

2011 Water Quality Management Plan Update

Bad Axe-La Crosse Basin, Wisconsin

December 2011

The Coon Creek Watershed, located in west central Vernon, southwest Monroe, and southern La Crosse counties, covers 238 square miles and includes all streams that drain to Coon Creek as well as the following Mississippi River tributaries: Chipmunk Coulee Creek, Mormon Coulee Creek, Creek 16-6 and Creek 29-1. This watershed contains more than 136 miles of classified trout streams, the majority of which contain self-sustaining trout populations.

The Coon Creek Watershed contains steep, wooded hills with farming activities in both the valleys and ridge tops. Streams in the Coon Creek Watershed characteristically contain clear, cold, spring-fed water with gravel and rubble bottoms in their upper reaches changing to predominantly sand bottoms further downstream. Numerous streams in the watershed contain both natural and restored overhead cover for trout and are accessible for fishing through public easements.

Beginning in the 1980's, a coordinated effort in the watershed of purchase of public stream-bank easements, restoration of in-stream cover for trout, streambank stabilization, and stocking of wild brook and brown trout has culminated in the Coon Creek Watershed being called the 'Montana of the Midwest'. License plates from around the country can be routinely found parked along the roads of the watershed, their owners fishing for trout along the nearby streams.



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**Watershed Details**

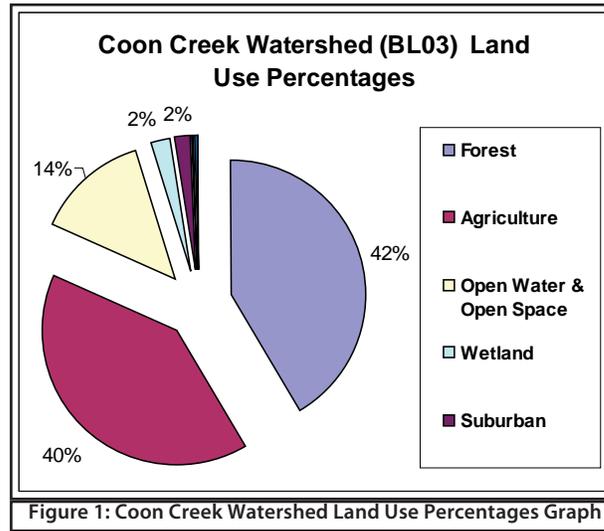
**Population and Land Use**

The southern tip of the City of La Crosse, the villages of Stoddard, Chaseburg, and Coon Valley, as well as a portion of the City of Westby are all within the Coon Creek Watershed. Suburban growth is occurring throughout the watershed, but largely in the rural areas near the City of La Crosse.

Forest cover and agriculture are the predominant land uses in the Coon Creek Watershed, with 41% and 40% of the total area, respectively. Open water and open space encompass the remaining sizeable land use areas in the watershed with 14% of the total area. This area essentially is the Upper Mississippi River Fish and Wildlife

Refuge, also known as Pool 8 of the Mississippi River. Urban and suburban environments total about two percent of the watershed's area. Land Use (2001 NLCI dataset analysis)

| Land Use                 | Acres      | Percent of Area |
|--------------------------|------------|-----------------|
| Forest                   | 62,874.14  | 41.26%          |
| Agriculture              | 61,501.29  | 40.36%          |
| Open Water & Open Space  | 20,853.74  | 13.68%          |
| Wetland                  | 3,527.18   | 2.31%           |
| Suburban                 | 2,770.82   | 1.82%           |
| Grassland                | 590.90     | 0.39%           |
| Urban                    | 240.19     | 0.16%           |
| Barren                   | 38.70      | 0.03%           |
| Total Acres in Watershed | 152,396.96 |                 |



## Hydrology

Hydrology is the study of water – its occurrence, circulation, distribution and properties. Water in the Coon Creek Watershed is ultimately derived from rainfall and snowmelt that either percolates into the ground or runs off the land. In the most basic sense, the condition of a stream is a reflection of the watershed it drains. This concept is especially true in the Coon Creek Watershed due to steep stream gradient, small watershed size and extremely steep hills. To determine the watershed of a stream, one need look no further than the hillsides on either side of the stream. The steep hills found throughout the Driftless Area can shed water very quickly; consequently the vegetative cover and soil condition of hillsides are vital to the health of adjacent streams. The trees or healthy grasses that grow on these hillsides are what effectively retain water with their roots, leaves and ultimately the soil. This water then slowly moves through the underlying rock layers to become groundwater that is either pumped from wells for consumption or resurfaces as springs.

Some springs in the basin flow as if from an underground pipe while others gently bubble up out of the ground. This constant source of water that averages around 50 degrees Fahrenheit throughout the year is what keeps dissolved oxygen levels high in the summer and trout eggs developing properly throughout the winter. The greater the absorptive capacity of a watershed, the more precipitation can infiltrate into the groundwater where it is slowly released into a stream via clean cool springs. In a watershed with little or no absorptive capacity, for example one with acres of concrete, rooftops or soil devoid of vegetation, rainfall moves quickly over these surfaces to the nearest stream causing flash flooding.

Streamflow trends in southwestern Wisconsin were recently analyzed by comparing stream flow data to precipitation data. The study concluded that baseflow (stream flow during dry periods) has increased and peak flood flows have decreased over the last century in the Driftless Area of southwestern Wisconsin (Gebert, Warren A., Krug, William R. August 1996. Streamflow Trends in Wisconsin's Driftless Area. Water Resources Bulletin, American Water Resources Association. Vol. 32, No. 4.). Land management practices which allow more rainwater to infiltrate the ground rather than runoff to the nearest stream have been suggested as the primary reason for the discovered increase in baseflow and decrease in flood peaks.

Since most baseflow of Driftless Area streams is derived from groundwater, an increase in the amount of groundwater would intuitively be reflected in increased baseflow. Alternately, more water soaking into the ground results in less water running off to the nearest stream thus reducing flood levels. That's not to say that floods don't occur in the Coon Creek Watershed, but rather that they are less frequent and less severe than in the past.

Depending on the amount of rain and soil saturation or frozen conditions, streams in the Coon Creek Watershed can be flashy. Extreme rainfall amounts on saturated ground in 2007 and 2008 created flood conditions not seen for decades. Flooding wrecked havoc on the roads in the area, but did not greatly diminish the fish resources in the watershed. Decades of stream habitat improvements and streambank stabilization created optimal conditions for fish survival during catastrophic flood events.

A total of 14 flood control structures are found within the Coon Creek Watershed. Most of these structures are dry dams that only hold back water during flood events. They are designed to impede and hold back the flow of water in the stream, thereby reducing flood damages downstream.

## Ecological Landscapes

This watershed is located in the Western Coulee and Ridges Ecological Landscape in southwestern and west central Wisconsin and is characterized by its highly eroded, driftless topography and relatively extensive forested landscape. Soils are silt loams (loess) and sandy loams over sandstone residuum over dolomite. Several large rivers including the Wisconsin, Mississippi, Chipewaga, Kickapoo and Black flow through or border this Ecological Landscape.

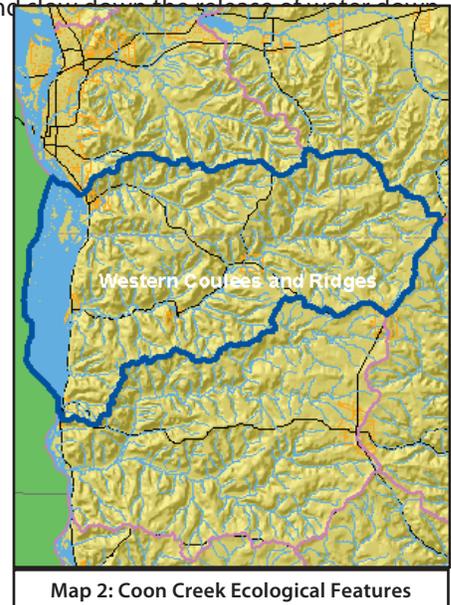
Historical vegetation consisted of southern hardwood forests, oak savanna, scattered prairies, and floodplain forests and marshes along the major rivers. With Euro-American settlement, most of the land on ridge tops and valley bottoms was cleared of oak savanna, prairie, and level forest for agriculture. Current vegetation is a mix of forest (41%), agriculture (40%), and grassland with some wetlands in the river valleys. The primary forest cover is oak-hickory (51%) dominated by oak species and shagbark hickory. Maple-basswood forests (28%), dominated by sugar maple, basswood and red maple, are common in areas that were not subjected to repeated pre-settlement wildfires. Bottomland hardwoods (10%) are common in the valley bottoms of major rivers and are dominated by silver maple, ashes, elms, cottonwood, and red maple. Relict conifer forests including white pine, hemlock and yellow birch are a rarer natural community in the cooler, steep, north slope microclimates.

## Historical Note

European settlers began arriving in the basin by the early 1800's. People of various ethnic backgrounds settled in the basin, but Germans and Norwegians are the major ethnic groups residing in the basin today. By the 1850's, at least 50% of the basin was in agricultural production. The unique hill and valley characteristics of the Driftless Area influenced many cultural features of the region. Roads do not follow section lines; instead they wind through valleys or along ridgetops. Some township boundaries and other governing boundaries sometimes follow a river rather than the man-made section lines.

Conversely, property boundaries conformed to survey sections, which forced a square or rectangular farm onto very irregular topography. Much of the future soil erosion problems stemmed from this unfortunate choice of land parceling that did not follow land contours. Farmers cropped in square and rectangular shaped fields, as they had done in their homelands, with little regard for the steep slopes of the region. Some row crops were plowed up and down hills, creating an easy route for water to scour soil from hillsides.

