

CHAPTER EIGHT

# NATURAL RESOURCES MANAGEMENT & CONSERVATION



The preservation, enhancement, and restoration of the community's character and resources are pivotal issues that have shaped this plan. Open space, bluffs, coulees, Kinnickinnic River and its tributaries, and environmental resources were cited throughout the public participation process as some of the community's major assets.

The mapping of existing environmental resources, conditions, and constraints provide the basis for resource conservation and management policies. Aerial photography research and fieldwork were performed prior to analysis.

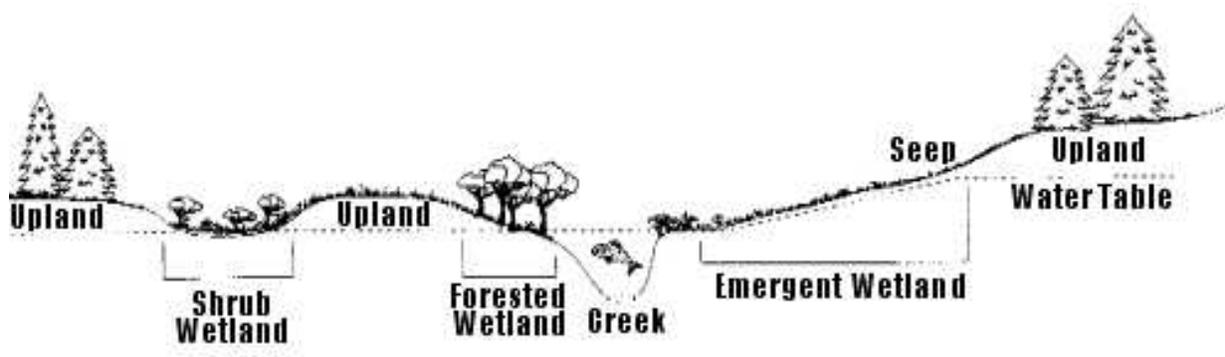
Resource conservation and management policies help determine a service area while protecting and preserving valuable areas from development. To do this, Resource Protection Areas are delineated and growth is prohibited or limited from occurring in these areas. Two classifications are defined that protect habitat that is sensitive and declining or that represents valuable, biological resources in the community. In general, these two classifications are Resource Protection Areas (RPAs) and Sensitive Resource Areas (SRAs). RPAs

contain the most sensitive and valuable habitat and require protection. The SRAs shall be investigated with particular attention to sites that include habitat for sensitive species of plants and animals. The Natural Resources management and conservation issues are addressed in the following Plan elements:

- Biological and Natural Resources and habitat conservation,
- Soils,
- RPAs and SRAs,
- Natural landscapes and landmarks, and
- Environmental protection.
- Additional environmental issues are referenced and addressed in other chapters.

## THEMES

- **Sustainable Growth.** Ensure that development is sustainable and that growth, conservation, redevelopment, and Natural Resources protection are balanced.
- **Quality of Life.** Enhance the quality of life of the community and ensure the availability of community services for residents.



*Shorelands provide valuable habitat for both aquatic and terrestrial animals and vegetation.*

## 8.1 BIOLOGICAL AND NATURAL RESOURCES AND HABITAT CONSERVATION

### 8.1.1 Kinnickinnic River

The Kinnickinnic River is perhaps the finest coldwater resource in the Upper Midwest, if not in the entire United States. Designated as an Outstanding Water Resource by the Wisconsin Department of Natural Resources, the Kinnickinnic River (also known as the Kinni) is one of the two Class 1 Trout streams in Wisconsin that flow through a City of 10,000. This natural gem is truly unique and the centerpiece of our community which is located on the falls of the Kinnickinnic River.

The Kinnickinnic River contributes a unique character and quality of life to the City of River Falls and surrounding area. It provides a pleasant natural environment close at hand, and contributes to the economic and social prosperity by enhancing the attractiveness of the community to businesses and residents. These benefits can only derive from a healthy and vital river. The Kinni is a major natural community amenity that deserves our very best efforts to protect it as growth occurs.

As such, this comprehensive plan strives to:

- Maintain a healthy, clear, clean, cold flowing river and its critical habitats
- Participate in developing strategies for the City, townships and general public to protect the Kinni and its watershed
  - Recognize the river as a powerful core amenity that makes River Falls unique and attracts residents and visitors
  - Provide protection of this natural treasure for present and future generations through sustainable development
  - Provide an opportunity for the public (residents and visitors) to enjoy the river

Urban growth is a permanent process that irreversibly changes the landscape. Protection of the Kinni requires that growth be carefully crafted to preserve its water quality and critical habitats. The health and future of the Kinnickinnic River depend on three key elements:

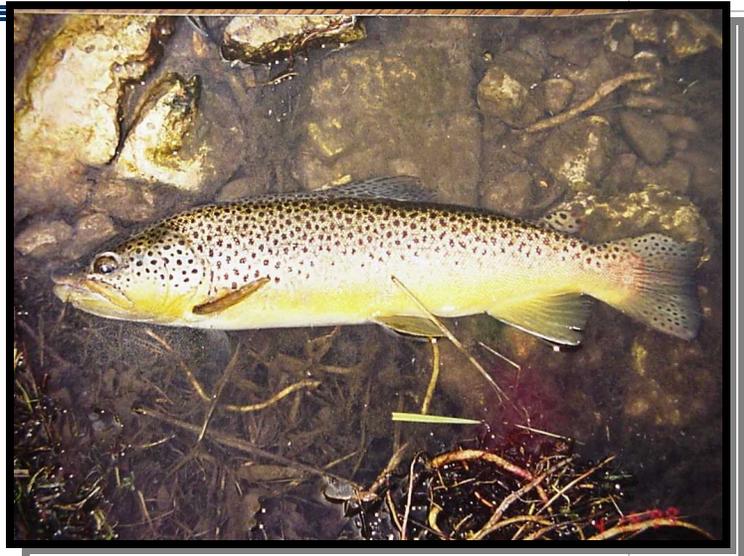
- Protecting the groundwater supplies that sustain the river and provide a water source for all watershed residents
- Protecting the natural flow regime, water quality and aquatic residents of the river
- Protecting the critical natural habitats that enhance water quality and defines the scenic beauty of the river way.

According to the guidance for watershed Stewardship, Lower St. Croix River: A Stream Protection Strategy, 1998 to achieve river protection ten key sustainable actions need to be addressed as growth occurs:

1. Watershed-based planning and zoning
2. Protect sensitive areas and Natural Resources from development
3. Establish a river buffer network
4. Reduce, where possible, the creation of impervious cover
5. Limit the disturbance and erosion of soils
6. Treat the quantity and quality of stormwater runoff, and promote stormwater infiltration whenever possible
7. Maintain stream protection measures
8. Promote water conservation, and treat wastewater at a high level
9. Actively encourages river protection and stewardship by all residents
10. Monitor river water quality, to ensure that protection is being achieved

The Kinnickinnic River watershed covers many jurisdictional boundaries. The ideal method of planning for river protection is watershed based. In the absence of this the City and surrounding townships must work together to ensure protection of the Kinni. Decisive action will be required for river protection. Chapters three Land Use and Chapters four Growth Management provides implementation steps for protecting the Kinnickinnic River and natural resources.

