Natural Resources 4

Introduction

The Natural Resources chapter begins to highlight some of the unique features that define Johnston's landscape. These natural features continue to serve as important assets to the community and are valued by residents. As Johnston continues to develop, it is important to recognize these assets by finding an appropriate balance between the natural environment and the built environment. In doing so, it is possible to preserve natural resource areas and create a future living environment that integrates the man-made development patterns with the natural characteristics of the landscape.

To ensure that Johnston's natural resources are protected, the comprehensive plan addresses a number of land use and environmental standards that should be maintained to prevent the degradation of these resources. In developing additional regulations, the city should consider the findings in the city's Watershed Assessment and Stormwater Management Plan. In addition to this plan, the following policies and action steps have been established to protect and preserve Johnston's natural resources.

Natural Resources Policies

1. *Promote conservation of key natural resources and open space areas.*
2. *Establish a balance between the protection of natural resources and future urban development.*
3. *Facilitate development in areas with environmental resources to use site and building designs that embrace sustainable practices.*
4. *Preserve sensitive environmental resources as natural open space and greenways.*
5. *Promote strategies and best practices for energy conservation and preventing pollution of the land, water, and air.*
6. *Partner with and support environmental organizations that promote green building practices and standards, such as Leadership in Energy and Environmental Design (LEED).*

Natural Resources Action Steps

In order to enhance natural resource protection, the city will:

1. *Examine specific requirements for environmental protection that may be incorporated into the city's subdivision regulations.*
2. *Emphasize proper management of open space areas in order to preserve the trees, floodplain, steep slopes, water quality and similar environmentally sensitive features.*
3. *Cooperate with the Wastewater Reclamation Authority (WRA) and other levels of Des Moines metropolitan government in promoting the use of innovative sewage treatment systems.*
4. *Encourage tree planting on private property within the city.*
5. *Assist in the preservation of prime agricultural lands to allow areas to be farmed as long as desired by property owners by designating agricultural reserve areas and other mechanisms.*
6. *Require appropriate erosion controls during construction.*
7. *Limit urban development on steep slopes.*
8. *Incorporate select stands of timber into permanent open space areas as part of traditional platting and quality planned unit developments.*
9. *Encourage tree planting along street rights-of-way and other publicly owned land to improve community aesthetics.*
10. *Encourage efforts to preserve wildlife species including preservation of natural habitat areas where feasible.*
11. *Consider public acquisition of select plant and wildlife habitat areas to ensure preservation.*
12. *Maintain compliance with federal, state and local wetland rules and regulations and compliance with air quality, water quality and noise regulations.*
13. *Provide protection of the floodplains of Beaver Creek and the Des Moines River and the erosion-prone drainage courses that are tributary to them.*
14. *Continue participation in the National Flood Insurance Program.*
15. *Sand and gravel deposits are a natural resource. Future reclamation efforts for lands being mined for sand and gravel should be continually monitored and evaluated.*

Existing Conditions

During the 1900s development patterns started to influence the landscape in and around Johnston. The development of Camp Dodge, the railroad and the interstate system fueled development throughout the community. Land that was once rolling prairie hills or cultivated for corn, soybeans and other agricultural goods, now has assumed an urban development pattern. These landscape transformations represent fundamental changes to the area's historic natural landscape.

Development and natural events will continue to influence the landscape. The Land Use chapter provides the foundation necessary to understand how future growth will occur in the next twenty years. This chapter provides an inventory of natural resources (soils, water