The first major crop in the basin was wheat, but by the 1870's, the majority of agricultural income was derived from dairy. When the first farmers arrived in the basin, the land could support small numbers of livestock and the soil still retained the rich, water absorbing humus that had accumulated from centuries of forest and prairie vegetation. However, by the 1940's approximately a majority of land in the watershed was in agriculture. As the agri-



Map 2: Coon Creek Ecological Features

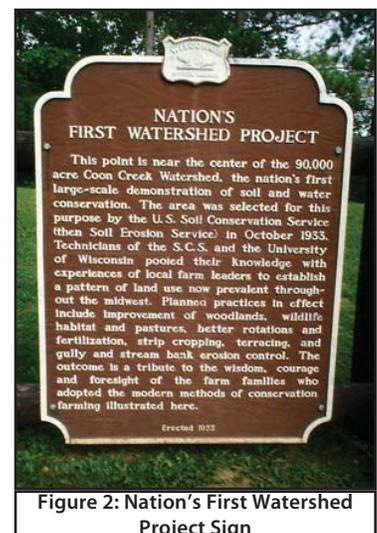


Figure 2: Nation's First Watershed Project Sign

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cultural economy changed to dairy, trees were removed from steep hillsides so more cows could graze them. The rich humus valley soils were drained of their nutrients and soil absorbing capacity by constant plowing and cropping. As the hillside soils compacted under the constant weight of grazing livestock and vegetation became sparse, rains began to quickly run off the hills rather than soak into the once spongy soil. Water carved massive gullies into hillsides, which moved tons of soil to the valley floor.

Large amounts of runoff originating from ridge top fields also carved gullies into hillsides. Aldo Leopold once referred to rain on the hillsides of the Driftless Area as water running off a tin roof. By the 1930's, after nearly eighty years of cultivation and grazing, virtually every rainstorm resulted in flash floods. By this time, farming in the Coon Creek Watershed developed into a frustrating venture with every new rainstorm washing away valuable crops, pasture and soil. An average of 12 to 15 feet of soil was added to many valleys. The once crystal clear streams which held brook trout were now shallow, wide, warm and full of silt. The tons of sediment that reached the valley floor buried many springs and groundwater seeps, causing many perennially flowing streams to become intermittent, flowing only after rainstorms. Streams became braided meanders with their channel lost to the massive amounts of sediment now in the valley. In-stream fish habitat was lost and the cold water brook trout were replaced by warmwater species such as suckers, carp, chubs and other minnows. In 1934, the Soil Conservation Service, now named the Natural Resource Conservation Service, launched the Coon Valley Erosion Project in the Coon Creek Watershed. They asked farmers to allow men from the newly founded Civilian Conservation Corp (C.C.C.) to enter their land and plant trees, fence livestock out of steep slopes, reconfigure fields to follow the hills' contours, plant grassed waterways, and stabilized gullies. Efforts to restore streams were also attempted by the addition of brush mats to eroding banks, wood and rock deflectors to force floodwaters away from streambanks toward the stream's center, and re-vegetation of raw streambanks. These land management practices were successfully adopted and are still in use today not only by farmers in the Coon Creek Watershed, but also farmers in the entire Driftless Area, including parts of Minnesota, Iowa, and Illinois.



Figure 3: Coon Creek (WDNR photo)

Changes throughout the 20th Century: Even after soil conservation measures were added to the land, immediate improvements were not visible. Flash floods continued to damage land and property in the basin. Major floods occurred in 1951, 1961 and again in 1965. It was about this time that a state biologist remarked that "because of watershed management problems... trout stream fishing in the coulee region may practically disappear in the future".

It was during the 1940's to the 1960's that an improvement in land health could be seen as farms on marginal land in the basin did not survive and began to revert back to more natural conditions. During the 1970s, many farming operations were encouraged to expand and many landowners went deep into debt. When overvalued land values fell and interest rates remained high in the early to mid 1980's, many producers were forced to financially dissolve their farms. Large amounts of agriculturally worked land was purchased by hobby farmers, who were not interested in raising livestock or growing crops as their sole source of income.

Inconspicuously, the Food Security Act of 1985 enabled further improvement of the land and water resources of the Coon Creek Watershed. This act contained a component which required compliance with farm specific Conservation Plans in order to receive any kind of government subsidy. From 1983 to 1988, land under conservation tillage in the area increased over 700%. Wisconsin also began promoting Farmland Preservation Program conservation plans as a tool to keep valuable soil on farm fields. The Conservation Reserve Program (CRP) also was a financial incentive to remove highly erodible land from crop rotation and replace with perennial vegetative cover.

Infiltration of rain and snowmelt into the ground increased approximately fifty years later after trees were planted on hillsides, marginal cropland was converted to perennial vegetative cover and fewer livestock numbers grazed the hillsides. By the 1980's, springs reappeared, effectively cooling streams and causing intermittent streams to once again flow perennially. Watercress, an aquatic plant indicative of groundwater inflow to a stream, was documented not only

at springheads, but also further downstream on many small and medium sized streams. In 1978, money became available from the Wisconsin state trout stamp fund to allow installation of in-stream habitat structures designed to improve trout streams around the state. Restoration efforts occurred on stream sections owned by the state or where streambank easements had been acquired. Brown trout have been stocked in many streams for many years, but carryover from year to year and natural reproduction was lacking.

As streambanks became more stable, flood events less frequent, and infiltration of rain to groundwater increased, the streams of the Coon Creek Watershed held more water during dry periods and began to produce self-sustaining brown trout populations. Beginning in the mid-1990's, fishery surveys of streams in the basin revealed not only self-sustaining brown trout streams but also streams capable of supporting native brook trout, absent from the basin for nearly 100 years. Stocking of wild brook trout fingerlings in some streams has since resulted in self-sustaining populations of brook trout.



Figure 4: Watercress found in Bohemian Valley Creek on 09/02/2003 (WDNR photo)

After the land and water resources of the Coon Creek Watershed had reached their worst conditions in the 1930's, nearly 60 years of changes and improvements in land management were necessary for the resources to recover to near pre-European settlement conditions. Since millions of tons of soil moved from the hilltops and hillsides to the valley floor, the Coon Creek Watershed will never look or act like it did before Europeans settled the area. However, equilibrium has been reached where streams that drain agricultural lands are once again narrow, deep, clear, cold, and contain healthy trout populations.

The success of this soil conservation project is evidenced by farmers still maintaining original contour strips, re-vegetated hillsides, and the recovery of the Class I trout streams. Numerous studies have been conducted on the Coon Creek Watershed since the 1933 project. It is important to note that the Wisconsin DNR defined Coon Creek Watershed encompasses 238 square miles; whereas the NRCS defined Coon Creek Watershed encompasses 141 square miles including only Coon Creek and its tributaries.

## Watershed Condition

### Overall Condition

Many of the streams located in the Coon Creek Watershed are groundwater-fed coldwater trout streams. There are about 50 miles of outstanding or exceptional resource waters and 137 miles of trout waters in this watershed. Class I trout streams cover over 76 miles, Class II trout streams equal around 33 miles, and Class III trout streams make up the remaining 26 miles. Twenty-five miles of Outstanding Resource waters can be found along stretches of Berge Coulee Creek, Rullands Coulee Creek, Spring Coulee Creek, and Timber Coulee Creek. Another 25 miles of Exceptional Resource Waters are found along segments of Coon Creek, Poplar Creek, and Fishback Creek.

Recognizing the high quality trout streams in the Coon Creek Watershed, the WDNR created the Coon Creek Fishery Area. WDNR ownership of land and easements on private property provides access to Coon Creek upstream of Chaseburg, Timber Coulee, Rullands Coulee, Bohemian Valley, Spring Coulee creeks, and many unnamed tributaries for fishing and hiking. Parking areas are found throughout the fishery area and posted signs ask users to respect private landowners while enjoying the streams on public easements.

## River and Stream Condition

According to the WDNR's Register of Waterbodies (ROW) database, there are over 900 miles of streams and rivers in the Coon Creek Watershed; 179 miles of which have been entered into the WDNR's assessment database. Of these 179 miles, approximately 53% are meeting Fish and Aquatic Life uses and are specified as in "good" condition. The condition of the remaining stream miles is not known or documented.

Additional uses for which the waters are evaluated include Fish Consumption, General Uses, Public Health and Welfare, and Recreation. As the Table 2 shows, most of these uses have not been directly assessed for the watershed. However, a general fish advisory for potential presence of mercury is in place for all waters of the state, and about 15 miles of rivers and streams within the watershed are indicated as not supporting fish consumption or general uses.

It has been suspected that a gradual decrease in average stream temperatures has occurred over decades in Coon Creek and its tributaries. Proof of this comes from a decrease in fish species diversity found in area streams. Fewer fish species can tolerate constant cold water temperatures. The loss of some forage fish species over the years may be linked to decreasing average water temperatures. The observation that more natural springs are flowing than in past years also points to colder stream temperatures. To document current water temperature trends, continuous water temperature data loggers were installed in 1999 in Coon, Spring Coulee, Timber Coulee, Rullands Coulee, Bohemian Valley, Poplar, and Mormon Coulee creeks. While continuous water temperature data was not collected 30 years ago, there are not direct data comparisons besides the fish assemblages. Monitoring studies were designed in 2002 to collect water temperature hourly for approximately eight years.

