Tete Des Morts Creek Watershed Management Plan

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Tete Des Morts Creek Watershed

Tete Des Morts Creek is a meandering stream that flows for 16 miles through Dubuque and Jackson Counties, draining directly into the Mississippi River. The last 5.2 mile segment from the confluence with Lux Creek to the mouth is listed as impaired due to a low biotic index as determined by DNR assessments. The watershed encompasses 30,433 acres. A development grant was procured in 2007 and resulted in a completed Land Use assessment and Rapid Assessment of Stream Corridor Along Length (RASCAL). As a result of the assessment, the project has set its goal of reducing nutrient and sediment delivery by 40 percent over five years and to improve the aquatic habitat. The RASCAL was also used to determine critical areas, best management practices for specific areas, and realistic goals for the number of practices to be implemented.

Monitoring data warranted placing Tete Des Morts Creek on Iowa's 303(d) List of Impaired Waters. The creek has been scheduled for the total maximum daily loads (TMDL) determination on the 2008 Water Quality Improvement Plan list. Water quality monitoring has been conducted by the Iowa DNR and the Long-Term Resource Monitoring Program since 1996. The Tete Des Morts Creek watershed development project is cooperating with the TMDL team by collecting monthly water samples and having them tested at a certified lab for Total Suspended Solids and ammonia, with funding supplied by an IOWATER mini-grant.

According to DNR Fisheries specialists in the Manchester and Guttenberg offices, Tete Des Morts is a "stream of interest" due to a history of unexplained fish kills, the most recent being in 2005. A fish kill was reported in 1997 on a ¼ mile segment of the stream, but the cause was never determined. The assessment results on the 2002 Water Quality in Iowa report stated that the class B aquatic life uses were "partially supported." The DNR has been stocking trout in some of the small spring fed tributaries for several years.

Results of a landowner survey identified stream bank and gully erosion as the two main physical problems, with soil run-off and livestock access to the stream as the major contributors of poor water quality. Eighty –five landowners said they would be willing to support the project, and thirteen producers have joined the advisory board.

Land Use

An estimated 98% of the Tete Des Morts watershed is devoted to agriculture and timber uses. The only urban area is the town of St. Donatus., which consists of about 500 acres.

Table 1: Results of Land Use Survey

Grassland/Pasture	53 %	16,129 acres*
Timber	34%	10,347 acres
Row Crop	11%	3,347 acres
Urban	1.5 %	456 acres
Water/wetland	.2%	55 acres

*****Approximately 4,000 acres of CRP included.

Land Management/Cropping

The bulk of farm land in the watershed is managed for pasture and grazed timber, with 10.7 percent in crops. The crop land is commonly planted to a corn-oat-multiple meadow rotation. Non-highly erodible land along the stream is sown in continuous corn or corn-bean rotations. Forty-seven percent of the producers who responded to the survey said

they used mulch till as their tillage option, followed by 34 percent who used no-till. Unfortunately, 17 percent said they still plowed their fields.

Ownership Characteristics

There are 137 individual farm-owner-operators in the watershed, and an additional 50 recreational landowners and urban residences in the watershed area. The Nita-Ho Valley campground and seasonal residential area is located at the mouth of the creek. Commercial businesses within the town include a gas station/restaurant and feed store.

Highly Erodible Land

According to GIS maps supplied by DNR, about 88 percent of this watershed comprised of Highly Erodible Land (HEL) soil types.

Soils

The Tete Des Morts watershed contains over 30,400 acres of rock outcrop and gently sloping to very steep slopes. The moderately well drained soils were formed in loess, with underlying residuum of shale or limestone bedrock. Half the area is included in the Fayette-Nordness-Rock Outcrop Association. Only the small percentage of land along the stream is nearly level, and is the more highly cropped area.

Climatic Conditions

The annual precipitation in this area is 35 inches, and the average seasonal snowfall is about 32 inches. The prevailing winds are from the south. Cold winters and moderate summers describe the temperatures.

Geological Characteristics

The Tete Des Morts watershed straddles the Paleozoic Plateau and Driftless Plain landform regions. According to the Iowa DNR Geological Survey, the area is of the Silurian age, in the Hopkinton strata. Limestone throughout the area is near the surface or exposed and is accessible for quarrying. Because of the karst topography, sinkholes are common throughout the area.

Livestock – Table 2

Estimated numbers based on landowner surveys and advisory board imput.

Livestock species	Number of producers	Approximate number of head
Beef Cattle	52	7,600
Dairy	13	3,000
Swine	2	800
Sheep	3	350

The livestock in this watershed are typically allowed to graze in pastures where the creek and its tributaries are the only source of drinking water. This unrestricted access to the stream has resulted in increased streambank erosion and increased turbidity.

Problems and Causes

Tete Des Morts Creek is a scenic stream that winds through narrow valleys overshadowed by limestone bluffs. The watershed encompasses 30,433 acres of rugged terrain in Dubuque and Jackson counties. The Jackson Soil and Water Conservation District has identified the Tete Des Morts Watershed as a priority subwatershed. The stream is listed on Iowa's Section 303(d) list of impaired waterbodies, with the impairments identified as biological and habitat alteration. Water testing has been conducted by the Iowa DNR and the Long-Term Resource Monitoring Program since 1996. IOWATER testing began in 2006 by SWCD staff. The SWCD staff is also cooperating with the TMDL team by collecting water samples at five locations in the watershed and testing them for Total Suspended Solids and ammonia levels.

The Iowa DNR fisheries in Manchester stock the creek and some of its tributaries with trout, periodically sampling the fish population to monitor their investment in the stream. The Nature Conservatory has also shown interest in becoming a project partner. This organization is writing a Conservation Action Plan for the creek as part of their Northeast Iowa's karst stream project. Their main concern is the preservation of habitat used by the Higgins eye pearlymussel.

The recreational uses of the stream include fishing, boating, and wading. A 20 lot campground is located near the mouth of the stream, providing access directly into the Mississippi River from two boat docks. A small community of summer cabins is also located next to the campground.

Two resident surveys identified stream bank and gully erosion as major problems, with livestock access and soil delivery to the stream as the main causes of poor water quality. The result of the RASCAL stream assessment concurs with the landowners, indicating that both upland treatment and riparian area BMPs are needed to address the nonpoint source sediment and nutrient problems and habitat conditions.

Stream bank erosion

Responses from the landowner survey indicated that stream bank erosion is a perceived problem that contributes to sediment delivery to the stream. The RASCAL data indicates that about 30 percent of the banks are unstable, and that the stability is correlated with the presence of livestock.

