Wetlands, Wildlife Habitat, and Flood Hazards in the Root River Watershed: Wetland and Watershed Management

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MN Southeast Technical Winona

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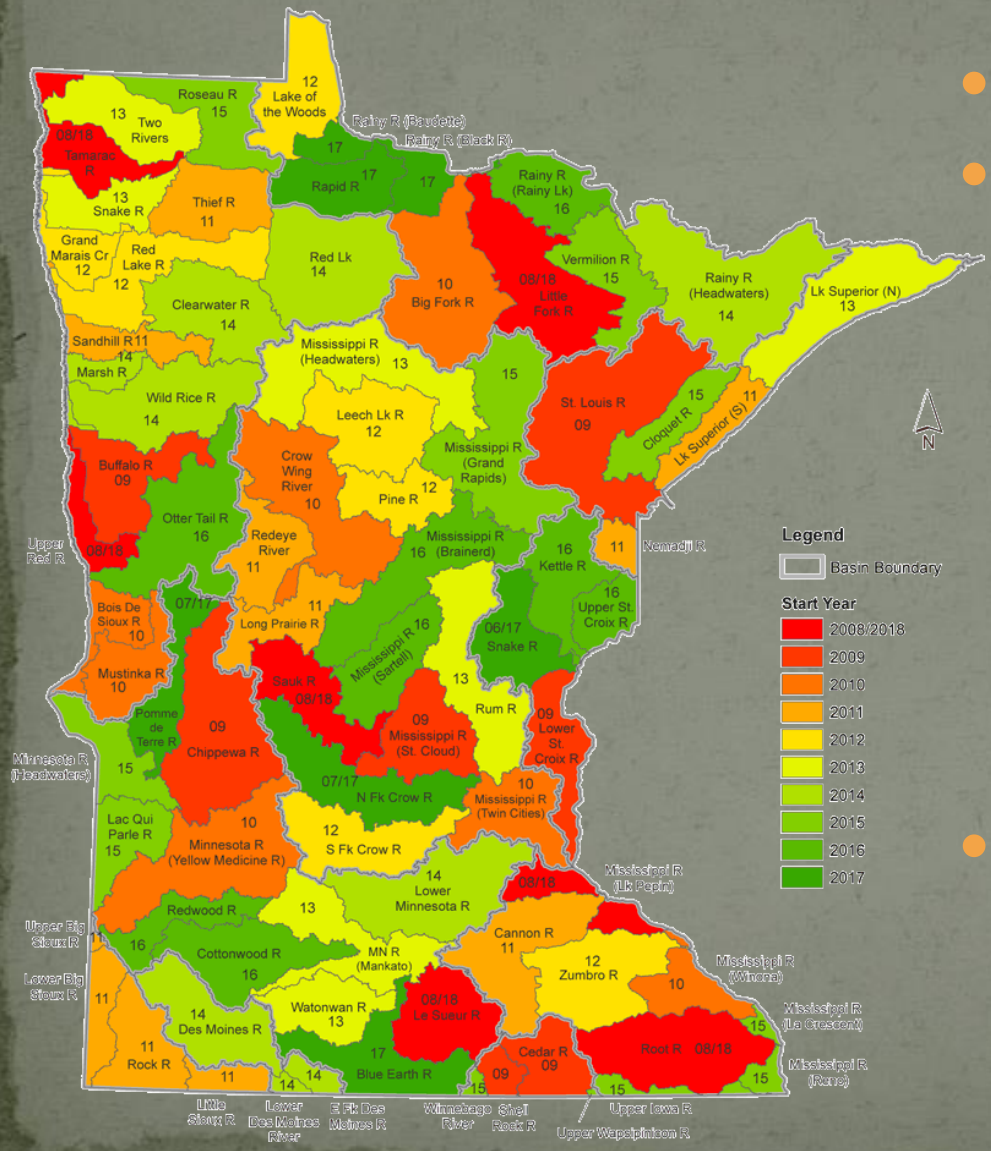
Fillmore Soil and Water Conservation District (SWCD)

Root River Watershed Restoration and Protection Strategy (WRAPS)



- 81 major watersheds in MN
- MPCA Watershed Approach (2008)
  - Assess 8 watersheds/year
  - Re-assess every 10 years
  - Root assessment began in 2008
    - Water chemistry
    - Biology
    - Physical characteristics
- Outcome:
  - Watershed Restoration and Protection Strategy (2014)

Jekyll and Hyde.....