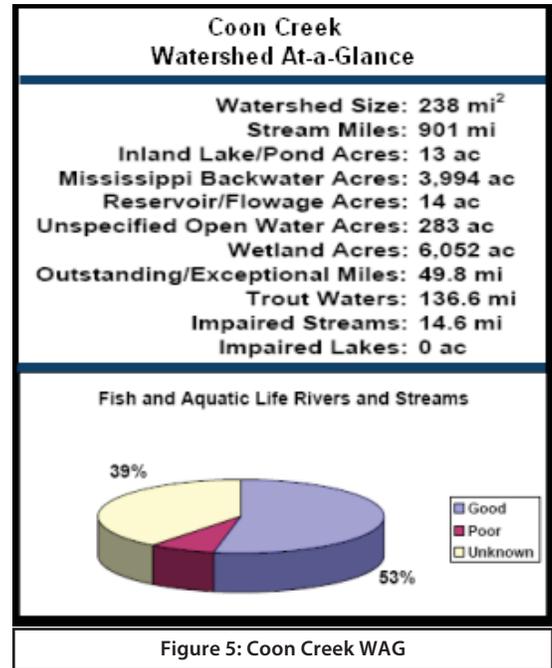


Table 2: Designated Use Support Summary for Coon Creek Watershed Rivers and Streams (all values in miles)

| Use                       | Supporting | Fully Supporting | Not Supporting | Not Assessed | Total Size |
|---------------------------|------------|------------------|----------------|--------------|------------|
| Fish Consumption          |            |                  | 14.6           | 164.13       | 178.73     |
| Fish and Aquatic Life     | 88.14      | 6.44             | 13.81          | 70.34        | 178.73     |
| General                   |            |                  | 14.6           | 164.13       | 178.73     |
| Public Health and Welfare |            |                  |                | 178.73       | 178.73     |
| Recreation                |            |                  |                | 178.73       | 178.73     |

Eighty-two (82) stations with data are located in this watershed. Recent studies include stations in several different baseline monitoring programs including "Comprehensive Sites" (biological, physical and chemical parameters), Stratified Random Site studies focusing on studying natural communities (cold versus warm waters), and a reference sites study. This study involves reference site selection and monitoring using the 2008 Streams Natural Communities dataset, which was based on stream flow and temperature modeled by WDNR Integrated Science Services and USGS Region V States. This study evaluates highest quality streams representative of each of the 11 proposed natural communities. The purpose of the study is to provide the range of biological and ecological conditions for specific communities through determining the "potential biological use" of each and to gather information that will provide insight into the value of the eleven distinct natural communities for state assessment and water quality standards work.

### Berge Coulee Creek

Berge Coulee Creek, also known as Bergen Coulee Creek and Creek 35-16, is located in southeastern La Crosse County, northeast of Coon Valley. It flows in a southerly direction for approximately 1.5 miles before reaching Timber Coulee Creek. It has a steep gradient of 77 feet per mile and drains forested hillsides, lowland pasture and agricultural land.

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Berge Coulee Creek is a Class I trout stream and an Exceptional Resource Water for its entire length.

The most recent survey, conducted in 1983, documented a naturally reproducing population of brown trout. There are no stocking records for Berge Coulee Creek. Access is available from three road crossings and WDNR streambank easements.

**Bohemian Valley Creek (also known as upper Coon Creek)**

Bohemian Valley Creek flows through La Crosse, Monroe and Vernon counties. This creek is actually the uppermost nine miles of Coon Creek, but is locally known as Bohemian Valley Creek. Since it is smaller in size and managed differently than Coon Creek, it is discussed here separately from the Coon Creek narrative. It begins in Monroe County and flows for nine miles in a southwesterly direction, cutting through the southeastern corner of La Crosse County and into Vernon County. It has a moderate gradient of 45 feet per mile and drains steep sloped agricultural land and forested hillsides as well as lowland pasture. Bohemian Valley Creek is an Exceptional Resource Water from the La Crosse/Monroe County line downstream to the Timber Coulee Creek tributary. This is also a Class I trout stream.



Figure 6: Mottled Sculpin found in Bohemian Valley Creek on 09/02/2003 (WDNR photo)

In 1955, the Wisconsin Conservation Department (now the WDNR) initiated a fishery habitat demonstration project along Bohemian Valley, Timber Coulee, and Rullands Coulee creeks. The purpose of this project was to develop and perfect in-stream habitat restoration techniques. This pioneering project resulted in restoration methods that are still used today in coulee region streams.

Three P.L. 566 dry pool flood detention structures exist in the watershed draining toward Bohemian Valley Creek. From the Korn Spring (Section 24, T15N, R5W) downstream, water temperature and quality are ideal for brown trout. The cool water temperatures are the result of more than 50 springs entering the creek in La Crosse County alone. Fishery population surveys conducted in 2006 documented a healthy, naturally reproducing brown trout population along with a variety of forage fish, including slimy sculpin. The gravel and cobble stream bottom was covered with silt in some areas, especially the upper end.

Perpetual fish management easements were purchased by the WDNR, as recommended in the Coon Creek fishery Area Master Plan, from Korn Springs in Monroe County downstream to the Vernon and La Crosse County line. Protection easements were also purchased on most of the major springs entering Bohemian Valley Creek. Access to the stream is possible from three road crossings, DNR easements, and DNR owned land.

**Chipmunk Coulee Creek (Creek 3-6)**

Chipmunk Coulee Creek, also known as Creek 3-6, is located in northwestern Vernon County. It flows in a southwesterly direction for approximately 5.5 miles before reaching the Mississippi River between the Cities of La Crosse and Stoddard. This stream has a gradient of 54 feet per mile and drains steep forested hillsides, agricultural land, and expanding rural subdivisions. Chipmunk Coulee Creek is a Class I trout stream for its entire length.

The most recent habitat survey, conducted in 2009, documented a stream bottom consisting mainly of sand and clay with lesser amounts of silt, gravel, detritus and rubble. Riparian land use was comprised of mostly woodland with some home development and meadow areas. Aquatic insects were also collected in 2009 and the Macroinvertebrate Index of Biological Integrity (MIBI) score was determined to be poor (1.69). Seven fish collections have occurred in this stream since 2007 with game fish such as brown trout, brook trout, tiger trout (brook and brown trout hybrid), northern pike, green sunfish, largemouth bass, and pumpkinseed being found. The coldwater Fish Index of Biological Integrity (FIBI) was calculated for the fish collections, resulting in four fair and three good scores, indicating water quality adequate to support a cold water fishery. Chipmunk Coulee Creek would benefit from the acquisition of streambank easements and in-stream habitat restoration. Access is possible from four road crossings and the Upper Mississippi River National Wildlife Refuge.

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### **Coon Creek**

Coon Creek, located in northwestern Vernon County, flows in a southwesterly direction for approximately 22 miles before reaching the Mississippi River near Stoddard. It has a slight gradient of 7.1 feet per mile and drains steep forested hillsides and agricultural lands. Coon Creek is a Class III trout stream from STH 35 upstream to CTH K at Chaseburg and Class II from CTH K upstream to the confluence of Bohemian Valley Creek and Timber Coulee Creek just northeast of Coon Valley.

The latest survey, completed in 2004, documented watershed land use split evenly between agricultural land and forests, with approximately 140 acres of adjoining wetland. Riparian land was comprised of pasture, shrub marsh, swamp hardwood and cultivated land. In-stream cover consisted of logs, deep pools and undercut banks. Problems noted were bank erosion, log jams in the lower reaches, flooding, and siltation. The lower gradient of Coon Creek allows any suspended sediment a chance to settle out. This creates a silty bottom which is not ideal for trout. The lower end of Coon Creek from Chaseburg downstream contained the following game fish species: brown trout, smallmouth bass, largemouth bass, walleye, sauger, and rock bass. The creek just downstream of Coon Valley contained brown trout, brook trout, and smallmouth bass.

Access to Coon Creek is possible from numerous road crossings, the Coon Valley Veterans Memorial Park at STH 14/61, DNR easements, DNR owned land, and from the Mississippi River. The Village of Chaseburg has a walking trail and wheelchair accessible fishing to Coon Creek. The Village of Coon Valley Veterans Memorial Park provides a looped walking path along both sides of Coon Creek with two bridges and wheelchair accessible trout fishing. The deep water, swift current, in-stream habitat structures and easy access create an enjoyable fishing experience for many.

The DNR should continue stocking trout and restoring in-stream habitat from Coon Valley to Chaseburg. Coon Creek between Chaseburg and the Mississippi River would benefit from the acquisition of streambank easements and in-stream habitat restoration. Consequently, the DNR should extend the Coon Creek Fishery Area to include Coon Creek downstream of Chaseburg to the Mississippi River.

### **Creek 19-5 (also known as Breidel Coulee Creek)**

Creek 19-5, also known as Breidel Coulee Creek, flows in a southerly direction for two miles before reaching Mormon Coulee Creek in the Town of Shelby. It has a moderate gradient of 66 feet per mile and drains forested hillsides with some single family homes as well as agricultural land. Creek 19-5 is currently not classified as a trout stream. A 2010 fish survey documented a cool clear rocky bottomed stream with some brown trout and an abundance of brook trout for such a small stream. Access to Breidel Coulee Creek is from one road crossing.

### **Creek 29-1**

Creek 29-1, located in west central Vernon County, flows in a northwesterly direction for three miles before reaching the Mississippi River near Genoa. It has a moderate gradient and drains steep forested hills and agricultural valley land. Creek 29-1 is currently not a classified trout stream.

A 1988 fish survey found conditions conducive to a brook trout stream, however no brook trout were found. In October 2001, 324 yearling wild brook trout were stocked in Creek 29-1. The stream was surveyed in each year from 2002 to 2004. Brook trout were documented each year as well as natural reproduction. However, the population of brook trout declined each year. Consequently, Creek 29-1 has not been classified as a trout stream as of yet. A fish survey of Creek 29-1 should document the current status of the stream. Access to Creek 29-1 is from three road crossings.

### **Fishback Creek**

Fishback Creek, located in southeastern La Crosse County, flows in a southerly direction for two miles before reaching Bohemian Valley Creek (aka upper Coon Creek). It has a steep gradient of 100 feet per mile and drains forested hillsides and agricultural land. Fishback Creek is a Class I trout stream for its entire length. The lower 0.5 mile is also designated as an Exceptional Resource Water.

A 2005 fish survey documented brook trout, brown trout and a variety of minnow species. Fishback Creek hasn't been stocked since 1990. Access is possible from the CTH G road crossing where DNR easements border the stream above and below the bridge for approximately 180 feet of public frontage.

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### **Hasley Creek**

Hasley Creek, located in northwestern Vernon County, flows for approximately 1.5 miles in a northerly direction before reaching Coon Creek east of Chaseburg. It has a gradient of 57 feet per mile and drains steep forested hillsides and agricultural land in the valley. Numerous springs enter the stream at various locations. Hasley Creek is classified as a Class III trout stream for its entire length.

The most recent surveys were completed in the mid 1970's. Updated fish and habitat data should be collected from Hasley Creek to determine its current condition. There is navigable water access from Coon creek and a DNR stream-bank easement borders Hasley Creek where it meets Coon Creek.

