TMDLs for Sediment Impaired Streams in the Waumandee Creek Watershed:

Buell Valley Creek
Cochrane Ditch (Rose Valley)
Irish Valley Creek
Jahns Valley Creek
Weiland Valley Creek

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Introduction

These Total Maximum Daily Loads (TMDLs) for sediment address sedimentation and degraded habitat impairment conditions in: Buell Valley Creek, Cochrane Ditch, Irish Valley Creek, Jahns Valley Creek and Weiland Valley Creek. These five streams are located in the Waumandee Creek Watershed, in the Buffalo-Trempealeau Basin. These TMDLs identify load allocations and management actions that will restore the biological integrity of these streams. Buell Valley Creek, Cochrane Ditch, Irish Valley Creek, and Jahns Valley Creek were placed on the 303(d) impaired waters list in 1998 and were identified as low priority on the 2004 303(d) impaired waters list. Weiland Valley Creek was placed on the 2004 303(d) list as low priority. All of the streams currently support a warm water forage fishery (WWFF) with potential to support a cold water fishery (Table 1).

Table 1. Impaired Waters of the Waumandee Creek Watershed

Stream	WBIC	TMDL ID	Impaired Stream Miles	Existing Use	Potential Use	Codified Use
Buell Valley Creek	1813100	60	2	WWFF	Cold III	default (WWFF)
Cochrane Ditch (Rose Valley)	1813600	88	9	WWFF	Cold III	default (WWFF)
Irish Valley Creek	1811400	196	8	WWFF	Cold III	default (WWFF)
Jahns Valley Creek	1810800	204	8	WWFF	Cold III	default (WWFF)
Weiland Valley Creek	1813000	701	2	WWFF	Cold III	default (WWFF)

The Waumandee Creek Watershed is located in Buffalo County, Wisconsin. The Waumandee Creek Watershed drains 204 square miles and is characterized by steep topography, narrow valleys and numerous streams. Surface water drains to the Mississippi River by direct runoff or via Waumandee Creek and its tributaries.

Each of the impaired stream's immediate watersheds has been delineated to determine the land use and total acreage draining to the stream (see Appendix A for maps and land use percentages). Forested land dominates land use. Due to the steep topography of the regions, agriculture occurs in the valleys by the streams. Cropland erosion, trampled streambanks, and loss of streambank vegetation are the primary nonpoint sources of sediment pollution to these impaired waters.

In most cases, the gravel substrate is extensively covered by sand, silt, and soft organic matter preventing a suitable habitat for fish and macroinvertebrate communities. Filling-in of pools reduces the amount of available cover for juvenile and adult fish. Sedimentation of riffle areas reduces the reproductive success of fish by reducing the exposed gravel substrate necessary for appropriate spawning conditions. Sedimentation also affects macroinvertebrate biomass (fish food source) which tends to be lower in areas with predominantly sand substrate than a stream substrate with a mix of gravel, rubble, and sand. Sedimentation also causes elevated turbidity which reduces the penetration of light necessary for photosynthesis in aquatic plants, reduces the feeding efficiency of visual predators and filter feeders, and lowers the respiratory capacity of aquatic invertebrates by clogging their gill surfaces. In addition, other contaminants such as nutrients (phosphorus) attached to sediment particles can be transported to streams during runoff events.

Coverage of the substrates with sediment constitutes "an objectionable deposit" under the water quality standards criterion noted in S.NR 102.04(1) (a) cited below. The creeks are limited by excessive sediment loading and habitat unsuitable to support a coldwater fishery.

Critical Condition

There is no critical condition in the sedimentation of these impaired streams. Sediment is a "conservative" pollutant and does not degrade over time or during different critical periods of the year. EPA acknowledges in its 1999 Protocol for Developing Sediment TMDLs: "The critical flow approach might be less useful for the sediment TMDLs because sediment impacts can occur long after the time of discharge and sediment delivery and transport can occur under many flow conditions." The excessive sedimentation is a year-round situation. This is not to say that there is no variation on the sediment carried in run-off to a stream (see Seasonal Variation section below).

Description of Impaired Waters

Buell Valley Creek

Buell Valley Creek is a headwater stream located in the northern portion of the Waumandee Creek Watershed. Buell Valley Creek is a two-mile tributary of Weiland Valley Creek (also included in these TMDLs). Currently, Buell Valley Creek is listed on the 303(d) impaired waters list as supporting a warm water fish forage community, but monitoring of the stream since the 1998 listing has shown signs of habitat improvement, and may be obtaining its potential use as a Class III trout fishery. Compared to zero trout found in the creek in 1989, a fish survey conducted in 2001 found 27 Brook Trout resulting in a Cold Water Index of Biotic Integrity

(CWIBI) of 90. This improvement may be due to reduced farming activity in the headwaters due to the Conservation Reserve Program (CRP).

Cochrane Ditch (Rose Valley)

Cochrane Ditch is a nine-mile stream, located within the Rose Valley Subwatershed in the western portion of the Waumandee Creek Watershed, adjacent to the Mississippi River. Rose Valley Creek becomes the Cochrane Ditch. This ditch is an extensively channelized conduit that receives flow from Belvidere Valley Creek. Sedimentation is the impairment of this stream. Currently, Cochrane Ditch supports a warm water forage fishery, but the potential use is a Class III trout fishery.

