

WATERSHED MANAGEMENT ACTION PLAN

DNR GUIDEBOOK



Background

- The DNR WMP Guidebook was created to aid local watershed groups in developing a WMP.
- Each section of the guidebook contains information and examples to help construct a valuable WMP that will address EPA's nine elements of watershed planning.



1) Community Based Planning

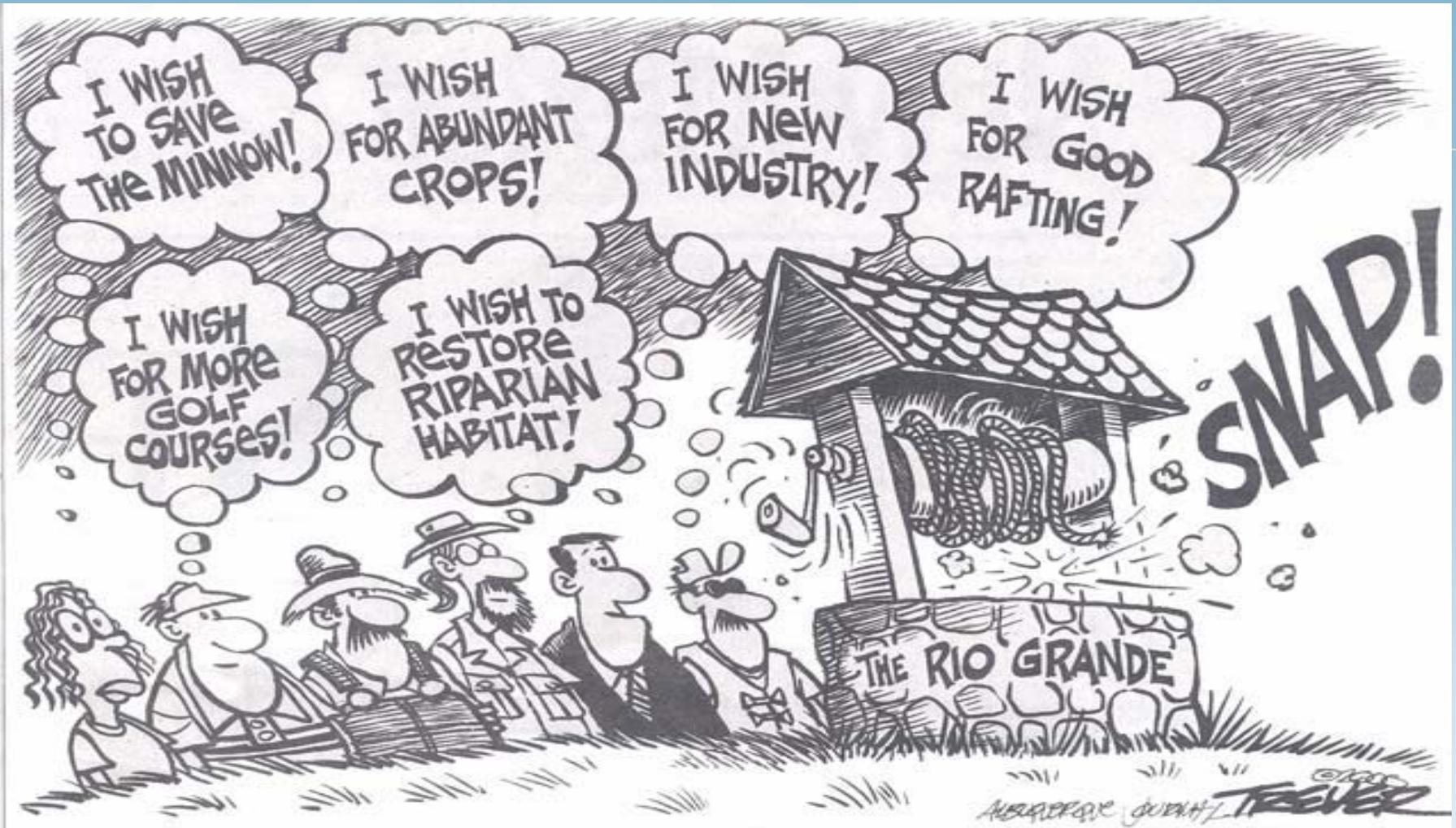
- Voluntary, locally-led planning process
- Integrates social, economic and environmental concern



Advisory Groups

1. Watershed Advisory Council (WAC) – examples Raccoon River Watershed Association (RRWA) or non-profit entities. Members such as - people in local community, community leaders, landowners, etc.
2. Technical Advisory – Basin Coordinators, Engineers, GIS Specialist, NRCS staff, Project Officers, TMDL staff.





clean water
starts with you.
IOWA DNR WATERSHED IMPROVEMENT

2) Vision Statement

- One sentence summarizing what the partners, landowners & citizens are striving for with the plan.



