

**Wild Rice Watershed District  
Green Meadow Subwatershed  
Problem Statement  
DRAFT 2/21/2014**

**Problem Description:**

Water resource problems in the Green Meadow sub watershed include frequent and substantial flood damages to roads, culverts, agricultural fields, artificial and natural waterways, and existing flood damage reduction structures (Green Meadow Dam). Floodwaters from the Green Meadow subwatershed also contribute to larger scale flooding and flood damages downstream of the subwatershed outlet along the Marsh River and the Red River of the North.

Green Meadow subwatershed natural resources problems include altered hydrology causing unstable watercourse channels and degraded aquatic and riparian habitats, limited amounts of quality upland habitat, poor soil health resulting in compaction (greater runoff rates), loss of soil structure, nutrient degradation, and elevated soil salinity.

**Flood Damage problem category:**

- Road Flooding
- Public Infrastructure Damage
- Private Infrastructure Damage
- Channel and Bank Erosion
- Agricultural Land Flooding
- Natural Resources

**Description of the damage (maps attached):**

FLOOD DAMAGE PROBLEMS

Road Flooding - Road (bed erosion and overtopping) and culvert damages have occurred at approximately 41 locations in the middle and upper portions of the Green Meadow subwatershed. Road damages are mostly occurring in the upper reaches of the subwatershed and include approximately 7 miles of MN Highway 32 and 2 miles of county road damages near the CR 24/149 intersection.

Public Infrastructure - The Green Meadow Dam is at risk of failure during flood events. Green Meadow Dam was constructed in approximately 1973 by the Soil Conservation Service (SCS). The dam was constructed to have an approximately 13,000-ft of embankment (2.5 miles) with approximately 2,200 ac-ft of flood storage. The Green Meadow dam levees have a 3:1 upstream/2:1 downstream slope, 10-ft top width, and 2-ft deep keyway.

Wild Rice Watershed Project No. 30 (1988) included the Green Meadow Dam and the series of setback levees further downstream of the dam outlet. The Wild Rice Watershed is responsible for the operation and maintenance of the project which primarily involves mowing, spraying, and beaver control. Flood events have necessitated additional project maintenance involving installation of additional granular soils and geotextile fabrics on the downstream face of the dam along with clay blanketing on the upstream slope to correct potential piping problems. During the 2000 and 2002 floods, the dam

received extensive embankment damage and required sandbag placement to prevent overtopping in several areas.

In 2004, the WRWD commissioned a geotechnical evaluation of the Green Meadow dam by Midwest Testing Laboratory, Inc. The evaluation determined that much of the embankment consists primarily of sandy granular soils. A repair project was undertaken in 2006 to address the eroded and damaged areas. However, due to the limited capacity and granular material in the embankment, the dam remains at risk during flood events.

Private Infrastructure - Failure of the Green Meadow dam would result in substantial damages to downstream farmsteads, road infrastructure, and communities.

Channel and Bank Erosion - Floodwaters also cause extensive erosion and channel/bank failure associated with the setback levees in the middle reaches (downstream of the Green Meadow Dam) and along the lower (channelized) reaches.

Agricultural Land Flooding -

Frequent flooding occurs at various locations throughout the watershed as a result of excess runoff from rainfall or snow melt events. A map of the primary flood prone areas has been developed. The causes of this flooding depends on the location, however widespread flooding typically occurs more frequently during spring snow melt events when channels and culverts have not fully opened from winter snowfall. However, due the limited capacity of the channels and roadway crossings throughout the subwatershed, flooding also occurs during intensive summer rainfall events.

#### NATURAL RESOURCES PROBLEMS

Altered hydrology - Hydrologic conditions in the watershed are considered “flashy” with high peak flows followed by fast return to low flows. There are also extended periods of low flow in watercourses compared to conditions found historically. These conditions contribute to increased sediment loading in watercourses and decreases in channel stability.

Unstable Watercourses - Channels with degraded aquatic and riparian habitats. Many ditches and other altered watercourses have unstable grades and/or side slopes which increase sediment loading within the channel. In addition, along many ditches and streams there is only a narrow strip of perennial vegetation adjacent to the watercourse. This decreases channel stability, increases sediment loading, and reduces the amount of riparian habitat.

Limited amount of upland habitat - More than 90% of the lands within this watershed area are dedicated to agricultural production. Very little grassland or wetland habitat exists to support upland wildlife species.

Degraded soil health – Soils in many areas of the Green Meadow subwatershed are compacted with low organic matter content resulting in increased runoff and pollution/sedimentation on rivers and streams which stress existing aquatic biota.

**Is this described in a formal planning document?\***

Yes

Wild Rice Watershed  
Water Management Plan  
April, 2003

**What is the source of the Flood Damage problem?**

- Overland flow leaving river stream or drainage system
- Overland flow from snowmelt leaving river, stream or drainage system
- Cross country break-out flow from river, stream or drainage system
- Inadequate conveyance system
- Inadequate outlet
- Failure of flood control infrastructure
- Road system failure
- Private landowner activities

**Is your knowledge of this problem based on observations?:**

Yes

Observations from local landowners and from data and observations of Project Team members

**Are you able to list specific years of flood damage?**

Yes

**Describe how often this flood damage occurs**

Once every other year

**How long does the problem last**

4-9 days