Irish Valley Creek (sediment)

Irish Valley Creek is an eight-mile creek that flows west and converges with Waters Valley Creek before flowing into Waumandee Creek. Irish Valley Creek transports the majority of the sediment in the subwatershed. The headwaters area of this stream is wooded with protected streambanks. Based on information from the Waumandee Creek Priority Watershed Project, cattle in the majority of the downstream area are permitted access to the creek, causing trampled banks, slumping and increased erosion of the banks. Sedimentation is the reason the creek was placed on the 1998 303(d) list. Irish Valley Creek currently supports a warm water forage fish community with potential to support a Class III trout fishery. The stream substrate is primarily silt and sand. Water quality surveys based on macroinvertebrates were completed in 1999 and 2001. According to the Hilsenhoff Biotic Index (HBI), the diversity of macroinvertebrates resulted in a score of 2.798 and 3.286, respectively, reflecting “excellent” water quality. This is a significant improvement from the macroinvertebrate study on Irish Valley Creek in 1990, which resulted in an 8, which signifies “poor” water quality. A fish survey was conducted on Irish Valley Creek in 2001. Table 2 shows the results of the survey (Site No. 5 is upstream, Site No.1 furthest downstream).

Table 2. Fish Survey for Irish Valley Creek

	Irish Valley Creek Fish Surveys		Brook Trout		Brown Trout		**2001 Coldwater IBI**	
Site	Location	Flow (cfs)	1989	**2001**	1989	**2001**	Score	Rating
1	CTH E (Bork property)	4.37	0	6*	0	0	30	Fair
2	CTH E (upstream of bridge)	3.28	0	0	2	0	0	Very Poor
4	Private Drive (Waters property)	2.83	0	n/a	0	n/a	n/a	-
5	Private Drive (Symitcek property)	n/a	0	52	0	2*	60	Good
* most likely stocked								

As shown above, Site No. 5 has seen considerable improvement in the Brook Trout population since 1989. Where streams have improved, little or no cattle have access to the stream. The banks are fairly stable and well vegetated. The downstream areas that have seen very little improvement are still impacted by sedimentation due to agricultural activities.

Jahns Valley Creek (sediment)

Jahns Valley Creek is an eight-mile creek that flows the length of the Jahns Valley Subwatershed; one of the smaller subwatersheds in the Waumandee Creek Watershed. Downstream sections of the creek have been widened and channelized. Pasture borders the majority of the stream with livestock permitted access to the creek, resulting in trampled stream banks in the downstream portion of Jahns Valley Creek. Grazed woodlot and pasture contribute the majority of sediment to the creek. Sand and silt creek bottom, poor shading, and elevated water temperatures yield a poor fish habitat[1]. Jahns Valley Creek supports a warm water forage fishery, with potential to support a Class III trout fishery. A fish survey conducted in 2001 found 7 brown trout out of 25 fish total. Speculation is that the brown trout found in the creek were stocked.

Weiland Valley Creek (sediment)

Weiland Valley Creek is a two-mile stream that flows into Waumandee Creek. Weiland Valley Creek receives flow from Buell Valley Creek. The current use of Weiland Valley Creek is a warm water forage fishery, with potential to support a Class II trout fishery. According to the Waumandee Priority Watershed Plan, high gradient, cool water, and fairly good sand and rubble substrate provide an ideal coldwater fish habitat. Fish surveys conducted in 2002, above Hayes Valley Road (see map, Appendix A), found 87 brook trout (of several age classes), suggesting the stream currently supports a Cold II fishery. Below Hayes Valley Rd. the stream is impacted by cattle pasturing, bank erosion and feedlot runoff. The fish survey in 2002 conducted at one mile below Hayes Valley Road showed zero fish. This fish survey data suggest the entire stream has potential to support a Cold II fishery if nonpoint sources are controlled.

Water Quality Standards

The impaired streams listed in these TMDLs are not currently meeting applicable narrative *water quality criterion* as defined in NR 102.04 (1); Wis. Admin. Code:

> "To preserve and enhance the quality of waters, standards are established to govern water management decisions. Practices attributable to municipal, industrial, commercial, domestic, agricultural, land development or other activities shall be controlled so that all waters including mixing zone and effluent channels meet the following conditions at all times and under all flow conditions: (a) *Substances that will cause objectionable deposits on the shore or in the bed of a water, shall not be present in such amounts as to interfere with public rights in waters of the state*."

Excessive sedimentation is considered an objectionable deposit.
As stated above, the impaired waters in these TMDLs are not meeting their potential uses. The designated uses applicable to these impaired creeks are as follows:

[1] The water temperature is elevated, but not sufficiently elevated to exceed the water quality criterion. Similarly, dissolved oxygen levels are low for a stream of that type, but not to the point of exceeding the water quality criterion.

S. NR 102.04(3) intro, (a) and (c), Wis. Adm. Code:
"FISH AND OTHER AQUATIC LIFE USES. The department shall classify all surface waters into one of the fish and other aquatic life subcategories described in this subsection. Only those use subcategories identified in pars. (a) to (c) shall be considered suitable for the protection and propagation of a balanced fish and other aquatic life community as provided in federal water pollution control act amendments of 1972, P.L. 92-500; 33 USC 1251 et.seq.

"(a) *Cold water communities*. This subcategory includes surface waters capable of supporting a community of cold water fish and aquatic life, or serving as a spawning area for cold water fish species. This subcategory includes, but is not restricted to, surface waters identified as trout water by the department of natural resources (Wisconsin Trout Streams, publication 6-6300 (80)."

(c) *Warm water forage fish communities.* This subcategory includes surface waters capable of supporting an abundant diverse community of forage fish and other aquatic life.