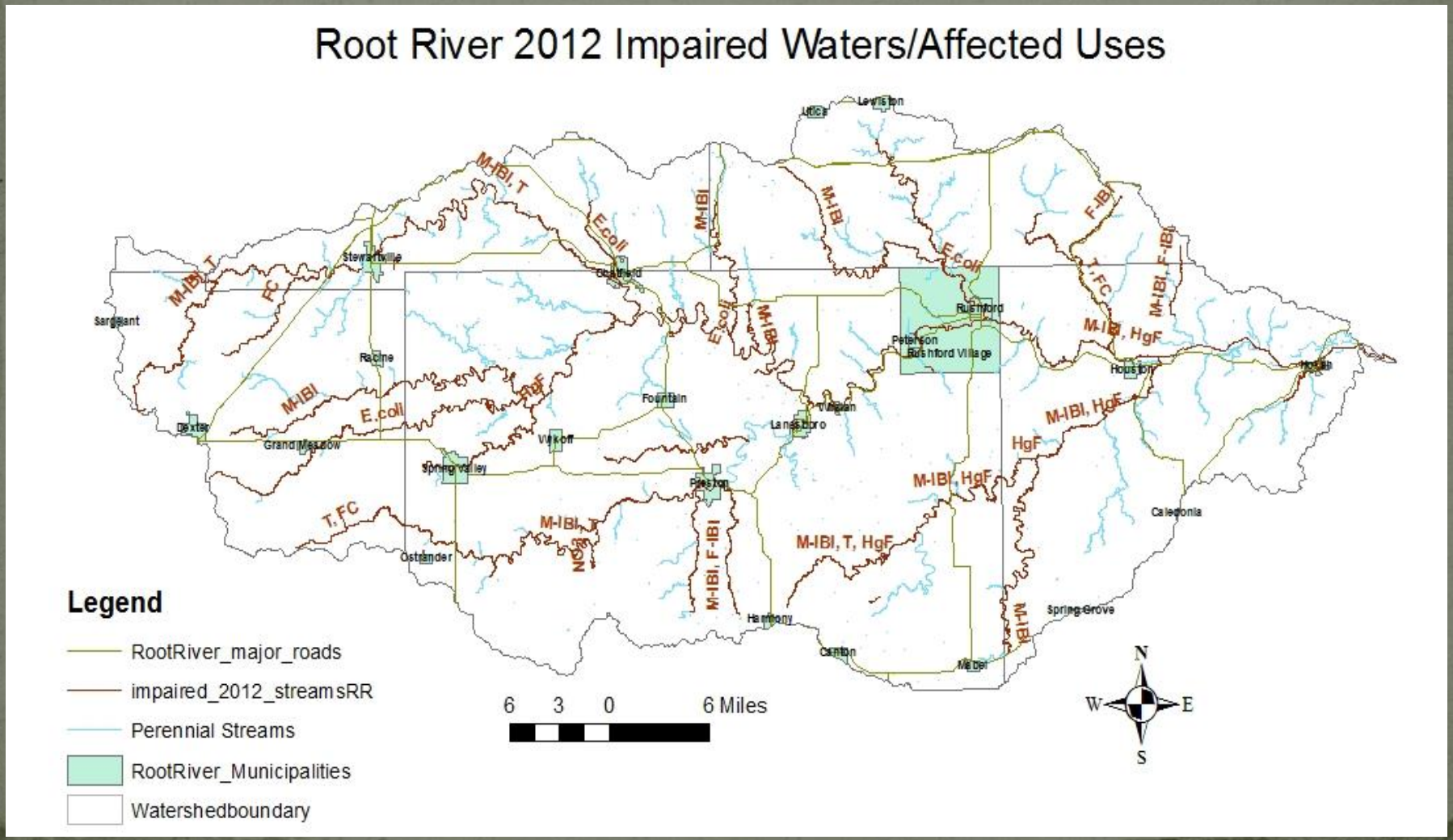
Root River Watershed Pollutants and Impaired Uses