Vision Statement Example

“Carter Lake will be the crown jewel of the metropolitan area by being a stable, healthy ecosystem that provides for multi-use recreational activities and economic opportunities.”



3) Public Outreach

- Set your plan goals.
- Determine your target audiences.
- Research your audiences.
- Use research to develop your outreach strategy.
- Carry out the plan.
- Measure & evaluate effectiveness; promote success.



4) Watershed Anatomy

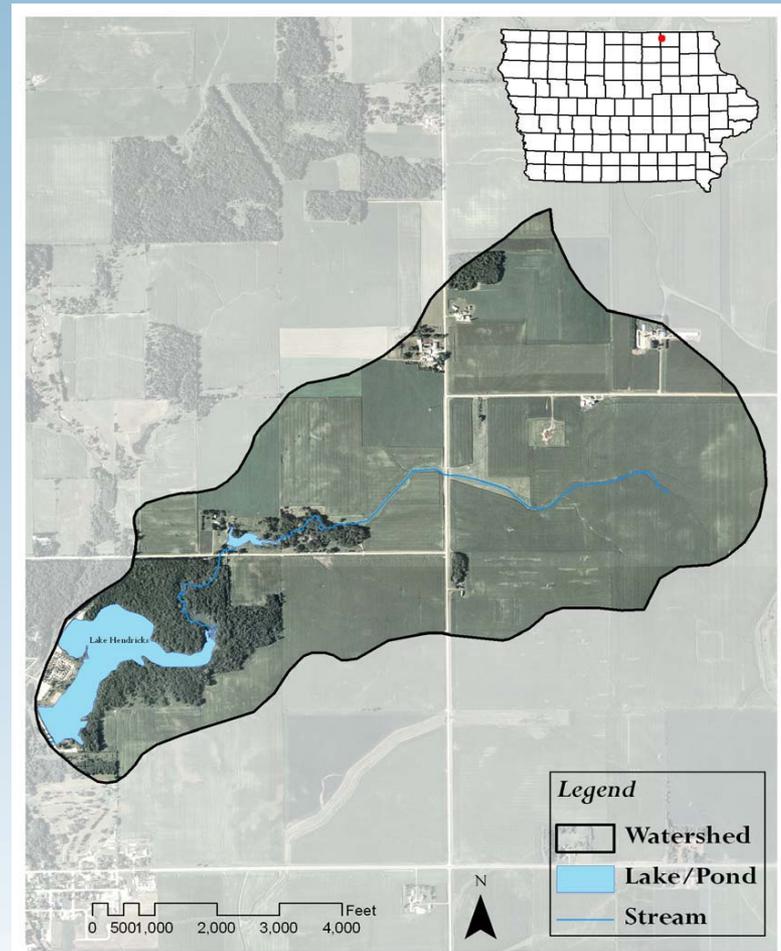
4.1 Determine Watershed Boundaries

4.2 Location Narrative and History

4.3 Physical Characteristics



4.1) Watershed Boundaries



4.2 Location Narrative and History

The six counties in the Rathbun Lake watershed (347,537 acres) include:

- **Appanoose** - 52,063 acres, 15 percent of the watershed
- **Clarke** - 15,500 acres, 4 percent of the watershed
- **Decatur** - 7,280 acres, 2 percent of the watershed
- **Lucas** - 90,997 acres, 26 percent of the watershed
- **Monroe** - 5,623 acres, 2 percent of the watershed
- **Wayne** - 181,697 acres, 51 percent of the watershed

The counties in the Rathbun Lake watershed are among the least prosperous in Iowa based on per capita income. These counties suffer some the highest poverty and unemployment rates and lowest levels of income and farm sales in the state. Approximately 15,000 people live in the Rathbun Lake watershed. There are nine communities and an estimated 857 farms in the watershed. The majority of farms are family owned and operated. Almost all the residents in the watershed rely on Rathbun Lake for their drinking water.