Habitat alteration

DNR water quality assessments for 1996 and 1998 identified isolated channel alterations (pasturing) and relatively stable stream banks along Tete Des Morts Creek, but suggested that aquatic life could be threatened if livestock were continually grazed in the riparian zone. The 2004 assessments of aquatic life were hindered by rocky substrate, mud and aquatic growth, so it was considered Not Assessed. According to the RASCAL data, 31 percent of the stream habitat is poor, and 56 percent is only average.

Sediment

The data collected from the land use survey during the project development period figured the potential erosion rate to be 2.73 tons/acre/year, or 83,045 tons/year over the entire watershed. Total sediment delivery was calculated to be 18,269 tons/year. According to RASCAL data, about 74 percent of the stream is at least partially embedded with sediment.

Nutrients

Runoff from land applied manure and livestock waste from cattle yards or pasture located right along the creek contributes to the nutrient delivery to the stream. Although monitoring of nutrients has only been conducted for one year by the district, nitrate levels average between 2 – 5 ppm and phosphate levels are usually around 0.1 ppm. These amounts are within acceptable levels in typical Iowa streams.

Livestock Waste

It appears that livestock waste is a significant source of non-point pollution. Ammonia levels originating from livestock manure can increase the toxicity of the water, especially during periods of high temperatures. According to data collected from the RASCAL, livestock have access to over half of the stream, greatly increasing the probability of manure reaching the water. Ammonia levels are being monitored by the Tete Des Morts development project in cooperation with the TMDL team. Certified lab testing shows consistent ammonia levels in the stream, suggesting that spikes in the readings are a result of contaminated storm water runoff.

Bacteria from Human or Animal Waste

Water samples have been collected by the district for about one year. Samples are taken to ChemRight Labs for analysis. The average coliform count has been 2400 cfu/100 ml, with e-coli averaging 1,425 cfu/100 ml. This amount is six times the water quality standard set by the DNR for class A1 streams, meaning it is severely impaired for e-coli.

The sewage lagoons for the town of St. Donatus are located a few yards from the creek. Testing by the DNR is not conclusive as to the effect of these structures. Although there has not been a permit violation to date, DNR suspects the lagoons are seeping, and are concerned about the repeated fish kills here. A survey of landowners revealed that at least 20 landowners identified some concerns about their septic tanks, but gave no specifics.

Pesticides

Pesticides entering the water system can have a direct toxic effect on aquatic life. This can lead to pesticide toxicity proceeding up the food chain, ultimately causing health problems in humans, livestock and wildlife. Most landowners do not have pest management plans. Of special concern in this watershed is the high number of sinkholes that may be providing indirect access of pesticides to the stream. (See Attachment sinkhole map).

Identify Sources and Critical areas:

The Tete Des Morts Watershed Project will identify and focus on the critical areas of the watershed that are having the greatest impact on the water quality. By concentrating on these critical areas, project resources will be used in the most efficient and cost effective manner. Data from the RASCAL will be used to locate major critical areas within the watershed, and the Sediment Delivery Calculator will be used to rank management practices and individual projects. Critical areas in the Tete Des Morts Watershed include:

- Areas where livestock come in direct contact with the stream
- Sharp turns along streams and creeks that accelerate stream bank erosion.
- Steeply sloped fields that are planted with conventional tillage in proximity to drainage network
- Ephemeral and classic gully erosion in proximity to drainage network

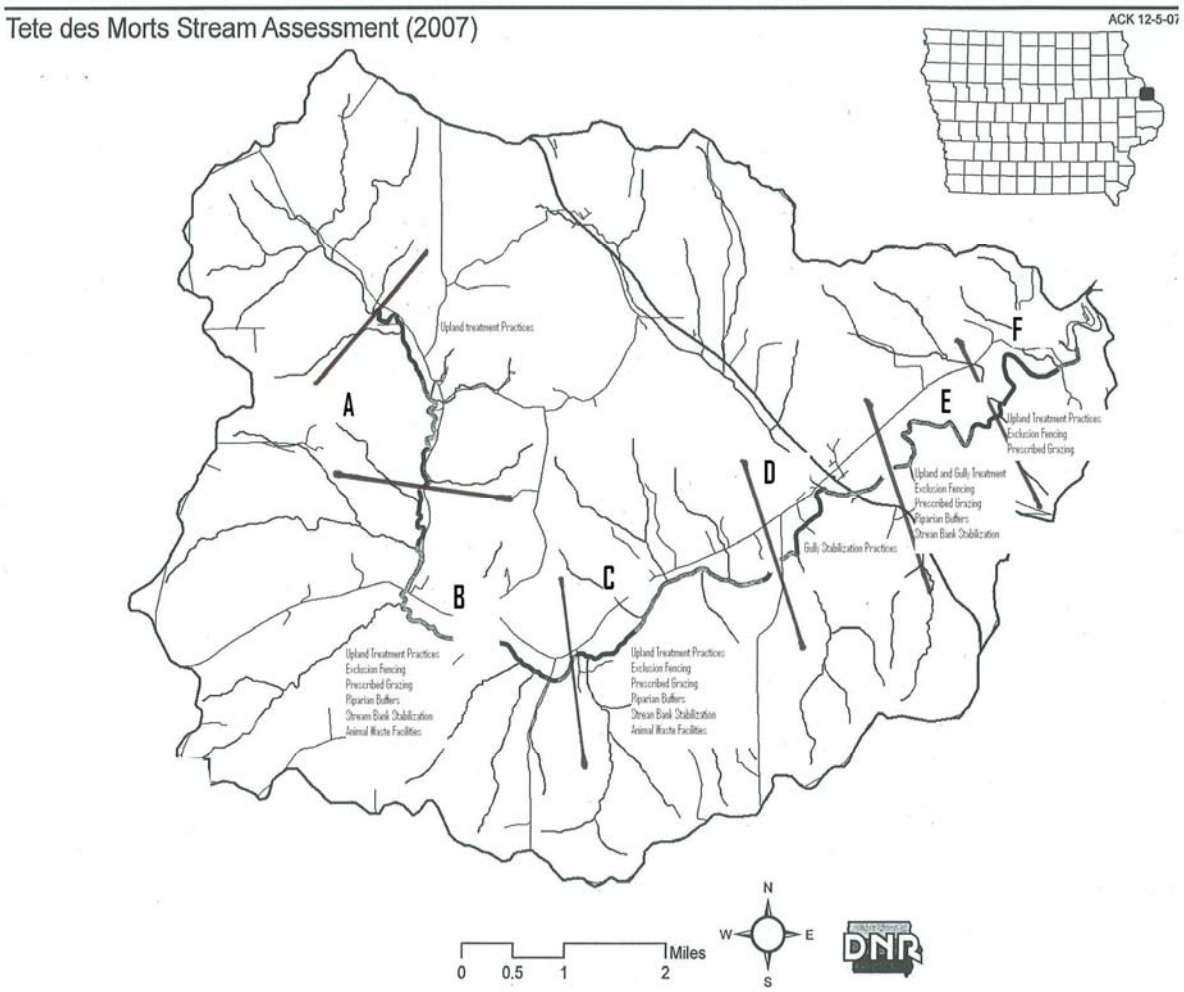
Stream Assessment Results (RASCAL)

