

Johnson County  
Native Plant Community Policy

Integrated Roadside Vegetation Management

2006

## **Abstract**

The intent of this *Native Plant Community Policy* is to provide guidance for the identification, care, and preservation of native remnants/restorations and reconstructions (including prairies, woodlands, wetlands, and mixtures of these communities) in Johnson County's right-of-ways, and to provide objective criteria for evaluating and ranking these communities. This policy addresses any roadway right-of-ways managed by the Secondary Road Department, and activities performed either by County personnel or by private individuals or companies seeking permits to work therein. Furthermore, this policy allows the incorporation of fact-based native-vegetation-related considerations into daily decision-making processes related to the ongoing maintenance of roads and utilities (including ditch maintenance), the siting and construction of roads and utilities, and other public uses of roadside right-of-ways. Although routine activities of private landowners in the right-of-ways are not regulated by county policies, these individuals are also encouraged to consider the suggestions made in the management section of this policy.

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## Introduction

In 1990, the Johnson County Board of Supervisors approved an Integrated Roadside Vegetation Management (IRVM) program to better serve the public by using an integrated approach to roadside vegetation maintenance. The ultimate purpose of the IRVM program is to provide safe, healthy, and environmentally sustainable roadways. Objectives of the County's IRVM plan state that the program "be based on a systematic assessment of conditions existing in roadsides, preservation of valuable vegetation and habitats in the area, and the adoption of a comprehensive plan and strategies for cost-effective maintenance and vegetation planting." The intent of the Native Plant Community Policy (hereafter referred to as "this policy") is to provide guidance for the identification, care, and preservation of native remnants/restorations and planted vegetation (including prairies, woodlands, wetlands, and mixtures of these communities) in the County's right-of-ways, and to provide objective criteria for evaluating and ranking these communities.

If the guidance in this policy is followed, the likely benefits will be:

- To recognize and consider native plant communities as valuable natural resources when carrying out road construction/maintenance.
- To identify and maintain potential sources of seed for future plantings.
- To preserve habitat for wildlife.
- To preserve native biodiversity in Johnson County roadsides.
- To encourage the preservation of native plant communities by private landowners.
- To recognize native plant communities as valued cultural, historical, and educational resources for present and future generations.
- To provide a reminder of the aesthetic pleasure that native plants have afforded to past and present residents.
- To reduce County expenditures for seeding, reseeding, and maintenance.

This policy addresses any roadway right-of-ways managed by the Secondary Road Department, and activities performed either by County personnel, or by private individuals or

companies seeking permits to work therein. Furthermore, this policy allows the incorporation of fact-based vegetation-related considerations into daily decision-making processes. These processes relate to the ongoing maintenance of roads and utilities (including ditch maintenance), the siting and construction of roads and utilities, and other public uses of road right-of-ways. A more proactive stance enables the County to make informed maintenance and management decisions while attempting to conserve native biodiversity. Although routine activities of private landowners in the right-of-ways are not regulated by county policies, these individuals are also encouraged to consider the suggestions made in the management section (page 5) of this policy. This policy is not intended to unduly restrict road construction or magnify problems with maintaining the County's roads.

In Johnson County, the Secondary Road right-of-ways contain the following four mixtures of herbaceous ground cover: a) domestic grass stands, b) native remnants/restorations, c) reconstructions, and d) weeds. (See definitions in Appendix A.) This policy addresses only two of the above types: native remnants/restorations and reconstructions. Native remnants/restorations will be treated separately from reconstructions in this policy for the following reasons:

- Very few native remnants remain in Johnson County. These remnants harbor genetic resources adapted over the millennia to local conditions. This valuable genetic reservoir can only decline as the County's continued development homogenizes the roadsides with groomed plantings of exotic turf and ornamental species.
- Reconstructions are covering an increasing area of roadsides as public and private parties recognize the value of native plant materials as attractive, low-maintenance roadside cover.
- Only a limited portion of roadsides can be targeted for the special management and other considerations outlined herein. Thus, such considerations are concentrated on plant communities of maximum worth, irreplaceable native remnants, which must not compete for protection with the constantly expanding reconstructions.

Native remnants/restorations on level B roads are not currently being considered due to Board of Supervisors policy. Current Board policy directs minimal management of level B

roads, to include the roadside. Therefore, vegetation on level B roadsides will be managed only with site-specific permission from the Board of Supervisors. In addition, roadsides that lie in Johnson County but are maintained by other counties are not considered in this policy.

Educational activities (e.g., web information, tours, fair booths, programs) regarding this policy and the value of native roadside plant communities are considered an integral part of the policy.

At the regularly scheduled IRVM meeting, the Roadside Vegetation Manager (RVM) will include an update regarding County and permittee activities that may impact native remnants/restorations and reconstructions. Whenever possible, the RVM will inform the IRVM committee members when County or permittee activities will significantly impact any identified remnant.

## **Identification and Assessment of Native Plant Communities**

No two native plant communities are identical. They may differ significantly in type, quality, size, diversity, and presence of non-native species. They also change through time in species composition, size, and location. Native plant communities may improve in quality or lose significant species, expand or contract, become more dominated by native species or negatively impacted by invasive plants, and even slowly migrate from one location to another. Therefore, identification and assessment of native plant communities must be an ongoing process. A brief explanation of this process is provided below.

### **A. Native Remnants/Restorations:**

The first and ongoing step in the assessment of native plant communities is the identification and documentation of native remnants/restorations. To date, information has been compiled for this purpose from the following sources: a) a roadside survey performed by Professor Lon Drake, 1983; b) map data from former Johnson County RVM Russ Bennett, 1990-1999; c) natural areas inventory by Professor Steve Hendrix, 1993; d) map data from current Johnson County RVM Chris Henze, 1999-present; and e) the 2002 Johnson County Roadside Inventory prepared by the Iowa Valley Resource Conservation & Development (Iowa Valley

RC&D). The resulting data have been digitized and are in a Geographic Information System (GIS) database maintained by the Iowa Geological Survey. This continually evolving geodatabase and the corresponding maps found in Appendix B will be updated periodically as new information becomes available, and are the basis for the identification and ranking of native remnants/restorations covered in this policy.

Once identified, native plant communities will be further assessed, prioritized, and ranked through a system that utilizes the following factors: 1) adjacency, 2) native species conservativeness, 3) existence of threatened and/or endangered species, 4) remnant size, and 5) ecological diversity. This ranking system was developed in an attempt to remove subjectivity from the process of selecting sites, and to take into account those factors most important in preserving sites. The rationale for including each of these factors is provided below. A complete explanation of the ranking system can be found in Appendix C.

- 1) Adjacency: Right-of-ways remnants that are adjacent to other remnants beyond the right-of-ways become part of a larger unit with greater integrity and functional value. Such right-of-ways remnants also might serve as corridors between disjunct remnants on adjacent lands.
- 2) Native Species Conservativeness: If a native species is more conservative (i.e., if it has a larger “coefficient of conservatism” or C value), the plant is indicative of an undegraded, mature native community that reflects our state’s presettlement condition.
- 3) Existence of State-Listed Threatened , Endangered , and/or Special Concern Species: Endangered, threatened, and special concern species are protected by Iowa law and possibly indicate the presence of other rare or sensitive species.
- 4) Remnant Size: Larger remnants are better able to maintain habitat integrity and viable plant populations than are smaller remnants.
- 5) Ecological Diversity: The presence of multiple community types within a given remnant implies that the site will have greater native biodiversity.