Existing Sediment Loads

Existing sediment loads were based on data in the 1990 Nonpoint Source Control Plan for Waumandee Creek Priority Watershed. In the Waumandee Priority Watershed Plan, detailed analysis using the WINHUSLE model determined the sediment loads for subwatersheds. The WINHUSLE model calculates average annual soil erosion based on actual field conditions, exiting best management practices and crop rotations, from the Universal Soil Loss Equation with runoff based on NRCS TR-55 routed from the field to the stream. Since the subwatersheds in the Waumandee Creek Priority Watershed Plan included not only the impaired waters, acreage and land use was delineated for subwatersheds for each of the impaired streams in the Waumandee Watershed using WISCLAND ((1991), See Appendix A). WISCLAND is the Wisconsin Initiative for Statewide Cooperation on Landscape Analysis and Data, a partnership of public and private organizations seeking to facilitate landscape GIS data development and analysis. The ratio of sediment in tons/acre for the subwatersheds outlined in the Waumandee Creek Priority Watershed plan was multiplied by the acres delineated in WISCLAND to estimate sediment loads for each impaired stream's watershed (Appendix B). The terminology for land use differs between WISCLAND and the Watershed Creek Priority Watershed, so the following assumptions were used:

WISCLAND Data	From Waumandee Creek Priority Watershed
Agriculture	(includes cropland and farmstead)
Grassland	(includes grassland and pasture)
Forest	(includes woodlot to grazed woodlot)

During the inventory phase of the Waumandee Creek Priority Watershed streambank erosion was estimated to contribute sediment (tons/year) to the impaired streams (Table 3).

Table 3. Sediment Contributed to Streams due to Streambank Erosion

Subwatershed	Streambank Erosion (tons/year)
Buell Valley Creek	200
Cochrane Ditch	109
Irish Valley Creek	1152
Jahn's Valley Creek	401
Weiland Valley Creek	600

The National Resource Conservation Service (NRCS) volumetric method (mass based on height, width, depth, and density) was applied to field data collected on individual eroding stream banks to estimate the amount of sediment reaching the streams (tons/year). The sediment contributed via streambank erosion was added to the estimated sediment loads for each impaired stream to calculate the existing sediment load (Table 4 and Appendix B).

Table 4. Existing Sediment Loads for Waumandee Impaired Streams

Impaired Stream	Existing Sediment Loads (tons/acre)
Buell Valley Creek	357
Cochrane Ditch (Rose Valley)	797
Irish Valley Creek	1857
Jahns Valley Creek	841
Weiland Valley Creek	1004

Total Load Capacity, Wasteload Allocation and Load Allocation

The objective of this TMDL is to produce habitat conditions in all the streams that meet narrative water quality standards and support a Class III coldwater trout fishery, as described in NR 1.02(7)(b), Wis. Adm. Code, as follows:

"A class III trout stream is a stream or portion thereof that:

a. Requires the annual stocking of trout to provide a significant harvest, and

b. Does not provide habitat suitable for the survival of throughout the year, or for natural reproduction of trout."

The total annual loading capacity for sediment is the sum of the wasteload allocation, the load allocation and the margin of safety, as generally expressed in the following equation:

TMDL Load Capacity = WLA + LA + MOS

WLA = Wasteload Allocation = 0 tons/year (no point sources)

LA = Load Allocation

MOS = Margin of Safety (0 or implicit for these TMDLs)

Total Load Capacity

Based on review of the data for these impaired waters, in the best professional judgment of the WDNR Water Quality Staff, the total load capacity is shown in Tables 5 and 6.

Table 5. Total Load Capacity for the Waumandee Impaired Streams

Impaired Stream	Total Load Capacity (tons/acre)
Buell Valley Creek	146
Cochrane Ditch (Rose Valley)	385
Irish Valley Creek	800
Jahns Valley Creek	341
Weiland Valley Creek	412

The total load capacities are consistent with or less than the corresponding total load capacity assigned for Eagle Creek; a reference stream also located in the Waumandee Creek Watershed, where streambank improvements have been successful in the upstream reach.

Table 6. Sediment Reduction to Attain
Total Load Capacity for Waumandee Creek Impaired Streams.

Buell Valley Creek	Sediment Delivery Annual Load (tons/year)	Percent Reduction	**Reduced Sediment Load (tons)**
Forest	91	75%	23
Agriculture	46	50%	23
Grassland	20	-	20
Urban/Developed	-	-	-
Streambank Erosion (tons/year)	200	60%	80
Total Sediment Load (tons/year)	357		
Reduced Load Allocation			**146**
Cochrane Ditch (Rose Valley)	Sediment Delivery Annual Load (tons/year)	Percent Reduction	**Reduced Sediment Load (tons)**
Forest	228	75%	57
Agriculture	353	50%	176
Grassland	100	-	100
Urban/Developed	8	-	8
Streambank Erosion (tons/year)	109	60%	44
Total Sediment Load (tons/year)	797		
Reduced Load Allocation			**385**
Irish Valley Creek	Sediment Delivery Annual Load (tons/year)	Percent Reduction	**Reduced Sediment Load (tons)**
Forest	256	75%	64
Agriculture	347	50%	174
Grassland	102	-	102
Urban/Developed	-	-	-
Streambank Erosion (tons/year)	1152	60%	461
Total Sediment Load (tons/year)	1857		
Reduced Load Allocation			**800**
Jahns Valley Creek	Sediment Delivery Annual Load (tons/year)	Percent Reduction	**Reduced Sediment Load (tons)**
Forest	255	75%	64
Agriculture	137	50%	68
Grassland	48	-	48
Urban/Developed	-	-	-
Streambank Erosion (tons/year)	401	60%	160
Total Sediment Load (tons/year)	841		
Reduced Load Allocation			**341**
Weiland Valley Creek	Sediment Delivery Annual Load (tons/year)	Percent Reduction	**Reduced Sediment Load (tons)**
Forest	238	75%	60
Agriculture	106	50%	53
Grassland	59	-	59
Urban/Developed	-	-	-
Streambank Erosion (tons/year)	600	60%	240
Total Sediment Load (tons/year)	1004		
Reduced Load Allocation			**412**

Wasteload Allocation
Since there are no point sources in the watershed the wasteload allocation is zero. If a point source discharge were proposed, one of the following would need to occur:

- An effluent limit of zero sediment load would be included in the WPDES permit
- An offset would need to be created through some means, such as pollutant trading.
- A re-allocation of sediment load would need to be developed and approved by EPA.