The future of this unique water resource requires the efforts of the entire community and residents of the Kinnickinnic watershed. Traditional approaches to development endanger this community centerpiece. The City has adopted and continues to work on updating and passing ordinances on storm water management and shore-land protection.

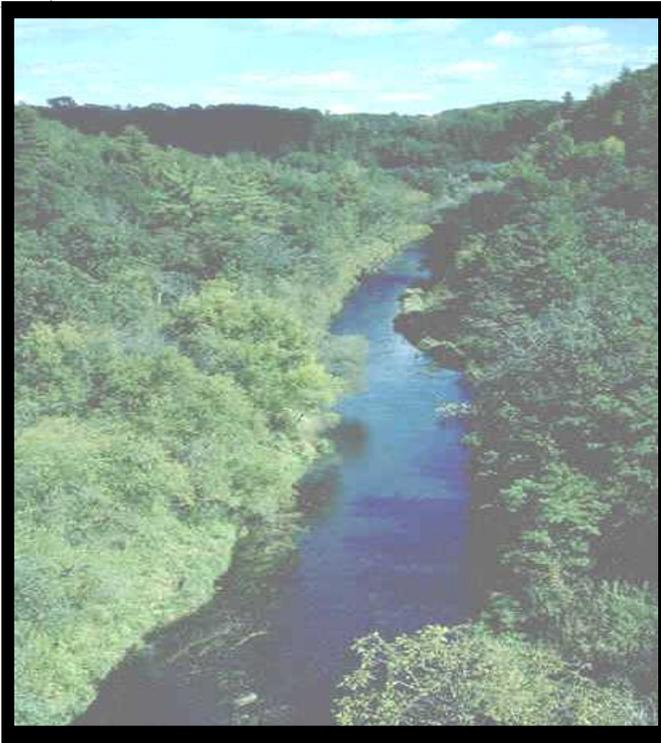


*A wild Brown Trout from the Kinni.*

This comprehensive plan in its Natural Resources management and conservation guiding and implementation policies, outlines approaches to protect the Kinni and its watershed for the future residents of River Falls.

### Early Notification

This document supports the enhancement of the development review process to better facilitate community involvement and encourage public input on development proposals. For example, chapter nine Community Services outlines a Early Neighborhood Notification (ENN) process (see appendix G). The adoption of an **Early Neighborhood Notification** process will provide for an exchange of information between the prospective applicant and the affected neighborhoods, property owners, concerned citizens and organizations before plans become too firm to respond meaningfully to community input and before changes in plans might require major financial losses by the applicant. The Comprehensive Plan also proposes development of a Public Participation Handbook that will explain the development review process and the stages and methods for public input.



*Kinnickinnic River.*

### 8.1.2 Riparian Corridors and Wetlands

The riparian regions provide valuable habitat as well as corridors for wildlife movement. These areas include the Kinnickinnic River and the South Fork of the Kinnickinnic River. The riparian corridors and wetlands include marshes, bogs, swamps, wet meadows, potholes, sloughs, and river overflow lands. Wetlands are significant because they provide habitat for wildlife and fish; reduce flood peaks; maintain water quality; and serve as groundwater recharge zones, open space, and educational areas.

Protection of these valuable resources from intrusion and infill due to development is important in maintaining a balance between nature and manmade development. Historically, wetlands have not been viewed as important and have been filled in for “convenience” and “progress.” Updates in the City Code have assisted in minimizing the effect of development on these areas.

**Wetlands.** State Statute defines wetlands as areas where water is at, near, or above the

surface long enough to support hydrophytic vegetation or water-loving plants with soils indicative of wet conditions. Wetlands may be seasonal or permanent and are commonly referred to as swamps, marshes, or bogs. These areas serve as groundwater recharge zones and also as habitat for a variety of plants and animals. Wetlands act as a sieve, filtering out silt before it can enter streams and lakes. Particular attention must be given to wetlands within lakes to assure that they are protected from development. The federal government and the WDNR restrict development in wetlands through Section 404 of the Clean Water Act and NR 103, respectively. Wetlands can be damaged, resulting in restoration costs, fines, and/or restrictions. The WDNR has an inventory of wetlands of two acres and larger. All wetlands, no matter how small, that meet the state definition, are subject to WDNR regulations. Federal regulations may also apply.

Attention must be given to wetlands within shorelands to ensure protection from development. Site investigation is required to ensure compliance with federal and state regulations. The Wisconsin Wetland Inventory Map, and aerial photographs, were used to assist in delineating all regulated wetlands within the study area.

A description of wetlands by type follows.

- **Emergent.** These wetlands are also frequently called marshes. They are characterized by standing water and usually dominated by cattails, bulrushes, and sedges.
- **Forested.** These wooded wetlands are usually associated with bogs and floodplains and are dominated by silver maple, cottonwood, elm, green ash, and black spruce. If standing water is present, it is only several inches deep.
- **Scrub/Shrub.** Short trees and woody shrubs such as alder, willow, birch, and dogwood dominate these wetlands. If standing water is present, it is only several inches deep.

- **Wet meadow.** These wetlands have saturated soil rather than standing water and are dominated by sedges, reeds, grasses, marsh marigold, and asters. The state threatened wood turtle (*Clemmys insculpta*) is found in wet meadows, as is the wild licorice plant (*Glycyrrhiza lepidota*).

A description of the wetlands by minor watershed, as shown in the City of River Falls Water Management Plan (1995), follows.

**Upper Kinnickinnic Minor Watershed.**

The wetlands in this area are generally associated with the Upper Branch of the Kinnickinnic River; those located directly along the riverbanks are forested with cottonwood, silver maple, and willow. These forested wetlands provide high quality resources for wildlife; wood ducks were observed in the field, and the shading provided by the overhanging trees helps to maintain the low temperatures that support the trout population. In wider areas of the river, there are islands vegetated with diverse wetland vegetation including reeds and marsh marigold. There are also several wet meadow/emergent wetlands that are associated with prairie remnants in this watershed that provide additional wildlife resources. Protecting the wetlands in this area from development impacts is crucial to maintaining their value to wildlife and to preserving the quality of the river for trout habitat.

**Upper Dam Minor Watershed.** The large wetland in this area is mostly forested with cottonwood, silver maple, ash, and box elder, with some interspersed open areas. This wetland likely serves as an important wildlife resource along the section of the Kinnickinnic River that runs through the City, as it is one of the only areas that is not developed close to the riverbanks.

**Lower Dam Minor Watershed.** The wetlands associated with Lake Louise are both forested and emergent. The trees are generally willow and cottonwood, while the

emergent wetlands are cattails, willow shrubs, and reed canary grass. Lake Louise is the largest water body in the study area, and these associated wetlands provide important buffers to its water quality, as well as adding diversity of habitat for wildlife, such as water birds, amphibians, and larger mammals.



*Water Lilies blooming on a lake.*

**South Fork Minor Watershed.** There are several high quality wetlands associated with the South Fork of the Kinnickinnic River. As with the Upper Branch, most of the wetlands closest to the riverbanks are forested with cottonwood, silver maple, and willow. There is a high quality sedge meadow wetland located at the southeastern edge of the study area; this large wetland has many sensitive species, such as marsh marigold and hummock sedges, and appears to have been minimally impacted by the surrounding agricultural land uses. Protecting the wetlands in this area should be a high priority because they offer unique habitat.