- Bacteria: aquatic recreation
  - Swimming, wading, canoeing, any contact with water
- Nitrate: drinking water
  - Class 1B coldwater streams can be used as drinking water
  - 10 ppm drinking water standard applies
- Turbidity: aquatic life
  - Smothers habitat and reproduction areas, difficult to find food, low oxygen and increased temperature
- Fish and macroinvertebrates impaired

Low Dissolved Oxygen
Temperature
Physical Habitat
Nitrate
Turbidity

Root River Watershed Impaired Waters

42 impairments



Root River Watershed Restoration and Protection Strategy (WRAPS)

Water Body and Location		Parameter (incl. non-pollutant stressors)	Water Quality		Strategies (see key below)	Estimated Scale of Adoption Needed	Governmental Units with Primary Responsibility										Other partners				Priority (H, M, L)	Timeline to reach WQ goal	Interim 10-yr Milestones
Waterbody (ID)	**Location** and Upstream Influence Counties		Current Conditions	Goals / Targets			MDA	SWCD	MPCA	County	DNR	MDH	SE TECH JPB	SE WRB	Cities	Townships	NRCS	TNC	TU	LSP			
Willow Creek (558), T101 R11W S12, west line to S Br Root R	**Fillmore**	E. coli	10x water chemistry geometric mean 975 (16/16 exceedences)	Reductions needed at all flows (insert % reduction from TMDL computation	SEMN Bacteria Implementation Plan (2007)	Watershed wide		•	•	•	•			•	•		•				H	Lower geometric means (all flows) by 2018	Reassess at IWM 2018
					Septic system compliance	Greenleafton			•	•				•									
					Karst Sinkhole Treatment (527)	Sinkholes		•				•					•						
		Nitrate (WQ, Inverts)	Mean value: ~10 mg/L	8 mg/L	Increased Perennial Cover (645, 342, 643, CRP)	Watershed wide, with focus on marginal lands		•			•	•									H	Reduction in baseflow N concentration	Use MGS info to inform N reduction response time
					Nutrient (N) Management	Watershed wide, with focus on row crop acres	•	•	•			•					•			•			
					Cover crops (340)	Corn silage, soybean acres		•				•					•	•		•			
		Physical Habitat (Inverts)	Habitat loss due to bedded sediment	Decrease bedded sediment in channel, MSHA embeddedness	Water storage practices (410, 638)	Upper catchments, field/bluff interface, target using LiDAR		•		•			•				•				H		Reassess at IWM 2018
					Streambank Protection and Stream Habitat Improvement (580, 395)	Localized Stream Reaches		•			•		•				•		•				
					Pasture Management/Prescribed Grazing (528)	Localized Stream Reaches		•					•							•			

Strategies/Land Use Practices

- Turbidity (sediment)
  - Upland erosion control
    - Contour farming, cover crops, no/strip/reduced tillage,
    - Structures to hold water and settle/filter sediment: terraces, water and sediment control basins, grade stabilization structures, grassed waterways, urban storm water ponds
  - Streambank protection
    - Riparian buffers (Shoreland 50' Ag Buffer)
    - Limit cattle access
  - Increase perennial vegetation
    - Hay, pasture, buffers, filter strips, rain gardens, managed forest and grassland

Strategies

- Nitrate
  - Cover crops
  - Denitrification
    - Wetland restoration/anaerobic treatment, bioreactors
  - Nutrient management
    - (right fertilizer, right rate, right time, right place)
- Bacteria
  - Pasture management
  - Manure management (feedlots and fields)
  - Fix malfunctioning septic systems