The chart below outlines the recommended BMPs needed in each stream segment. Segments were determined after the Rapid Assessment of Stream Corridor Along Length (RASCAL) data was analyzed. Refer to Stream Assessment Map, Attachment A

Table 4	A	B	C	D	E	F
Upland practices *	X	X	X		X	X
Waste facility		X	X			
Exclusion fencing		X	X		X	X
Prescribed grazing		X	X		X	X
Riparian buffer		X	X		X	
Bank stability		X	X		X	
Gully stabilization				X	X	

*Water and sediment control basins, grade stabilization, terraces, and waterways.

Attachment A:



BMPs needed to improve water quality

The main goals of this project are to reduce the amount of sediment and nutrient delivery to Tete Des Morts Creek and its tributaries, and to improve the stream habitat. Based on the data collected by RASCAL, and assuming unlimited funding and stakeholder cooperation, the following practices will need to be implemented to address the threats to water quality. Based on the rate of progress on other watershed projects in the county, it would take approximately 30 years to accomplish these proposed practices. See Assessment Attachment Map A.

Table 3

BMP	Quantities	Estimated Cost
Animal Waste Facilities	42 units	$ 2,520,000
Grade Stabilization Structures	90 units	$ 1,080,000
Water & Sediment Control Structures	180 units	$ 540,000
Grassed Waterways	200ac	$ 1,240,000
Riparian Buffers	174 ac	$ 104,400
Filter strips	174 ac	$ 104.400
Stream Stabilization	4 miles	$ 549,120
Pasture Management	700 acres	$ 140,000
Exclusion fencing	5 miles	$ 34,584
	Total:	$6,312,504

Watershed Goals and Objectives

Goal – The goal of the Tete Des Morts Watershed Project is to improve the water quality of the stream and reverse the damage that has affected the fish population and habitat of the stream. This goal will be accomplished by promoting structural and cultural BMPs that reduce or trap sediments and nutrients before they get to the stream, and by improving in-stream and riparian habitats. In addition, public and landowner education will be conducted via multimedia sources.

Objective 1: Reduce Sediment Delivery by 40%
Conservation practices that promote water quality and reduce erosion and sediment delivery, such as grade stabilization structures, water and sediment control basins, and grassed waterways, will be placed in critical areas of the watershed. The sediment delivery calculator will be used to determine the effectiveness of the BMPs installed and to estimate the sediment reduction of proposed projects. According to DNR estimates, the total sediment delivery is 18,269 tons/year.(See Attachment B) To meet the intended goal, the applied practices should reduce the sediment delivery by at least 7,500 t/y over five years.

Objective 2: **Restore Habitat along the stream**
Habitat restoration will be accomplished by encouraging producers to plant riparian buffers and filter strips along the stream, especially where the crop fields are planted along the bank. In addition, prescribed grazing to minimize the time that livestock spend along the banks, exclusion fencing, and cattle approaches will be promoted by offering

cost share and incentives. Stream bank stabilization cost share will be offered as a cost-share item, to both reduce sediment delivery to the stream and provide better habitat.

Objective 3: **Pasture Management and Livestock Exclusion**
The removal of livestock from at least two miles along the stream corridor would decrease bank erosion and reduce sediment and nutrient delivery. Through practices such as rotational grazing, exclusion fencing, cattle approaches, and alternative watering systems, the damage to eroded banks can be reversed.

Objective 4: **Reduce the risk of contamination via sinkholes**
The karst topography of the watershed is peppered with hundreds of sinkholes which may facilitate the contamination of the groundwater and stream. This objective will be met by promoting CRP filter strips and diversions, and to encourage landowners with expiring CRP fields to leave the buffers around the sinkholes.(See Attachment Map E)

Objective 5: **Provide Information and Education to Landowners and Residents**
The project will continue to work with the established watershed advisory board to get their input and opinions on the project progress. The project will continue to publish and distribute a quarterly newsletter, as well as monthly newspaper and/or radio announcements that focus on water quality issues. Field Days, tours and demonstrations will be offered to make residents aware of best management practices and cost share options that are available.

Objective 6: Water Quality Monitoring
The project will continue the current water monitoring program that has been followed since 2006 according to IOWATER procedures, to include e-coli testing at the request of the Iowa DNR in Manchester. Cooperation will also continue as needed with the IDNR-Iowa Geologic and Water Survey staff working on the TMDL. Monthly samples from the five test sites will be monitored as requested by the Water Quality Improvement Plan team. Data collected will be reported on the IOWATER database and would continue to be made public via newsletters and articles, in order to educate and inform the residents about water quality in their area.

BMPs or Measures needed to meet goals:

Nutrient and Sediment

A. Assist 10 producers in installing manure containment and/or storage systems. Payment for this practice will be piggy backed with EQIP, not to exceed 75%. Assist 15 livestock producers to complete Manure Management Plans or CNMPs, with possible EQIP incentive payment.
B. Build 25 water and sediment control basins. Cost share up to 75 percent, to include intakes and tile.
C. Install 20 grade stabilization structures for gully control. The structures could include gabions or rock chutes. EQIP dollars will be used to piggyback the bulk of the cost, up to 75% total.
D. Establish 30 acres of grassed waterways in critical areas. Cost share not to exceed 75 percent, piggy backing with other cost share programs when possible.

E. Protect 2,000 feet of stream bank in the watershed. This will be piggy backed when possible with EQIP funds, up to75% total. Project funds will not be piggy backed if bio-retention methods such as revetments are used.

Habitat Improvement:

F. Assist in the planning and implementation of 35 acres of riparian buffers. CRP will provide 50 percent to 90 percent cost share.
G. Assist producers in planning and applying 35 acres of filter strips along the streams and sinkholes, to be cost shared by CRP if eligible.
H. Encourage producers to initiate rotational grazing on 700 acres by offering a ten dollar per acre incentive payment. Fencing and seeding will be provided through EQIP.
I. Encourage 5 producers to limit livestock access to 2 miles of the stream by providing up to 75% cost share on exclusion fencing.
J. Encourage 5 producers to use alternative watering sources and approaches in conjunction with exclusion fencing by offering 75% cost share for those practices not covered through EQIP.