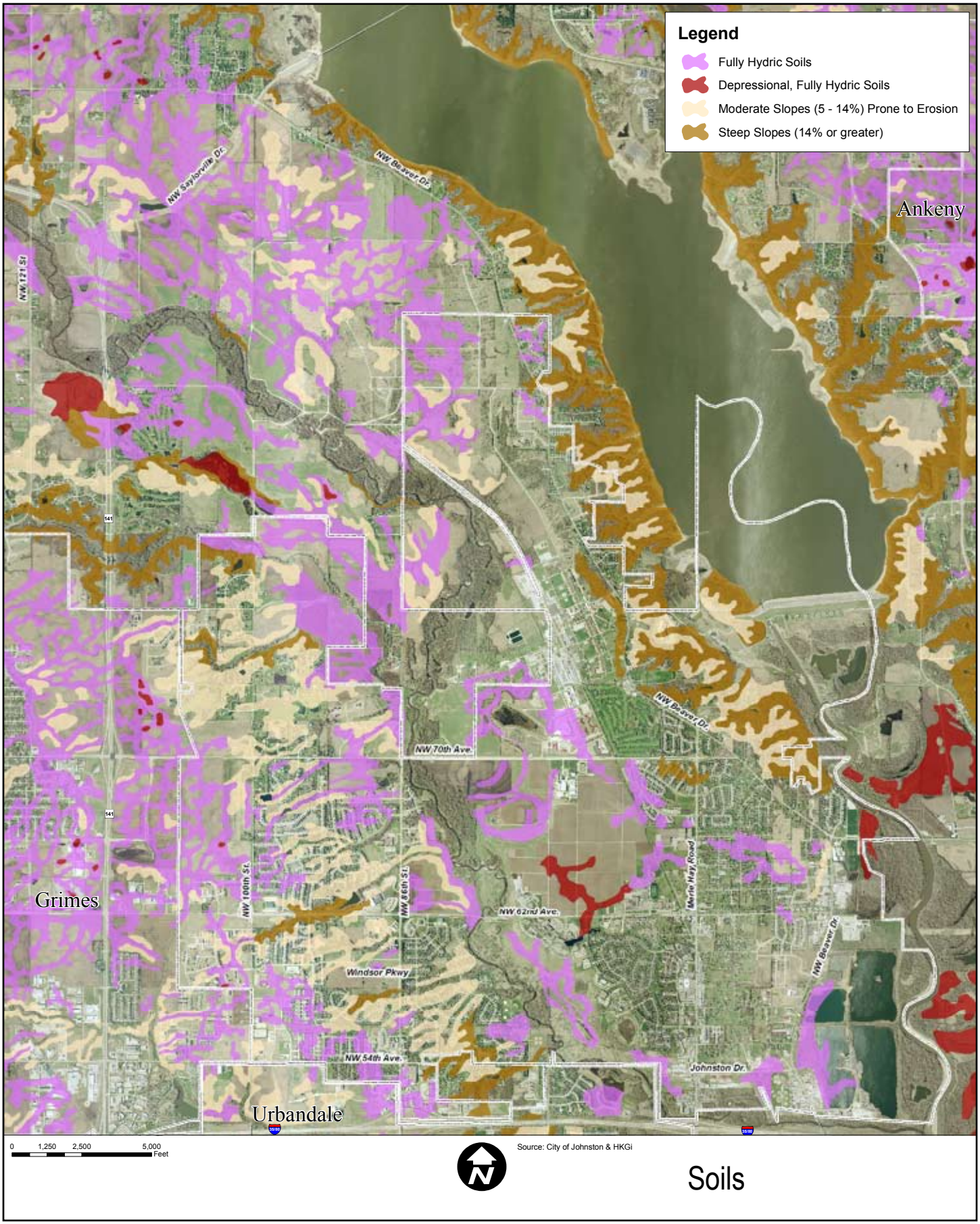

Figure 4.1 - Johnston Soils

features & natural open spaces) that will need to be considered as part of the land use plan. Findings in the City's Watershed Assessment and Stormwater Management Plan that was prepared by Nilles Associates in December of 2009 and other information was used as the basis for this natural resource inventory. The stormwater plan provides an in-depth look at the natural resources within the area, in addition to providing mitigation measures to address watershed and stormwater management issues.

Soils

One of the most reliable and detailed data sets available for soils information is the Soil Survey Geographic Database (SSURGO) prepared by the National Cooperative Soil Survey. This data depicts information about the kinds of soils dispersed throughout the landscape. It is important to be cognizant of these characteristics as certain soil structures can be prone to flooding and erosion. Figure 4.1 highlights key soil conditions within Johnston and the surrounding area. The following soil properties were identified as part of the stormwater plan.

Fully Hydric Soils

These soils often have a shallow watertable and are often located near swales, depressions and flood plains. Special construction practices are often required to construct improvements such as streets, utilities and structures in these areas. These soils may also indicate the presence of jurisdictional wetlands.

Depressional, Fully Hydric Soils

These areas often exist in shallow depressions and are often prone to seasonal shallow flooding. Many of these areas are located along floodplains or were once part of prairie pothole wetlands that were common in Iowa prior to agricultural development. These areas should be reserved from development and are candidates to be re-established as wetlands.