Load Allocation
The load allocation corresponds to the total load capacity since the waste allocation is zero and the margin of safety is implicit. The Waumandee Creek Priority Watershed Plan was used in defining reductions in loads for cropland (agriculture) and streambank erosion. The following reductions were used to calculate reduced load capacities for streams: agriculture (50%) and streambanks (60%). The reductions were based on WDNR professional judgment for implementation purposes and on improvements seen in Eagle Creek, a reference stream also located in the Waumandee Creek Watershed (Please refer to the Eagle Creek and Joos Valley Creek TMDL for additional information). Grazed woodlots contribute the highest amount of sediment to the impaired streams. For this reason, the streams would benefit if grazing in woodlots were prevented to reduce sediment loads by 75%. All values are expressed in average annual tons of sediment reaching the stream.

Margin of Safety

The margin of safety (MOS) accounts for the uncertainty about the relationship between the sediment loads and the response in the waterbody. An implicit MOS is used for these TMDLs. Additional load reduction should be achieved through implementation of additional best management practices (BMPs) in the watershed that could not be modeled. Specifically, the establishment of vegetative buffers along streams through activities such as the Conservation Reserve Enhancement Program (CREP) would also further reduce the sediment load. Vegetative buffers along streams were not included in estimating the load allocations. In October 2001, the CREP was approved for portions of Wisconsin, including Buffalo County and the Waumandee Creek Watershed. Implementation of vegetative buffers could result in up to a 10 to 15% greater control of sediment from croplands. This value is based on the buffers controlling at least 75% of the sediment carried in overland flow across the buffers and would not be an explicit MOS since a significant portion of the sediment load is from other sources.

Seasonal Variation

There is no seasonal variation in the sedimentation of these streams. Sediment is a "conservative" pollutant and does not degrade over time or during different critical periods of the year. The extensive sedimentation occurs year-round. Under some stream flow regimes, sediment is deposited, and at other times, sediment is scoured and transported downstream. Much of the sediment in these streams remains within the confines of the streams until major floods scour some of the accumulated sediment. However, over time the net result has been an accumulation of sediments in and along the streams under the current amounts of sediment reaching the streams.

Undoubtedly, the amount of sediment reaching these impaired streams through major rainfall and snowmelt runoff events varies throughout the year[2]. However, most of the sediment enters during spring runoff and intense summer rainstorms. Considerable sediment also enters the streams from eroding stream banks during runoff events. The best management practices to achieve the load allocation are selected and designed to function for 10-year or 25-year, 24-hour design storms, providing substantial control for the major rainfall events.

Reasonable Assurance

There are no point sources in the watershed. The following information is provided to demonstrate the implementation of the TMDLs:

The impaired streams that are tributaries of the Waumandee Creek are part of a larger watershed project, the Waumandee Creek Priority Watershed Project. As part of a financing plan for priority watershed projects, long-term state cost sharing and local staff funding was committed to the Waumandee Creek Priority Watershed Project.

No new or additional enforcement authorities are provided under these TMDLs. However, future enforcement of nonpoint source performance standards and prohibitions will likely take place in the watersheds of these impaired waters. It is also anticipated that regulatory agricultural and non-agricultural performance standards and performance standards called for in Wisconsin Statutes will be implemented in the watershed for these impaired waters. Administrative rules passed by the Natural Resources Board identify that watersheds with impaired waters will have the highest priority for enforcement. In addition to the implementation of enforceable nonpoint source performance standards, there are a number of voluntary programs that will assist in implementing these TMDLs.

Farmers may enroll in the Conservation Reserve Enhancement Program (CREP) or similar programs to establish vegetated buffers on cropland and marginal pastures. As of March 1, 2005, farmers enrolled in CREP in Buffalo County maintain 299.7 acres of grass filter strips and

[2] The reader should clearly differentiate between sedimentation-the deposition of sediment-and the sediment as a pollutant reaching the stream. The first is a year-round situation where the depth of the sediment deposition may vary in response to flood flows in the stream. The second is the pollutant itself, which reaches the stream during storm events.

1275.8 acres of forest riparian buffers. Riparian buffers assist in making CREP a viable program for these impaired streams. Another program available to farmers is the Conservation Reserve Program, which takes highly erodible lands out of agricultural use.

The Environmental Quality Incentives Program (EQIP) is another option available to farmers. EQIP is a federal cost-share program administered by the NRCS that provides farmers with technical and financial assistance. Farmers may receive up to 75% reimbursement for installing and implementing run-off management practices. Projects include terraces, waterways, diversions, and contour strips to manage agricultural waste, promote stream buffers, and control erosion on agricultural lands.

