Dutchman's Breeches (*Dicentra cucullaria*), Bloodroot (*Sanguinaria Canadensis*), and trout lily (*Erythronium americanum*) are present in the spring (Mark Vitosh, personal communication). The area has a problem with exotic honeysuckle shrubs which are encroaching into the park on the southern edge of the area. Honeysuckle is abundant and should be eradicated before it becomes a dense thicket and overtakes this part of the park. Garlic mustard (*Alliaria petiolata*) has not been a problem in this park but should be monitored and immediately removed if found. Oak regeneration could be promoted here since mature white oaks are present. A constructed prairie also lies within the grassy area on the eastern part of the park, which has been in existence since about 2000. The City has been working with Diana Horton, who is writing a management plan for Ryerson Woods, and once that is completed the Park will be awaiting award of preserve status from the state's preserve board.

Management Priorities:

- Development of a Forest Management Plan
- Continue removal of invasive species, especially non-native honeysuckle
- Promotion of oak regeneration by clearing vegetation around existing oak trees
- Prairie inventory and maintenance plan



## Oxeve Prairie



**Type:** Prairie Restoration (with wetland cells)

**Maintenance needed:** Routine

**Prior maintenance:** Prescribed burning, removal of invasives over last 12 years

**Managed by:** Public Works

**Management plan:** 2008, Public Works

The wastewater treatment plant prairie is a 22-acre prairie planted in 1996. This acreage was in row crop for about 100 years, but was restored by planting it with native species that would have been present here prior to European settlement. The prairie is predominantly native grasses, but has a nice selection of native flowering species near the main entrance to the plant. This twelve year old mature planting has been well maintained over the years through annual burning of half of the prairie by wastewater personnel. Flowering species were planted in the two years after the original native grass planting and have been successfully introduced. Few invasive species are present within the prairie, probably due to the benefit of annual maintenance. An effort to reduce the most predominant invasive (sweet clover) and increasing species diversity by adding more flowering species would improve the quality of the prairie. It is similar in size and soil moisture to Williams Prairie, a native prairie in Johnson Co. Williams Prairie is similar in that it is also in the Iowa River Flood plain, and contains species that do well in wet or moderately wet soils. A vegetation inventory for Williams Prairie has been compiled by Professor Diana Horton at University of Iowa and over 320 species of plants have been identified in this prairie. While it is unrealistic to expect this level of diversity in this City owned prairie restoration, species diversity could be greatly increased if well managed. Four elongated wetland cells, which were

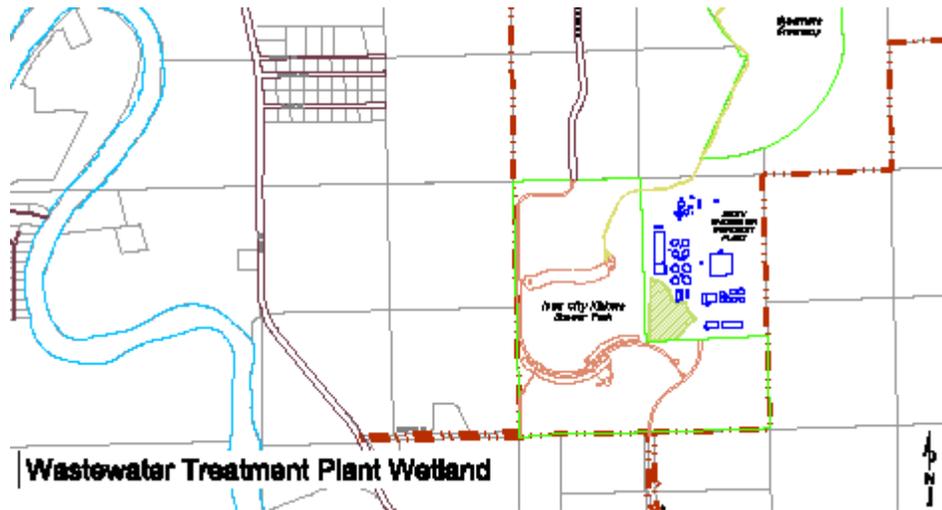
constructed for a University of Iowa research project to evaluate wetland processing of wastewater lie within the prairie (Goetsch, 2000). A comprehensive management plan was written which includes a vegetation species inventory and five year management goals (Nations, 2008).