The ranking system has been used to identify the sites that will receive maximum protection in the siting and construction for maintenance, construction, or utility usage. Site rankings are presented in Appendix D. This appendix will be amended as new sites are

evaluated. Native remnants that have been identified as quality sites but are not one of the top designated sites will be included in the geodatabase and the RVM will manage them according to the low impact techniques outlined in the management section of this policy.

In the future, more detailed assessments will likely be required, especially for road segments scheduled for major maintenance or construction efforts that would have significant impact on native plant communities. Primary among such assessments would be a Floristic Quality Assessment (FQA, see Appendix E). Additional vegetation assessments are suggested in the “County Engineering and Construction Considerations” section, and may be requested or completed as directed by the County Engineer or designee.

#### **B. Reconstructions:**

Reconstructions have been identified from planting maps provided by the RVM and are included on the maps shown in Appendix B. Right-of-ways reconstructions are areas intentionally planted into a mix of native species for several purposes, such as:

- long-term control of erosion, using the plants’ extensive fibrous root system,
- wildlife habitat and improved diversity of wildlife species,
- aesthetic purposes, and
- noxious weed and brush control.

Reconstructions represent an investment of time, money, and effort by Johnson County to plant, establish, and maintain these plant communities. Although these reconstructions are valuable resources, their importance falls below that of remnant areas in terms of historical and ecological significance. Thus they are not the proposed recipients of the same strong management practices and interventions suggested for native remnants.

### **County Management of Native Plant Communities**

The roadside inventory database will be routinely updated by the Secondary Roads Department in conjunction with the Iowa Geological Survey in order to better guide the daily decisions that are made by the maintenance sector of the Secondary Roads Department. Secondary Roads Department employees will have a regularly updated map that will pinpoint

areas that need special management methods. Practices such as ditch cleaning, spot spraying, brush removal, mowing, and snow trap removal that may be affected by this policy can then be adjusted accordingly, as directed by the County Engineer or designee. Safety will be a primary factor in deciding how to handle a project. Suggested management practices are considered below.

**A. Native Remnants/Restorations:**

In order to promote a healthy, sustainable plant community in the County-managed roadsides, this policy seeks to identify, recognize, and implement low-impact maintenance methods for existing native remnants. Once a site has been identified as a native remnant/restoration via past and current surveys or through ongoing observations, vegetation management techniques should be evaluated to minimize detrimental disturbances wherever possible, regardless of the site's ranking.

The *Johnson County Noxious Weed and Brush Control* policies specify how native plant communities will be managed with regard to noxious weeds and woody plant control. This policy goes further in specifying low-impact management techniques for these native plant communities regardless of weed or brush invasion. Specifically, it is recommended that all roadside remnant communities, regardless of their ranking score, be managed to improve the plant community biodiversity and to lessen impacts associated with County maintenance activities whenever possible. Examples of low impact control methods include:

- Use of prescribed fire.
- Hand cutting of trees and brush.
- Very limited use of spot spraying to control invasive species.
- Interseeding of locally harvested seed to improve stand quality and density.
- Limited and strategically timed mowing.
- Encouraging landowners to explore the use of federal and state conservation programs to preserve adjacent native communities.

The RVM will also address sources of sediment deposition in roadsides containing native plant communities by collaborating with the Soil and Water Conservation District to provide

technical assistance and possible cost-share incentives to interested landowners. Solutions to prevent sedimentation and associated weed populations in roadside ditches may include the utilization of conservation buffers parallel to roadways and the repair of degraded waterway outlets. The RVM will refer landowners to the Soil and Water Conservation District office for more information.

**B. Reconstructions:**

Management techniques utilized for reconstructions will be similar to the tools used in native remnants/reconstructions. Interseeding of locally harvested seed may be done on an as-needed basis by the RVM. While efforts are made to protect reconstructions, more detrimental disturbances may be tolerated than in native remnants/restorations.

**County Engineering and Construction Considerations**

This policy addresses all the county's road projects, beginning with the planning stage of road and structure construction. The policy suggests that the County work with the road design engineers in an attempt to protect valuable native plant communities.

**A. Native Remnants/Restorations:**

Existing records identify known remnants/restorations, but are not necessarily comprehensive. Thus further inventories should be completed on right-of-ways to be heavily impacted by planned road construction. Specifically, three to four years prior to construction, vegetation surveys (i.e., windshield or walk through) of right-of-ways adjacent to planned construction sites will be conducted several times during the growing season to identify desired or indicator native species. If the right-of-ways contain indicator species or exhibit conservative species, the RVM will do a more complete evaluation using the ranking system found in Appendix D, or an FQA. As planning/design for a construction project continues, identified native plant communities will be factored into the design of the new structures/roads. Whenever possible, from an engineering and resource standpoint, native remnants are to be considered for a design exception, or methods will be implemented to reduce the adverse impact to these remnants from sediments, construction equipment, topsoil storage, or other adverse practices.

In the event that native remnants will be destroyed or severely impacted, other management methods should be used to preserve native plants and local germplasm. For example, seed from potentially disturbed locations may be harvested prior to construction and stored for later reseeded of the area. The IRVM Committee, local conservation groups, landowners, garden clubs, etc. may be engaged by the RVM to assist County efforts in salvaging plants and placing them in suitable locations. In addition to the methods stated above, topsoil may need to be stripped away and stored with the intent of being returned to an appropriate area. Collected seed and stored topsoil can provide propagules, which can gradually re-establish vegetative cover and conserve local ecotypes on sites disturbed during the construction process. Disturbed sites can also be reseeded with local seed. As new management methods are investigated and evaluated, they can provide a valuable information base for future applications and efforts.

**B. Reconstructions:**

In the event that a reconstruction will be impacted by County construction activities, provisions will be made to account for the County’s past investment of both time and materials. When appropriate, the County will reseed the disturbed area with a seed mixture equivalent to that used originally. Adjacent landowners will be consulted to ensure cooperation with these efforts.

**Utility Company/Private Permits**

This section addresses those utility companies and other private entities which must disturb the vegetation in the roadsides of Johnson County. All permit applications will be checked to determine if the permit site crosses a native remnant or a reconstruction known to the Secondary Roads Department staff. In addition, a map of Johnson County roadsides with the location of known remnants and reconstructions (Appendix B) will be maintained by the County Engineer or designee and made available to the permittee. If the County Engineer or designee determines that the permit crosses a native remnant or reconstruction, that person will route the permit to the RVM for review.