Information and Education

K. The project coordinator will oversee the watershed advisory board. The board was formed during the project development phase and has thirteen active members. Members represent a cross section of landowners, including crop farmers, dairymen, cattle producers, businessmen, two women and two non-farming residents.
L. The public will be invited to at least one field day, pasture walk or special event per year to keep them informed of practice options and new ideas.
M. Quarterly newsletters will be sent to all stakeholders to keep them informed and up to date on watershed activities.

Status of Total Maximum Daily Load (TMDL) Development:

Tete Des Morts Creek has been placed on Iowa's 303(d) List of Impaired Waters. It is on the 2011 list of streams to have a Water Quality Improvement Plan developed. Four locations along the stream have been identified as sampling sites. The SWCD is cooperating in this effort by collecting water samples from these locations on a monthly basis and having them tested for Total Suspended Solids and ammonia. Upon completion of the TMDL, the District would be willing to consider modifications to the watershed management plan based upon the outcomes and recommendations of the Water Quality Improvement Plan.

Measures of Success:

The Tete Des Morts Creek Watershed group will use models and monitoring to evaluate the impact on water quality by applying BMPs in priority areas:

- GIS-based models including the "Iowa Sediment Delivery Calculator" will be used to estimate the impact of BMPs in reducing the delivery of sediment and phosphorus to Tete Des Morts Creek.
- The current water quality monitoring program will be expanded with the assistance of Iowa DNR water monitoring staff (Comprehesive Water Monitoring Plan will be available by June 2009). Monitoring results will be used to understand water quality conditions in Tete Des Morts Creek Watershed, and help evaluate the effectiveness of BMPs in reducing the delivery of sediment and nutrients to the impaired waterbody.

Although difficult to measure the success of educational outreach efforts, attendance records for all field days and demonstrations will be kept and event surveys will gauge attendee satisfaction. A follow-up survey will be sent to all landowners in the watershed and then be compared to the initial survey. Results will determine perceived changes in water quality, as well as modifications of farm management practices. A photo record will be kept of all installed practices and serve as documentation in the final report.

The First Five Years

Implementation of the watershed project will be a combined effort involving multiple groups and organizations. The most important inputs will come from landowners and residents who will help decide which best management practices are needed and where they will be applied. Some of these decisions have already been addressed by the thirteen member advisory board that was formed as part of the watershed development project. The process also requires input from resource agencies that have the technical expertise to recommend practices and plans. Support of this nature is provided by the Jackson Soil and Water Conservation District, the Iowa Department of Natural Resources, Iowa Department of Agriculture and Land Stewardship, the natural Resources Conservation Service, and Limestone Bluffs RC&D.

The Tete Des Morts Creek Watershed Project is designed to improve the water quality of the stream by restoring habitat and reducing nutrient and sediment delivery through thoughtful placement of practical BMPs in critical areas as designated by GIS maps and the RASCAL. BMPs that will have the greatest impact on water quality will be offered at up to 75% cost share through the project and by piggy backing with other funding and encouraging Low Interest Loan programs. The specific practices and actions that are planned for this project are outlined and quantified below.

The results of the Tete Des Morts Creek Watershed Project will be a perceivable and quantifiable improvement in the water quality of the creek and its associated tributaries. Water clarity will improve as Total Suspended Solids decreases. The impact will affect the residents and agricultural landowners by not only improving the overall health of the watershed, but by enhancing the aquatic habitat.

Outputs also include providing all required reports to DSC and DNR. Included in annual reports will be estimated sediment load reductions. Copies of all educational

materials developed for the public, articles, and photographs will be forwarded as part of monthly reports.

Project Cost and Funding Sources – the following are the proposed **project costs** for the five year project:

Category	**Fund Source**	**Five-Year Total**
Salary and benefits	Grant	$ 349,700
Indirect costs		
Travel/Training: Mileage, hotel, registration	Grant	5,000
Supplies: Office supplies, postage,etc.	Grant	7,000
Equipment:		
Info/Education: newsletters, printing, posters...	Grant	5,200
Contractual Services		
BMPs		
10 manure management systems@up to 75%with EQIP piggy back	Grant	250,000
	Landowner	250,000
25 water/sediment control basins @up to 75%	Grant	93,750
	Landowner	31,250
20 Grade Stabilization structures @ up to75% with EQIP piggy back	Grant	90,000
	Landowner	90,000
30 acres of grassed waterways @ up to75%	Grant	90,000
	Landowner	30,000
2000 ft stream bank stabilization @up to 75%	Grant	25,000
		25,000
35 acres CRP Riparian buffers @ 50%	FSA	10,500
	Landowner	10,500
35 acres CRP Filter Strips/sinkhole treatment	FSA	1,750
	Landowner	1,750
700 acres rotational grazing incentive @$10/ac	Grant	7,000
2 miles exclusion fencing @ $1.12/ft NTE 75%	Grant	11,827
	Landowner	3,960
5 alternative watering facilities/approaches @up to 75%	Grant	11,250
	Landowner	3,750

Schedule of Activities to be completed: Project to start FY 2009

Major Project Activities	Person Responsible	Q1	Q2	Q3	Q4
Year 1					
Send project announcement to landowners	Coord.	X			
Hold kick-off meeting for landowners	Coord,SWCD	X			
Meet with established watershed advisory board	Coord,SWCD	X	X	X	X
Develop plan of operation	Coord,SWCD	X			
Reaffirm BMP needs with producers	Coord.	X	X	X	X

Begin BMP installation	Coord, Tech		X	X	X
Install watershed boundary signs	Coor, Co.Eng.			X	
Continue quarterly newsletter	Coord.	X	X	X	X
Attend pertinent conferences	Coord	X	X	X	X
Attend SWCD meetings	Coord,SWCD	X	X	X	X
Complete monthly,quarterly,annual reports	Coord	X	X	X	X
Write and submit newspaper articles	Coord	X	X	X	X
Set up booth at Farm and Home show	Coord	X			
Continue IOWATER testing	Coord	X	X	X	X
Develop project brochure	Coord	X			
Year 2					
Review Plan of operation	Coord,SWCD		X		
Continue to assess landowners needs	Coord	X	X	X	X
Continue to install BMPs	Coord,Tech		X	X	X
Continue quarterly newsletter	Coord	X	X	X	X
Continue to meet with Advisory board	Coord, AB	X	X	X	X
Attend needed conferences	Coord	X	X	X	X
Complete all required reports	Coord	X	X	X	X
Host field day event	Coord			X	
Continue IOWATER testing	Coord	X	X	X	X
Attend SWCD meetings	Coord	X	X	X	X
Set up booth at Farm and Home Show	Coord	X			
Write and submit newspaper articles	Coord	X	X	X	X
Present landowner water quality award	Coord,SWCD				X
Year 3					
Review Plan of Operation	Coord,SWCD		X		
Continue to assess landowner needs	Coord	X	X	X	X
Continue to install BMPs	Coord,tech		X	X	
Continue quarterly newsletter	Coord	X	X	X	X
Continue to meet with advisory board	Coord,AB	X		X	
Attend needed conferences	Coord	X	X	X	X
Attend SWCD meetings	Coord	X	X	X	X
Host field day event	Coord,SWCD			X	
Continue IOWATER testing	Coord	X	X	X	X
Set up booth at Farm and Home show	Coord	X			
Submit newspaper articles	Coord	X	X	X	X
Present landowner water quality award	Coord,SWCD				X
Complete all required reports	Coord	X	X	X	X

