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LOWER GRANT RIVER WATERSHED NARRATIVE

(GP04)

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Table of Contents

GP04 Map

LOWER GRANT RIVER WATERSHED (GP04)

The Lower Grant River Watershed is a 145 square mile watershed in southwest Grant County. It includes the mainstem of the Grant River from its mouth at Pool 11 on the Mississippi River upstream to Pigeon Creek. Other principle streams in the watershed include Rattlesnake Creek, Boice Creek and Muskellunge Creek. The watershed contains approximately 66 miles of warm water sport fishery.

The terrain in the upper parts of the watershed has long gentle slopes of between one to five percent. In the remainder of the watershed, the slopes are steeper, often in excess of 20 percent. The steeper slopes lead to the more rapid runoff of stormwater and snowmelt. Consequently, the streams of the watershed tend to be subject to very rapid increases in stream levels during and immediately after runoff events. Soil erosion, a concern everywhere in the watershed, is particularly a problem in the areas with steeper slopes. The Grant River carries one of the highest sediment loads in the state, which can be evidenced by the delta of eroded sediments that has developed at the river's mouth. This high sediment load is a concern on more than just a state or regional level since the Grant River is a major contributor of sediment and nutrients (phosphorus and nitrogen) to the Mississippi River. Overall, the increased runoff, due to agriculture, over the last 150 years has affected instream water quality, habitat, and fisheries of streams in the watershed. In fact, the primary cause of water resource problems in the watershed is poor water quality, specifically low dissolved oxygen following runoff events (Wang et.al., 1996). Department studies indicate that the cause of the low dissolved oxygen levels appears to be manure in the runoff from barnyards and feedlots (Wang et.al., 1996). Overall, the watershed and the streams in the watershed are ranked by the Department as a high priority with respect to non-point source pollution.

Land uses in the watershed are mostly rural and agricultural land accounts for roughly 86 percent of the 130 square mile drainage area. About 62 percent of the watershed is cropland. Woodlots occupy another 12 percent of the watershed. The most extensive grouping of wetland complexes in the watershed are in the lower reaches of the Grant River where it empties into Pool 11 of the Mississippi River. There are other smaller wetlands adjacent streams in the watershed. These wetlands are usually grazed. Many acres of wetlands adjacent streams are farmed. Farms in the watershed are relatively large, with an average farm size of 310 acres (Bachhuber et.al., 1991). Corn is the dominant crop grown and livestock operations include a mix of dairy, beef and swine.

The watershed has an abundant supply of groundwater. Groundwater in shallow aquifers is the source of virtually all drinking water in the watershed. Two studies done in the watershed indicate that nitrate concentrations in groundwater is a concern. A study done in the Rattlesnake Creek part of the watershed showed that 23.5 percent of the wells tested exceeded state standards for nitrates (University of Wisconsin, 1989). Studies done in Iowa found a direct correlation between increasing use of nitrogen based fertilizers and increasing level of nitrates in groundwater. Overall, the groundwater in the watershed has been ranked as a high potential for groundwater contamination.

The Lower Grant River Watershed was selected as a Wisconsin non-point source abatement priority watershed project in 1989. It is scheduled to end in October of 2001. The priority watershed project is a partnership of the Grant County LCD, the DNR, DATCP and the NRCS. These agencies work together with willing landowners in the watershed to install non-point

source best management practices to protect water resources and improve farm conservation practices. Goals of the priority watershed project are to:

- improve sport and forage fish populations;
- reduce organic pollution from livestock wastes by 75 percent;
- improve riparian habitat (Bachhuber et.al., 1991)

As of 1998, the watershed project had signed 71 contracts in the watershed to improve water quality. The project has provided over $700,000 in total cost sharing to protect and improve water resources (Grant County, 1998). Participation by landowners in the watershed project, however, has been less than desired. This is reflected in the reductions of barnyard phosphorus and streambank erosion that are significantly below expectations. As of 1997, only 10% of the total barnyard phosphorus loading reduction desired had been accomplished. Sediment loading reductions from streambank erosion were at less than 10% of desired goals. By contrast, it was projected that the goal for upland sediment reduction or soil loss would exceed its goal (DATCP, 1998).