#### **A. Native Remnants/Restorations:**

If the entity seeking the permit proposes to disturb a site that is one of the highest quality native remnant areas listed in Appendix D, it will be incumbent upon the permittee to provide proof that no alternative routes are economically feasible. If no such route is available, the permittee will be directed to the RVM who will assist in developing a plan that preserves the native germplasm and the remnant site to the greatest degree possible. This plan will be developed in consultation with a public official trained in conservation or restoration ecology from one of the following agencies: County Conservation Board, Soil and Water Conservation District, IDNR (Iowa Department of Natural Resources), or a State Regents institution. The plan must:

1. Document that the financial and/or safety consideration of following an alternative route outweigh mitigation considerations.
2. Account for minimizing disturbance of the remnant site, to the greatest degree possible.
3. Account for minimizing the introduction of noxious weed seeds to the site and to the soil stockpile.
4. Account for minimizing soil loss and compaction.
5. Incorporate provisions for preserving the remnant site's germplasm (e.g., seed and plant harvest, soil stockpiling, and/or any new, appropriate technologies as they become available). Mitigation costs are to be borne by the entity seeking the permit.
6. Specify the exact location of a mitigation site on public land. This site must be three times the area of the disturbed site.
7. Be approved by the County Engineer.

If the permit seeks to cross a native remnant/restoration that is not one of the highest quality protected sites, or if it is a remnant that has been identified and mapped but not evaluated, the RVM and staff of the Secondary Roads Department will work with the permittee to seek other ways to work around the remnant area. Areas where native remnants/restorations are disturbed will be revegetated by the RVM at a one-to-one ratio. The cost of the seed and labor will be borne by the entity seeking the permit.

**B. Reconstructions:**

If the area to be disturbed is a reconstruction, the entity seeking the permit will be required to have the disturbed area reseeded by an approved contractor using a native seed mixture equivalent in quality and origin to that used originally, as approved by the Johnson County RVM. The entity should look at ways to avoid disturbing the vegetation, such as using smaller equipment, minimizing weed seed introduction, boring rather than trenching, and finding additional ways of avoiding soil compaction. The RVM will keep a list of qualified contractors who will provide seed and can accomplish the seeding. If the Secondary Road Department needs to revegetate a roadside reconstruction area, an appropriate native seed mix will be used. The cost of the seed and labor will be borne by the entity seeking the permit.

## BIBLIOGRAPHY

- Drake L. 1983. Unpublished inventory of Johnson County Roads, results reported via lists and maps to the Secondary Roads Department.
- Hendrix S. 1992. *Report: Preliminary Assessment of Natural Areas in Johnson County and Recommendations for a Natural Areas Inventory*. Unpublished report, prepared for the Johnson County Conservation Board. 13 pp plus maps.
- Iowa Valley Resource Conservation and Development (C. Taliga). 2002. *Johnson County Roadside Inventory*. Report funded by the Iowa DOT's Living Roadway Trust Fund, prepared for Johnson County Secondary Roads Department. 74 pp plus maps.
- Swink, F. and G. Wilhelm (1994). *Plants of the Chicago Region, 4<sup>th</sup> ed.*, Indiana Academy of Science, Indianapolis, 921 pp.

## APPENDIX A

### Definitions and their Application to Johnson County Right-of Ways

#### Conservative Species:

Species with very low tolerance of disturbance and high fidelity to habitat integrity. A conservative species is defined in this policy as having a C-value of six or greater.

#### Domestic Grass Stands:

A plant community composed nearly entirely of exotic species, such as brome. These either have been intentionally planted or have invaded from adjacent agricultural ground (e.g., resulting from being rotated through pasture).

#### Indicator Species:

A species that provides information on the overall condition of the ecosystem, and on other species in that ecosystem, or a species that flags changes in biotic or abiotic conditions. These species reflect the quality and changes in environmental conditions as well as aspects of community composition.

#### Local Ecotype:

Seed, root stock, or established populations of native plants believed by appropriate authorities to have been derived from germplasm present in Johnson or adjacent counties prior to Euro-American settlement.

#### Native Plant:

A plant species believed by appropriate authorities to have grown in Iowa prior to Euro-American settlement in the mid-1800s. Determination of native status is to be made by the RVM, in concurrence with the IRVM Committee, and should be based on authoritative sources such as historic records and botanical guide books.

Native Remnant:

An area where populations of naturally occurring local ecotype native plant species are believed by appropriate authorities to have survived or regenerated spontaneously after a greater or lesser amount of disturbance since Euro-American settlement. Such stands are derived from Johnson County's original prairie, wetland, and woodland communities. However, remnants may have been degraded from their parental communities by impoverishment (i.e., loss of many prominent species) and/or by the invasion of aggressive exotic species. Disturbances attendant to agricultural and recreational activities, utility services, and landscape grooming by private parties along with road building and maintenance have contributed to significant degradation. Therefore, the occurrence of pristine remnant communities would be unlikely.

Plant Community:

A grouping of populations of different species of plants found living together and interacting in a particular environment.

Reconstruction:

An intentionally planted area, by private or public parties, consisting primarily of native plants for either aesthetic and/or practical reasons. These plantings are intended to resemble native communities. Species composition is likely to differ from naturally occurring remnants because many native species may be excluded from reconstructions. Species may be excluded because of propagation difficulties, expense, unavailability of stock, drab or unkempt appearance, or aggressive tendencies.

Restoration:

An area generally comprised of naturally occurring remnant vegetation which has been enhanced by the interseeding and/or management practices outlined in this policy.

Right-of-Ways:

An area of land, the right to possession of which is temporarily or permanently secured or reserved by the state or a governmental subdivision, for roadway purposes. The right-of-ways for the majority of secondary roads are 66 feet in width, unless otherwise specified by the Johnson County Board of Supervisors.

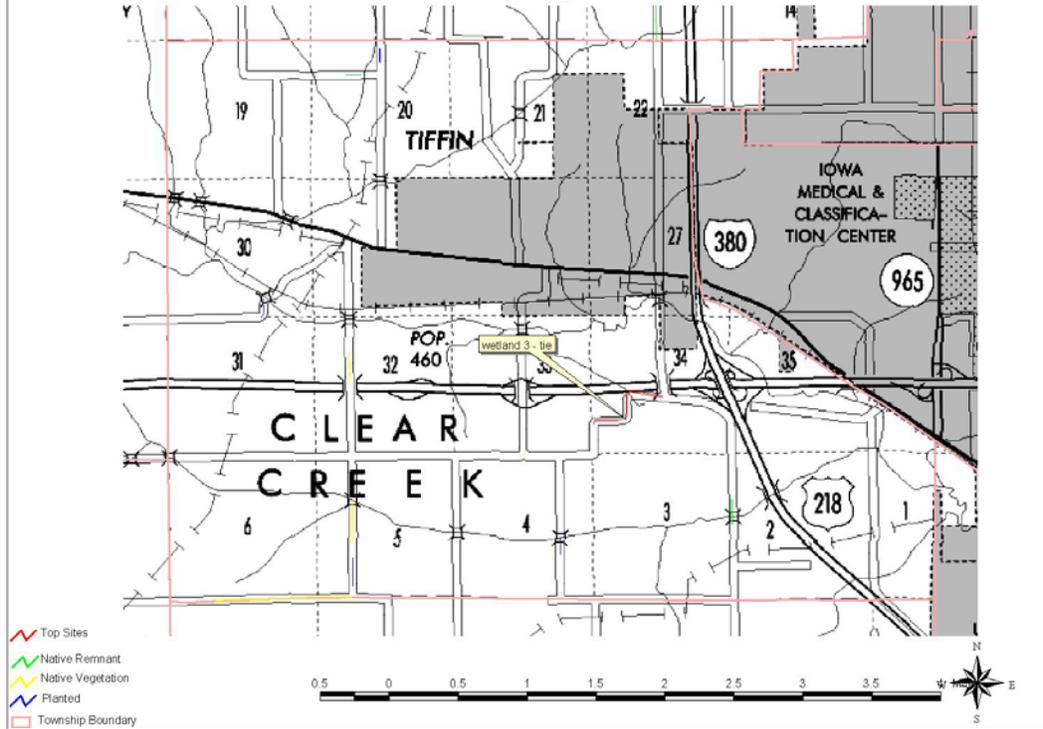
Weeds:

Aggressive annual or biennial plant species, either exotic or native in origin. Repeated disturbance makes this normally transitory ground cover persistent in some areas.