Year 4					
Review Plan of Operation	Coord,SWCD		X		
Continue to assess landowner needs	Coord	X	X	X	X
Continue to install BMPs	Coord,tech		X	X	
Continue quarterly newsletter	Coord	X	X	X	X
Continue to meet with advisory board	Coord,AB	X		X	
Attend SWCD meetings	Coord	X	X	X	X
Host field day event	Coord,SWCD			X	
Continue IOWATER testing	Coord	X	X	X	X

Submit newspaper articles	Coord	X	X	X	X
Present landowner water quality award	Coord,SWCD				X
Complete all required reports	Coord	X	X	X	X
Year 5					
Review Plan of Operation	Coord,SWCD		X		
Continue to assess landowner needs	Coord	X	X	X	X
Continue to install BMPs	Coord,tech		X	X	
Continue quarterly newsletter	Coord	X	X	X	X
Continue to meet with advisory board	Coord, AB	X		X	
Attend SWCD meetings	Coord	X	X	X	X
Host field day event	Coord,SWCD			X	
Continue IOWATER testing	Coord	X	X	X	X
Submit newspaper articles	Coord	X	X	X	X
Present landowner water quality award	Coord,SWCD				X
Complete all required reports	Coord	X	X	X	X
Hold final annual review	Coord,SWCD				X
Turn in final report	Coord				X

Attachment 1

EPA required Element	**Page or location in the Application**
1. Identification of the causes and sources that will need to be controlled to achieve the load reductions estimated in this plan (Sources that need to be controlled should be identified at the significant subcategory level with estimates of the extent to which they are present in the watershed.	Pg. 2 summarizes land use in Table 1 Page 3 Livestock numbers in table, Page 4 section: Practices Needed to Protect Water Quality. BMPs needed to fully address problem are listed pg4
2. An estimate of the load reductions expected for the management measures implemented below (number 3) to address items identified above (number1)	Page 6 Nutrient and Sediment Reduction A-E. Page 5, Objective1
3. Description of NPS management measures needed to be implemented to achieve load reductions (number 2) and an identification of critical areas (map or narrative)	Page6- 7 letters A – J. Page 4 – Critical Areas and all bullets following.
4. Estimate of financial and technical assistance needed.	Page 9 Project Cost chart;Detailed budget –Attachments 5-1 through 5-5
5. Identification of an information/education component.	Pg. 7 K-M; Pg 5 Objective 5
6. A schedule	The project schedule is on page 10-11
7. Description of interim, measurable milestones for determining whether NPS management measures or control actions are being implemented.	Page 8 in Evaluation and Feedback Mechanisms and page 9 Project Outputs section.
8. Set of criteria to be used to determine whether load reductions are being achieved.	Measures of Success on page 8 describe the criteria used to determine reductions
9. A monitoring component to evaluate the effectiveness of the implementation efforts	Page 8 Measures of Success state continued monitoring with IOWATER

WATER QUALITY PROJECT BUDGET SUMMARY FORMAT
(Funding requested from **Section 319, WPF and/or WSPF**)

Budget	**Project Funding**

Category						
	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Salary and Benefits	$ 62,000	65,750	69,700	73,900	78,350	349,700
Indirect Costs	0	0	0	0	0	0
Travel	$ 500	500	500	500	500	2,500
Training	$ 500	500	500	500	500	2,500
Supplies	$ 1,900	1,900	1400	900	900	7,000
Equipment	$ 0	0	0	0	0	0
Contractual Services						
Financial Incentives and Cost-Share	$ 45,515	115,765	119,515	149,015	149,015	578,825
Info/Ed	$ 1,000	1,000	1,000	1,100	1,100	5,200
TOTAL	$ 111,415	185,415	192,615	225,915	230,365	945,725

WATER QUALITY PROJECT BUDGET SUMMARY FORMAT
(contributions from **Other Agencies and Organizations**)

Budget	**Project Funding**

Category						
	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Personnel	$					
Fringe Benefits	$					
Travel	$					
Training	$					
Supplies	$					
Equipment	$					
Contractual Services						
Financial Incentives and Cost-Share	$ 31,950	149,950	149,950	208,950	208,950	749,750
Other*** Info/Ed	$					
TOTAL	$ 31,950	149,950	149,950	208,950	208,950	749,750

ATTACHMENT 5

PROJECT BUDGET FOR FY200__
SECTION 319, WPF and/or WSPF FUNDING

BUDGET FOR YEAR #: 1 [FY2009__

PROJECT NAME: **Tete Des Morts Creek Watershed Project** SWCD: **Jackson**

Component	Number, Acres or Other Units	Total Cost	Cost Share Rate	Landowner Cost	Project Cost	319, WPF, WSPF	Other Funding Source(s)	Other Source ID
Salary & Benefits		$62,000			$62,000	$62,000		
DSC Indirect Costs		$0			$0	$0		
Travel/Training		$1,000			$1,000	$1,000		
Supplies		$1,900			$1,900	$1,900		
Inform./Educ.		$1,000			$1,000	$1,000		
Contractual (DSC)								
Contractual (SWCD)								
Equipment		$0			$0			
Other								
Practices:								
Animal waste facility	0	$0	75%	$0		$0	$0	EQIP
Grade Stabilization structures	2	$36,000	75%	$9,000	$27,000	$9,000	$18,000	EQIP
Water and Sediment Control	2	$10,000	75%	$2,500	$7,500	$7,500		
Grassed Waterways	6 ac	$24,000	75%	$6,000	$18,000	$18,000		
Stream bank stabilization	400 ft	$20,000	75%	$5,000	$15,000	$5,000	$10,000	EQIP
Riparian buffers	7 ac	$4,200	50%	$2,100	$2,100		$2,100	CRP
Prescribed Grazing	140 ac	$1,400	$10/ac incent.		$1,400	$1,400		
Filter/sink hole buffers	7 ac	$700	50%	$350	$350		$350	CRP
CNMP	3	$1,500			$1,500		$1,500	EQIP
Exclusion Fencing	2112 ft	$3,157	75%	$792	$2,365	$2,365		
Alternative Watering Source	1	$3,000	75%	$750	$2,250	$2,250		
Totals		$169,857		$26,492	$143,365	$111,415	$31,950	