**Floodplains.** Floodplains primarily occur along the Kinnickinnic River, South Fork of the Kinnickinnic River, and along streambeds that serve as tributaries. Except north of the City, floodplains do not extend to any great distance beyond the shoreline of the Kinnickinnic River due to the steepness

of the slopes. The South Fork of the Kinnickinnic River has a floodplain of approximately one-eighth to one-quarter mile because of the shallow flow and nearly level stream terrace. There are, however, tributary areas of the City that experience periodic flooding. Floodplain zoning is required and implemented by counties, cities, and towns by Wisconsin State Statute.

The purpose of the Wisconsin Administrative Code NR 116, Floodplain Management Program is to protect property and public investment from the effects of flooding. Federal Emergency Management Agency 100-Year Floodplain Maps were used to delineate flood hazard areas within the study area. Flood hazard areas are prevalent throughout the study area. Variations in the width of the flood hazard zone are due to topography and water volumes. In the Urban Area Boundary, there is minimal development within the 100-year floodplain. Enforcement of local floodplain ordinances has reduced the amount of development within the 100-year floodplain.

**Shorelands.** Shorelands are usually considered prime development areas because of their scenic beauty. It is these shorelands that provide valuable habitat for both aquatic and terrestrial animals and vegetation. Shorelands also provide a buffer and serve to protect water quality. The State of Wisconsin requires communities to protect and prevent the loss and erosion of these valuable resources by adopting and enforcing a shoreland ordinance. The authority to enact and enforce this provision comes from the Wisconsin Statutes, Wisconsin Administrative Code NR 115, which outlines the Shoreland Management Program. Ordinances can be more stringent but must not be less stringent than the Wisconsin Administrative Code. The surrounding towns have adopted either St. Croix County's or Pierce County's shoreland zoning provisions. In 2003, the City adopted a more stringent shoreland ordinance. The City's shoreland zoning provisions come into effect when any land is annexed into the City.

### 8.1.3 Potential Impact of Development on the River

The cold, clear water of the Kinnickinnic is vulnerable to impacts from development. The river's trout population, being very sensitive to the effects of these impacts, can act as a "canary in a coal mine," possibly showing great impacts from small changes in water temperature or quality. Potential impacts from development are outlined below.

It is important to realize that a river's watershed extends far beyond its banks and the land and wetlands directly adjacent to it. As shown on the Water Management Plan (1995), the minor watersheds for the Kinnickinnic and its tributaries within the study area range from under .5 square mile to over 15 square miles in area. Any change in land cover or surface water management within a watershed, from filling wetlands to farming a hilltop miles away from the river, has the potential to impact the river environment. As the percent of impervious surfaces is increased in a watershed, the volume of runoff increases. Increased runoff, if not properly managed, can have a variety of negative impacts on receiving water bodies such as the Kinnickinnic. These potential impacts include increased chances of flooding, erosion of stream banks and drainage ways, warming of stream waters, and decreased ground water base flow due to less infiltration. Storm water management practices are routinely used to reduce the magnitude of these potential impacts.

In addition to increasing impervious surface areas, other infrastructure requirements of development can negatively affect water quality:

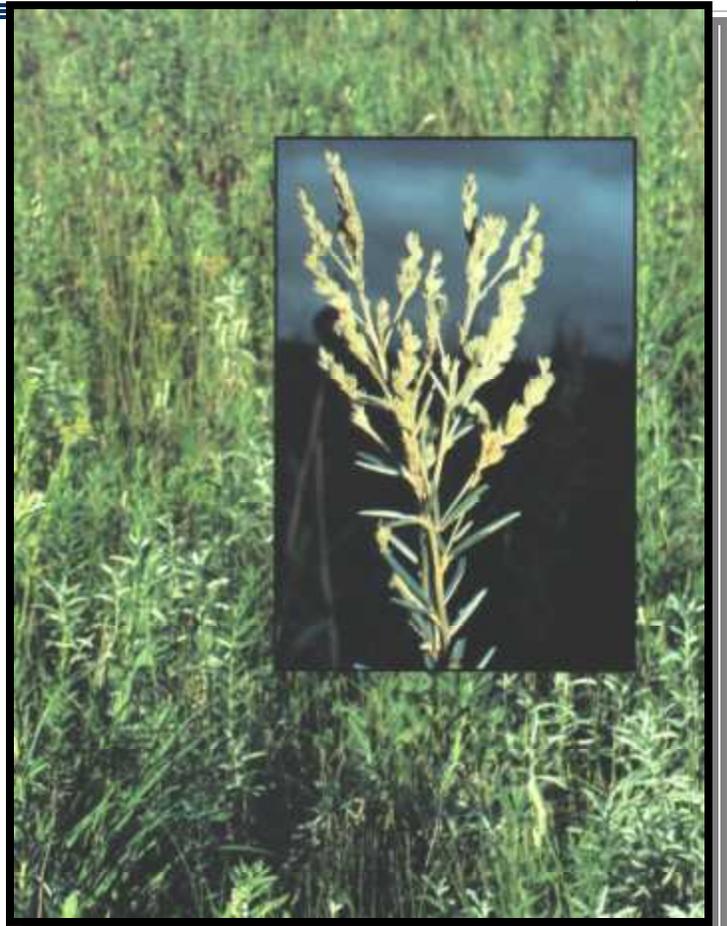
- Water supply wells are often required in developing areas outside the City service area. A potential effect of removing large amounts of ground water for water supply can be to reduce ground water base flows in ground-water-fed water bodies. This effect can be exacerbated by the increase in impervious surfaces.

- Increased amounts of wastewater are generated as development occurs. While current wastewater treatment technology can remove almost all of the nutrients in wastewater, trace levels still exist in their effluent. Discharge of this treated wastewater can affect the quality of receiving water bodies.
- Increased traffic increases the risk of toxic spills occurring near a water body. Such a spill could have a serious impact on water quality and aquatic habitat.
- Impacts to other wildlife species would occur primarily through the loss of habitat as development encroaches on previously undisturbed areas.

#### 8.1.4 Habitats

Habitat is a term used for a set of natural conditions including climate, elevation, solar aspect, water, wind, soil, geology, and other elements combined. Plants are most often used to characterize biotic communities, which form habitat for animals and other plants. WDNR has developed a rare, threatened, and endangered species and natural communities list for St. Croix and Pierce Counties. A detailed vegetation study that maps the biotic communities around the City of River Falls has not been performed. Such a study would help locate and designate critical habitat for threatened and endangered species and for other species of concern. In the future, a detailed study and map should be developed that locates these habitats.

As stated above, many scenic vistas of bluffs, coulees, valleys, and the Kinnickinnic River surround the community. The River Falls community is located in the northern part of the Coulee Region of Wisconsin. Most of the land within the community of River Falls is fairly level to gently sloping, except for the steep, rock bluffs along the Kinnickinnic River and the South Fork. Within the Urban Area Boundary, there are lands that are quite hilly with many steep slopes and sharply defined bluffs and watercourses.