Buffalo County in the Waumandee Creek Watershed may also apply to the Targeted Runoff Management (TRM) grant program through the WDNR. The TRM program is a competitive grant program that provides financial assistance to control polluted runoff from both rural and urban sites. The grant period is two years, and the maximum cost-share rate is 70% of eligible costs. Two TRM grants were awarded for the Waumandee Creek Watershed Conservation Project in 2004 for awards of $49,000.00 and $36,000.00. The following practices have been installed since 2001 by TRM funds:

- 1400 linear ft. of streambank shaping and seeding
- 550 linear ft. of riprap
- 80 linear ft. of riprap, including the installation of lunkers for fish habitat
- 1 wetland restoration site
- 9 acres of grassed waterways on 4 separate sites
- 2 grade stabilization structures for erosion control

Public Participation

This TMDL was subject for public review from July 5, 2005 through August 5, 2005. On Tuesday, June 28, 2005 a news release was sent to over 800 entities including: newspapers, television stations, radio stations, interest groups, and interested individuals. The news release indicated the public comment period and how to obtain copies of the public notice and the draft TMDL. The news release, public notice, and draft TMDL were also placed on the WDNR’s website. In addition, copies of the TMDL were sent to the West Central Regional Office of the WDNR, Julie Fernholz (Buffalo County Conservationist) and Todd Mau (NRCS).

Monitoring

Monitoring will continue once every three years, until baseline sampling methods identified in the WDNR Monitoring Strategy deem that the streams have responded to the point where they are meeting their codified uses or until funding for these studies is discontinued.

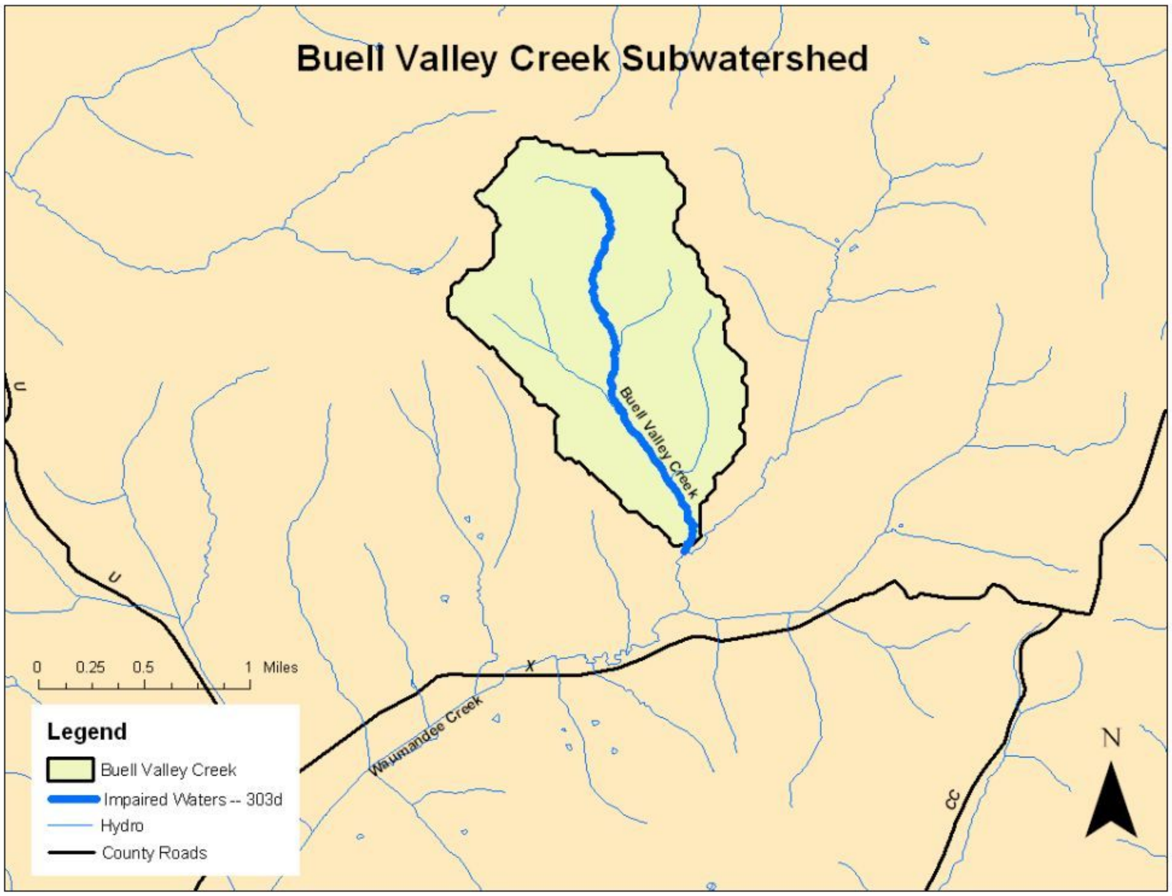
References

Wis. Dept. of Natural Resources. 1990. A nonpoint source control plan for the Waumandee Creek Priority Watershed Project. Pub. No. WR-247-90.

Schreiber, Ken. 1990. Waumandee Creek Priority Watershed Water Resources Evaluation Monitoring Plan. WNDR. Unpublished report. Western District. Wis. 16pp.