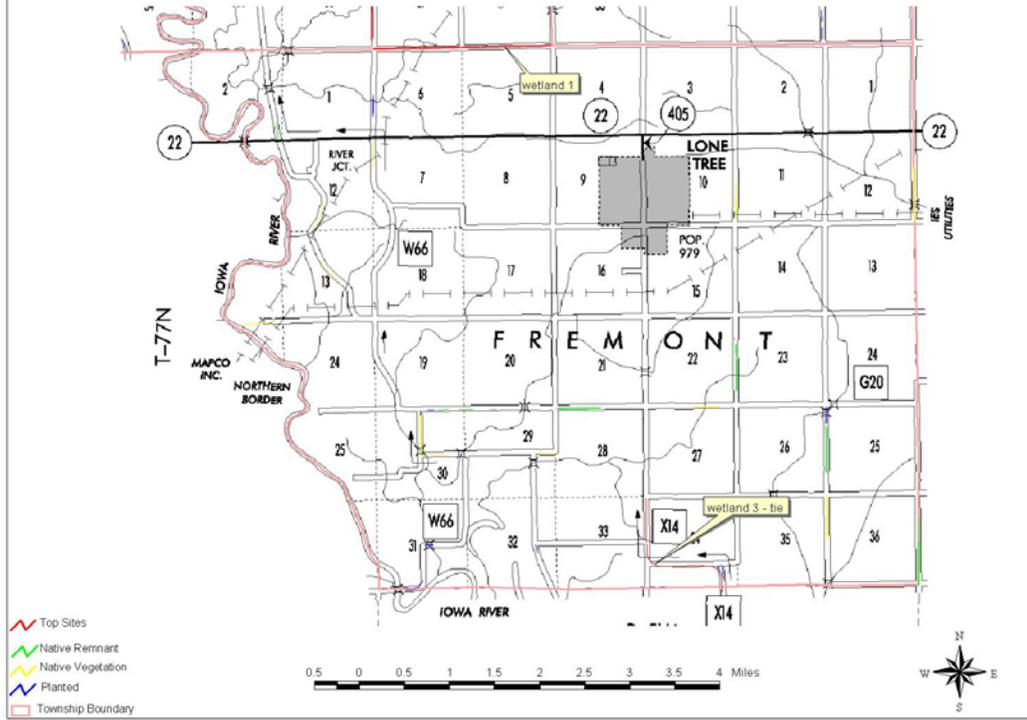




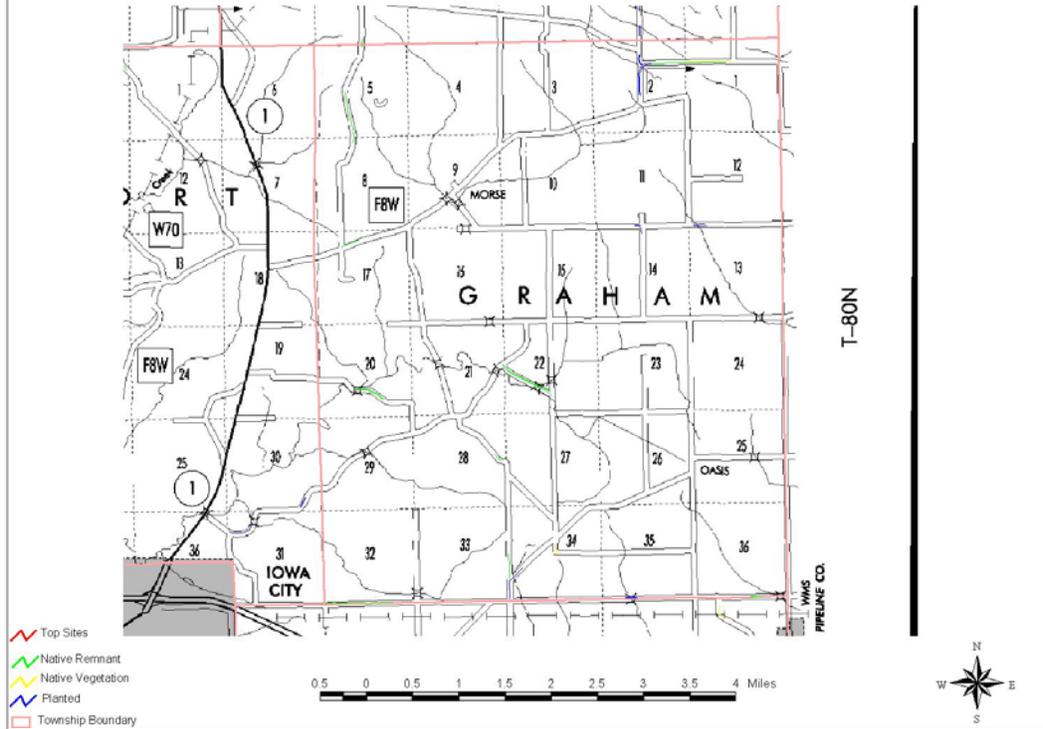
# Clear Creek Township Roadside Remnants