*Prairie bush clover (Lespedeza leptostachya) has pink flowers and widely spaced slender leaves.*

The most sensitive and important of these biotic communities is the riparian area, which provides food, water, and prime nesting habitat for migrant as well as resident species. Since most of the biotic community in the River Falls area occurs over a wide range of southwestern Wisconsin, few of the biotic communities are rare or unique, but many of them provide habitat for rare, threatened, or endangered species of both plants and animals.

#### 8.1.5 Plants

There are approximately 2,000 species of native and naturalized seed plants in the State of Wisconsin. Table 8.1 lists *some* of the rare, threatened, and endangered plant species within St. Croix and Pierce Counties.



Winter Scene along the Bluffs

### 8.1.6 Woodlands

Woodlands provide habitat for a variety of plants and animals as well as scenic beauty to the landscape. Woodlands exist near rivers and streams, wetlands, steep slopes, landscaped yards, and forest cropland. They are essential for erosion control, wildlife habitat, and the aesthetic environment. Retention of a maximum acceptable percentage of woodland cover in developable areas will greatly contribute to the environment and the value of residential, commercial, and industrial development. Existing woodlands provide aesthetic areas for group gatherings and recreation. These areas should be reserved for those purposes through the planning and development process. The City of River Falls has an existing urban forestry program that revegetates and maintains woodlands for future generations.

### 8.1.7 Wildlife

Table 8.2 outlines some of the rare, threatened, or endangered animal species within St. Croix and Pierce Counties.

### 8.1.8 Threatened and Endangered Species, and Species of Concern

The range of biological communities in the regional area and surrounding the City provides suitable environments for animals and plant species that are considered threatened, endangered, or of concern. These

communities are subject to protection under the Federal Endangered Species Act and the Wisconsin Endangered Plant and Animal Act. All site plan reviews for development should include consideration of these endangered resources.

These resources primarily occur within the bluffs and riparian corridors and other specific areas. Many of the animal species are migratory and are present infrequently. In some cases, such as that of the endangered Crystal Darter fish or Higgins' Eye mussels, it is possible to enhance or restore habitat for a species to increase the possibility of its occurrence. Unlike the migrating animals, several of the rare plants that may occur within the area may be uprooted and destroyed as a result of construction and development.

The WDNR, Bureau of Endangered Resources conducts data searches for natural areas and endangered plants and animals. The bureau urges that special care be taken to protect any and all endangered resources from development. The exact locations of the endangered resources can only be used for analysis and review purposes. The following sections provide information and a list of those endangered plants and animals within the St. Croix and Pierce County area.



Great Egret (*Casmerodius albus*), a large predatory wading bird, is listed as a threatened species by the state.

**Table 8.1 Plants of Concern in Pierce and St. Croix Counties, Wisconsin.**

Scientific Name	Common Name	State Status	Federal Status	Habitat
<i>Adoxa moschatellina</i>	Musk-root	Threatened	–	Shaded, damp cliffs
<i>Anemone caroliniana</i>	Carolina Anemone	Endangered	–	Dry prairies, sand prairies, bluff prairies
<i>Astragalus crassicaarpus</i>	Ground Plum	Endangered	–	Bluffs and dry prairies
<i>Besseyia bullii</i>	Kitten Tails	Threatened	–	Prairies, barrens, open woods
<i>Calylophus serrulatus</i>	Yellow Evening Primrose	Special Concern	–	Prairies, river valleys
<i>Catabrosa aquatica</i>	Brook Grass	Endangered	–	Cold springs
<i>Cirsium hillii</i>	Hill’s Thistle	Threatened	–	Dry prairies
<i>Dalea villosa</i>	Silky Prairie-clover	Special Concern	–	Sand prairies
<i>Drosera linearis</i>	Slenderleaf Sundew	Threatened	Threatened	Bogs
<i>Glycyrrhiza lepidota</i>	Wild Licorice	Special Concern	–	Wet meadows and prairies
<i>Lespedeza leptostachya</i>	Prairie Bush Clover	Endangered	Threatened	Dry sandy prairies
<i>Lesquerella ludoviciana</i>	Silver Bladderpod	Threatened	–	Dry prairies
<i>Liatris punctata</i> (var. <i>nebraskana</i> )	Dotted Blazing Star	Endangered	–	Sand prairies, roadsides
<i>Nothocalais cuspidata</i>	Prairie False-dandelion	Special Concern	–	Dry prairies
<i>Onosmodium molle</i>	Marbleseed	Special Concern	–	Dry open woods
<i>Orbanche ludoviciana</i>	Louisiana Broomrape	Endangered	–	Dry prairies and sand dunes
<i>Prenanthes apsera</i>	Rough Rattlesnake-root	Endangered	–	Dry prairies
<i>Psoralea esculenta</i>	Pomme-de-Prairie	Special Concern	–	Dry prairies
<i>Scutellaria parvula</i> (var. <i>parvula</i> )	Small Skullcap	Endangered	–	Dry prairies and bluffs
<i>Senecio plattensis</i>	Prairie Ragwort	Special Concern	–	Dry prairies, open woodlands
<i>Talinum rugospermum</i>	Prairie Fame-flower	Special Concern	–	Sand barrens
<i>Trillium nivale</i>	Snow Trillium	Threatened	–	Calcareous woods