### **Hohlfield Creek (Creek 20-16)**

Hohlfield Creek, also known as Creek 20-16, is located in northwestern Vernon County. In past years this stream was also known as Huff Creek and Swain Hollow Creek. It flows in a southwesterly direction for approximately four miles before reaching Coon Creek west of Chaseburg. Hohlfield Creek has a slight gradient of 18 feet per mile and drains steep forested hillsides and agricultural valley land. Hohlfield Creek is a Class I trout stream for its entire length.

The most recent surveys, conducted in 2005 and 2007, documented both brook and brown trout populations in Hohlfield Creek. Access to the stream is possible from five road crossings.

### **Johns Coulee Creek (Creek 20-6)**

Johns Coulee Creek, also known as Creek 20-6, is located in southern La Crosse County. It flows in a southwesterly direction for approximately two miles before reaching Mormon Coulee Creek. This stream has a moderate gradient of 47 feet per mile. Johns Coulee Creek is a Class I trout stream for its entire length. A fish survey conducted in 2005 documented a self-sustaining brook trout population. Access to this stream is from two road crossings and DNR owned streambank easements on the lower end.

### **Lindahl Creek**

Lindahl Creek, also known as Hagen Creek or Dodson Hollow Creek, is located in northwestern Vernon County. It flows in a westerly direction for approximately three miles before reaching Coon Creek east of Chaseburg. This stream has a moderately steep gradient of 53 feet per mile and drains steep wooded hillsides and agricultural land. Lindahl Creek is a Class I trout stream for its entire length.

The most recent survey, conducted in 1999, documented a streambed consisting mainly of sand and silt with lesser amounts of gravel. The riparian land use was pasture, woodland and meadow, with some shrub and cropland. Fish cover consisted mainly of undercut banks and overhanging vegetation with little woody debris. Natural reproduction of brown trout was evident. A variety of aquatic invertebrates and minnows were also observed. Lindahl Creek would benefit from the acquisition of streambank easements and in-stream habitat restoration work. Access to this stream is possible from Coon Creek.

### **Mormon Coulee Creek**

Mormon Coulee Creek, located in southeast La Crosse County, flows in a westerly direction for approximately 15 miles before reaching the Mississippi River south of La Crosse. It has a gradient of 23 feet per mile and drains steep forested hillsides, agricultural land and numerous housing developments. Mormon Coulee Creek is a Class II trout stream for its entire length.

The stream contains a gravel and cobble bottom in the extreme upper end and eventually contains more sand, silt and clay downstream. Brown trout have been stocked in Mormon Coulee Creek since 1976. Several forage fish species and numerous year classes of brown and brook trout were documented in a June 2010 fish survey. The majority of in-stream cover was woody debris. More permanent cover in the form of LUNKER structures have been installed in some areas. Mormon Coulee Creek would benefit from the purchase of additional streambank easements and in-stream habitat restoration. Recently, wild brown and brook trout were stocked in Mormon Coulee Creek. The stream should be re-surveyed in the near future to determine if the introduction of these wild trout develop into self-sustaining populations. Access to Mormon Coulee Creek is from 14 road crossings, a Town of Shelby park and DNR streambank easements.

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The lower end of Mormon Coulee Creek is located on the south end of the City of La Crosse and the Town of Shelby. The stream has a fairly wide valley here surrounded by steep hills. The major land use was agriculture until fairly recently. Due to the close proximity to the City of La Crosse and beautiful landscape, numerous housing developments have been built in the lower end of the Mormon Coulee Creek watershed and more are planned. Trout streams in urban areas are rare due to the detrimental effects of stormwater runoff. Stormwater from areas with impervious surfaces such as roofs, sidewalks and streets generate more runoff of rainwater than vegetated areas. This added volume of runoff is often times warmer than the cold temperatures healthy trout streams require. When this warm water is discharged to trout streams and their tributaries, warming of the stream creates conditions which stress trout. The accumulation of these subdivisions eventually will produce stormwater volumes that exceed what agricultural lands previously generated. Additional volume of stormwater can reduce in-stream habitat through its scouring and erosive action. Infiltration of stormwater reduces surface water volume fluctuations in the stream during both dry and wet periods by returning the stormwater to groundwater, as was the case with natural vegetation or agricultural crops. Rain and snow that percolates through the ground, rather than over the land surface, is much cooler once it reaches the stream. All new subdivisions in the Mormon Coulee Creek watershed should detain and infiltrate their stormwater. To reduce the costs of stormwater systems and reduce the affects of stormwater to the stream, the City of La Crosse and the Town of Shelby should create a stormwater plan for the Mormon Coulee Creek watershed with costs shared by new subdivision developments.

### **Poplar Creek**

Poplar Creek, located in northwestern Vernon County and southeastern La Crosse County, flows for approximately two miles in a southerly direction before reaching Coon Creek northeast of Coon Valley. In Vernon County, this stream is also known as Creek 4-8. In La Crosse County, this stream is also known as Creek 33-1. This stream has a steep gradient of 100 feet per mile and drains steep forested land and agricultural lowland pasture. Poplar Creek is a Class I trout stream for its entire length. The La Crosse County portion of this stream is designated as an Exceptional Resource Water.

The most recent surveys, conducted in 2003 and 2004, documented a self-sustaining brown trout population throughout the length of the stream. The Vernon County portion of Poplar Creek was subsequently reclassified from Class II trout to Class I trout. Access is possible from the County Highway P Bridge. Access is also available to the entire length of Poplar Creek via the DNR owned streambank easements.

### **Rullands Coulee Creek**

Rullands Coulee Creek, located in southwest Monroe County, flows in a southwesterly direction for 4.5 miles before reaching Timber Coulee Creek. It has a gradient of 62 feet per mile and drains steep forested hills and agricultural valley land. Rullands Coulee Creek is a Class I trout stream and an Outstanding Resource Water for its entire length.

In 1955, the Wisconsin Conservation Department (now the WDNR) initiated a fishery habitat demonstration project along Bohemian Valley, Timber Coulee, and Rullands Coulee creeks. The purpose of this project was to develop and perfect in-stream habitat restoration techniques. This pioneering project resulted in restoration methods that are still used today in coulee region streams.

The most recent fish surveys were conducted in the mid 1970's. An updated fish and habitat survey should be conducted on Rullands Coulee Creek. A 2001 aquatic insect sample indicated good water quality. Three road crossings, DNR owned land, and DNR owned streambank easements provide access to Rullands Coulee Creek.

### **Rundahl Creek (Creek 8-8)**

Rundahl Creek, also known as Creek 8-8, flows for 1.5 miles in a westerly direction before reaching Coon Creek just north of Coon Valley. This stream has a steep gradient of 120 feet per mile and drains steep forested hillsides and agricultural lands. Rundahl Creek is a Class I trout stream for its entire length.

A 2010 survey documented a cold, clear stream with a gravel, cobble bottom. This small stream with a largely wooded streambank held several year classes of brown trout and very few brook trout. Gravel spawning areas were abundant. This stream would benefit from the purchase of additional streambank easements from willing sellers as stated in the

Coon Creek Fishery Area Master Plan. Access to Rundahl Creek is from one road crossing and a DNR owned easement.

### **Spring Coulee Creek**

Spring Coulee Creek, located in northern Vernon County, flows in a northwesterly direction for six miles before reaching Coon Creek northeast of Coon Valley. It has a moderate gradient of 45 feet per mile and drains steep forested hills and agricultural valley land. Spring Coulee Creek is a Class I trout stream and designated as an Outstanding Resource Water for its entire length.

A 2009 survey documented a cold, clear stream with an abundance of brown trout and very few brook trout. A variety of forage fish species were also recorded. In-stream cover consisted of rocks, boulders, undercut banks, LUNKER structures, aquatic vegetation, and an occasional log. Access to Spring Coulee Creek is from DNR owned streambank easements, two DNR owned parcels, and four bridges.

### **Spring Coulee Creek (Creek 16-6)**

Spring Coulee Creek, also known as Creek 16-6, flows for approximately two miles in a westerly direction before reaching the Mississippi River just north of Genoa. This stream has a moderate gradient of 46 feet per mile and drains steep forested hills, lowland pasture, and agricultural land. Creek 16-6 is Class I trout stream for its entire length.

A 1999 survey of Spring Coulee Creek documented numerous forage fish species and a stream with the potential to hold and grow wild brook trout. In October, 2000, 409 adult wild brook trout were stocked in Spring Coulee Creek. Surveys in the subsequent three years documented a naturally reproducing brook trout population. This data allowed the WDNR to classify Spring Coulee Creek as a Class I trout stream for its entire length.

The extreme flooding that took place in the Coon Creek Watershed in the summer of 2007 and the spring of 2008 may have detrimentally affected the population of brook trout in this small tributary to the Mississippi River. A follow-up survey should be conducted to determine if the brook trout still inhabit Spring Coulee Creek. Access is possible from three road crossings, the Upper Mississippi River Fish and Wildlife Refuge, and DNR owned land.

### **Timber Coulee Creek**

Timber Coulee Creek, located in north central Vernon County, flows in a westerly direction for approximately 8.2 miles before reaching Coon Creek northeast of Coon Valley. This stream has a gradient of 40 feet per mile and drains steep forested hillsides and agricultural valley land. Timber Coulee Creek is a Class I trout stream for its entire length. Timber Coulee Creek is also an Outstanding Resource Water in Vernon County.

Surveys of this stream first began in 1950. Trout were found but bank erosion was severe. In 1955, the Wisconsin Conservation Department (now the WDNR) initiated a fishery habitat demonstration project along Bohemian Valley, Timber Coulee, and Rullands Coulee creeks. The

### **Stream Volunteers - Coon Creek Watershed**

Three Volunteer Stream Monitoring stations have been monitored by five volunteers from 2005 through 2010 in the BL03-Coon Creek Watershed. All stations are monitored using Level 1 procedures and are entered into the WAV database (<http://www.uwex.edu/erc/wavdb/>). On average, stations were monitored monthly from May through October with a total of seventeen field events entered for the watershed. All stations were monitored for the biotic index, flow, dissolved oxygen, instantaneous temperature and transparency.