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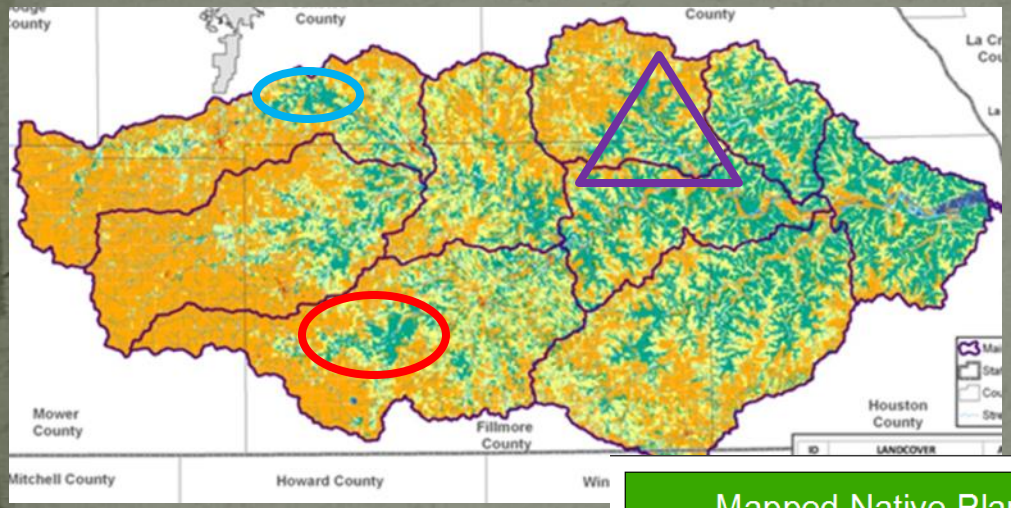
- Improve soil health for better water infiltration and more nutrient efficiency
  - No till, cover crops, managed grazing, manure management, perennial vegetation

Root River Watershed Restoration **and Protection** Strategy (WRAPS)

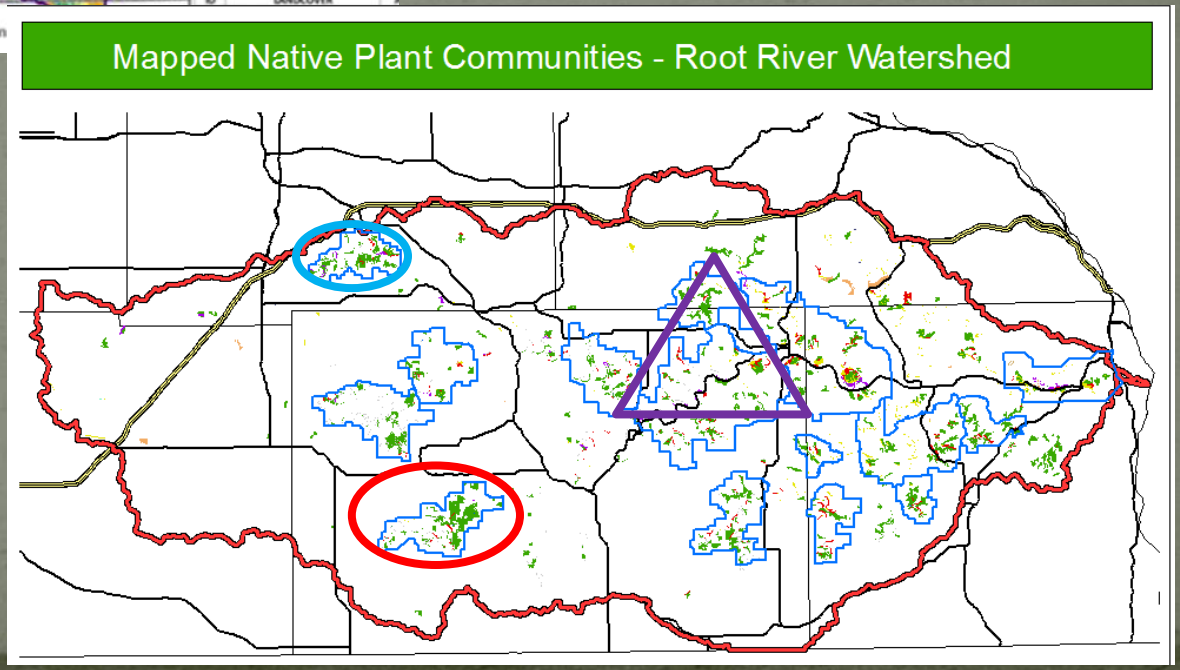
How to protect those areas where the land and water are in good condition?