ATTACHMENT 5

PROJECT BUDGET FOR FY200__
SECTION 319, WPF and/or WSPF FUNDING

BUDGET FOR YEAR # 2 [FY2010__

PROJECT NAME: **Tete Des Morts Creek Watershed Project** SWCD: **Jackson**

Component	Number, Acres or Other Units	Total Cost	Cost Share Rate	Landowner Cost	Project Cost	319, WPF, WSPF	Other Funding Source(s)	Other Source ID
Salary & Benefits		$65,750			$65,750	$65,750		
DSC Indirect Costs		$0			$0	$0		
Travel/Training		$1,000			$1,000	$1,000		
Supplies		$1,900			$1,900	$1,900		
Inform./Educ.		$1,000			$1,000	$1,000		
Contractual (DSC)								
Contractual (SWCD)								
Equipment		$0			$0	$0		
Other								
Practices:								
Animal waste facility	2	$200,000	75%	$50,000	$150,000	$50,000	$100,000	EQIP
Grade Stabilization structures	4	$72,000	75%	$18,000	$54,000	$18,000	$36,000	EQIP
Water and Sediment Control	5	$25,000	75%	$6,250	$18,750	$18,750		
Grassed Waterways	6 ac	$24,000	75%	$6,000	$18,000	$18,000		
Stream bank stabilization	400 ft	$20,000	75%	$5,000	$15,000	$5,000	$10,000	EQIP
Riparian buffers	7 ac	$4,200	50%	$2,100	$2,100		$2,100	CRP
Prescribed Grazing	140 ac	$1,400	$10/ac incent.		$1,400	$1,400		
Filter/sink hole buffers	7 ac	$700	50%	$350	$350		$350	CRP
CNMP	3	$1,500			$1,500		$1,500	EQIP
Exclusion Fencing	2112 ft	$3,157	75%	$792	$2,365	$2,365		
Alternative Watering Source	1	$3,000	75%	$750	$2,250	$2,250		
Totals		$424,607		$89,242	$335,365	$185,415	$149,950	

ATTACHMENT 5

PROJECT BUDGET FOR FY200__
SECTION 319, WPF and/or WSPF FUNDING

BUDGET FOR YEAR # 3 [FY2011__

PROJECT NAME: **Tete Des Morts Creek Watershed Project** SWCD: **Jackson**

Component	Number, Acres or Other Units	Total Cost	Cost Share Rate	Landowner Cost	Project Cost	319, WPF, WSPF	Other Funding Source(s)	Other Source ID
Salary & Benefits		$69,700			$69,700	$69,700		
DSC Indirect Costs		$0			$0	$0		
Travel/Training		$1,000			$1,000	$1,000		
Supplies		$1,400			$1,400	$1,400		
Inform./Educ.		$1,000			$1,000	$1,000		
Contractual (DSC)								
Contractual (SWCD)								
Equipment		$0			$0	$0		
Other								
Practices:								
Animal waste facility	2	$200,000	75%	$50,000	$150,000	$50,000	$100,000	EQIP
Grade Stabilization structures	4	$72,000	75%	$18,000	$54,000	$18,000	$36,000	EQIP
Water and Sediment Control	6	$30,000	75%	$7,500	$22,500	$22,500		
Grassed Waterways	6 ac	$24,000	75%	$6,000	$18,000	$18,000		
Stream bank stabilization	400 ft	$20,000	75%	$5,000	$15,000	$5,000	$10,000	EQIP
Riparian buffers	7 ac	$4,200	50%	$2,100	$2,100		$2,100	CRP
Prescribed Grazing	140 ac	$1,400	$10/ac incent.		$1,400	$1,400		
Filter/sink hole buffers	7 ac	$700	50%	$350	$350		$350	CRP
CNMP	3	$1,500			$1,500		$1,500	EQIP
Exclusion Fencing	2112 ft	$3,157	75%	$792	$2,365	$2,365		
Alternative Watering Source	1	$3,000	75%	$750	$2,250	$2,250		
Totals		$433,057		$90,492	$342,565	$192,615	$149,950	

ATTACHMENT 5

PROJECT BUDGET FOR FY200__
SECTION 319, WPF and/or WSPF FUNDING

BUDGET FOR YEAR # **4** [FY2012_

PROJECT NAME: **Tete Des Morts Creek Watershed Project** SWCD: **Jackson**

Component	Number, Acres or Other Units	Total Cost	Cost Share Rate	Landowner Cost	Project Cost	319, WPF, WSPF	Other Funding Source(s)	Other Source ID
Salary & Benefits		$73,900			$73,900	$73,900		
DSC Indirect Costs		$0			$0	$0		
Travel/Training		$1,000			$1,000	$1,000		
Supplies		$900			$900	$900		
Inform./Educ.		$1,100			$1,100	$1,100		
Contractual (DSC)								
Contractual (SWCD)								
Equipment		$0			$0	$0		
Other								
Practices:								
Animal waste facility	3	$300,000	75%	$75,000	$225,000	$75,000	$150,000	EQIP
Grade Stabilization structures	5	$90,000	75%	$22,500	$67,500	$22,500	$45,000	EQIP
Water and Sediment Control	6	$30,000	75%	$7,500	$22,500	$22,500		
Grassed Waterways	6 ac	$24,000	75%	$6,000	$18,000	$18,000		
Stream bank stabilization	400 ft	$20,000	75%	$5,000	$15,000	$5,000	$10,000	EQIP
Riparian buffers	7 ac	$4,200	50%	$2,100	$2,100		$2,100	CRP
Prescribed Grazing	140 ac	$1,400	$10/ac incent.		$1,400	$1,400		
Filter/sink hole buffers	7 ac	$700	50%	$350	$350		$350	CRP
CNMP	3	$1,500			$1,500		$1,500	EQIP
Exclusion Fencing	2112 ft	$3,157	75%	$792	$2,365	$2,365		
Alternative Watering Source	1	$3,000	75%	$750	$2,250	$2,250		
Totals		$554,857		$119,992	$434,865	$225,915	$208,950	