Volunteers collect macroinvertebrates twice a year to determine a biotic index for each stream monitored. Streams are considered in poor quality if biotic index is between 1.0-2.0, fair quality if between 2.1-2.5, and in good quality if the index is between 2.6-3.5. Generally, biotic index values rated streams in the watershed to be in poor quality (ranging from 1.3-1.8) in the spring and fair to good quality (ranging from 2.2-3.1) in the fall.

Stream flow varied between the three streams. Flow in Mormon Creek at Mormon Coulee Park Bridge, CBSM-10030753 and Mormon Creek, 1/2 mi. N Kriebach Coulee Rd bridge, CBSM-10008930 averaged of 10-15 cubic feet per second (cfs), while Timber Coulee Creek near Moen Lane, CBSM-10032014 averaged 36 cfs.

From 2005 through 2010, volunteers recorded dissolved oxygen levels in the watershed ranging from 7.4-12.4 mg/l, all of which are sufficient to sustain aquatic life.

Temperature measurements, used to classify streams as cold, cool or warm water habitats, and which are indicative of the ability of a habitat to sustain aquatic species, were manually recorded at all three stations. Maximum instantaneous temperatures were below 25°C for all streams; suggesting they may be cold water streams.

Stream transparency measurements primarily indicated good water quality with 94% of measurements less than 10 NTU. Only one field event resulted in a measurement above this level. It was recorded on 7/27/2005 at Mormon Creek at Mormon Coulee Park Bridge, CBSM-10030753 with a measurement of 27 NTU.

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purpose of this project was to develop and perfect in-stream habitat restoration techniques. This pioneering project resulted in restoration methods that are still used today. In coulee region streams streambank erosion was reduced and fish cover increased by the installation of large rocks, root masses, log and rock deflectors.

The massive flooding that occurred in 2007 and 2008 in this watershed caused only minor damage to Timber Coulee Creek itself. The streambank and instream habitat work removed trees and reconnected the creek to its floodplain. These changes allowed the high water to come out of its normal banks without causing erosion. However, damage did occur at many road crossings where debris would pile up and block flood flows.

The most recent survey, conducted in 2010, documented an abundant brown trout population throughout the stream. The lower reaches contain more forage fish species while the upper end contains only brown trout and slimy sculpin. Eleven mIBI collections have occurred in Timber Coulee Creek since 2001 and lowest score was fair (4.15), the highest was excellent (8.26) and the median of the samples was 5.42. The entire length of Timber Coulee Creek is accessible from three road crossings, a county wayside, WDNR owned land, and from WDNR streambank easements.

### **Wing Hollow Creek**

Wing Hollow Creek, located in northwestern Vernon County, flows in a northwesterly direction for 2.5 miles before reaching Coon Creek west of Chaseburg. It has a moderately steep gradient of 54 feet per mile and drains steep forested land with an agricultural valley. Wing Hollow Creek is a Class III trout stream for its entire length.

The most recent survey, conducted in 2007, documented several forage fish species and brown trout. The upper end of the stream contained more gravel whereas the lower end was dominated by sand. This small stream does not have the capacity to hold many trout or many big trout, however three year classes of trout were found suggesting natural reproduction. Access to Wing Hollow Creek is possible from two road crossings.

### **Lake Health**

The WDNR's ROW database shows that there are 13 acres of inland lakes and ponds and 14 acres of reservoirs in the Coon Creek Watershed. Another 283 acres of unspecified open water and 3,994 acres of Mississippi River backwaters (almost entirely from the Wigwam Slough, which encompasses more than a dozen small lakes in and around Goose Island) are also located within the watershed. The 13 acres of inland lakes are made up of several old oxbow lakes, which are all less than three acres in size. About 37 lake acres and 99 acres of riverine backwaters found within the Coon Creek Watershed have been entered into the WDNR's assessment database; none of which have been assessed for fish and aquatic life use or any other use.

### **Wetland Health**

#### **Wetland Status**

The Coon Creek Watershed is located in west central Vernon, southwest Monroe, and southern La Crosse counties. An estimated 2% of the current land uses in the watershed are wetlands. Currently, only 52% of the original wetlands in the watershed are estimated to exist. Of these wetlands, the majority include emergent wetlands (58%), which include marshes and wet meadows, and forested wetlands (32%).

#### **Wetland Condition**

Little is known about the condition of the remaining wetlands but estimates of reed canary grass infestations, an opportunistic aquatic invasive wetland plant, into different wetland types has been estimated based on satellite imagery. This information shows that reed canary grass dominates 23% of the existing emergent wetlands and 12% of the remaining forested wetlands (See Figure 6 below). Reed Canary Grass domination inhibits successful establishment of native wetland species.

#### **Wetland Restorability**

Of the 2,804 acres of estimated lost wetlands in the watershed, approximately 84% are considered potentially restorable based on modeled data, including soil types, land use and land cover (Chris Smith, DNR, 2009).

## Groundwater

Groundwater wells vary from very shallow sandpoints to wells over 600 feet deep. Artesian wells are also common at lower elevations. Groundwater in this basin is generally of high quality, but in some locations high iron dissolving out of sandstone formations causes aesthetic and nuisance problems requiring filters to remedy. Hardness is also a problem in certain localities.

Springs are common throughout the area and serve as potable water for some of the older homes and farmsteads. In general terms, springs occur when moisture, in the form of rain or snow melt, percolates downward through the layers of rock until it encounters a layer that is difficult to penetrate, for example the contact between sandstone and shale. Since it is more difficult for the moisture to enter the next rock formation, it instead flows horizontally, to exit on the sides or bottom of a hill.

During drought, the flow in some streams is derived solely from groundwater discharge as baseflow into the stream. This is an important contribution, not only in terms of quantity, but also because the surface water temperatures are maintained by groundwater. Cold water fisheries are preserved, as are other water-fed habitat areas.

Coon Valley, Westby, and Cashton are the only municipal water systems within the Coon Creek Watershed that have wellhead protection plans, which are developed to achieve groundwater pollution prevention measures within public water supply wellhead areas. Coon Valley and Westby also have wellhead protection ordinances in place. Vernon, La Crosse, and Monroe counties have all adopted animal waste management ordinances.

The following groundwater information is for Vernon and La Crosse counties (from Protecting Wisconsin's Groundwater through Comprehensive Planning website, <http://wi.water.usgs.gov/gwcomp/>), which roughly approximates to the Coon Creek Watershed.

### Groundwater Use

From 1979 to 2005, total water use in Vernon County has increased from about 4.8 million gallons per day to about 8.1 million gallons per day through 2000 and decreased to 5.2 million gallons per day in 2005. The increase in total water use over this period until 2000 is due primarily to an increase in aquaculture use and the subsequent decrease after 2000 is due to a steep decline in aquaculture use. The proportion of county water use supplied by groundwater has been consistently greater than about 97% during the period 1979 to 2005, with a decrease to 68% in 2000 due to the spike in aquaculture around that time, which relied on surface water.

During the same time period, total water use in La Crosse County has fluctuated from about 25.4 million gallons per day to 27.8 million gallons per day. The increase in total water use is due to increases in aquaculture and domestic uses, offsetting declines in other use categories. The proportion of county water use supplied by groundwater has been consistently above 99% during the period 1979 to 2005. Since 2000, domestic water use has surpassed industrial water use to encompass the largest share of any water use category in the county.



Figure 7: Marshland (above); Sedge or "Wet" Meadow (below) [Photos courtesy WDNR]

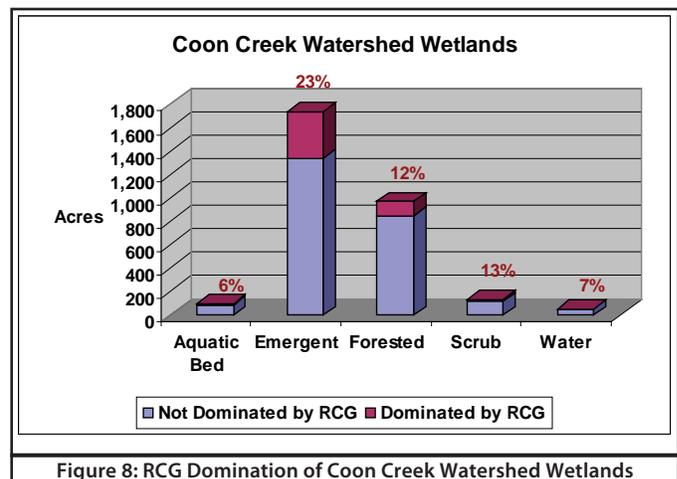


Figure 8: RCG Domination of Coon Creek Watershed Wetlands

### Private Wells

Ninety-two percent of 132 private well samples collected in Vernon County and 77% of 157 private well samples collected in La Crosse County from 1990-2006 met the health-based drinking water limit for nitrate-nitrogen. Land use affects nitrate concentrations in groundwater. An analysis of over 35,000 Wisconsin drinking water samples found that drinking water from private wells was three times more likely to be unsafe to drink due to high nitrate in agricultural areas than in forested areas. High nitrate levels were also more common in sandy areas where the soil is more permeable. In Wisconsin's groundwater, 80% of nitrate inputs originate from manure spreading, agricultural fertilizers, and legume cropping systems.

A 2002 study estimated that 43-52% of private drinking water wells in the region of Wisconsin that includes the Coon Creek Watershed contained a detectable level of an herbicide or herbicide metabolite. Pesticides occur in groundwater more commonly in agricultural regions, but can occur anywhere pesticides are stored or applied. A total of 3,861 acres of land in Vernon County are in atrazine prohibition areas. All three private well samples collected in Vernon County and 100% of 11 private well samples collected in La Crosse County met the health standard for arsenic.

### Potential Sources of Contamination

There are no Concentrated Animal Feeding Operations (CAFOs) in the Coon Creek Watershed; nor are there any licensed landfills or Superfund sites within the watershed.

WDNR's Remediation and Redevelopment (RR) Program oversees the investigation and cleanup of environmental contamination and the redevelopment of contaminated properties. The RR Program provides information about contaminated properties and other activities related to the investigation and cleanup of contaminated soil or groundwater in Wisconsin through its Bureau for Remediation and Redevelopment Tracking System (BRRTS) database (WDNR 2010e).