Steep Slopes (14% or greater)

It is difficult to prevent erosion and re-establish stable vegetation on steep slopes disturbed by construction activities. Exposed slopes can be prone to erosion and slope failures potentially causing downstream siltation, erosion and flooding. Structures constructed near the top of steep slopes can be impacted if sufficient separation is not maintained from the base of the structure to the toe of the slope. Construction in these areas can also harm the scenic character of these areas, especially if they are established with quality woodlands or native prairie flowers and grasses. These issues need to be addressed before allowing development on or near these slopes.

Moderate Slopes (5 to 14%) Prone to Erosion

Some soils are more prone to erosion when disturbed than others. Preventing erosion and sediment loss and re-establishing vegetation on these areas when graded may require added silt fencing and other measures. Proper pollution planning and vegetation management will be needed in theses areas.

The soil inventory shows a significant portion of the western edge of town to be fully hydric soils and moderate slopes of 5 to 14%. These soil characteristics can be challenging for development. A number of new housing developments have occurred within this area since the release of the SSURGO data in 2005. It is important to understand that these soils do not prohibit development, but require a more in-depth assessment to determine where development is most appropriately placed.

Water Features

Saylorville Lake

One of the most iconic water features in the area is Saylorville Lake. This reservoir plays an important role in the area as it provides capacity to prevent flooding downstream and

river cresting along the Des Moines River. The lake is managed by the U.S. Army Corps of Engineers.

Wetlands

An important part of Johnston's ecosystem is a series of wetlands that are dispersed throughout the community. This system supports wildlife habitat and spawning areas. Alteration of wetlands in the form of filling or draining can have an adverse effect on these systems and increase flooding and runoff in other areas. For this reason, they require special attention. Federal law also can protect wetlands under the regulations administered by the U.S. Army Corps of Engineers. It is necessary to consult with the city and the Army Corps of Engineers before developing near wetlands. Figure 4.2 depicts the National Wetland Inventory (NWI), which includes jurisdictional and non-jurisdictional water bodies.

Rivers, Streams & Creeks

Johnston is part of a complex system of water corridors that includes the Des Moines River, Beaver Creek and Little Beaver Creek. Each of these corridors feed into a number of smaller streams that contribute to a natural greenway system. This system is discussed in more detail under the Natural Open Space section.

These waterways play a vital role in capturing stormwater runoff thereby preventing flooding and enhancing water quality. Preserving these corridors is beneficial from a public investment standpoint as it reduces storm sewer and other capital improvement cost. The stormwater plan has identified three types of streams within the area and each is defined below. Each of these streams requires a different level of protection and maintenance. The plan provides guidance and mitigation measures on how to preserve and protect these natural waterways.

Type I Streams

These streams include Beaver Creek, Little Beaver Creek and the Des Moines River. Type I streams have established flood plains, established baseflows and watershed areas of a much larger scale than most other urban streams. Proper protection is a key concern for these streams.

Type II Streams

Type II streams do not usually have established floodplains, but often have established baseflows in urban areas. These streams often have watersheds of 40 – 2,000 acres and likely will require ongoing maintenance to prevent larger erosion issues from being created as development occurs. Such issues are difficult to handle by either a private homeowner or an association of local property owners.

Type III Streams

Type III streams may or may not have established baseflows and usually have watershed areas of less than 80 acres. These corridors should be protected or enhanced through the site development process, but likely could be maintained by a private entity as long as maintenance access is available through appropriate building setbacks and required easements. Public or private ownership of these watercourses could be considered on a case by case basis at the site development stage.

Floodplains

Like many communities along the Des Moines River, Johnston has suffered property damage from flooding. The last major floods occurred in 1993 and 2008. Flood events have primarily occurred along the Des Moines River and Beaver Creek during the early