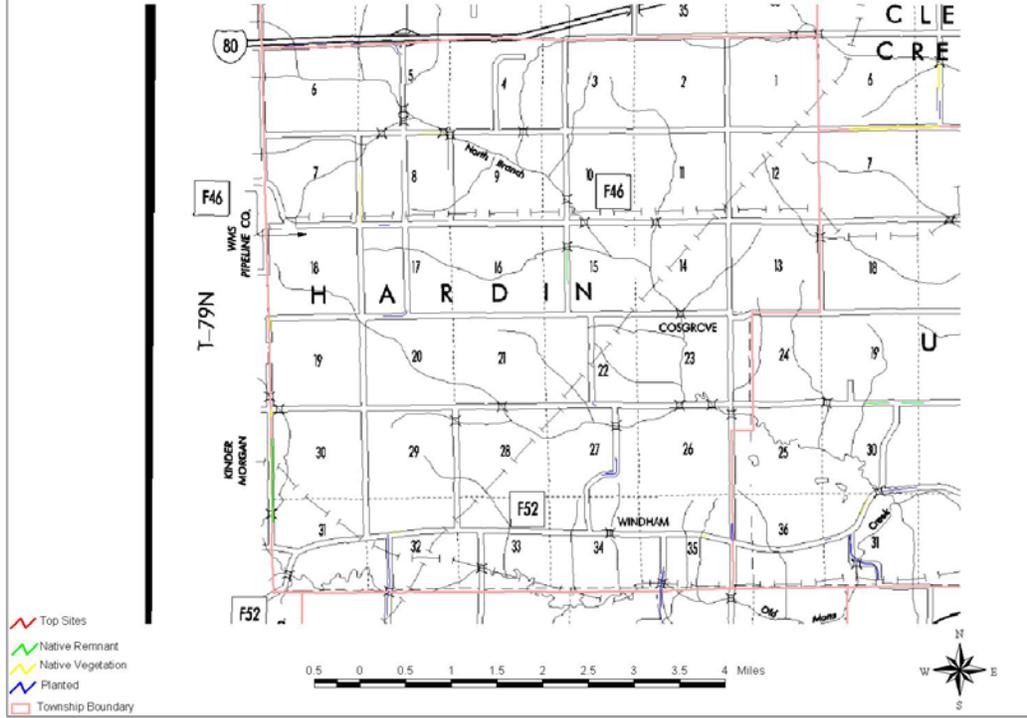
# Fremont Township Roadside Remnants



# Graham Township Roadside Remnants

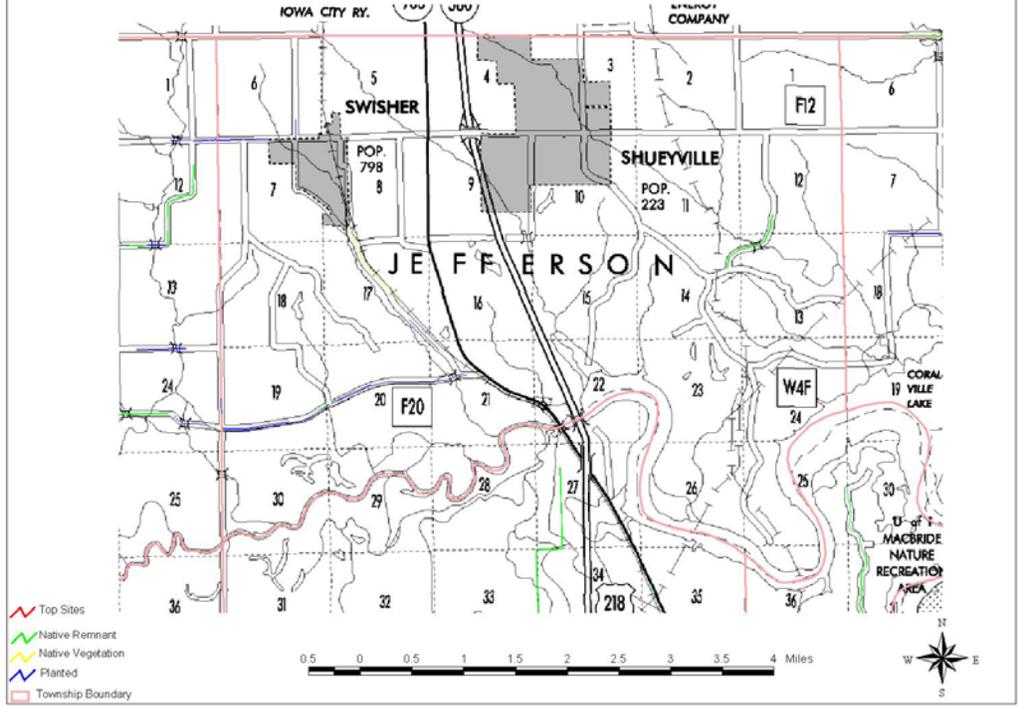


# Hardin Township Roadside Remnants

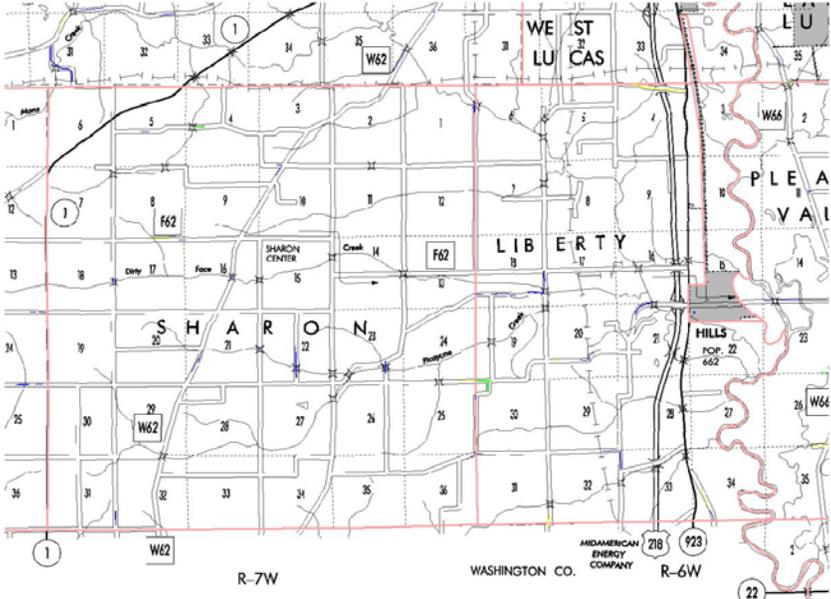


- Top Sites
- Native Remnant
- Native Vegetation
- Planted
- Township Boundary

# Jefferson Township Roadside Remnants



# Sharon and Liberty Township Roadside Remnants

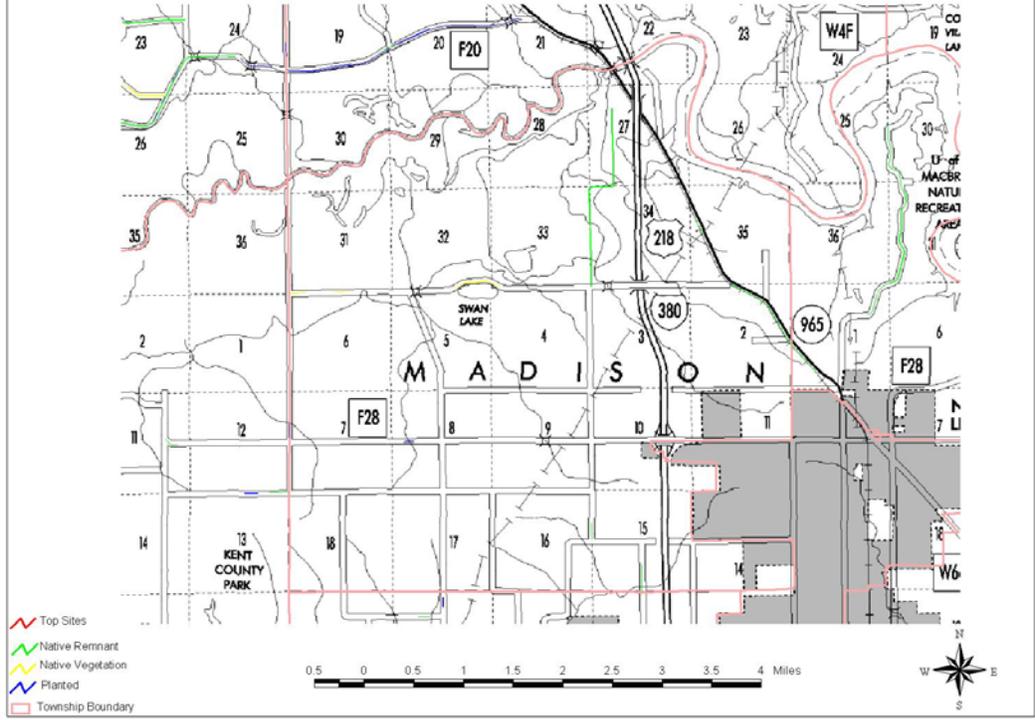


- Top Sites
- Native Remnant
- Native Vegetation
- Planted
- Township Boundary

0.5 0 0.5 1 1.5 2 2.5 3 3.5 4 Miles

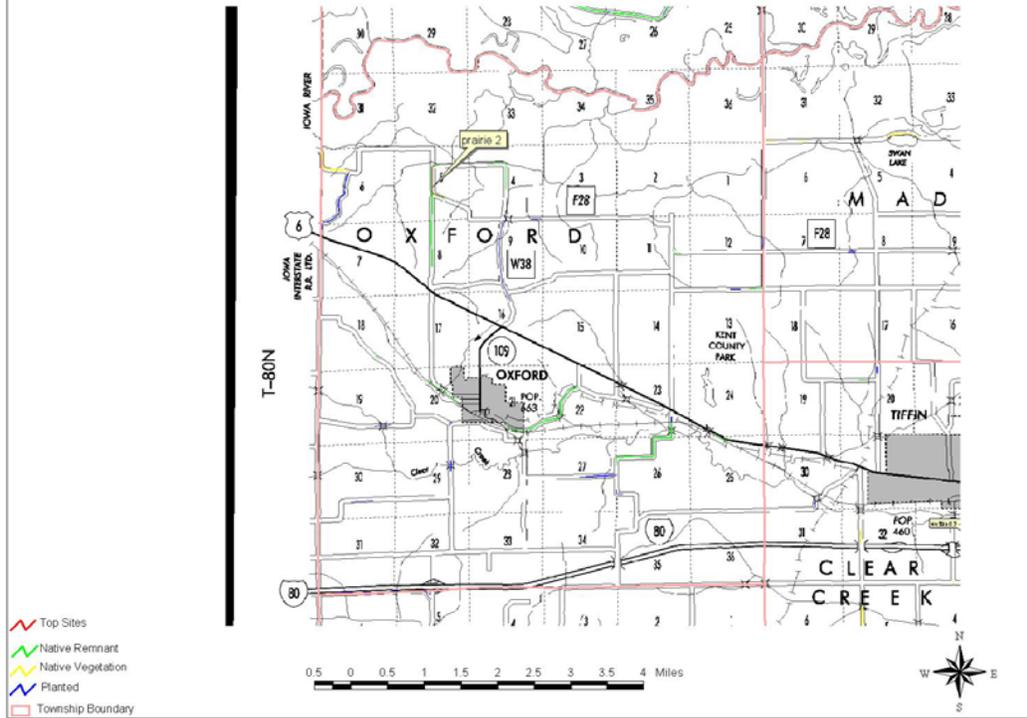


# Madison Township Roadside Remnants



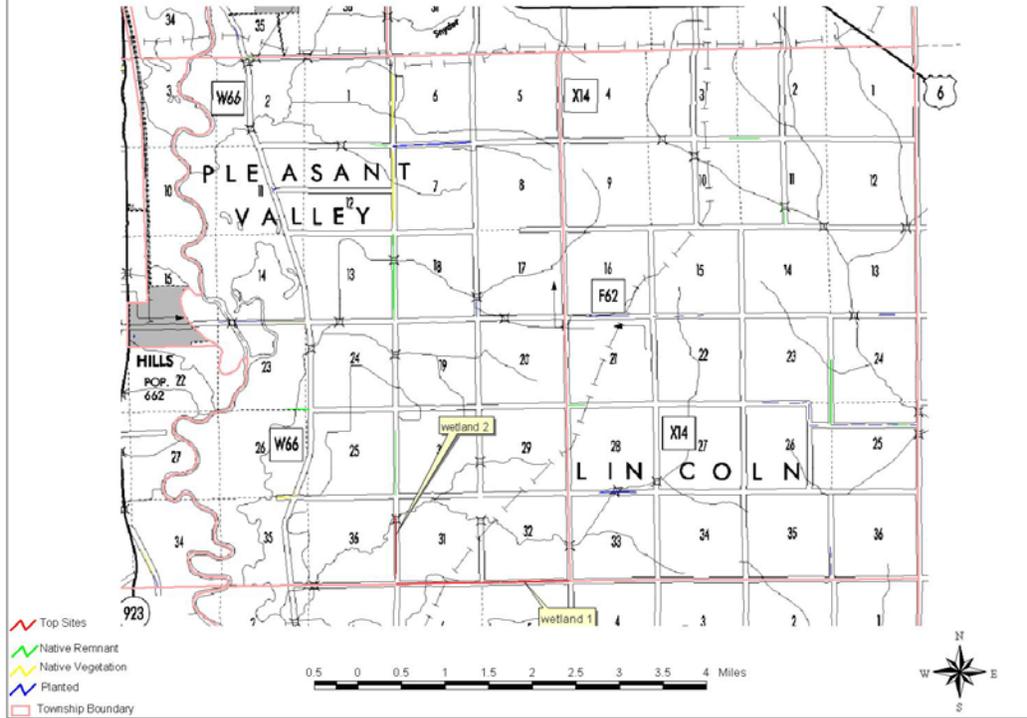


# Oxford Township Roadside Remnants

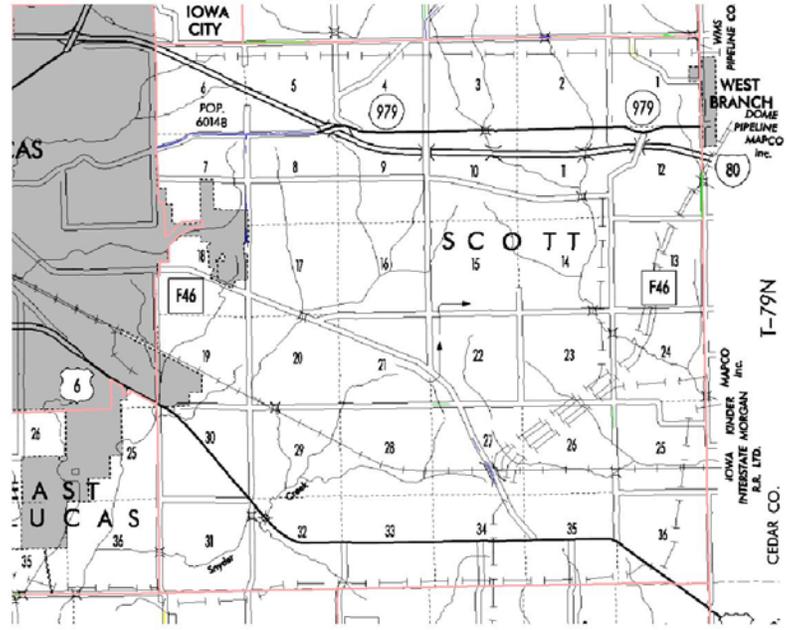




# Pleasant Valley and Lincoln Township Roadside Remnants



# Scott Township Roadside Remnants

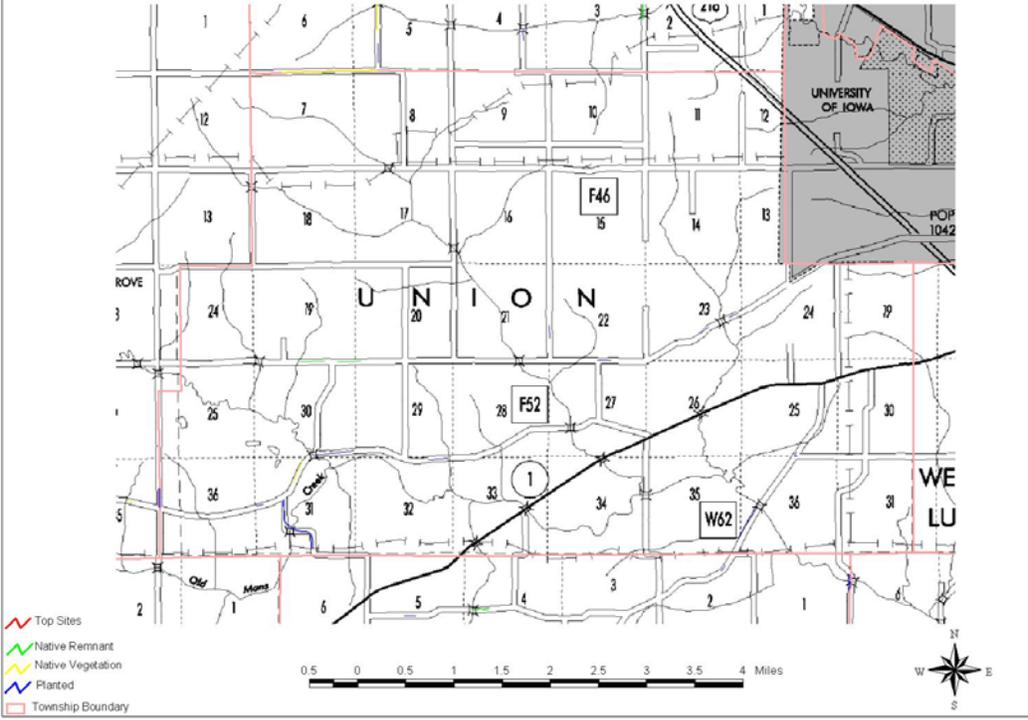


- Top Sites
- Native Remnant
- Native Vegetation
- Planted
- Township Boundary

0.5 0 0.5 1 1.5 2 2.5 3 3.5 4 Miles



# Union Township Roadside Remnants





## APPENDIX C

### Remnant Ranking System

This ranking system gives priority to remnants that a) are adjacent to other remnants, b) contain more sensitive, “conservative” species, c) contain state-listed threatened, endangered, and/or special concern species, d) are longer in length, and e) contain multiple types of communities. Each of these five factors is discussed below, as is the rationale for how points are to be awarded. The discussion is followed by the Remnant Scoring Guide, which demonstrates how the scoring criteria are to be applied.