**Table 8.2 Animals of Concern in Pierce and St. Croix Counties, Wisconsin.**

Scientific Name	Common Name	State Status	Federal Status	Habitat
<i>Alosa chrysochloris</i>	Skipjack Herring	Endangered	–	St. Croix River system
<i>Ammocrypta asprella</i>	Crystal Darter Fish	Endangered	–	St. Croix River system
<i>Buteo lineatus</i>	Red-shouldered Hawk	Threatened	–	Bottomland hardwoods, mixed forests
<i>Casmerodius albus</i>	Great Egret	Threatened	–	Lakes, streams, marshes
<i>Clemmys insculpta</i>	Wood Turtle	Threatened	–	Hardwoods, wet meadows
<i>Crotalus horridus</i>	Timber Rattlesnake	Special Concern	–	Woodlands, prairies, bluffs
<i>Cumberlandia monodonta</i>	Spectacle Case Mussel	Endangered	–	St. Croix River system
<i>Cyclonaias tuberculata</i>	Purple Wartyback Mussel	Endangered	–	St. Croix River system
<i>Ellipsaria lineolata</i>	Butterfly Mussel	Endangered	–	St. Croix River system
<i>Elliptio crassidens</i>	Elephant Ear Mussel	Endangered	–	St. Croix River system
<i>Epioblasma triquetra</i>	Snuffbox Mussel	Endangered	–	St. Croix River system
<i>Falco peregrinus</i>	Peregrine Falcon	Endangered	Endangered	Bluffs
<i>Fusconaia ebena</i>	Ebony Shell Mussel	Endangered	–	St. Croix River system
<i>Gastrocopta procera</i>	Wing Snaggletooth Snail	Threatened	–	St. Croix River system
<i>Hiodon alosoides</i>	Goldeye Fish	Endangered	–	St. Croix River system
<i>Ictiobus niger</i>	Black Buffalo Fish	Threatened	–	St. Croix River system
<i>Lampsilis higginsii</i>	Higgins' Eye Mussel	Endangered	Endangered	St. Croix River system
<i>Lanius ludovicianus</i>	Loggerhead Shrike	Endangered	–	Prairie and bushland
<i>Macrhybopsis aestivalis</i>	Speckled Chub Fish	Threatened	–	St. Croix River system
<i>Moxostoma carinatum</i>	River Redhorse Fish	Threatened	–	St. Croix River system
<i>Moxostoma valenciennesi</i>	Greater Redhorse Fish	Threatened	–	St. Croix River system
<i>Notropis amnis</i>	Pallid Shiner Fish	Endangered	–	St. Croix River system
<i>Ophiogomphus anomalus</i>	Extra-striped Snaketail Dragonfly	Endangered	–	Warm water streams in forested watersheds
<i>Ophiogomphus howei</i>	Pygmy Snaketail Dragonfly	Threatened	–	Streams in forested watersheds
<i>Ophiogomphus susbehcha</i>	Saint Croix Snaketail Dragonfly	Endangered	–	Large streams in forested watersheds
<i>Percina evides</i>	Gilt Darter Fish	Threatened	–	St. Croix River system
<i>Plethobasus cyphus</i>	Bullhead Mussel	Endangered	–	St. Croix River system
<i>Podiceps grisegena</i>	Red-necked Grebe	Endangered	–	Bluff prairies, sandy prairies
<i>Polydon spathula</i>	Paddlefish	Threatened	–	St. Croix River system
<i>Quadrula fragosa</i>	Winged Mapleleaf Mussel	Endangered	Endangered	St. Croix River system
<i>Quadrula metanevra</i>	Monkeyface Mussel	Threatened	–	St. Croix River system
<i>Simpsonaias ambigua</i>	Salamander Mussel	Threatened	–	St. Croix River system
<i>Speyeria idelia</i>	Regal Fritillary	Endangered	–	Prairies and pastures
<i>Tritogonia verrucosa</i>	Buckthorn Mussel	Threatened	–	St. Croix River system

### 8.1.9 Impacts of Development on Biological Resources and Habitat

Continued urban growth and expansion poses several challenges to plant and animal communities in River Falls, both rare and common. These impacts fall into the following broad categories, including:

**Direct Species Removal** is essentially the demise of a plant or animal. Such removal can occur in a number of ways. Construction or development projects that require surface disturbance may result in the taking of plants, which are destroyed by the activity of heavy equipment. In most cases, these are common plants that occur in abundance elsewhere. However, in some cases, construction activity can destroy plants. For example, construction projects have reduced the number of oak savannahs, birch, ash, cedar, and pine that serve as a resource to wildlife by adding to the diversity of cover and food sources. Direct removal of plants also can occur from the use of pesticides, indiscriminate collection of wildflowers, and through trampling of plants by heavy pedestrian, equestrian, or cycle traffic.

Although less obvious, direct removal of animals occur during many construction projects. Small animals, such as the timber rattlesnake and lizards, often rest in underground burrows during the heat of the day or hibernate during the winter. Clearing land with heavy equipment can crush these animals in their burrows or bury them beyond their capacity to dig out. As with plants, most of these species are common, but in some cases protected amphibians such as the wood turtle, which nests in low and some upland forests could be destroyed by large-scale development activities. Direct species removal can occur from remote activities, such as the discharge of hazardous substances like pesticides or herbicides, which can make their way into aquatic environments, killing fish and invertebrates and potentially affecting terrestrial wildlife that prey on these species.



Wood turtles (*Clemmys insculpta*) are on the state endangered list.

**Loss of Habitat.** Aside from direct removal of species, land conversion activities can destroy or modify key habitat. Many wildlife species require territories for hunting or foraging. Birds often require specific nesting sites. Some animals utilize localized migration corridors to travel between habitats. Conversion of land can result in loss of key habitats, which indirectly can result in the removal of the species. Such conversion can occur, for instance, by indirect means such as changes in hydrological flow resulting from upstream changes in the land. This can increase storm water runoff from paved areas, which can result in the erosion or sedimentation of habitat. The habitat may be damaged to the point where the species can no longer utilize it to survive.

Large construction projects may have adjacent drainage and watercourses. A drainage course may be channelized and lined with concrete or soil cement to reduce erosion. Although from an engineering standpoint, these modifications may control erosion, they can alter the natural character of the flow pattern and infiltration of water into the soil and destroy wildlife habitat along and within the natural drainage channels. Riparian zones are currently used by wildlife, as well as by people engaging in recreational activities. As development increases, it impinges on the natural habitat within and adjacent to these riparian zones, resulting in loss of habitat for wildlife species and loss of access to the areas for enjoyment by people.

**Interrupting Reproductive Cycles.** In both plants and animals, interrupting the reproductive cycle can result in a failure of reproduction by the species. In the case of plants, moving, burning, or spraying pesticides or herbicides during the reproductive season can result in a total failure of reproduction for the species. Common species will likely reseed in the area, but rare species have highly limited distribution and could be destroyed by extensive use of herbicides or pesticides.

Animals are also sensitive to interpretation of reproductive cycles. Birds are particularly sensitive to such disturbances, and some will abandon nests if they are subject to increased levels of noise or disturbed while they are incubating eggs. In the case of rare birds, this could result in the destruction of the population.

**Sedimentation.** Urban development past and present in the River Falls' area including the downtown has involved paving large areas that previously held infiltrated soils. Runoff from this pavement is clean water that picks up sediment as it flows to the Kinnickinnic River and its tributaries. Depending upon the location and intensity of a storm, runoff can score the sides and bottoms of some portions of riparian habitat, destroy plant communities adjacent to the watercourse, and deposit