Management Priorities:

- Removal of invasive species, especially sweet clover, reed canary grass crown vetch, poison ivy
- Increase species diversity by adding more flowering species
- Continue management by burning, but perhaps less often so as not to encourage overabundance of native grasses



## Wastewater Treatment Plant Wetland



**Type:** Wetland Restoration (with prairie sections)

**Maintenance needed:** Enhancement

**Prior maintenance:** Managed by mowing, plantings

**Managed by:** Public Works

**Management plan:** Draft 2008, Public Works

This wetland was constructed in 2005 west of the administration building of the Wastewater Treatment Plant. The wetland was not constructed as a part of mitigation, but added as an environmental and teaching asset to the property. It consists of small open body of water on a 4 acre area within the fenced in property of the plant. During construction numerous wetland species were transplanted from Professor emeritus Lon Drake's property. The area was also planted with prairie seed after construction. The soil which was dug out of the wetland was used to make a hill to the west of the wetland and a hibernaculum (shelter for hibernating animals) was constructed at its base. The hill was planted with 800 shrubs (6 different species) and a trail runs around the margin of the wetland and across the hill. Although the prairie vegetation is not yet well established, the open body of water in the wetland supports a wide variety of plant species and is home to a variety of frogs, birds, and insects. Several management practices took place during summer of 2008, including grading the edge of the wetland, planting numerous wetland plugs, removal of invasive species (reed canary grass, willows, thistles, curly dock) and reseeding in areas of abundant weedy vegetation. This wetland has the potential of being a wonderful learning environment for those who come for tours at the wastewater treatment plant, but needs removal of invasive plant species and reseeding. The area is one of the smaller areas to

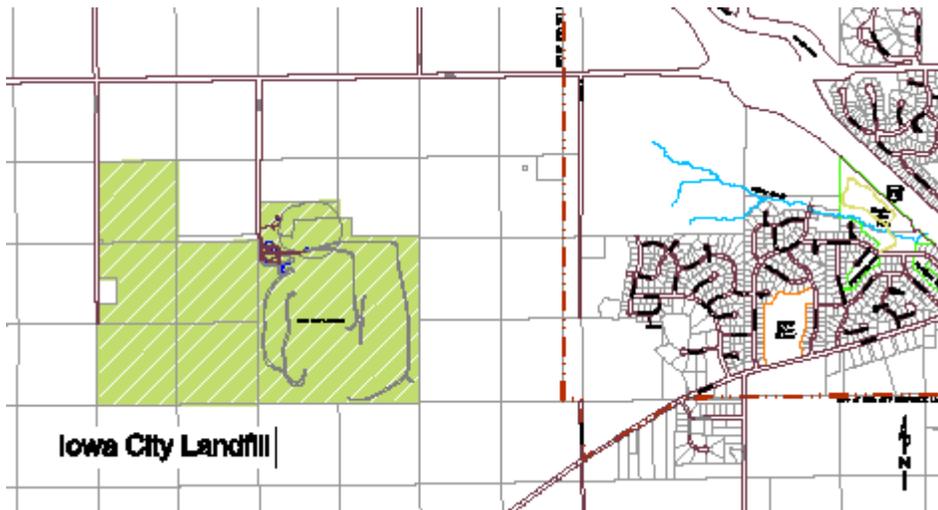
manage and continued management could produce a very diverse and attractive natural area to which the tour groups could be exposed. A management plan is being drafted which will include a species inventory and recommended management for this area. The upgrade of the wastewater plant, which was completed in 2014 impacted this area. The prairie area was reseeded, but has to be re-established.

Management Priorities:

- Removal of invasive species, especially reed canary grass, willows, and thistle
- Reseeding of prairie areas to increase native species and decrease weeds
- Mowing in areas reseeded to establish prairie species to re-establish growth



## Iowa City Landfill Wetland



**Type:** Wetland Mitigation (5 acres), riparian forest

**Maintenance needed:** Invasive species removal, planting

**Prior maintenance:** Mowing of prairie, pulling of invasive purple loosestrife

**Managed by:** Public Works

**Management plan:** Yes, 2013

The landfill acquired approximately 120 acres in 2007 which will be available for expansion over the next several years. Two additional 40 acre tracts are contiguous to the 2007 purchase, along with the original 200 acre landfill site (1972 purchase). A wetland mitigation requirement was required due to the necessity of filling a farm pond and a small drainageway during construction of a new landfill cell. Howard R. Green Company completed the wetland delineation for the project and Transition Ecology planned the construction of a 5-acre wetland area to fulfill the Individual Permit requirements for U.S. Army Corps of Engineers.