The database lists that there are seven sites in the Coon Creek Watershed that are classified as "open-status", meaning "contamination has affected soil, groundwater, or more and the environmental investigation and cleanup need to begin or are underway." These sites include four Leaking Underground Storage Tank (LUST) sites and three Environmental Repair (ERP) sites. A summary of these sites is included in the table below. Several other open-status LUST and ERP sites can be found just outside of the watershed boundary in La Crosse, Cashton, and Westby.

Table 3: Open-status Bureau for Remediation and Redevelopment Tracking System (BRRTS) sites in the Coon Creek Watershed

| WDNR BRRTS # | Site Name, Location                    | Start Date | Activity Type | Remediation Activities | Waste Activities | Substance   |
|--------------|--|------------|---------------|------------------------|------------------|---|
| 332557377    | St Joseph Equipment Inc., La Crosse    | 07/12/2011 | LUST          | 1                      | 0                | Arsenic & Chromium (Metals); Diesel Fuel (Petroleum)                                |
| 242555546    | Heartland Country Coop, Cashton        | 03/22/2010 | ERP           | 1                      | 0                | Fertilizer (Ag. Chem.) (Transferred to DATCP)                                       |
| 263556885    | Chaseburg Farmers Union Coop, Stoddard | 10/29/2007 | ERP           | 1                      | 0                | Fertilizer (Ag. Chem.) (Transferred to DATCP)                                       |
| 263212707    | AMPI Milk Coop, Coon Valley            | 07/08/1998 | ERP           | 2                      | 0                | Polychlorinated Biphenyl (PCB)  |
| 363100841    | Pedrettis Kwik Stop, Genoa             | 11/08/1995 | LUST          | 1                      | 0                | Gasoline & Diesel Fuel (Petroleum) (Transferred to Commerce)                        |
| 332001511    | WKTY Broadcast Studio, La Crosse       | 09/01/1995 | LUST          | 1                      | 0                | Diesel Fuel (Petroleum)   |
| 363000194    | AMPI Milk Coop, Coon Valley            | 08/30/1989 | LUST          | 2                      | 0                | Polychlorinated Biphenyl (PCB); Gasoline, Diesel, & other unknown type of Petroleum |

The Petroleum Environmental Cleanup Fund Award (PECFA) program was created in response to enactment of federal regulations requiring release prevention from underground storage tanks and cleanup of existing contamination from those tanks. PECFA is a reimbursement program returning a portion of incurred remedial cleanup costs to owners of eligible petroleum product systems, including home heating oil systems. As of May 31, 2007, \$9,998,631 has been reimbursed by the PECFA program to clean up 94 petroleum-contaminated sites in Vernon County. This equates to \$343 per county resident, which is greater than the statewide average of \$264 per resident. Over \$19 million has been spent to clean up 178 petroleum-contaminated sites in La Crosse County, which equates to \$177 per county resident.

## Point and Nonpoint Pollution

The communities of Coon Valley and Chaseburg each discharge treated wastewater to Coon Creek. Both the La Crosse and Pineview Mobile Home Parks discharge treated wastewater to Mormon Coulee Creek and the Village of St. Joseph discharges to a dry creek bed tributary to Mormon Coulee Creek. Both Genoa and Stoddard send their treated wastewater to the Mississippi River.

Overall, the watershed is ranked medium for nonpoint source pollution. The streams in Coon watershed are ranked medium, the groundwater is ranked medium, and there are no inland lakes to rank for nonpoint source pollution.

In August of 2007, what has been called the 1,000 year storm hit Vernon County, including the entire Coon Creek Watershed. Constant rain fell for more than 12 hours saturating soils, flooding streams, washing out roads and causing landslides. The following June, 2008 another high volume storm passed over the area causing flooding nearly as extensive as the 2007 flood. The floods, however, did not wreak havoc on streambanks in the Coon Creek Watershed due to the decades-long effort to stabilize streambanks. Bank stabilization includes the replacement of woody vegetation and trees with grasses. During high water events, these grasses lay down and, along with proper bank re-shaping, allows the stream unimpeded access to its floodplain, thus reducing streambank damage due to high water. The majority of the flood damage in the Coon Creek Watershed was bridge and culvert washouts, landslides, and personal property damage.



Figure 9: Coon Creek flowing through the Village of Chaseburg, August, 2007

There are no permitted Confined Animal Feeding Operations (CAFOs) within the Coon Creek Watershed. However, there may be some acreage approved for land spreading in the Coon Creek Watershed of CAFO generated waste from outside the watershed.

### Stormwater Permits

The City of La Crosse and the Town of Shelby are both covered under a municipal stormwater permit which requires them to implement construction site erosion control. Post construction requirements include the control of total suspended solids and peak flows as well as infiltration of stormwater. La Crosse County also enforces their stormwater permit countywide and in two other townships in the Coon Creek Watershed: The Town of Greenfield and the Town of Washington. These ordinances that adhere to their stormwater permits help to control the amount and quality of stormwater that reaches Mormon Coulee Creek and its tributaries.

### Fishkills

Two fishkill investigations have been conducted recently in the Coon Creek Watershed. Both were categorized to be the result of natural environmental conditions.

David Heath conducted Investigation #87 on July 15, 2001, on an unnamed drainage ditch to the Mississippi River located in the Village of Genoa. It was concluded that fish were not allowed to escape from a normally isolated pond. Fish entered during abnormally high water and were not allowed to escape because the exit was blocked. Water elevations also dropped abnormally fast due to a planned pool drawdown. Recommended Action: educate local residents not to block ditch.

Ken Von Ruden conducted Investigation #85 on Wigwam Slough on April 8, 2003. The cause of the fishkill was found to be gas bubble disease. This conclusion was verified by Becky Lasee of the United States Fish and Wildlife Service (USFWS) National Health Lab in Onalaska WI. The fishkill took place on a refuge and was the result of natural conditions; therefore, no action was recommended to be taken.

## Waters of Note

### Trout Waters

There are over 137 miles of trout waters in the Coon Creek Watershed, including over 76 miles of Class I trout streams, 33 stream miles are Class II trout streams, and 26 stream miles are Class III trout streams.

Class I trout streams are high quality trout waters that have sufficient natural reproduction to sustain populations of wild trout, at or near carry capacity. Consequently, streams in this category require no stocking of hatchery trout. These streams or stream sections are often small and may contain small or slow-growing trout, especially in the headwaters. Class II trout streams may have some natural reproduction, but not enough to utilize available food and space. Therefore, stocking is required to maintain a desirable sport fishery. These streams have good survival and carryover of adult trout, often producing some fish larger than average size. Class III trout waters are marginal trout habitat with no natural reproduction occurring. They require annual stocking of trout to provide trout fishing. Generally, there is no carryover of trout from one year to the next (<http://dnr.wi.gov/fish/species/trout/streamclassification.html>).

Table 4: Coon Creek Watershed Trout Waters

| WADRS ID | Official Waterbody Name | Local Waterbody Name          | WBIC    | Start Mile | End Mile | Trout Class | Trout ID | Counties          |
|----------|-------------------------|-------------------------------|---------|------------|----------|-------------|----------|-------------------|
| 18587    | Berge Coulee Creek      | Berge Coulee Creek            | 1646400 | 0          | 2.03     | CLASS I     | 1012     | La Crosse         |
| 13985    | Unnamed                 | Chipmunk Creek (3-6)          | 1648100 | 0          | 8.97     | CLASS I     | 1015     | Vernon, La Crosse |
| 893459   | Coon Creek              | Coon Creek                    | 1643500 | 0          | 13.81    | CLASS III   | 3077     | Vernon            |
| 951128   | Coon Creek              | Coon Creek                    | 1643500 | 13.81      | 26.76    | CLASS II    | 2264     | Vernon            |
| 951152   | Coon Creek              | Coon Creek                    | 1643500 | 26.76      | 33.45    | CLASS I     | 1005     | La Crosse         |
| 1527836  | Coon Creek              | Coon Creek                    | 1643500 | 33.45      | 37.31    | CLASS I     | 1005     | Monroe, La Crosse |
| 1179884  | Unnamed                 | Creek 2-4                     | 1648200 | 0          | 0.99     | CLASS II    | 2268     | Vernon            |
| 1179907  | Unnamed                 | Creek 2-4                     | 1648200 | 0.99       | 3.37     | CLASS III   | 3082     | Vernon            |
| 1179851  | Unnamed                 | Creek 24-5                    | 1647700 | 0          | 1.48     | CLASS III   | 3081     | La Crosse         |
| 1179808  | Unnamed                 | Creek 29-16                   | 1646700 | 0          | 2.06     | CLASS I     | 1014     | Monroe            |
| 1527865  | Unnamed                 | Creek 29-16                   | 1646700 | 2.06       | 2.24     | CLASS I     | null     | Monroe            |
| 951391   | Unnamed                 | Creek 7-3                     | 1645900 | 0          | 1.66     | CLASS II    | 2265     | Vernon            |
| 13983    | Fishback Creek          | Fishback Creek                | 1647600 | 0          | 0.76     | CLASS I     | 2267     | La Crosse         |
| 13984    | Fishback Creek          | Fishback Creek                | 1647600 | 0.76       | 3.42     | CLASS I     | 3080     | La Crosse         |
| 18586    | Hasley Creek            | Hasley Creek                  | 1645200 | 0          | 4.18     | CLASS III   | 3079     | Vernon            |
| 13978    | Hohlfeld Coulee Creek   | Hohlfeld Coulee Creek (20-16) | 1645100 | 0          | 4.54     | CLASS I     | 1006     | Vernon            |
| 949211   | Unnamed                 | Johns Coulee Creek            | 1648500 | 0          | 1.88     | CLASS I     | 1017     | La Crosse         |
| 13979    | Lindahl Creek           | Lindahl Creek                 | 1645400 | 0          | 6.02     | CLASS I     | 1007     | Vernon            |
| 18588    | Mormon Creek            | Mormon Coulee Creek           | 1648300 | 0          | 0.84     | CLASS II    | 2269     | La Crosse         |
| 13986    | Mormon Creek            | Mormon Coulee Creek           | 1648300 | 0.84       | 17.67    | CLASS II    | 2069     | La Crosse         |
| 949155   | Unnamed                 | Poplar Creek                  | 1646200 | 0          | 0.59     | CLASS I     | 2266     | Vernon            |
| 1179744  | Unnamed                 | Poplar Creek                  | 1646200 | 0.59       | 3.3      | CLASS I     | 1010     | La Crosse         |