ATTACHMENT 5

PROJECT BUDGET FOR FY200__
SECTION 319, WPF and/or WSPF FUNDING

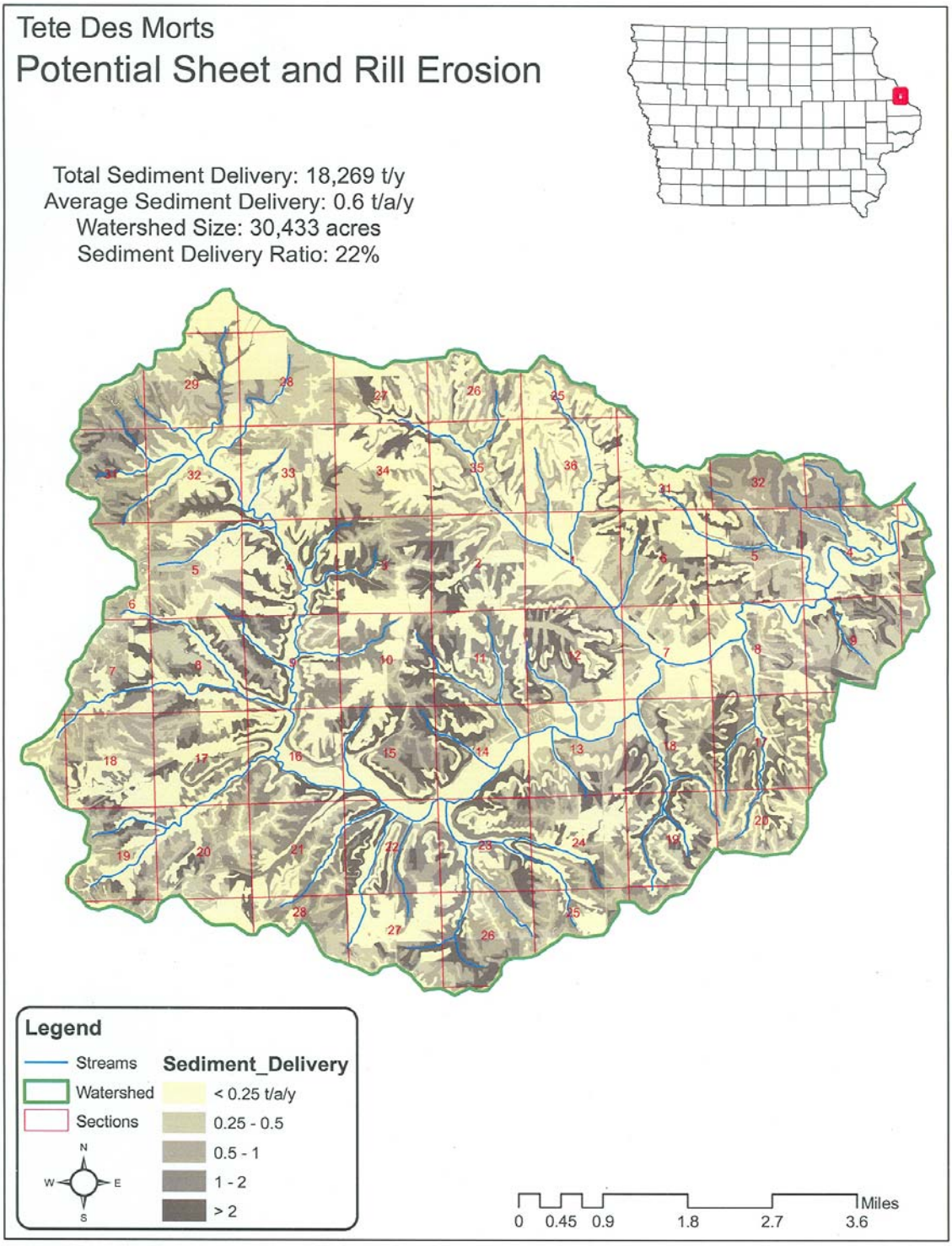
BUDGET FOR YEAR # 5 [FY2013_

PROJECT NAME: **Tete Des Morts Creek Watershed Project** SWCD: **Jackson**

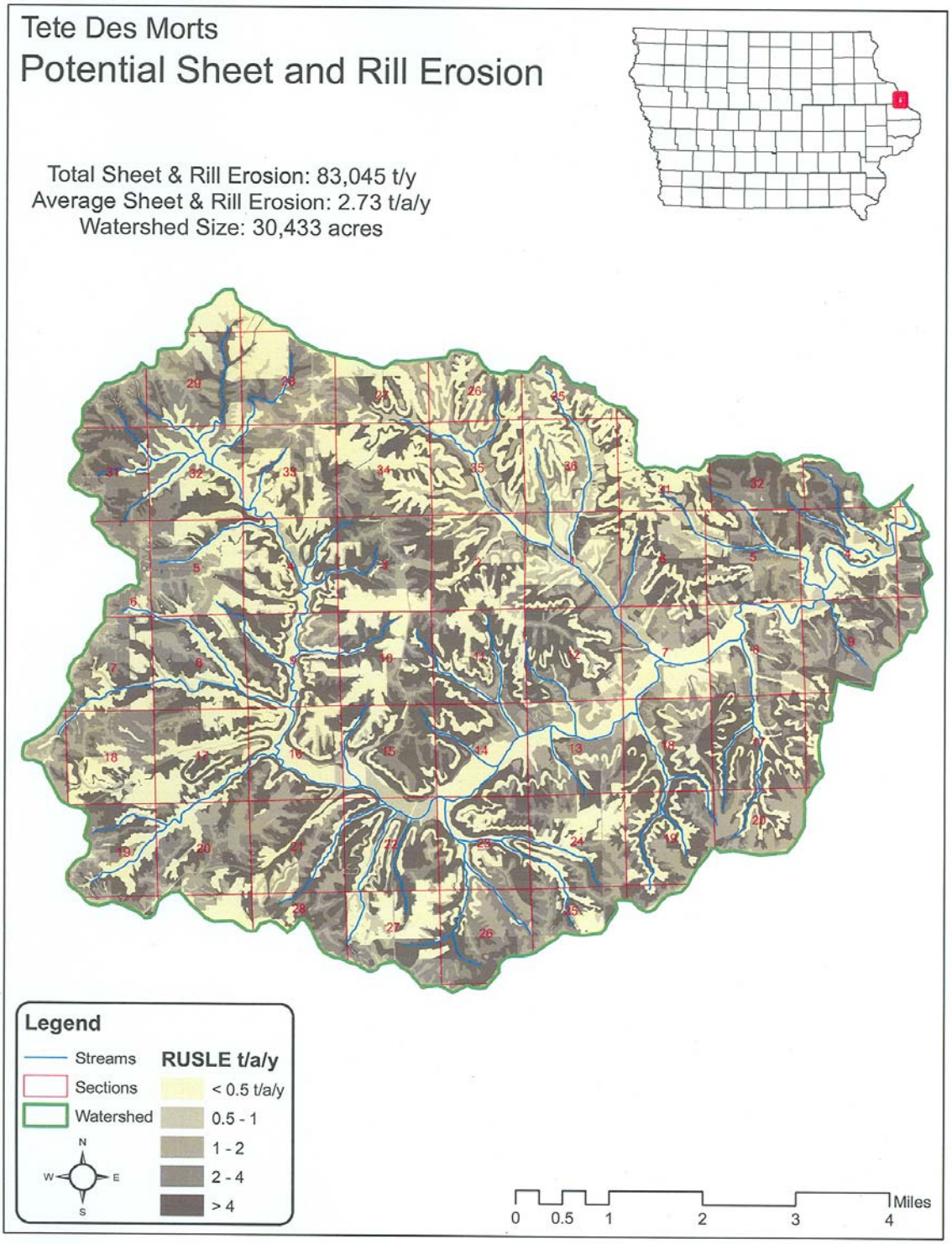
Component	Number, Acres or Other Units	Total Cost	Cost Share Rate	Landowner Cost	Project Cost	319, WPF, WSPF	Other Funding Source(s)	Other Source ID
Salary & Benefits		$78,350			$78,350	$78,350		
DSC Indirect Costs		$0			$0	$0		
Travel/Training		$1,000			$1,000	$1,000		
Supplies		$900			$900	$900		
Inform./Educ.		$1,100			$1,100	$1,100		
Contractual (DSC)								
Contractual (SWCD)								
Equipment		$0			$0	$0		
Other								
Practices:								
Animal waste facility	3	$300,000	75%	$75,000	$225,000	$75,000	$150,000	EQIP
Grade Stabilization structures	5	$90,000	75%	$22,500	$67,500	$22,500	$45,000	EQIP
Water and Sediment Control	6	$30,000	75%	$7,500	$22,500	$22,500		