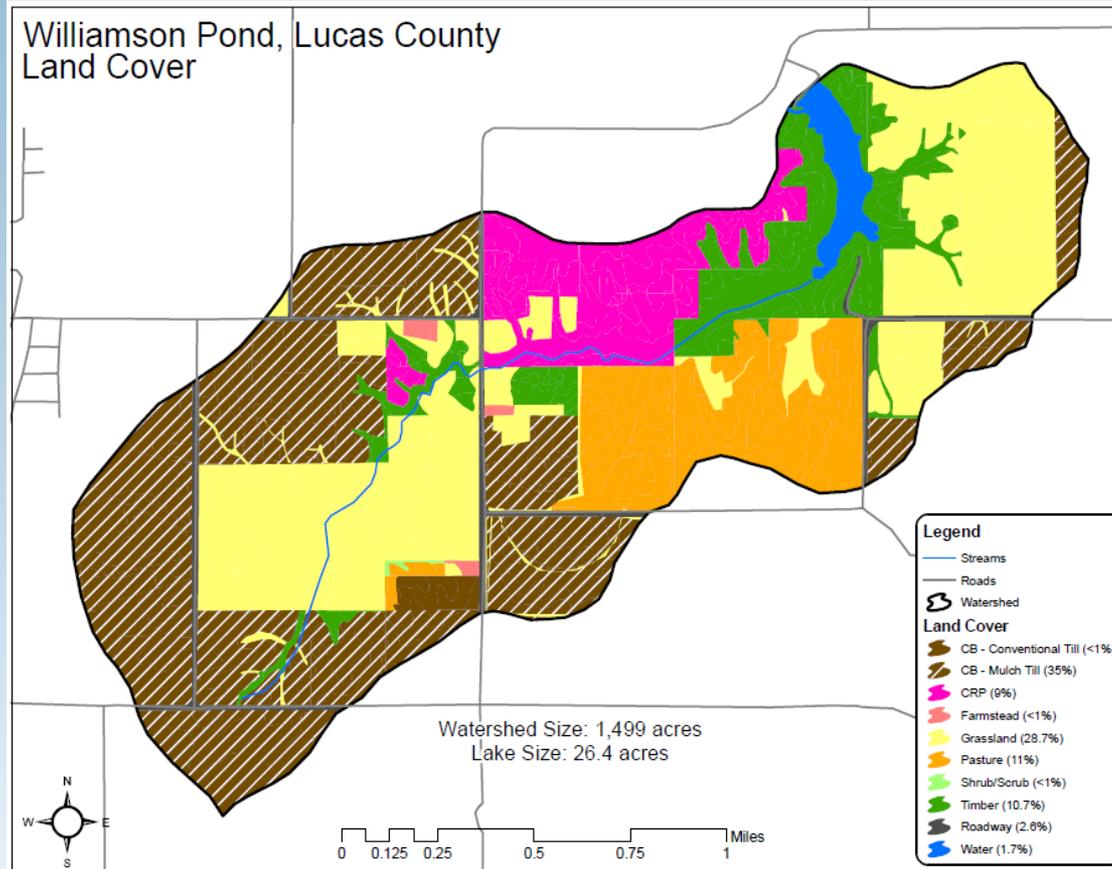


4.3) Physical Characteristics

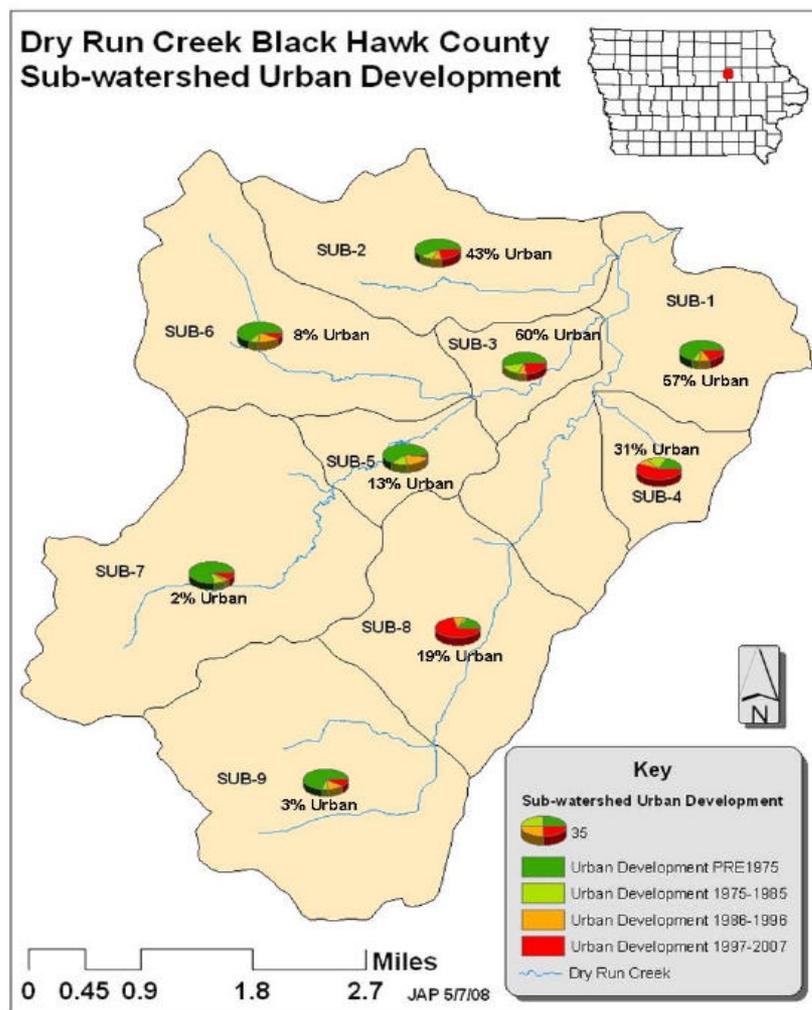
- Soils
- Hydrology
- Land Use
- Geology