Why is this important? Conversion of natural land cover to agricultural land uses = three to fivefold increase in the magnitudes of 1-5 year floods. (Platte watershed in Wisconsin, Knox 1977)

Root River forest/grass cover and biodiversity



← Root River Land Cover



Root River Landscape Plan Conservation Opportunity Areas—high quality biodiversity and native plant communities →

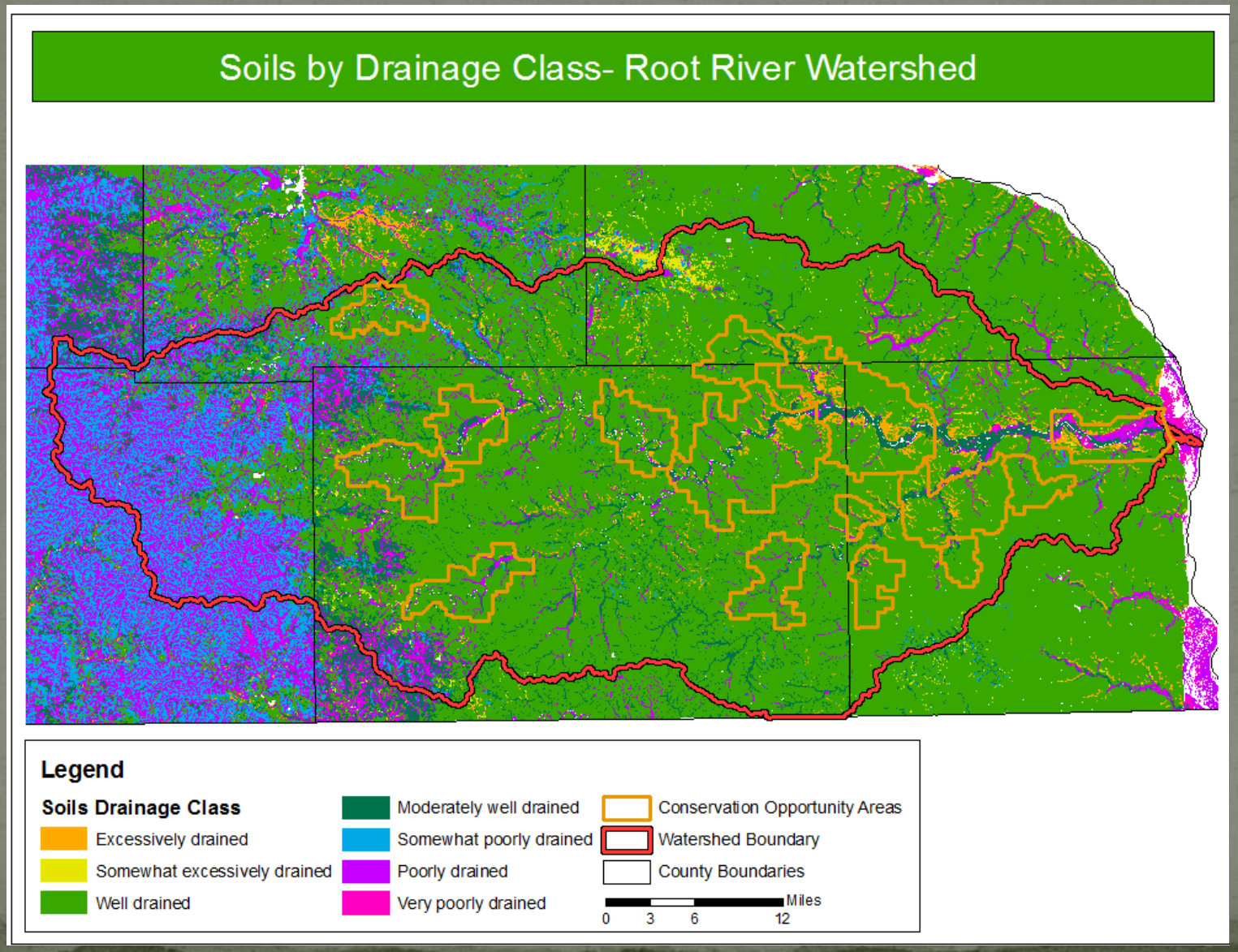
Root River Watershed Restoration **and** **Protection** Strategy (WRAPS)