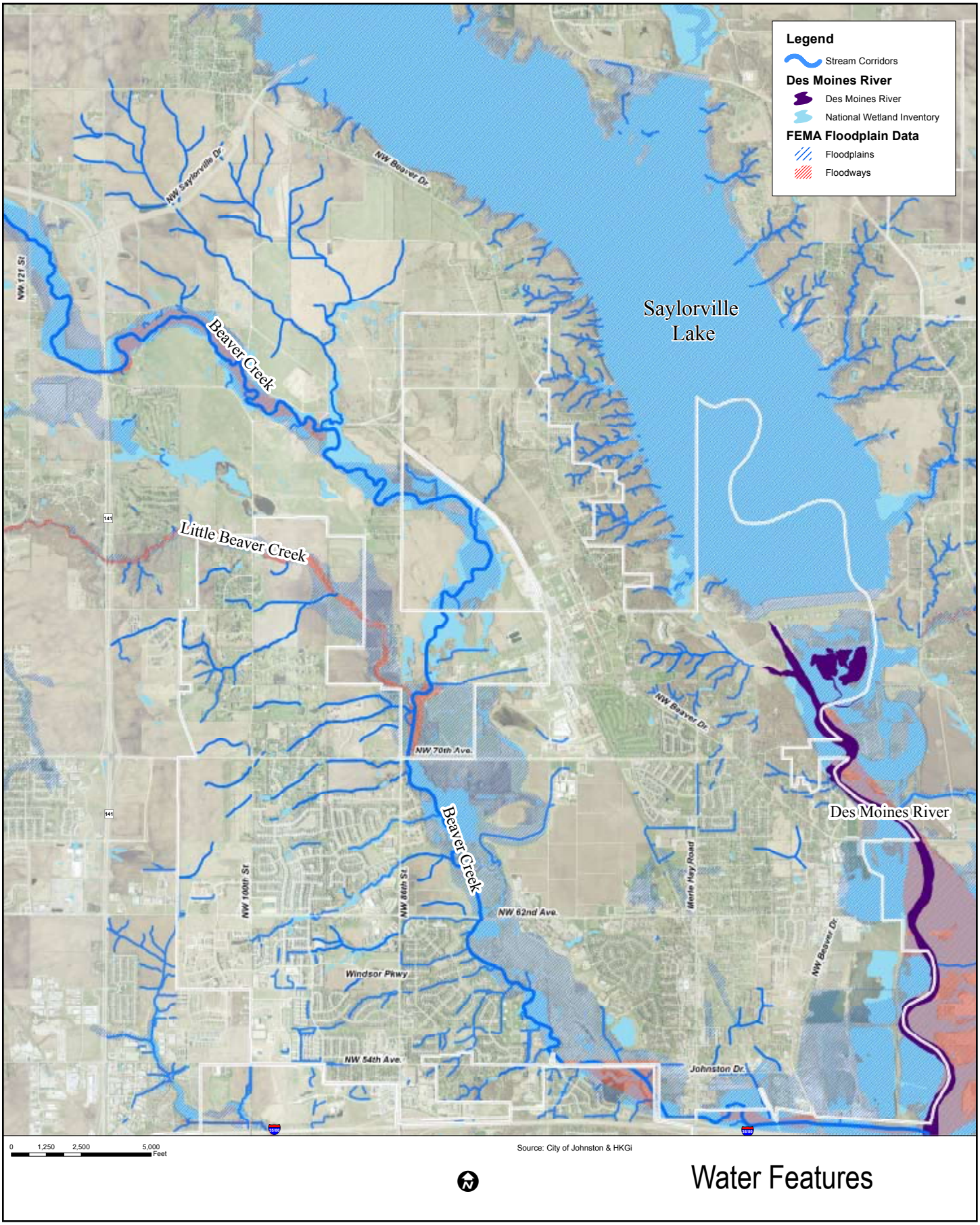

Figure 4.2 - Johnston's Water Features

months of spring and summer. The most up-to-date Federal Management Emergency Agency (FEMA) and Flood Insurance Rate Maps (FIRM) should be consulted to identify properties that may be subject to flooding prior to development. In addition to these resources, zoning provisions have been set by the city to regulate development within the floodplains to ensure the public's safety and minimize future property damage.

Natural Open Spaces

Open spaces and greenways are a valuable component for both functional and aesthetic purposes. They offer a range of opportunities to improve water quality, habitat and recreation. Johnston's landscape already provides a number of interconnected waterways with open spaces, forming a natural greenway system (see Figure 4.3). The backbone to these systems is the Des Moines River and Beaver Creek. Intermingled along these corridors are pockets of vegetation, wetlands and open spaces. Protecting these lands is important to ensure that the greenway functions as a corridor, not just as an assembly of isolated patches of natural areas. A fully interconnected system will require the coordination and collaboration between private landowners and public agencies. The following natural areas are identified in the stormwater plan and makeup the components of Johnston's greenway system.

Quality Wooded Areas

Well-managed tree areas, especially those with mature native trees provide important habitat for a variety of birds, insects and animals. Wooded areas reduce rainfall runoff and protect surface soils from erosion caused by rainfall.

Prairie Remnants

Existing prairies can prevent erosion, absorb pollutants and reduce stormwater runoff. They also provide a valuable seedbank for native flowers and grasses that can help to add diversity to any native planted areas constructed nearby. They also provide important habitat to a wide variety of species.