APPENDIX A

Figure A1. Map of Buell Valley Creek Subwatershed



APPENDIX A

Figure A2. Map of Cochrane Ditch (Rose Valley) Subwatershed

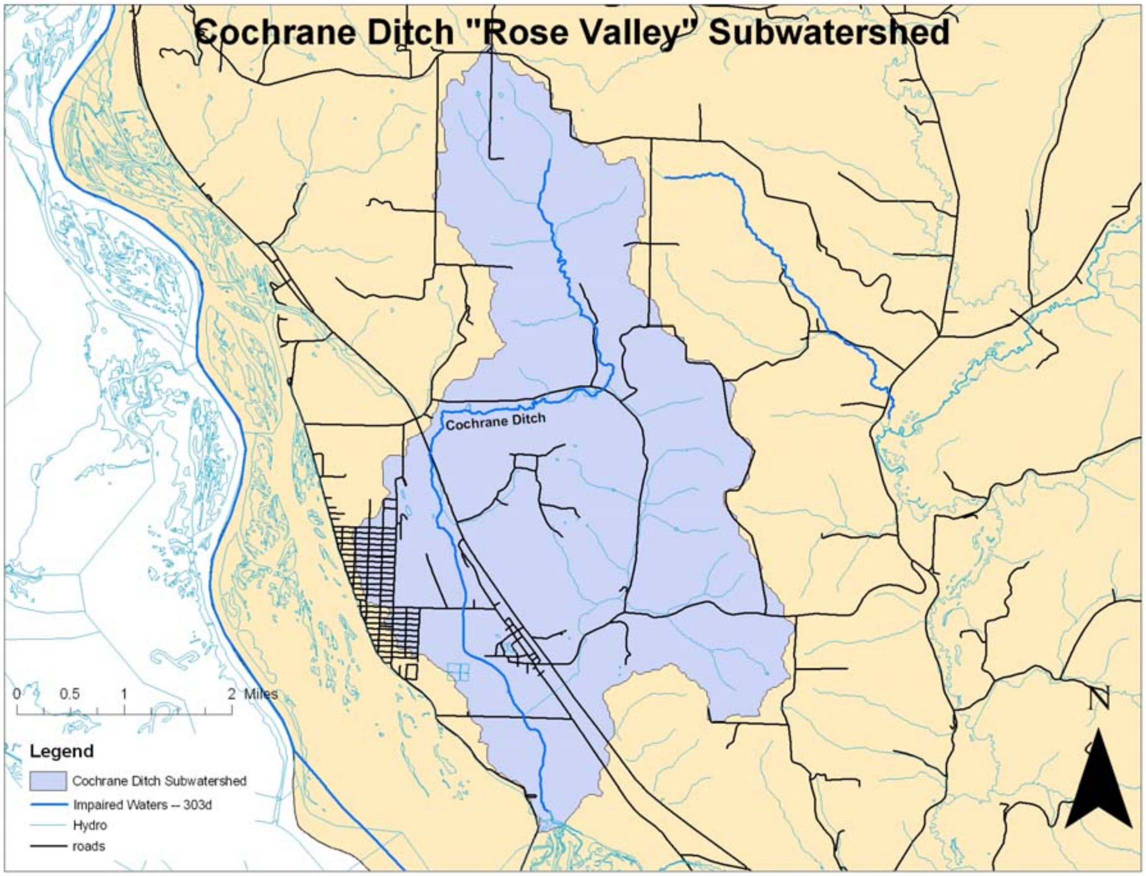


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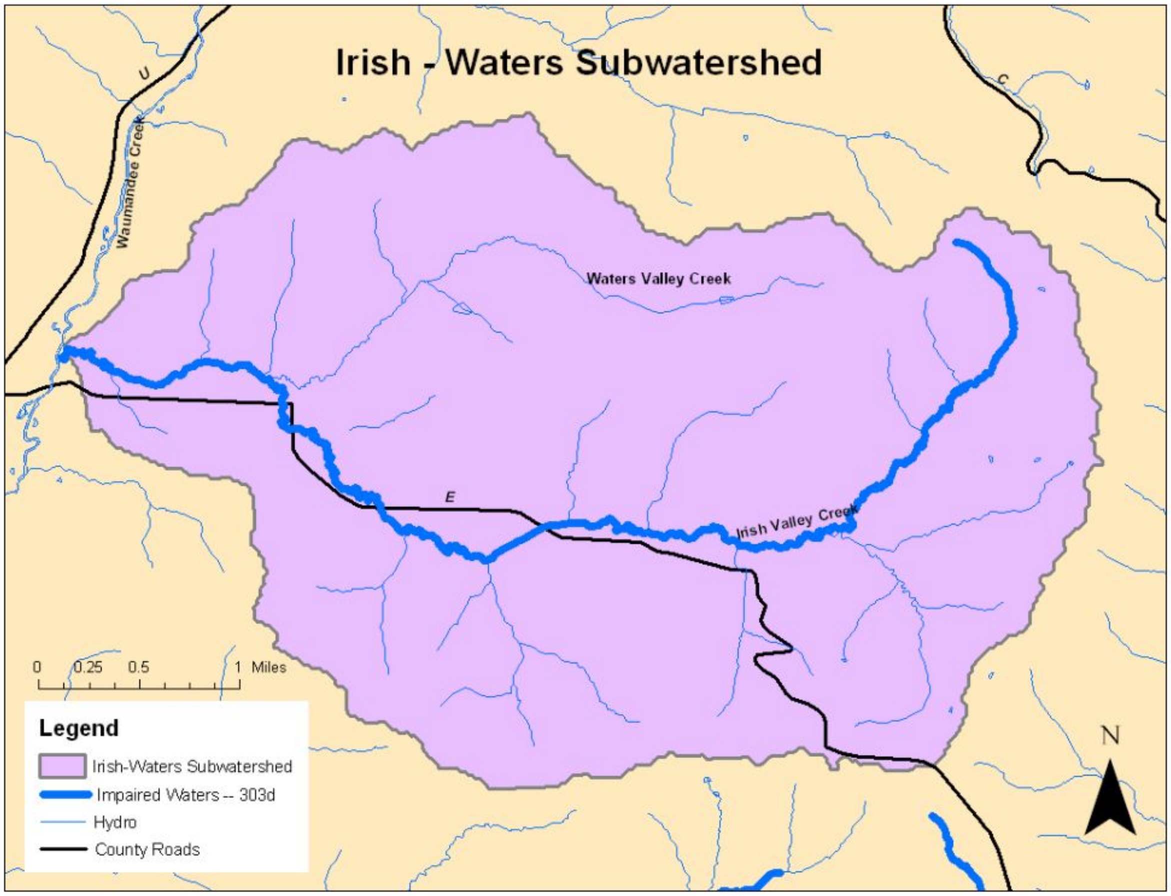
Figure A3. Map of Irish Valley Creek Subwatershed