4.3) Physical Characteristics



4.3) Physical Characteristics



4.3) Physical Characteristics



5) Pollutants and Causes

5.1 Designated Uses

5.2 Water Quality Data

5.3 Water Quality Improvement Plan (TMDL)



Designated Uses

The plan should include a complete list of all designated uses for the waterbody of concern, and should identify any designated uses that are not being met.



Designated Uses

One of the most common mistakes in development grants/project applications are groups who incorrectly reference the designated uses of the water body! (Or use the old language.)



Example: Designated Uses

Black Hawk Lake in Sac County is protected for the following designated uses:

- Class A1 – Primary contact recreation
- Class B (LW) – Aquatic life (lakes and wetlands)
- Class HH – Human health (fish tissue)

The 2006 water quality assessment has identified the Class A1 (primary contact recreation) as “not supported” due to aesthetically objectionable conditions caused by poor water clarity. The assessment states that this impairment appears to be due primarily to inorganic turbidity and secondarily to large populations of suspended algae.

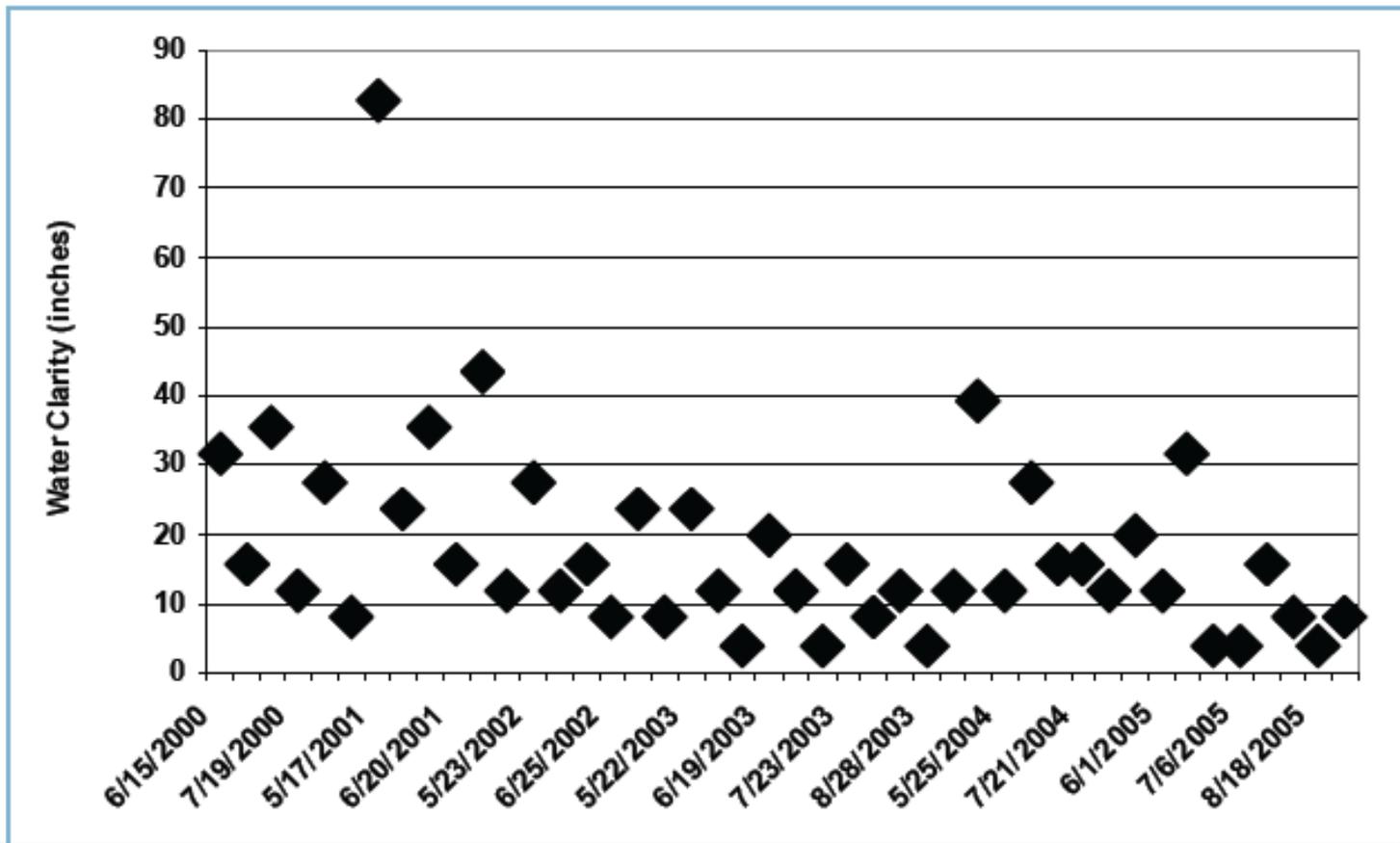


5.2 Water Quality Data

- Summarize water quality data that identifies, at a minimum, the pollutant(s) threatening or impairing the designated uses of the waterbody.
- Interpret the data for the reader. If they data is not explained/interpreted the data is useless!



Example: Water Quality Data



Example: Water Quality Data

WATER TRANSPARENCY