Stream Corridors

Maintaining a healthy buffer along both small and large streams offer the following benefits:

- *Absorption and filtration of stormwater runoff.*
- *Establishment and protection of wildlife habitat.*
- *Reduced streamflow velocities and streambank erosion.*
- *Provision for safe storage and conveyance of large storm runoff.*
- *Moderation of downstream flooding.*

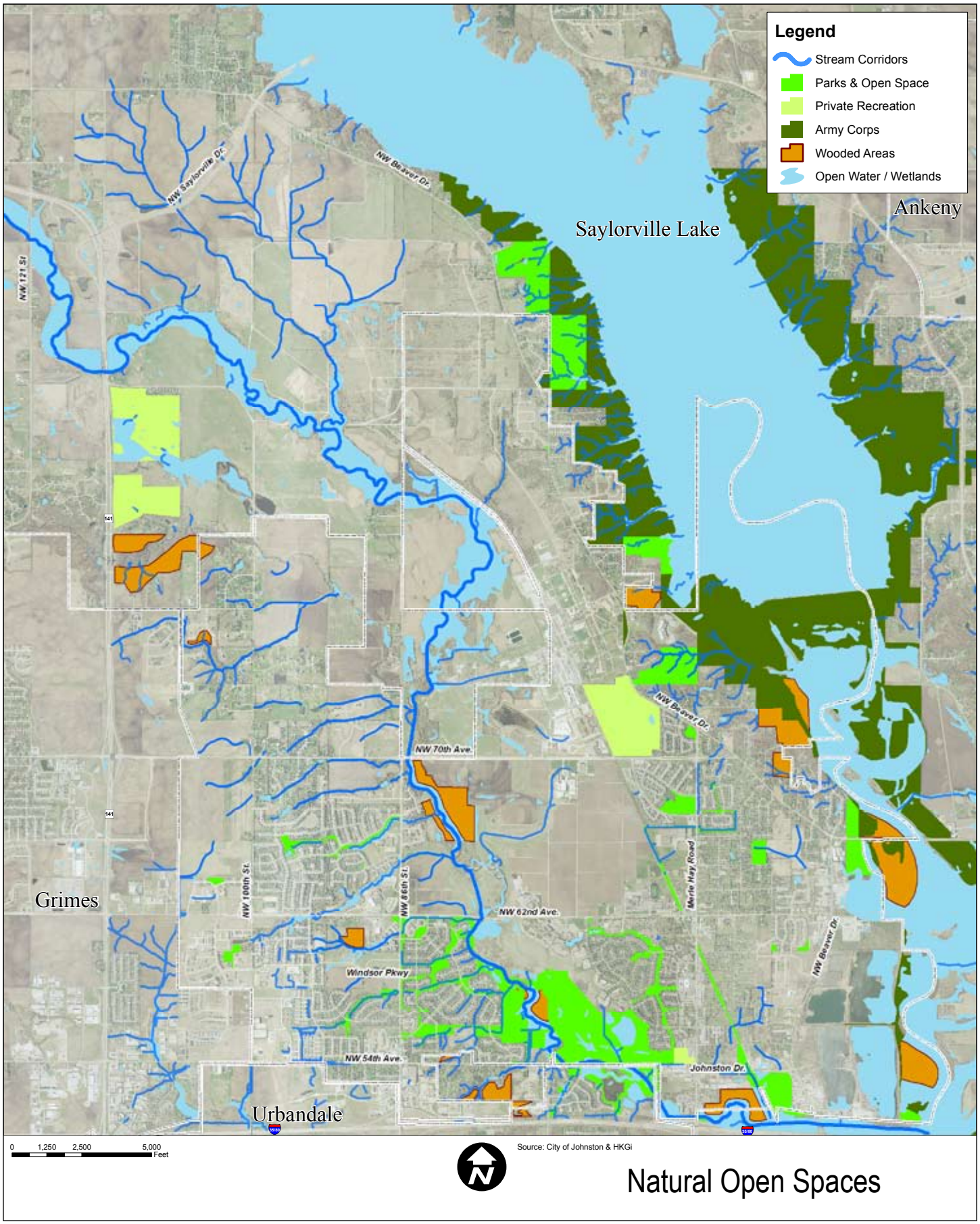

Figure 4.3 - Natural Open Spaces

SAYLORVILLE