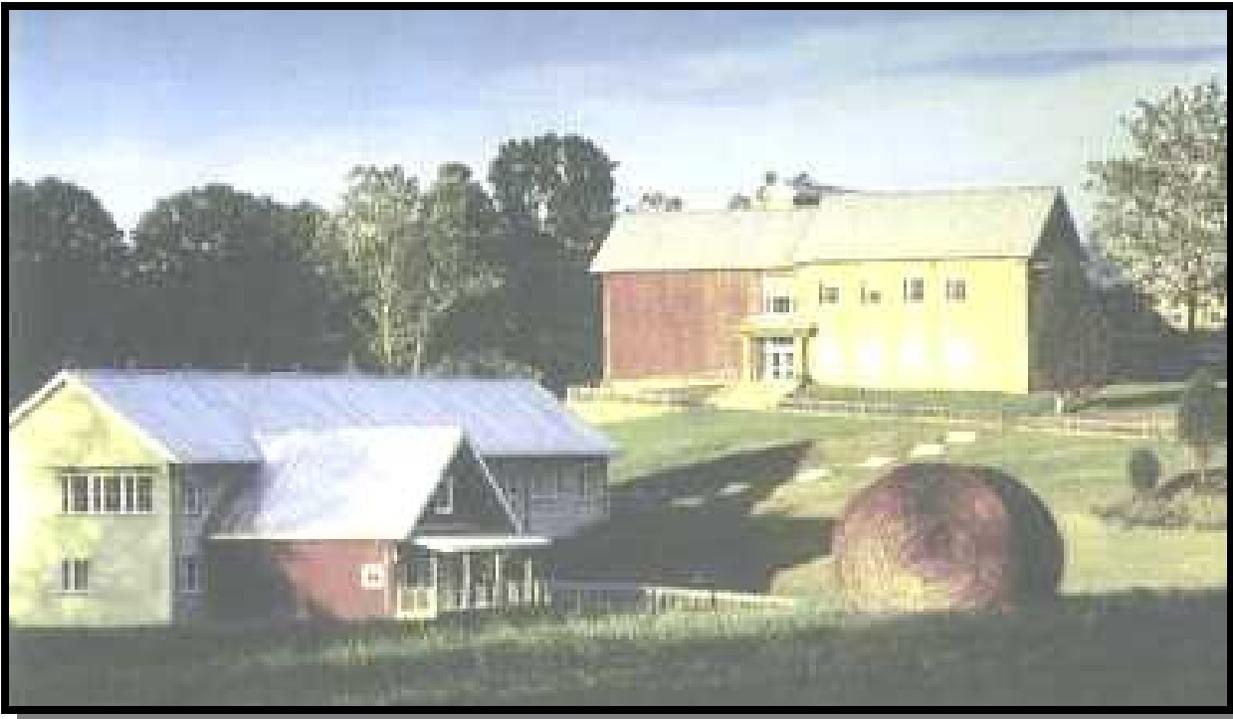
sediment in other portions of the drainage area. The deposition of sediment generates two types of mechanical problems:

- Physical blockage of the water flow into portions of the drainage area sometimes results in a shift of the alignment of the drainage area; and
- Slow filtering of the Riverine and Palustrine wetlands habitats and wildlife habitat within and adjacent to the watercourse. Additionally, some of these sediments could be deposited outside the urbanized area and affect riparian zones and wetlands downstream.

**Flooding.** With increased development, less and less of the ground surface has permeable soils. During periods of heavy runoff, water pours off the streets and parking lots into rivers and drainage channels. Any definable river channel or holding pond has a limited capacity for holding water within its banks. If the water entering these areas exceeds the capacity to hold the flow, then the storm water will spill out, potentially flooding adjacent properties and damaging structures.

**Contamination by Hazardous Substances.** Runoff from roads in urbanized areas contains toxic materials, such as lead, nitrates, sulfates, chlorides, and organic compounds and other heavy metals. Lead, in particular, is extremely hazardous in wetland environments. It binds to organic compounds and accumulates within the wetlands. Over time, lead can reach toxic levels. A variety of other polluting substances can enter riparian zones and wetlands, including pesticides, herbicides, hydrocarbons, and other heavy metals. National Pollution Discharge Elimination Systems Standards, if applied, may reduce or eliminate the deposition of hazardous materials.

As urbanization continues, the level of potential contaminants within storm water may be expected to increase. If contaminants accrue mitigation measures to eliminate or reduce the hazardous materials in storm water runoff may be required.



*Buildings Clustered on Farmland.*

## 8.2 SOILS

### 8.2.1 Prime Farmland

Prime farmland is land that is best suited for food, feed, forage, fiber, and oil seed crops. It may be cultivated land, pasture land, or other land, but it is not existing urban and built-up land or water areas. Soil quality, growing season, and moisture supply are necessary for a well-managed soil to produce a sustained high yield of crops in an economic manner. Prime farmland produces the highest yield with minimal input of energy and economic resources, and farming it results in the least damage to the environment. Soils that fall into Class I, II, and III of the Natural Resources Conservation Service capability unit classification system are considered prime agricultural land.

The value of these lands is associated with not only their soil class but also with their size, present use, and any regulatory framework for their protection. The Land

Evaluation Site Assessment system presents the opportunity to define agricultural lands that have the most productive potential. St. Croix County adopted a farmland preservation plan in 1980, and Pierce County adopted one in 1982. Both counties have exclusive agricultural zoning, farmland preservation areas within the county that are designated and managed by zones, which conform to the Wisconsin Administrative Code. The ETZ also provides zoning classifications for agricultural lands.

Low density, rural residential housing may be allowed in agricultural areas, depending upon individual town policies and the ETZ. Rural housing is intended to be located and designed to have minimal adverse effects on surrounding farm operations and to blend into the rural character of the area. Housing sites should avoid prime agricultural land, be located where appropriate services can be provided, not conflict with neighboring uses, and protect Natural Resources.

### 8.2.2 City of River Falls

The 1965 City Comprehensive Plan provides a detailed description and map of specific soil conditions, characteristics, and suitability of urban and rural uses in the River Falls area. This information was provided for the plan by the U.S. Department of Agriculture, Natural Resources Conservation Service.

The Plan states that soil productivity in the Towns of Troy, Kinnickinnic, and River Falls generally are below average compared to productivity in other parts of St. Croix and Pierce Counties. In some areas around River Falls, some of the best farmland has been eroded as a result of water and wind erosion. However, contour plowing and other soil conservation and erosion control measures have been employed in most of the study area.

The soils in the River Falls area may be placed generally into nine major groups based upon their suitability for agricultural or urban uses, which include engineering conditions related to construction and maintenance, maintenance of roads, airports, pipelines, building foundations, water storage facilities, drainage systems, sewage disposal systems, and erosion control structures. The 1965 plan provided a map and summary of the suitability and limitations for the different uses and a list of the soils for the major groups.

### 8.2.3 Pierce and St. Croix Counties

The type of soils in an area often dictates the best use of land. Soil suitability interpretations for specific urban and rural land uses are essential for physical development, planning, and determining the best use of the soil on a site. The 1996 Pierce County Land Management Plan references the U.S.D.A., Natural Resources Conservation Service Map for the locations of important farmlands. This map indicates the general location of the best farmland in the county and towns.

The 1996 St. Croix County Development Management Plan states that the county entered into an agreement with the Natural Resources Conservation Service to produce a digital soil survey. The soil survey has resulted in a detailed soil map for the county at a scale of one inch equaling 1,000 feet. The survey produced information on the physical, chemical, and biological properties of the soil and provided soil property interpretation for agricultural, engineering, planning, and resource conservation activities. The digital soil survey was used extensively for county planning efforts. The Towns of Kinnickinnic and Clifton do not have a Land Management Plan. Kinnickinnic follows the St. Croix County Development Management Plan and Clifton follows the Pierce County Land Management Plan.

### 8.2.4 Town of River Falls

The River Falls Township Land Use Plan (1982) addresses soils capability and provides a soil class map. It states that the Soil Conservation Service (presently Natural Resources Conservation Service) considers the majority of land in River Falls Town a Class II type soil and it is concentrated in the central and southern sections of the town. Class I, II, and III type soils are considered prime agricultural land and comprise 74% of the land in the town; however, only 3% is Class I. The area immediately south of and along County Trunk Highway 29 contains the highest proportions of soils not suitable for farming.

Depending on slope and the amount of wooded acreage, these areas are primarily used for grazing or pasture land, woodlands, and/or wildlife cover.