The transparency of water can limit or promote the production of certain species of algae, fish, and aquatic plants. The depth to which light will penetrate in a lake or reservoir is dependant upon several factors. Two main influences on light penetration are algae and suspended sediment.

Information on water transparency in Carter Lake was available from 2000 through 2005. Annual growing season water transparency measurements ranged from 4 inches on numerous dates to 83 inches in May of 2001 (**Figure 5-2**). The median water transparency from 2000 – 2005 was 14 inches. The goal established for the project is 54 inches. Carter Lake has exhibited a significant decreasing trend for water clarity since 2000.



5.3) Water Quality Improvement Plan

- If there is a completed Water Quality Improvement Plan, also referred to as a TMDL, for the waterbody, it must be summarized in the watershed management plan.
- Using the Water Quality Improvement Plan will save time and resources when preparing the Watershed Management Plan.



5.3) Water Quality Improvement Plan

Two key elements:

- Existing Load – The current amount of a pollutant present within the watershed.
- Load Allocation – The load capacity for the watershed.



Existing Loads/Pollutant Allocation

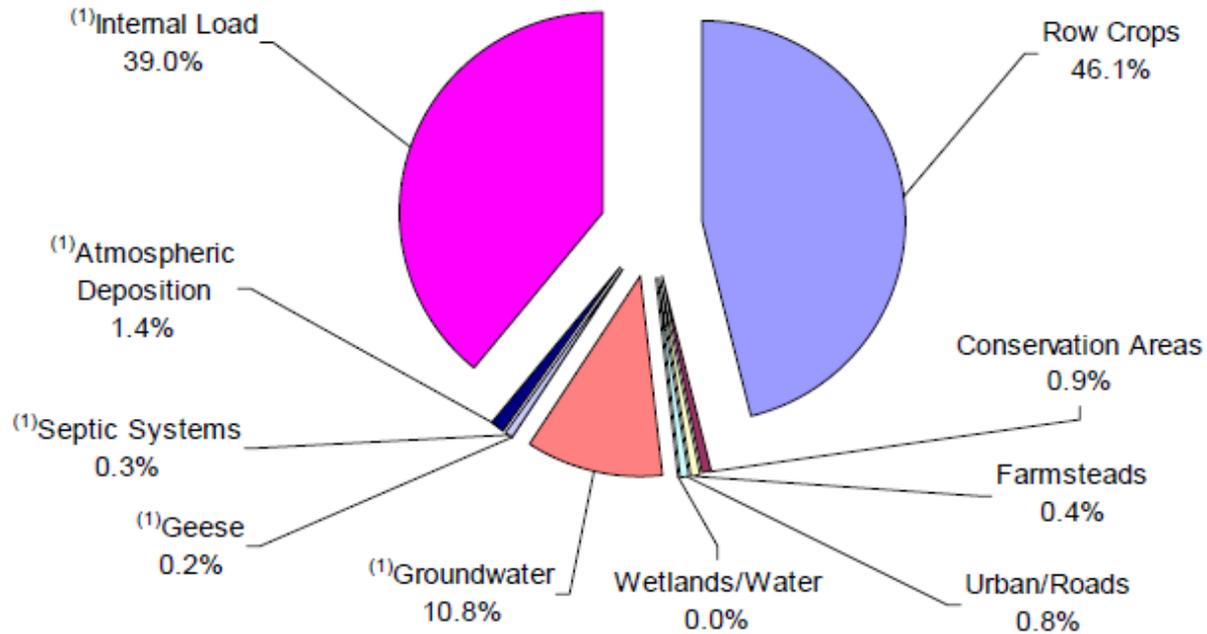
TP SOURCE	EXISTING LOAD (lb/yr)	LA (lb/yr)	LOAD REDUCTION (%)
ROW CROPS	8,561	3,168	63
CONSERVATION AREAS	176	158	10
FARMSTEADS	68	68	0
URBAN/ROADS	164	130	21
GROUNDWATER	2,160	2,160	0
GEESE	45	45	0
SEPTIC SYSTEMS	66	0	100
ATMOSPHERIC DEPOSITION	277	277	0
INTERNAL LOAD	8,469	1,694	80
TOTAL	19,986	7,699	61.5