There are no incorporated areas in the Lower Grant River Watershed. The unincorporated community of Beetown is in the watershed. It is estimated that about 2,600 people live in the watershed (Bachhuber et.al., 1991). Public access to streams is limited to road crossings. Hunting is allowed on private lands with the permission of the property owner. Increased participation in the CRP and CREP programs would increase wildlife habitat in the watershed.

SURFACE WATER NARRATIVES

Boice Creek - Boice Creek is tributary to the Grant River about two miles above the mouth of the Grant. It is a spring and seepage stream that begins about three miles south of Lancaster (Smith and Ball, 1971). It has a drainage area of about 37.5 square miles and includes a number of smaller named streams. Recent and historical fisheries studies show the stream to be dominated by forage species with only an occasional smallmouth bass present. The topography of this sub-watershed is steeper than much of the rest of the watershed. This means there is a higher runoff potential in this sub-watershed. About 56% of the land area is used for cropping. Streambank erosion in the sub-watershed is a major source of sediment to the system (Bachhuber et.al., 1991). This stream suffers dissolved oxygen problems following high flow or rainfall events. The riparian vegetation along Boice Creek provides valuable wildlife habitat for species such as wood duck (Bachhuber et.al., 1991).

Grant River – This watershed contains the reach of Grant River from its mouth upstream to Pigeon Creek. The valley tends to be steeper in this downstream portion of the river. Due to this local relief, land is less intensively cropped than in other parts of the watershed, however, non-point source pollution from streambank erosion is severe. The USGS maintains a flow monitoring station on the Grant River near Burton. Data from this station shows that almost 54,000 tons of sediment were discharged to the river above Burton (Holmstrom, et.al., 1998). This value averages out to slightly more than 5.5 tons of soil per acre from the entire Grant River drainage area above Burton during 1998. That sediment ultimately reaches the Mississippi River at Pool 11. The fishery of this reach of the river includes smallmouth bass, walleye, sauger, and catfish. The floodplain-wetlands complex at the mouth of the river provides a highly productive

habitat for waterfowl and nongame species (Bachhuber et.al., 1991). Overall, this reach of Grant River is heavily used for canoeing, hunting, fishing and other types of recreation.

Kuenster Creek - Kuenster Creek is a spring fed tributary to Rattlesnake Creek. Almost 100% of its drainage area is used for agricultural purposes. In addition, stream bank erosion is also a major problem. The stream is wide and shallow which leads to warmer water temperatures during the summer (Smith and Ball, 1971). Similar to most streams in this watershed, Kuenster Creek experiences dissolved oxygen levels below water quality standards during or immediately after runoff and storm events.

The fishery of the stream is dominated by pollution tolerant forage fish species. An occasional smallmouth bass is found in its lower reaches (Wang et.al., 1996). Fish distribution and population surveys were done during the 1990's to develop fish Index of Biotic Integrity (IBI) scores and stream water quality ratings. The IBI ratings, indicators of environmental degradation, for Kuenster Creek ranged from fair to very poor. Habitat quality was also rated for Kuenster and ranged from excellent to fair over the six-year period of study (Wang et.al., 1996). A recent macroinvertebrate study found that the stream to have fair water quality and nearly 20% of the macroinvertebrates sampled were mayflies, caddisflies and stoneflies. Despite this, over 60% of the macroinvertebrates sampled were midges, which often indicate ecological disturbances including those that can be attributed to non-point sources of pollution such as soil erosion (Gamman, 1983; Marshall, 1999). In addition, a study done by USGS on Kuenster Creek showed the stream carries a median unit-area load (tons per square mile) of sediment of 332 tons per square mile with a maximum load of 1,010 tons of sediment per square mile. The same study showed the stream receiving a median unit-area load of 957 pounds of phosphorus per square mile with a maximum loading of 3,960 pounds per square mile (Corsi, et.al, 1997). Based on these results, it can be assumed that water quality and fisheries in Kuenster Creek are affected by non-point sources of pollution that reach the stream.