APPENDIX A

Figure A4. Map of Jahn's Vallley Creek Subwatershed

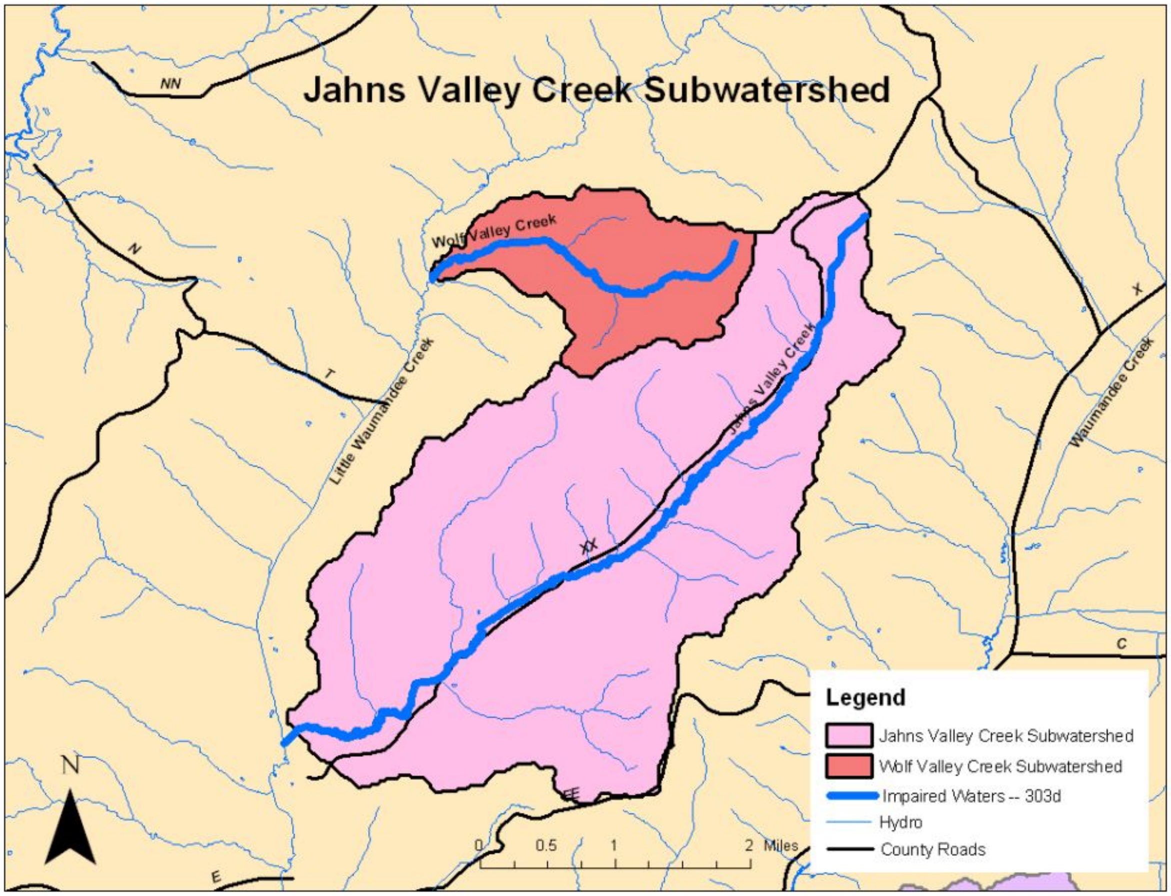


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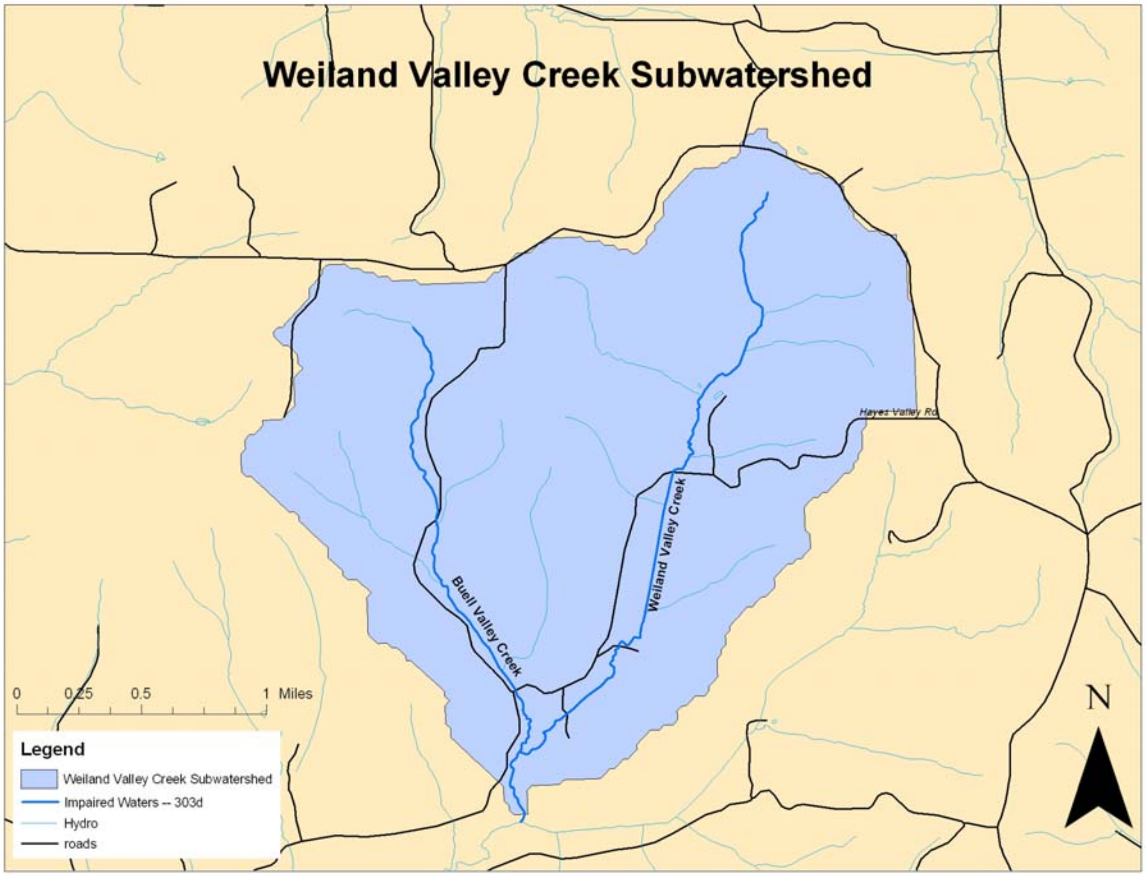
Figure A4. Map of Weiland Vallley Creek Subwatershed



APPENDIX A

Table A1. Table of Land Use for Each Subwatershed

Buell Valley Creek		
Area (acres)	Land Cover	%
608	Forest	58
317	Agriculture	30
123	Grassland	12
Cochrane Ditch		
Area (acres)	Land Cover	%
4753	Forest	48
3345	Agriculture	34
1245	Grassland	13
306	Wetland	3
180	Urban/Developed	2
24	Open Water	<1
1	Shrubland	<1
Irish Valley Creek		
Area (acres)	Land Cover	%
4164	Forest	55
2332	Agriculture	31
1002	Grassland	13
121	Wetland	1
4	Open Water	<1
Jahns Valley Creek		
Area (acres)	Land Cover	%
4266	Forest	65
1353	Agriculture	21
775	Grassland	12
161	Wetland	2
2	Open Water	<1
Weiland Valley Creek		
Area (acres)	Land Cover	%
1584	Forest	59
737	Agricultural	28
360	Grassland	13

APPENDIX B: Existing Sediment Loads for Waumandee Impaired Streams

Buell Valley Creek	1990 Inventory Results Upland Sediment Delivery (tons/acre)	Land Use from Wiscland (acres)	Sediment Delivery-relative to acreage derived by Wiscland (tons/year)
Forest	0.15	608	91
Agriculture	0.14	317	46
Grassland	0.16	123	20
Streambank Erosion			200
Total Sediment Load			**357**

Cochrane Ditch (Rose Valley)	1990 Inventory Results Upland Sediment Delivery (tons/acre)	Land Use from Wiscland (acres)	Sediment Delivery-relative to acreage derived by Wiscland (tons/year)