TMDL - Sources

Percent of TP Load from Existing Sources

(1) These sources are not associated with area



What if I don't have a TMDL for the watershed?

- What is the impairment?
- How much water quality data is present?
- What is your time commitment?



What if I don't have a TMDL for the watershed?

- Example: Lake Hendricks (Howard Co.)
- No TMDL, but had 10 years of monitoring data.



TMDL Contacts

Additional Questions?

Contact Jeff Berckes - TMDL Program
Coordinator Ph# 515-281-4791



6.1) Identify Pollutant Sources

- Land use Data
- Sheet & Rill
- Sediment Delivery
- Stream Assessments
- Stream Bank Erosion
- Gully Assessments
- Livestock Assessments
- Bacteria Sources



Lake Geode Watershed Gully Head Cut Erosion

Total Head Cut Erosion: 343 t/y

Legend

Estimated Erosion

- 0 - 1 t/y
- 1 - 2
- 2 - 5
- 5 - 10
- > 10

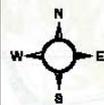
Mask

Watershed

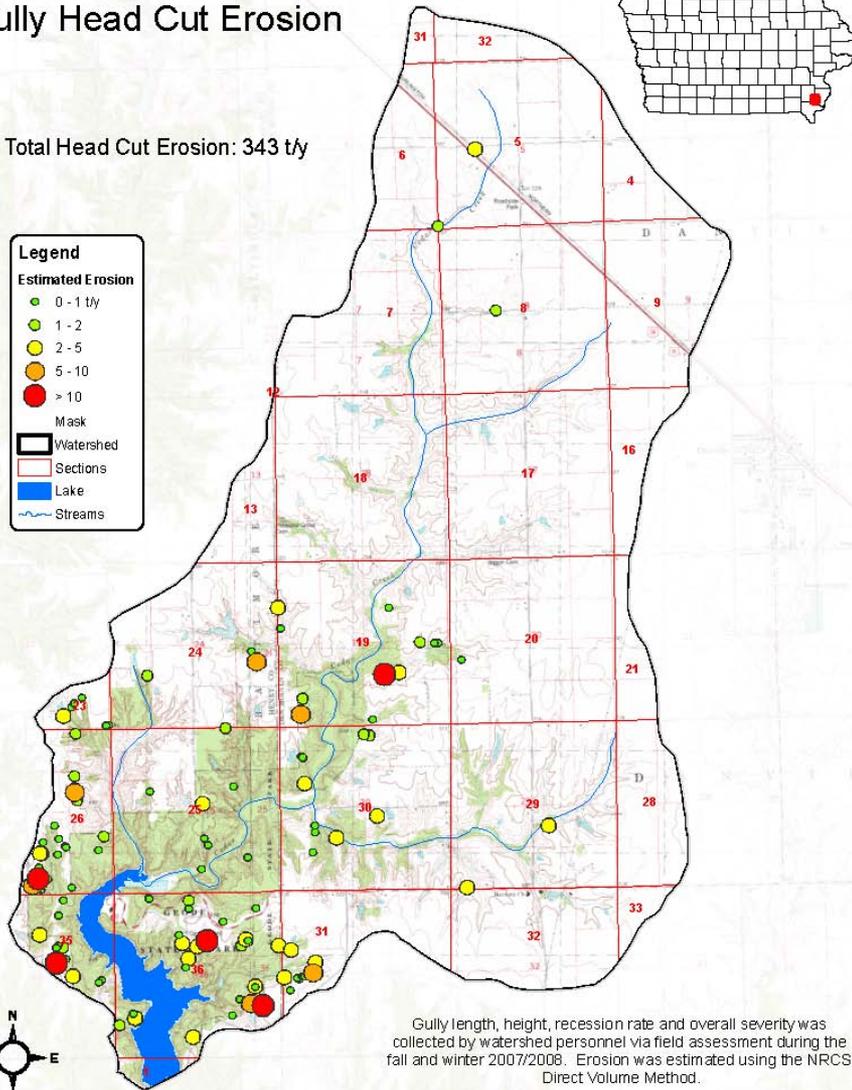
Sections

Lake

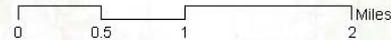
Streams



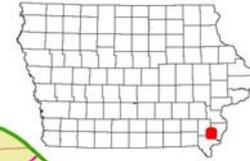
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Gully length, height, recession rate and overall severity was collected by watershed personnel via field assessment during the fall and winter 2007/2008. Erosion was estimated using the NRCS Direct Volume Method.