|         |                       |                         |         |      |       |           |         |                   |
|---------|-----------------------|-------------------------|---------|------|-------|-----------|---------|-------------------|
| 13982   | Rullands Coulee Creek | Rullands Coulee Creek   | 1646500 | 0    | 5.81  | CLASS I   | 1013    | Monroe, Vernon    |
| 951414  | Unnamed               | Rundahl Creek           | 1646000 | 0    | 3.44  | CLASS I   | 1008    | Vernon            |
| 13974   | Unnamed               | Spring Coulee Cr (16-5) | 1643400 | 0    | 4.56  | CLASS I   | 2008-91 | Vernon            |
| 13980   | Spring Coulee Creek   | Spring Coulee Creek     | 1646100 | 0    | 9.05  | CLASS I   | 1009    | Vernon            |
| 1515648 | Timber Coulee Creek   | Timber Coulee Creek     | 1646300 | 0    | 3.23  | CLASS I   | 1011    | Vernon, La Crosse |
| 13981   | Timber Coulee Creek   | Timber Coulee Creek     | 1646300 | 3.24 | 6.27  | CLASS I   | 1011    | Vernon, La Crosse |
| 1515680 | Timber Coulee Creek   | Timber Coulee Creek     | 1646300 | 6.28 | 10.94 | CLASS I   | 1011    | Vernon            |
| 13977   | Wing Hollow Creek     | Wing Hollow Creek       | 1644600 | 0    | 4.64  | CLASS III | 3078    | Vernon            |

### Outstanding and Exceptional Resource Waters

The creation of Chapter NR207 “Water Quality Antidegradation” and changes to NR102 “Water Quality Standards for Wisconsin Surface Waters”, (Wisconsin Administrative Code) allows the Department of Natural Resources to determine which waterbodies, because of their particular resource values and water quality, are most vital to protect for the citizens of Wisconsin. When coupled with other administrative codes, NR207 protects surface waters and reflects their values and priorities when determining what kind of environmental safeguards are applied to new or increased wastewater discharges. The purpose of the antidegradation policy is to increase protection for high quality streams and lakes in the state. To achieve this, the antidegradation classification system includes Outstanding Resource Waters (ORW) and Exceptional Resource Waters (ERW). An Outstanding or Exceptional Resource Water is a surface water which provides valuable fisheries, hydrologically or geologically unique features, outstanding recreational opportunities, unique environmental settings and which is not significantly impacted by human activities.

Twenty-five miles of streams in the watershed are considered Exceptional Resource Waters (Coon Creek, Fishback Creek, Creek 29-16, and Poplar Creek) and 20 miles are designated Outstanding Resource Waters (Berge Coulee Creek, Rutland’s Coulee Creek, Spring Coulee Creek, and Timber Coulee Creek).

Table 5: Coon Creek Watershed Outstanding and Exceptional Resource Waters

| WADRS ID | Official Waterbody Name | Local Waterbody Name  | WBIC    | ORW/ERW | ORW/ERW ID | Start Mile | End Mile | Counties          |
|----------|-------------------------|-----------------------|---------|---------|------------|------------|----------|-------------------|
| 18587    | Berge Coulee Creek      | Berge Coulee Creek    | 1646400 | ORW     | 395        | 0          | 2.03     | La Crosse         |
| 951128   | Coon Creek              | Coon Creek            | 1643500 | ERW     | 391        | 13.81      | 26.76    | Vernon            |
| 951152   | Coon Creek              | Coon Creek            | 1643500 | ERW     | 391        | 26.76      | 33.45    | La Crosse         |
| 1179808  | Unnamed                 | Creek 29-16           | 1646700 | ERW     | 397        | 0          | 2.06     | Monroe            |
| 13983    | Fishback Creek          | Fishback Creek        | 1647600 | ERW     | 398        | 0          | 0.76     | La Crosse         |
| 1179744  | Unnamed                 | Poplar Creek          | 1646200 | ERW     | 393        | 0.59       | 3.3      | La Crosse         |
| 13982    | Rullands Coulee Creek   | Rullands Coulee Creek | 1646500 | ORW     | 396        | 0          | 5.81     | Monroe, Vernon    |
| 13980    | Spring Coulee Creek     | Spring Coulee Creek   | 1646100 | ORW     | 392        | 0          | 9.05     | Vernon            |
| 13981    | Timber Coulee Creek     | Timber Coulee Creek   | 1646300 | ORW     | 394        | 3.24       | 6.27     | Vernon, La Crosse |
| 1515680  | Timber Coulee Creek     | Timber Coulee Creek   | 1646300 | ORW     | null       | 6.28       | 10.94    | Vernon            |

## Impaired Waters

Since 1998, Ninety-six (96) miles of the Mississippi River, which adjoins this watershed, are listed due to ambient concentrations of mercury and PCBs in the water column.

## Fish Consumption

The Mississippi (Reach 4, Coon-Yellow - Pool 9 portion - LD 9 to LD 8) has specific fish consumption advice issued for mercury and Beyers Lake and Mississippi (Reach 4, Coon-Yellow - Pool 8 portion - LD 8 to Root R.) have specific consumption advisories for PCBs. General water use restrictions under NR102 have been in place for the Mississippi River due to mercury and PCBs since 1998. The specific advisory for mercury was added as a new impairment in 2010.

## Aquatic Invasive Species

Big head carp, grass carp, and Eurasian water-milfoil have been documented in Pool 8 of the Mississippi River since 2008. Eurasian water-milfoil has been found along Goose Island and Shady Maple since 1991. Zebra mussels have also been verified and vouchered along the main body of the Mississippi since 1991.

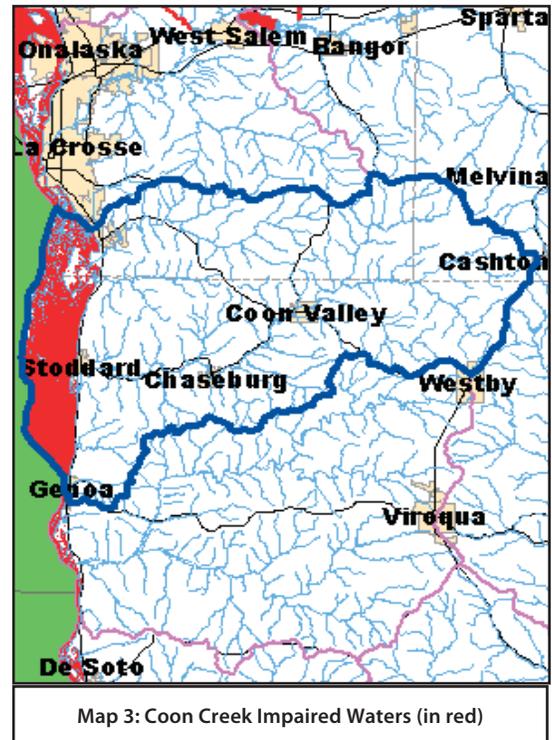


Table 6: Coon Creek Watershed Aquatic Invasive Species

| Database Key | Waterbody Name                    | Bio. Common Name       | Status                 | Subtype    | Start Date | WBIC   |
|--------------|-----------------------------------|------------------------|------------------------|------------|------------|--------|
| 40           | Mississippi River                 | Zebra Mussel           | Verified and Vouchered | Interstate | 01/01/1991 | 721000 |
| 1254         | Mississippi River, Goose Island   | Eurasian Water-milfoil | Verified and Vouchered | Mainbody   | 01/01/1991 | 721000 |
| 1302         | Mississippi River, Shady Maple    | Eurasian Water-milfoil | Verified and Vouchered | Mainbody   | 01/01/1991 | 721000 |
| 1333         | Mississippi River (main channel)  | Eurasian Water-milfoil | Verified and Vouchered | Mainbody   | 01/01/1992 | 721000 |
| 1295         | Mississippi River, Pool-8 Islands | Eurasian Water-milfoil | Verified and Vouchered | Mainbody   | 01/01/1991 | 726205 |
| 31243526     | Mississippi River-Pool 8          | Bighead Carp           | Verified and Vouchered | -          | 11/01/2008 | 721000 |
| 31243539     | Mississippi River-Pool 8          | Grass Carp             | Verified               | -          | 11/01/2008 | 721000 |

## Species of Special Concern

The following species are federally-listed Threatened, Endangered, Proposed, and Candidate species that have been observed in Vernon, Monroe, and La Crosse counties, in which the Coon Creek Watershed is located. A full list of special concern plants and animals for this watershed can be found on the state's Natural Heritage Inventory (NHI).

Table 7: Federally-Listed Threatened, Endangered, Proposed, and Candidate Species in Vernon, Monroe, and La Crosse Counties

| Species   | Status                                  | Habitat  | Taxa    |
|---|---|--|---------|
| Higgins eye pearl mussel ( <i>Lampsilis higginsii</i> )     | Endangered                              | Mississippi River  | Mussel  |
| Northern monkshood ( <i>Aconitum noveboracense</i> )        | Threatened                              | North facing slopes  | Plant   |
| Gray wolf ( <i>Canis lupus</i> )                            | Endangered                              | Northern forested areas                                    | Mammal  |
| Whooping crane ( <i>Grus americanus</i> )                   | **Non-essential experimental population | Open wetlands and lakeshores; nests found in Monroe County | Bird    |
| Eastern massasauga ( <i>Sistrurus catenatus catenatus</i> ) | Candidate                               | Open to forested wetlands and adjacent upland areas        | Reptile |
| Karner blue butterfly ( <i>Lycæides melissa samuelis</i> )  | Endangered                              | Prairie, oak savanna, and jack pine areas with wild lupine | Insect  |

\*\*Whooping Crane - On June 26, 2001, a non-essential experimental population of the whooping crane was designated in a 20-state area of the eastern United States. The first release of birds occurred in Wisconsin in 2001, and the counties listed as supporting whooping crane populations are those where the species has been observed to date. It is unknown at this time which counties the species will occupy in the future, as the birds mature and begin to exhibit territorial behavior. For purposes of section 7 consultation, this species is considered as a proposed species, except where it occurs within the National Wildlife Refuge System or the National Park System, where it is treated as a threatened species (<http://www.fws.gov/midwest/endangered/lists/wisc-spp.html>).