#### Adjacency

If a roadside remnant is adjacent to a remnant that lies outside the right-of-ways, the two together form a larger unit in which each remnant protects the integrity of the other, and the functional value of both remnants is increased. In such cases, the roadside remnant might serve as a buffer for invasive species or other intrusions and help create a larger habitat for remnant-dependant species. Such roadside remnants also might serve as corridors between adjacent but disjunct remnants on adjacent lands. Because of all these assets, roadside remnants adjacent to clearly identifiable remnants receive 25 points. Roadside remnants adjacent to sites that appear to be degraded remnants (typically unplowed but heavily grazed pasture land) receive 10 points, acknowledging the degraded sites’ potential for restoration but also their greater uncertainties. Thus a site could receive 0, 10, or 25 points for this factor.

#### Native Species Conservativeness

Ranking the quality of a site is accomplished by considering the “coefficients of conservatism” (C values) of inventoried plants. C values, which range from 0 to 10, reflect whether a plant species is likely to occur in a landscape relatively unaltered from its pre-settlement condition - i.e., whether the species has high fidelity to un-degraded, mature native communities or high-quality natural areas. Plants with such limitations are given a high C value. Those with low C values, in contrast, may be found in a variety of habitats and are more tolerant of disturbance and degraded conditions. (Swink & Wilhelm, 1994)

C values for Iowa's plants are listed at:

<http://www.public.iastate.edu/~herbarium/Cofcons.xls>. If the roadside remnant has at least one species that falls into one or more of the following C-value categories, it is assigned the number of points indicated in the following table:

<b>C-value</b>	<b>Points</b>
<5	0
5	5
6 or 7	10
8 or 9	15
10	25

The roadside remnant can receive points for each C-value category. Based on these criteria, a given site could receive 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, or 55 points for this factor.

#### **Existence of State-Listed Threatened, Endangered, and/or Special Concern Species**

State-listed threatened, endangered, and/or special concern species are protected by Iowa Law, in Iowa Administrative Code [571] Chapter 77. The identification of any such species in a given remnant constitutes a legal reason for protection. The presence of state-listed species also may indicate that other sensitive or rare species are present, a possibility that multiplies the remnant's worth. Thus, 100 points are awarded for each endangered species present in a remnant, 75 points are awarded for any threatened species, and 50 points are awarded for any special concern species. There is no upper limit to the number of points a given site could receive.