Lake Geode Watershed Potential Sediment Delivery



Total Sediment Delivery: 4,572 t/y
Average Sediment Delivery: 0.44 t/a/y
Watershed Size: 10,327 acres
Sediment Delivery Ratio: 25%

Legend

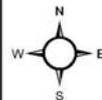
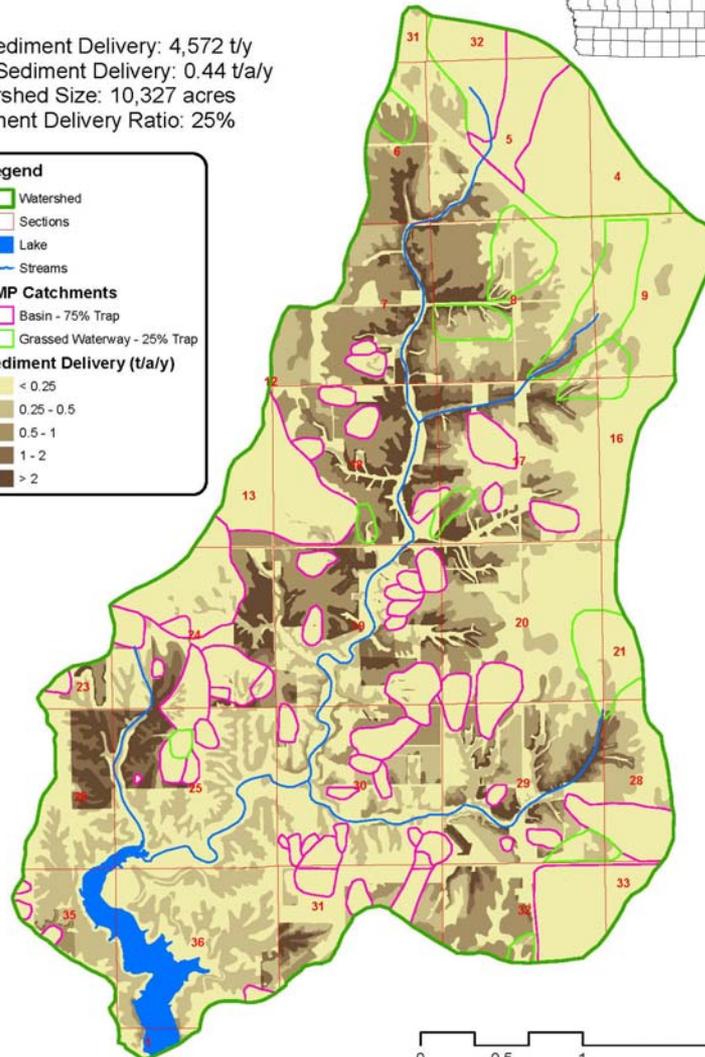
- Watershed
- Sections
- Lake
- Streams

BMP Catchments

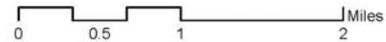
- Basin - 75% Trap
- Grassed Waterway - 25% Trap

Sediment Delivery (t/a/y)