Forestville Creek (563), Unnamed cr to S Br Root R	**Fillmore**	Fecal Coliform			SEMN Bacteria Implementation Plan (2007) See Key to Strategies Table[3]	Watershed wide		*	*	*			*		*		*			M		
					Karst Sinkhole Treatment (527)	Sinkholes		*									*						
		Nitrates (WQ)			Cover crops (340)	Watershed wide, corn silage and soybean acres		*					*				*	*		*			
					Nutrient Management (590)	Watershed wide	*	*					*				*						
					Wetland restoration (657)	Hydric soils on marginal cropland		*			*		*				*	*			H		
					Increased Perennial Cover (645, 342, 643, CRP)	Watershed wide, with focus on marginal lands and Shoreland		*			*						*	*					
		Turbidity	-TSS Exceedances: 1/11 -T-tube Exceedances: 2/19	-TSS: 60 mg/l -T-tube: 20 cm	Water storage practices (410, 638)	Upper catchments, field/bluff interface, target using LiDAR		•					•				•						
					Cover crops (340)	Target corn silage and soybean acres		•					•				•	•		•			
					Terraces (600)	Row crop >6%, long slopes		•									•						
					Karst sinkhole treatment (527)	Sinkholes (including entire springshed)		•									•				M		
		Protection			Root River Landscape Stewardship Plan (2013) See Key to Strategies Table [4]	Watershed wide		•			•						•	•					

Forestville Creek: Reference Landscape Plan priority for practices on private lands in proximity to public lands. (95% of forest land in SE MN is in private ownership.)

Wetland restoration opportunities

- Mower County; lower Root easements and acquisitions; floodplains



Local and Regional Projects:

ID water resource concerns, implement /evaluate BMPs

- NRCS/TNC/BWSR $ for USDA HEL conservation plan updates to identify conservation needs (2011-2016)
- DNR Root River Healthy Forests, Healthy Waters
- DNR Lower Mississippi River Habitat Partnership (FY14 LSOHC)
- MDA Root River Field to Stream Partnership
- Root River Sediment Budget (WSU, Utah State)
- MDA Controlled Drainage and Constructed Wetland/ Bioreactor Study, South Branch Root River, Mower SWCD
- Mower SWCD CP39 for Nitrate Reduction Study/Wetland Restoration

Local and Regional Projects:

ID water resource concerns, implement /evaluate BMPs

- WSU Riceford Creek Revetment Project/Stream Monitoring, Houston County/Root River SWCD
- Area Soil Health Technician
- SE SWCD Technical JPB
- Nutrient Management Specialist
- MPCA SE MN Nitrogen WRAP
- MPCA Root River Watershed Pollutant Load Monitoring Network
- Root River One Watershed, One Plan proposal

Thank you! Questions?