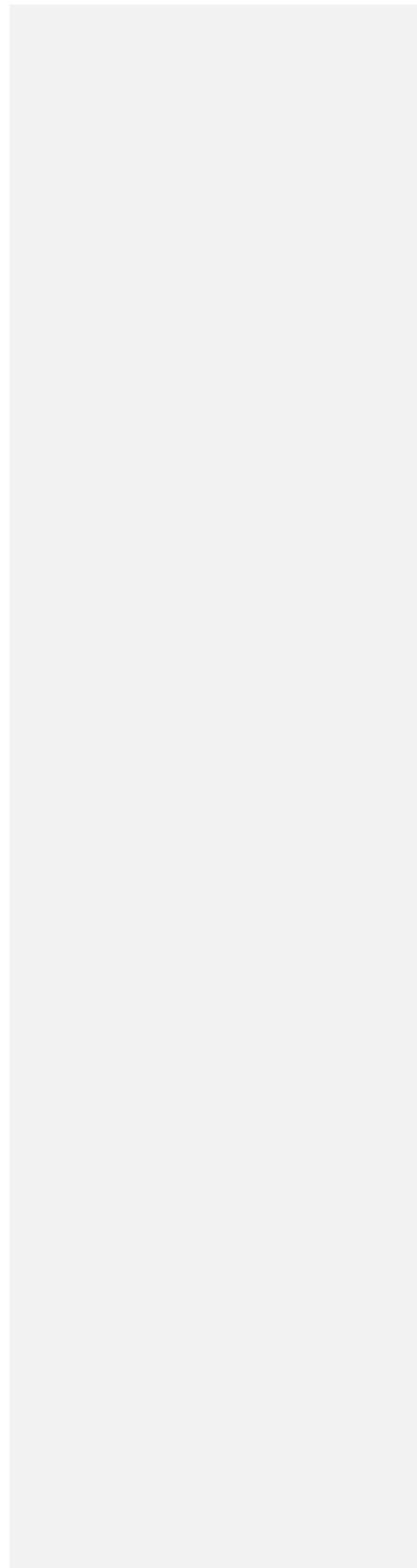
#### **Remnant Size**

Other factors being equal, larger remnants are better able to maintain their integrity and viable plant populations than smaller remnants. Thus remnants longer than 1/2 mile receive 15 points, remnants between 1/4 and 1/2 mile long receive 10 points, and remnants under 1/4 mile in length receive 5 points. Based on these criteria, a site could receive 5, 10, or 15 points for this factor.

#### **Ecological Diversity**

Native communities in Johnson County consist of prairies, wetlands, and woodlands. If more than one type of community is present in a given remnant site that site is likely to include

species typical of both community types, enhancing the site's native ecological diversity. Thus 25 points are awarded for each type of remnant community present, for a total of 25, 50, or 75 points.



## Remnant Scoring Guide

Remnant Name: \_\_\_\_\_ Date Assessed: \_\_\_\_\_  
 Remnant Location: \_\_\_\_\_ Person Completing Assessment: \_\_\_\_\_

Factors	Points Possible	Points Awarded
<b>1) Adjacency</b>		
Roadside is adjacent to a <u>known</u> remnant beyond the county right-of-ways	25	_____
Roadside is adjacent to a <u>potential</u> remnant beyond the county right-of-ways, but that remnant is not identifiable due to land use/condition	10	_____
Roadside is not adjacent to a known or potential remnant	0	_____
	Total	_____
<b>2) Native species Conservativeness:</b> The roadside plant population contains 1 or more species with a coefficient of conservatism within the following categories. (Points can be awarded for each category only once.)		
C= 10	25	_____
C= 8 or 9	15	_____
C= 6 or 7	10	_____
C=5	5	_____
C<5	0	_____
	Total	_____
<b>3) Existence of state-listed threatened, endangered, and or special concern species</b> (Points are awarded on a per species basis.)		
Endangered	100 per species	_____
Threatened	75 per species	_____
Special Concern	50 per species	_____
	0	_____
	Total	_____
<b>4) Remnant size</b>		
Greater than ½ mile long	15	_____
¼ to ½ mile long	10	_____
Less than ¼ mile	5	_____
	Total	_____
<b>5) Ecological diversity</b> (Points can be awarded for each category)		
Wooded	25	_____
Wetland	25	_____
Prairie	25	_____
	Total	_____
<b>Total Score</b>		_____

**APPENDIX D**  
**Site Evaluations**

The highest ranking site (regardless of ecosystem type) is considered the site of highest priority. Then, within each of the three ecosystems (i.e., woodland, wetland, prairie) the three sites with the highest scores have been selected. In cases where two or more sites have the same score, additional factors such as road type will be considered and decided by the committee. It is anticipated that the selection of only the ten top remnants should provide a manageable and workable number of sites to receive special protection without unduly restricting road maintenance, construction, or utility usage. The following is the current list of top ranked sites.

legend:  Prairie  
Woodland  
Wetland  
Shrub/Edge

Top sites	Location ID Code	Habitat Type	Adjacency	Existence of State-Listed Threatened, Endangered, and/or Special Concern Species	Size- length	Ecological diversity	C value	Ranking using the Remnant Scoring Guide
prairie 1	BG3	Prairie	25	0	5	50	30	110
prairie 2	A170	Prairie	25		10	50		85
prairie 3	WA1	Prairie	0	0	5	25	20	50
Top Site	BG2	Prairie	25	125	15	50	30	245
wetland 1	PV1	Wetland	0	50	15	25	15	105
wetland 2	PV3	Wetland	25	0	15	50	15	105
wetland 3 - t	CC1	Wetland	0	0	5	25	40	70
wetland 3 - t	FR5	Wetland	0	0	15	25	30	70
woodland 1	NE2	Woodland	25	0	15	50	55	145
woodland 2	MO5	Woodland	25	50	15	25	30	145
woodland 3	BG1	Woodland	25	50	5	25	30	135

## APPENDIX E

### Floristic Quality Assessment, FQA

#### Floristic Quality Assessment, FQA

Floristic quality assessment is a standardized tool for natural area assessment developed by Floyd Swink and Gerald Wilhelm (1994). The method replaces very subjective measures of quality, such as “high” or “low,” with a more dispassionate and quantitative assessment. The method assigns a numerical coefficient of conservatism (C) to each native plant species based on that species’ tolerance for disturbance and its fidelity to a particular pre-settlement plant community type. The aggregate conservatism of all the plants inhabiting a site determines its floristic quality index (I). This index allows comparison of the floristic quality among many sites and tracks changes at the same site over time. It is not intended to be used as a stand-alone method, but rather to complement and corroborate other methods of evaluating the natural quality of a site.

#### Coefficient of Conservatism, C

The concept of species conservatism is the foundation of floristic quality assessment. Each native species has been assigned a coefficient of conservatism (C) by professional botanists in the state of Iowa. These coefficients range from zero to ten and represent the estimated probability that a plant is likely to occur in a landscape relatively unaltered from what is believed to be a pre-settlement condition. For example, a C of zero is given to plants such as *Acer negundo*, box elder, that have demonstrated little fidelity to any remnant natural community (i.e., may be found almost anywhere). Similarly, a C of ten is applied to plants like *Potentilla fruticosa* (shrubby cinquefoil) that are almost always restricted to a pre-settlement remnant (i.e., a high quality natural area). Introduced plants were not part of the pre-settlement flora, so no C value is applied to these plants.

Although C values are assigned based on collective extensive experience with the flora throughout an area, the assignments are still somewhat subjective. The conceptual difference between a value of zero and a value of one, or between nine and ten, is slight, while the difference between a value of zero and a value of three is more distinct.

### Floristic Quality Index, *I*

The emphasis in this assessment procedure is not on individual species. Rather, the floristic quality index (*I*) value is derived from an analysis of all the native plant species in a community or community complex. The density, apparent dominance, and frequency of individual plant species are not relevant factors when considering the qualitative value of a site. Abundance and frequency are often artifacts of the season or year and may fluctuate greatly. Some species which are “dominant” (big or obvious) in spring can be scarcely evident in fall, when they have been replaced by species that were scarcely evident earlier in the year. Regardless of size, comeliness, or ease of identification, every species at a site provides information relative to the diffuse and scattered populations.

The *I* is used to discriminate among areas that have similar mean *C* values, but otherwise differ significantly. *I* is calculated by multiplying the *mean C* for all plant species present by the square root of the number of native species (*N*).