The wetland was constructed in fall of 2010 and the initial seeding of the wetland failed. Reseeding occurred the following growing season (2011). In 2013, the larger basin seeding still had not taken, so landfill staff regraded the area and seeded again. Landfill staff also mowed the upland areas several times a year the first three years to get the surrounding prairie buffer established. The wetland is becoming better established with this maintenance and is growing successfully. Also, Phebe Creek runs through the landfill and adjacent to the creek is wooded vegetation, which is overgrown and in need of management.

# Iowa City Landfill Wetland



## Estimated Labor Needs of Natural Areas Management

All of the natural areas owned by Iowa City need annual maintenance and routine management to avoid loss of functional, economic, and aesthetic value. Each site requires assessment, and all 12 sites have invasive plant species that need to be controlled before they become detrimental to the areas desired functions.

Estimated for maintenance needs are based on the condition the areas (Table 4). These estimates have been calculated using .5 hrs/acre for routine management and 1 hr/acre for enhancement management. Routine management includes mowing burn breaks, prescribed burns, mowing and spraying/removal of invasive species.

Management requirements for each site should include evaluation of management goals, assessment of invasive species type and quantity, supervision of type and amount of labor needed, and documentation of work completed.

Table 5. Iowa City Natural Areas Est. Labor Needed

	# of Acres	Year Purchased	Status	Maintenance Needed	Annual Management Hours*	Annual Total Labor Hours Needed**
Sycamore Greenspace	52	2001	Mature	Enhancement	52	1,560
Waterworks Park	230	2003	Mature	Routine	115	2,300
Penninsula Parkland	140	1998	Native	Routine	70	1,400
Rorhet Road Prairie	1.3	1995	Mature	Routine	0.65	13
Terry Trueblood Recreation Area	207	2006	Native	Routine	99	330
Sand Prairie	40	2005	Native	Enhancement	21	315
Whispering Meadows Wetland Park	18	1994	Mature	Enhancement	18	540
Hickory Hill Park	185	1967	Native	Enhancement	185	2,775
Ryerson Woods Park	49	1985	Native	Enhancement	49	735
Oxeye Prairie	22	1987	Mature	Routine	11	220
WWTP Wetland	4	1987	Newer	Enhancement	4	120
Iowa City Landfill Wetland	35	2008	Newer	Routine	18	210
<b>Total :</b>	<b>790.3</b>				<b>643</b>	<b>10,518</b>

\*Management hours calculations based on:

Routine .5 hr/acre

Enhancement: 1hr/acre

\*\*Labor hours calculations based on:

Routine: 6 hrs/acre

Enhancement: 12 hrs/acre

## Conclusion

Iowa City owns a diverse range of natural areas that serve a variety of functions and that are in need of management. Residents of Iowa City enjoy the aesthetic, recreational and educational benefits of these areas since most are open to public use. Iowa City also benefits from functions these natural areas provide such as well head protection, storm water management, flood impact reduction and carbon sequestration, and a natural areas management strategy could increase these benefits. The City has invested considerable cost and time in purchasing the tracts, creating wetlands and prairies and in the labor and equipment used to maintain them. A pro-active effort taken now to secure long-term management of each location will protect and enhance the City's investment in these areas and continue to make these valuable resources available to the citizenry.

A number of highly qualified and locally experienced natural areas managers are available in the Iowa City area. Some annual maintenance that can be performed during the summer months can be accomplished by temporary summer help or by contracting out specific tasks such as tree and brush removal. Oversight and inspection by a City employee responsible for the management of natural areas is critical to ensure continuity and quality of this maintenance program.

### Recommendations

- A management plan should be in plan for each natural area owned by the City of Iowa City
- Iowa City should budget for management of these areas
- Personnel should be hired to coordinate overall management and set priorities
- The City should consider areas for future protection as well as upcoming wetland mitigation sites

### Need personnel should be trained in:

- Prescribed fire management
- Restricted Pesticide Application
- Principles of ecology and conservation practices
- Species identification of plants, insects, mammals, reptiles & amphibians
- Invasive species identification and management
- Identifying soil types

### City personnel overseeing natural areas management should be trained in:

- Principles of ecology and conservation practices
- Invasive species identification and management
- Species identification of plants, insects, mammals, reptiles & amphibians
- Identifying soil types

- Prescribed fire management
- Restricted Pesticide Application
- Grant writing and application processes

In closing, the City owns over 1,000 of land which contains wetlands, prairies and forest which are valuable on numerous levels. These properties are enjoyed by citizens for recreational purposes and provide habitat for wildlife. Maintaining these areas on an ongoing basis will keep these areas functioning in their design and in maintaining biodiversity within the city. Yearly maintenance is more effective than waiting until they have become overgrown with invasive species. Caring for these properties is necessary to protect our past investment, and for our future environmental benefits.

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