### 8.2.5 Town of Troy

The 1992 Town of Troy Growth Management Plan also provides information on geology and soils, along with soil limitation maps. The plan states that the most fundamental criteria for development are the nature of the soils. The Plan states that agricultural capabilities Class I and II might be called the town's prime agricultural land. Much of this land is presently under cultivation, but much of it is suitable for septic systems, which has resulted in the present subdivision of many five-acre parcels in the area. The Plan delineates the agricultural capabilities into eight classes provided by the Soil Conservation Service (Natural Resources Conservation Service) capability unit classification system. Those classes are:

- **Class I.** Soils that have few limitations to restrict their use.
- **Class II.** Soils with some limitations that reduce the choice of plants or require moderate conservation practices.
- **Class III.** Soils with severe limitations that reduce the choice of plants or require special conservation practices, or both.
- **Class IV.** Soils with very severe limitations that restrict the choice of plants or require very careful management, or both.
- **Class V.** Soils that have little or no erosion hazard but have other limitations that are impractical to remove, which limit their use largely to pasture, range, woodland, or wildlife food and cover.
- **Class VI.** Soils with severe limitations that make them generally unsuited to cultivate and limit their use largely to pasture, range, woodland, or wildlife food and cover.
- **Class VII.** Soils with severe limitations that make them unsuited for cultivation; their use should be restricted largely to grazing, woodland, and wildlife or water supply or to aesthetic purposes.



*Farmland Barn .*

- **Class VIII.** Soils with very severe limitations that make them unsuited for cultivation; their use should be restricted largely to grazing, woodland, and wildlife or water supply or to aesthetic purposes.

In the past, soils that fell into Class I, II, and III of the Natural Resources Conservation Service capability unit classification system were considered prime agricultural land. Presently the Natural Resources Conservation Service has developed a new system for evaluating agricultural lands called Land Evaluation and Site Assessment. This system uses a more detailed consideration of soil capability and potential yields and provides for the assessment of factors beyond soil productivity in the determination of agriculture potential. Figure 8-1 shows environmentally sensitive areas (bottomlands, terraces, foothills, etc.) such as highly erodable soils, potentially erodable soils, and the leaching potential of soils. This map was developed using the St. Croix County digital soil survey and by converting applicable sheets of the Pierce County Soils Survey into electronic GIS versions.

### 8.2.6 Steep Slopes

Steep slopes are characterized by stony land with soils that are shallow over bedrock. In the River Falls area and along the Kinnickinnic River, several areas exist with steep slopes. Steep slopes are any areas where the gradient of the land is 12% or greater (each percent of slope is measured as one unit in elevation for every hundred horizontal units). One category of steep slopes is 12% to less than 20% slope and consists of any soil type. It has been demonstrated that 12% slopes is a threshold at which impacts from development becomes apparent. To allow development on these slopes, one should avoid direct runoff into streams or rivers; follow state approved construction site erosion control standards; and institute best management practices, monitoring, and maintenance to control on-site runoff and pollution.

Steep slopes of 20% or greater are subject to erosion impact, even from slight land cover disturbance. Development on these slopes results in high construction costs and severe erosion with resultant negative impacts to surface waters. Therefore, development on slopes 20% or greater shall be limited or prohibited. This is consistent with the St. Croix County Management Plan. (see Figure 8-3 Sensitive Resource Areas).

### 8.2.7 Soil Related Constraints on Development

A large part of the City is located on sites that have constraints on development due to the nature of the soils. These constraints include:

**Soil Erosion.** Some portions of the urban area contain soils that have been designated by the Natural Resources Conservation Service as having a moderate to severe potential for water erosion. Storm water erosion can be a major problem in areas of high growth due to increased impervious surfaces and lack of water infiltration.

### Wind Erosion and Rural Fugitive Dust.

Many of the soils in River Falls, especially those soils on difficult terrain, have a moderate to severe erosion rating. Once the vegetation is removed from these soils, they are often highly vulnerable to wind erosion.

Fugitive dust is a non-point source of air pollution that does not originate from a specific point. Significant sources include agricultural cropland, construction sites, and unpaved roads.

## 8.3 RESOURCE PROTECTION AREAS AND SENSITIVE RESOURCE AREAS

It is resource conservation and management policies that help determine development within the Urban Area Boundary while protecting and preserving valuable areas from development. Mapping of existing environmental resources and identifying conditions and constraints, provides the basis for resource conservation and management policies. To do this, RPAs are delineated and growth is prohibited or limited from occurring in these areas. This section discusses in detail two classifications that protect habitats that are sensitive or declining or that represents valuable biological resources in the community. The two classifications are RPAs and SRAs.

### 8.3.1 Resource Protection Areas

RPAs are environmentally sensitive areas and valuable habitat areas that require protection. They are located along riparian corridors and in other areas (to be designated) that provide important habitat for plants and animals and movement corridors for wildlife. RPAs include such areas as 100-year flood zones, wetlands, coulees, riparian corridors, landmark areas, slopes 20% or greater, and bluff areas. RPAs are prohibited from development. The only exception for development is for existing parcels/lots that exceed 20% or “pass through work” that includes needed work for public health and safety/utilities. This includes electricity, water, and a force main or other

sewer to pass through. This type of utility work is generally discouraged but sometimes needs to occur due to the need for the use of gravity. The RPAs are shown in Figure 8-2.

### 8.3.2 Sensitive Resource Areas

SRAs shall be investigated with particular attention to sites that include habitat for sensitive species of plants and animals. SRAs include such areas as the 500-year flood zone, coulees, wetlands, natural landscapes, landmarks, slopes between 12 and 20%, and ridge-top areas. Development is permitted on sites with SRA designation, provided certain steps are taken and that development is in accordance with the special standards established for SRAs. Policies shall be designed to ensure that biological resources are considered and incorporated in development design. Both the RPAs and SRAs are intended to be of sufficient size to ensure the long-term viability of the habitats and species located within them and connected to them (Figure 8-3).

## 8.4 NATURAL LANDSCAPES AND LANDMARKS

### 8.4.1 Landscapes

Landscape is the environment in which pre-history and history occur; it both limits and permits man's cultural endeavors, our way of life and forms of settlements. Preservation and enhancement of the natural environment, most conspicuously formed of trees and lower growing plants, eventually results in an ecologically rich landscape, attractive to a wide variety of birds and other animals, as both year-around and seasonal inhabitants.

Many plants, especially flowering plants and mid-height grasses, once present and common in and around River Falls, are now rare, some possibly absent. Likewise, the density and distribution of still common plants has been altered. This is due to a combination of factors, including hundreds of years of heavy overgrazing, intensive woodcutting, and subsequent erosion. Plant



*Nineteenth Century Lime Kilns That Stand on the Left Bank of the Kinnickinnic River.*

specimens should be encouraged to grow through soil stabilization and enhancement, reseeded, and protected. Plant species now found in quantity many miles outside the City should be systematically reintroduced to areas of former abundance.

### 8.4.2 Landmarks

Two areas of existing unique environmental features have been identified in the River Falls area. The first, a limestone outcrop north of the City, called the River Falls Monument, is visible from State Highway 65 during the fall, winter, and early spring. The second, called the Devil's Den, is southwest of the City and is a unique geological depression along the Kinnickinnic River.