## State Natural and Wildlife Areas

### Bergen Bluffs

Bergen Bluffs features a good quality southern oak forest located on a scenic bluff overlooking the Mississippi River. Large red oak and white oak dominate the canopy with black walnut, black cherry, hickory, white ash, and paper birch also present. As part of a larger tract of contiguous woodland along the river, the forest is an important stopover site for numerous migratory birds. This fact is particularly important given the forest's location within the Mississippi River Flyway, a migratory bird corridor of global significance. Millions of birds use the river corridor during spring and fall migration each year. The natural area provides a high quality "rest area" where birds can stop, rest, and refuel before continuing their migratory journey. The forest also contains high quality breeding habitat for many native songbirds. A nearly vertical, scenic sandstone-limestone rock outcrop is found along the east central site boundary. As home development along the bluffs continues to increase, protection of these ecologically important and unique areas is becoming ever important. Bergen Bluffs is owned by the DNR and was designated a State Natural Area in 2005.

### Coon Creek Cliffs

Coon Creek Cliffs features a long series of large, north-facing sandstone cliffs, many of which are dripping wet. They support a large population of rare plants which, along with a variety of mosses, liverworts, swamp saxifrage, wild ginger, and slender cliff brake, make these cliffs quite rich in flora. Another rare species, glade fern (*Diplazium pycnocarpon*) is also present. The woods at the base of the cliffs, where spring runs and seeps originate, have been grazed. The woods above the cliffs are young paper birch. With protection, the woods, springs, and seeps may gradually return to their former natural condition. Coon Creek Cliffs is owned by the DNR and was designated a State Natural Area in 1986.

### Coon Creek Fishery Area

Coon Creek Fishery Area is approximately 225 acres located about one mile northeast of the Village of Coon Valley along County Highway P. The habitat consists of upland forest, grasslands, and a Class I trout stream. Deer, squirrels, wild turkeys, cottontail rabbits, woodducks, and woodcock are game species that inhabit the area.

### Eureka Maple Woods

Eureka Maple Woods lies on a steep, north-facing slope above Timber Coulee Creek, a tributary of Coon Creek. The forest is dominated by small to medium sized sugar maple and basswood, along with red oak, yellow birch, white ash

and red elm. Large trees are uncommon. However, the herbaceous flora is exceptionally rich, containing such uncommon plants as squirrel corn, twinleaf, Goldie's fern, narrow-leaved spleenwort, walking fern, leafcup, and adam and eve orchid. Common mesic ground layer species are abundant, providing a tremendous springtime floral display. The shrub layer is also diverse with witch hazel, leatherwood, hazelnut, bladdernut, viburnums, and dogwoods. Bird species include several species sensitive to forest fragmentation such as cerulean warbler (*Dendroica cerulea*), Acadian flycatcher (*Empidonax virescens*), ovenbird, yellow-throated vireo, American redstart, blue-gray gnatcatcher, and wood thrush. Soils are Norden loams thinly covering the steep slopes. Eureka Maple Woods is owned by the DNR and was designated a State Natural Area in 1989.

### **Portland Maples**

Portland Maples features two small, but ecologically significant, tracts of southern mesic forest -- a community type that was once wide-spread in this region of Wisconsin. The northeast-facing slope supports a forest dominated by sugar maple. Also present are basswood, red oak, yellowbud hickory, and white ash. The subcanopy consists of sugar maple, ironwood, and eastern hop-hornbeam. The sparse shrub layer contains elderberry, bladdernut, leatherwood, and hazelnut while the ground layer contains such species as goldenseal, narrow-leaved spleenwort, and Goldie's fern. Other species include lady, rattlesnake and walking ferns, wild leek, bishop's-cap, red baneberry, nodding wake-robin, wild sarsaparilla, bloodroot, and great water-leaf. Next to the creek is a floodplain forest of cottonwood, black willow, and American elm along with mesic forest species including black maple. Birds include the state-threatened Acadian flycatcher (*Empidonax virescens*) and scarlet tanager and ovenbird. Portland Maples is owned by the DNR and was designated a State Natural Area in 2002.

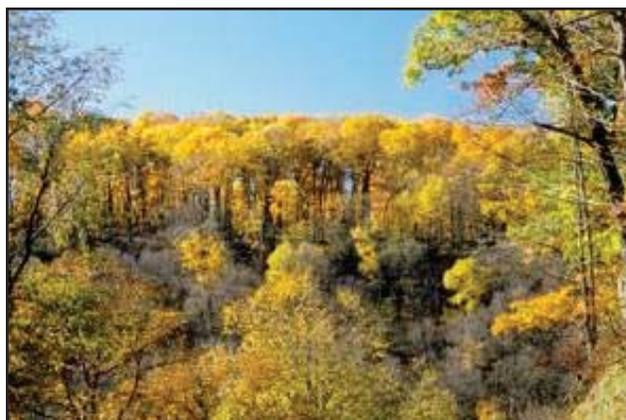


Figure 10: Portland Maple Bluffs,  
Photo by Thomas A. Meyer (WDNR photo)

### **Rulland's Coulee Fishery Area**

Rulland's Coulee Fishery Area is located two miles southwest of Portland on Highway P in Monroe County. The following recreational opportunities exist at Rulland's Coulee Fishery Area: hunting (Principle game species include waterfowl, woodcock, deer, wild turkeys, and furbearers), trapping, hiking, cross country skiing, wildlife viewing, fishing, and bird watching.

## **Watershed Actions**

### **Grants and Projects**

River Protection Grant – Mormon Creek 07/01/2004 – Complete The Coulee Region Chapter of Trout Unlimited proposed to restore 1,000 feet of streambank along Mormon Creek in the Town of Greenfield in La Crosse County. Major project elements included: 1) Reshaping and stabilization of streambanks, 2) Dredging of silted-in pools, 3) Placement of luncker structures.

### **Monitoring**

#### **Lakes Baseline and Trends Monitoring**

River Monitoring to comply with Clean Water Act implementation - water quality standards: use designations, criterion, permit issuance and compliance, assessments and impaired waters management.

Fisheries projects include a wide variety of "baseline" monitoring and targeted fieldwork to gain specific knowledge related to Wisconsin's fish communities.

In close cooperation with UW Extension and Wisconsin Sea Grant, education efforts focus on working with resource professionals and citizens statewide to teach boaters, anglers, and other water users how to prevent transporting aquatic invasive species when moving their boats. Additional initiatives include monitoring and control programs.



Figure 11: Bridge in Vernon County compromised by the August, 2007 flood.



Figure 12: Landslide from August 2007 flood in Coon Creek Watershed.

### Basin/Watershed Partners

In April 2008, a group of interested resource professionals met at a 197-acre, state-owned tract of land along the banks of Coon Creek just upstream of Coon Valley known as the Neprud property or the Coon Creek State Fishery Area. The group developed plans to transform the 197-acre site and discuss what each entity could bring to the project. Attending the meeting were representatives from the Wisconsin DNR Fisheries, Wildlife, Forestry, Water Resources and Endangered Resources, the U.S. Fish and Wildlife Service (USFWS), the U.S. Geological Survey (USGS), the Natural Resource Conservation Service (NRCS), the Vernon County Land and Water Conservation Department (LWCD), and the University of Wisconsin-La Crosse. Streambank restoration allowing the creek access to its floodplain, long term monitoring of Coon Creek, water quality monitoring, wildlife habitat scrapes, tree harvesting, herptile habitat restoration, and prairie restoration are all planned for this expansive acreage.

### Monitoring Studies

The La Crosse County Land Conservation Department has been sampling phosphorus and fecal bacteria in streams across the county on a quarterly or semi-annual basis for more than 10 years. The 2007-2011 La Crosse County Land and Water Resource Management Plan concludes from this long term data set that Berge Coulee Creek, Coon Creek, Mormon Coulee Creek and Chipmunk Coulee Creek are among the best streams in La Crosse County.

### Recommendations

- WDNR regional staff should continue to encourage communities to develop wellhead protection plans in the Coon Creek Watershed.
- The La Crosse County Land Conservation Department should continue baseflow sampling of Mormon Coulee Creek, Hasley Creek, Chipmunk Coulee Creek and Coon Creek to determine water quality trends.
- The WDNR should continue continuous temperature monitoring of streams in the Coon Creek Watershed to document trends.
- Chipmunk Coulee Creek (Creek 3-6) and Spring Coulee Creek (Creek 16-6) would benefit from the acquisition of streambank easements and in-stream habitat restoration.
- The purchase of additional streambank easements along Berge Coulee, Bohemian Valley, Fishback, Mormon Coulee, Rullands Coulee, Spring Coulee, Rundahl, and Coon creeks is recommended according to the Coon Creek Fishery Area Master Plan.
- WDNR should conduct a fish and habitat survey of Hasley Creek, Berge Coulee Creek, Lindahl Creek, Rullands Coulee Creek, and Creek 29-1 to document existing conditions.
- The WDNR should extend the Coon Creek Fishery Area to include Coon Creek downstream of Chaseburg to the Mississippi River.
- The WDNR should extend the Coon Creek Fishery Area to include Lindahl Creek.
- The WDNR should continue in-stream habitat restoration in all streams where necessary in Coon Creek Fishery Area streams.

## Contributors

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## Appendices

- Basemap
- Dams and Outfalls
- Land Use
- O/ERW and 303d
- Potentially Restorable Wetlands
- Trout Waters
- Wetlands



Mormon Coulee Creek

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# Coon Creek Watershed