Muskellunge Creek -Muskellunge Creek is a spring-fed tributary to Rattlesnake Creek. Streambank erosion is a major source of sediment to the stream (Smith and Ball, 1971). Although historically, a limited smallmouth bass fishery was found in the lower reaches of Muskellunge Creek, today the fishery of the creek is dominated by relatively pollution tolerant forage fish. Only a few smallmouth bass can still be found in the lower reaches of the stream (Wang et.al., 1996). Overall, the IBI ratings, indicators OF environmental degradation, for Muskellunge Creek were somewhat better than Kuenster and ranged from fair to poor with one very poor. Habitat quality when rated for Muskellunge Creek indicated either good or fair condition (Wang et.al., 1996). Recent macroinvertebrate samples found the stream to have fairly poor water quality. Approximately 10% of the sampled macroinvertebrates were mayflies, caddisflies and stoneflies, while over 70% of the samples were midges (Marshall, 1999). Midges typically indicate environmental degradation that may be attributed to agricultural non-point sources of pollution (Gamman, 1993) .

Rattlesnake Creek - Rattlesnake Creek is a spring and seepage stream that begins southeast of Bagley and flows southwest to enter the Grant River near Beetown. Almost 100% of its drainage area is used for agricultural purposes. The stream has experienced problems with non-point source pollution. A study done by USGS on Rattlesnake Creek showed the stream carries a median unit-area load (tons per square mile) of sediment of 200 tons per square mile with a maximum load of 837 tons of sediment per square mile. The same study showed the stream

received a median unit-area load of 821 pounds of phosphorus per square mile with a maximum loading of 3,670 pounds per square mile (Corsi, et.al, 1997).

Historically, it was a good smallmouth bass stream (Smith and Ball, 1971). However, while investigations during the 1980's showed that Rattlesnake had good to excellent smallmouth bass habitat, the stream had a very low population of smallmouth bass (Forbes, 1985). The population of smallmouth bass in the creek tends to fluctuate. The key factor in this fluctuation seems to be major runoff events that result in dissolved oxygen levels that fall below state water quality standards. These low dissolved oxygen levels are thought to be caused by runoff from barnyards in the watershed (Wang, et.al., 1996).

Recent observations, however, have indicated that the bass fishery has improved (Kerr, 1998; Wang et.al., 1996). The IBI ratings, indicators of environmental degradation, for Rattlesnake Creek were generally fair. Macroinvertebrate monitoring indicate a range in water quality from "fair" to "poor" (Marshall, 1999). Overall macroinvertebrate sampling found nearly 25% of the macroinvertebrates to be mayflies, stoneflies or caddisflies while approximately 55% of the samples were midges (Marshall, 1999). In addition, stream habitat was rated as being good to excellent (Wang et.al., 1996).

RECOMMENDATIONS FOR LOWER GRANT RIVER WATERSHED

Protecting and Improving Water Quality and In-Stream Habitat

- The DNR, in partnership with local governmental agencies and local conservation groups, should identify opportunities to better protect riparian habitat on reaches of **Rattlesnake Creek**.

- The following streams should be monitored, evaluated and considered for addition the state's list of impaired waters by the year 2002 as required by section 303(d) of the Federal Clean Water Act: **Boice Creek, Grant River, Kuenster Creek, Muskellunge Creek, and Rattlesnake Creek**.

- The DNR, with assistance from the Grant County LCD, should conduct baseline monitoring on **Boice Creek, Grant River, Kuenster Creek, Muskellunge Creek, and Rattlesnake Creek** by 2006.

- The DNR should monitor **Grant River** to track the status of state endangered and threatened species and species of concern.

Outdoor Recreation, Wildlife Habitat and Protecting Open Space and Farmland

- The DNR, in partnership with local governmental agencies and local conservation groups, should identify opportunities to provide public access on reaches of **Rattlesnake Creek**.