## 8.5 ENVIRONMENTAL PROTECTION

### 8.5.1 Air Quality

The City enjoys good air quality that meets federal and state standards for monitored pollutants (particulate matter and carbon monoxide). As long as state and federal standards are met, authority for additional controls and plans rest with the River Falls City, town, and county governments.

### 8.5.2 Outdoor Lighting

Excess glare, light pollution, and light trespass can be a safety and privacy issue as well as a cost and energy issue. The city will strive in developing standards that provide efficient and adequate outdoor lighting that is safe and visible for pedestrians, drivers, residences, neighborhoods, and the community.

### 8.5.3 Noise

Noise is unwanted sound and is known to have several adverse effects on people, including hearing loss, communication interference, sleep interference, adverse physiological response, and general annoyance. Noise sensitive land uses in River Falls include residences of all types, nursing homes, day-care centers, hospitals, schools, parks, and places of religious assembly. Outside the City, areas such as wildlife corridors and conservation districts are noise sensitive. Most portions of the City that contain noise sensitive uses are not negatively impacted by noise.

- **Existing Noise.** According to the City Police, residents complain about excessive noise from two occasional sources:
  - **Party Disturbance.** This can include loud music, loud talking/yelling, traffic noise, fighting, and other noise that disturbs the general peace.
  - **Electronic Noise.** This is most often associated with loud audio equipment; audible to citizens located a significant distance from the vehicular source.

A community noise survey could be conducted to record and analyze noise exposure in areas with sensitive land uses. Noise and monitoring sites should be selected to record daily conditions.

Typical noise sources include:

- **Traffic Noise.** Most roadways generate noise. Some of the building areas along travel corridors have very narrow setbacks, and residents or employees within these noise impact areas may be subject to significant noise levels. Shielding can reduce actual noise levels at specific sites. This may require berming or walled areas along major corridors.
- **Hospital Flight Care Helicopter Operation Noise.** The River Falls Area Hospital has a helicopter landing area. This facility is used on an occasional basis.
- **Stationary Noise Sources.** Stationary noise sources within the City include industrial and commercial facilities. Noise exposure within industrial facilities is controlled by employee health and safety regulations, but exterior noise levels are not regulated by the federal or state government. Noise generated from fixed sources may vary based on open doors and windows, climate conditions, time of day, and existing noise levels.
- **Noise Compatibility Standards.** From the known affects of noise, criteria have been established to protect the public health and safety, and prevent disruption of certain human activities. For planning purposes, a weighted scale is recommended to describe environmental noise at any one particular time. To account for the time-varying characteristics of noise, all of the individual noise readings must be averaged over a 24-hour period. Suggested noise capability standards are shown in Table 8.3. These have been designated to match each land use type with an appropriate range of noise levels. These standards should be used in conjunction with noise exposure contours shown on a noise map to determine whether noise levels exceed the normal acceptable range so that acoustic reports and noise mitigation measures can be required for development projects.

*Figure 8-1 Soils.*

*Figure 8-2 Resource Protection Areas.*

*Figure 8-3 Sensitive Resource Areas.*

**Table 8.3 Land Use Compatibility for Community Noise Environment.**

Building/Land Use Type	Exterior Day/Night Noise Levels DNL or Ldn, dB					
	55	60	65	70	75	80
Residential-Single Family						
Residential-Multiple Family						
Transient Lodging-Motels, Hotels						
Schools, Libraries, Churches, Hospitals*, Nursing Homes						
Auditoriums, Concert Halls, Amphitheaters						
Sports Arena, Outdoor Spectator Sports						
Playgrounds, Parks						
Golf Courses, Riding Stables, Water Recreation, Cemeteries						
Office Buildings, Business, Commercial and Professional						
Industrial, Manufacturing, Utilities, Agriculture						

**Legend**

 Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

 Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.

 Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

 Clearly Unacceptable: New construction or development clearly should not be undertaken

\*Because hospitals are often designed and constructed with high noise insulation properties, it is possible for them to be satisfactorily located in noisier areas. DNL or Ldn Day-Night Noise Level

CNEL: Community Noise Equivalent Level (normally within 0-5 dB of the DNL value)

## GUIDING AND IMPLEMENTING POLICIES

- ❖ See Chapter Three Land Use Guiding Policies 3-G-1- 2 and Implementing Policies 3-1-I-1-3 and Implementing Policies
- ❖ See Chapter Four Growth Management Guiding Policies 4-G-1 and Implementing Policies 4-1-I-1 and 5.

**8-G-1** Work with the state, counties and towns to protect, maintain, restore and enhance where possible environmental and biological resources, including the Kinnickinnic River and its tributaries, wetlands, native plant communities, and other habitats that are sensitive or declining, within its watershed, Urban Area Boundary and where possible within the region.

**8-1-I-1** Maintain and update an inventory of Resource Protection Areas (RPAs) and Sensitive Resource Areas (SRAs) including historic, natural and cultural landscapes, and open space landmarks as part of the City’s GIS database.

**8-1-I-2** Develop resource-sensitive standards for new construction throughout the Urban Area Boundary:

- Engineering standards for riparian corridors and wildlife areas,
- Noise level abatement,
- Storm water runoff,
- Erosion control,
- Air quality control.

**8-1-I-3** Prepare a comprehensive natural and environmental management plan with standards for the Kinnickinnic River and its watershed, Urban Area Boundary and the region.

**8-1-I-4** Cooperate and ensure coordination with townships and counties on plans and regulations to preserve the natural environment:

- Bluffs and ridgetops,
- Riparian corridors and adjacent areas,
- Trees, shrubs and natural vegetation – current, new and replacements.

**8-1-I-5** Consider establishment of an advisory body (a balance of concerned citizens, organizations and stakeholders) to the Plan Commission to serve as a resource on environmental issues and plans.

**8-G-2** Minimize disturbance and strengthen the integrity of riparian, native grassland, soils, and forested zones as wildlife habitat corridors.

**8-2-I-1** Assess the connections between corridors when managing activities in these areas so that activity in one section does not have a negative impact on other portions of the ecological network.

**8-2-I-2** Develop regulations to protect and preserve native vegetation, trees, shrubs, and grass; visual open space; and minimize erosion to soils from ground disturbance, wind, and storm water.

**8-G-3** Restrict and limit development in Resource Protection Areas.

**8-3-I-1** Assess impacts to biological resources before allowing development activity to take place in Sensitive Resource Areas, requiring mitigation of adverse impacts where appropriate. Take into consideration slope, wildlife habitat, native plant communities, water quality, and soil conservation among the factors used to assess potential impacts to these resources.

**8-G-4** Protect public health and welfare by reducing water, air, noise and light pollution.

**8-4-I-1** Encourage transportation alternatives and work with the State and Counties to reduce noise and erosion on major arterials such as State Highways 35, 65, 29 and County Trunk Highways M, MM, FF.

**8-4-I-2** Document noise levels in existing areas, prepare a noise contour map, and establish acceptable standards for existing and new development.

**8-4-I-3** Maintain and improve the relatively pristine air quality in the UAB, ensure construction sites reduce dust during periods of high winds and consider emission controls for trucks and buses.

**8-4-I-4** Update City regulations for smokestack emissions and industrial development.