Forest	0.05	4753	228
Agriculture	0.11	3345	353
Grassland	0.08	1245	100
Wetland	-	306	-
Urban/Developed	0.04	180	8
Open Water	-	24	-
Shrubland	-	1	-
Streambank Erosion			109
Total Sediment Load			**797**

Irish Valley Creek	1990 Inventory Results Upland Sediment Delivery (tons/acre)	Land Use from Wiscland (acres)	Sediment Delivery-relative to acreage derived by Wiscland (tons/year)
Forest	0.06	4164	256
Agriculture	0.15	2332	347
Grassland	0.10	1002	102
Wetland	-	121	-
Open Water	-	4	-
Streambank Erosion			1152
Total Sediment Load			**1857**

Jahns Valley Creek	1990 Inventory Results Upland Sediment Delivery (tons/acre)	Land Use from Wiscland (acres)	Sediment Delivery-relative to acreage derived by Wiscland (tons/year)
Forest	0.06	4266	255
Agriculture	0.10	1353	137
Grassland	0.06	775	48
Wetland	-	161	-
Open Water	-	2	-
Streambank Erosion			401
Total Sediment Load			**841**

Weiland Valley Creek*	1990 Inventory Results Upland Sediment Delivery (tons/acre)	Land Use from Wiscland (acres)	Sediment Delivery-relative to acreage derived by Wiscland (tons/year)
Forest	0.15	1584	238
Agriculture	0.14	737	106
Grassland	0.16	360	59
Urban/Developed	-	-	-
Streambank Erosion			600
Total Sediment Load			**1004**

* Since Buell Valley empties into Weiland Valley Creek, the above sediment loads include those of both Buell Valley Creek and Weiland Valley Creek. However, streambank erosion amount is Weiland Valley Creek only.