Grassed Waterways	6 ac	$24,000	75%	$6,000	$18,000	$18,000		
Stream bank stabilization	400 ft	$20,000	75%	$5,000	$15,000	$5,000	$10,000	EQIP
Riparian buffers	7 ac	$4,200	50%	$2,100	$2,100		$2,100	CRP
Prescribed Grazing	140 ac	$1,400	$10/ac incent.		$1,400	$1,400		
Filter/sink hole buffers	7 ac	$700	50%	$350	$350		$350	CRP
CNMP	3	$1,500			$1,500		$1,500	EQIP
Exclusion Fencing	2112 ft	$3,157	75%	$792	$2,365	$2,365		
Alternative Watering Source	1	$3,000	75%	$750	$2,250	$2,250		
Totals		$559,307		$119,992	$439,315	$230,365	$208,950	

Attachment Map A

Attachment MapB

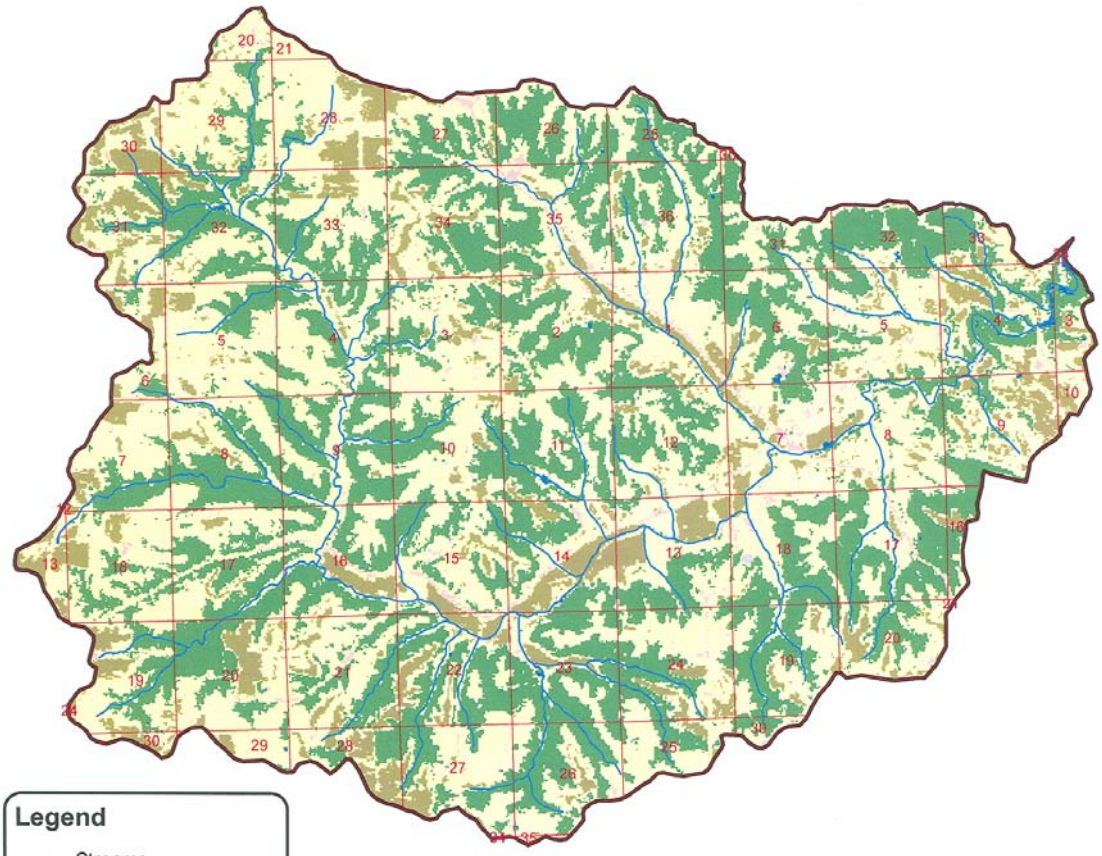


Attachment Map C



Attachment Map D

Tetes Des Morts Watershed
Land Cover (2002)



Legend

- Streams
- Sections
- Watershed

Land Cover (2002)

- Grassland (53.35%)
- Barren (0.02%)
- Artificial (1.52%)
- Timber (34.22%)
- Row Crop (10.71%)
- Water/Wetland (0.18%)

N
W E
S

0 0.5 1 2 3 4 Miles

DNR

Attachment Map E
Sinkhole locations along Tete des Morts Creek.