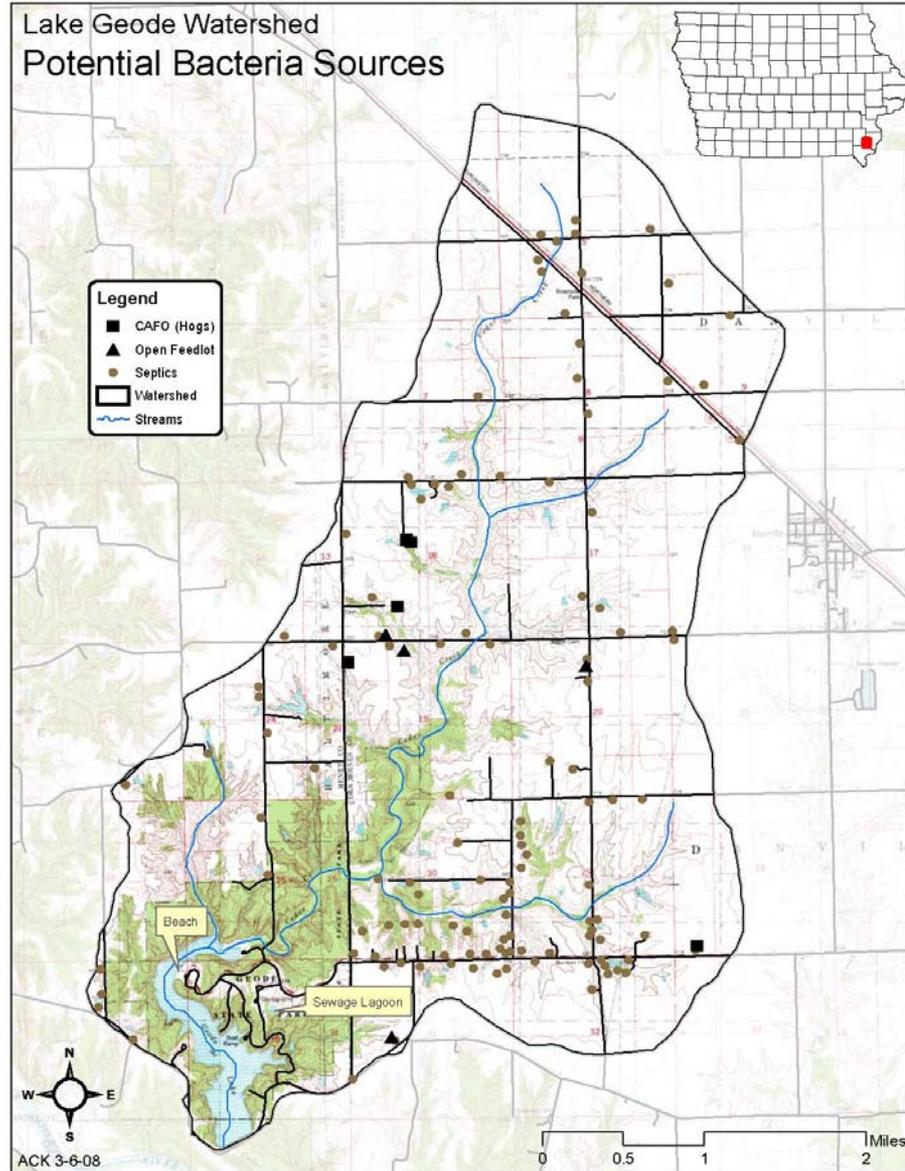
- < 0.25
- 0.25 - 0.5
- 0.5 - 1
- 1 - 2
- > 2



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Lake Geode Watershed Potential Bacteria Sources



6.2) Pollutant Data Analysis

- Quantifies pollutants that “impair” the waterbody.
- Pollutant load modeling and assessments.
- TMDL, estimated sediment delivery



7) WMP Plan Goals & Objectives

7.1 - Statement of Plan Goals and Objectives

7.2 - Target and Load Reductions

7.3 – Alternative Analysis (To be developed)

7.4 – Best Management Practices (BMPs)



Statement of Goals & Objectives

- Focus goals on the desired benefits and/or uses the waterbody provides to local stakeholders.
- Water quality and reducing the “impairing” pollutants should drive most goals.



Example

- Goal : Restore the lake to a healthy and safe place for people to boat, fish and swim.
 - Objective : Increase water clarity to fully support primary contact recreation (A1) WQS
 - Objective : Reduce bacteria levels and eliminate all beach swimming advisories



Target and Load Reductions

Must be specific water quality targets and consistent with goals and objectives.



Example

Reduce sediment load from 1000 tons/year to 500 tons/year

Increase median Secchi depth from 0.2 meters to 1 meter

Reduce bacteria below 126 org/100 mL (average) and 235 org/100 mL (max)



BMPs

- Identify management practices and measures to achieve water quality goals.



Examples

- Construct 6 sediment basins which will result in estimated sediment delivery reduction of 500t/y
- Eliminate geese population on beach in spring, summer and fall.



8) Water Monitoring Plan

8.1) Quality Assurance Project Plan
(QAPP)

8.2) Water Monitoring Plan



8.1) Quality Assurance Project Plan (QAPP)

- Document that specifies the data quality and quantity requirements of the study.
- Must be approved by DNR/EPA prior to sampling.



8.1) Quality Assurance Project Plan (QAPP)

Resources to assist in developing a QAPP

- Watershed Improvement Program Staff
- Monitoring and Assessment Section

EPA Links

- <http://www.epa.gov/quality/qapps.html>
- http://www.epa.gov/volunteer/qapp/vol_qapp.pdf



8.2) Water Monitoring Plan

- Guidance document containing all necessary information to set up a sampling network, collect samples, and analyze data.



8.2 Monitoring Plan

Two parts

- 1) Monitoring tracks short term improvements in water quality.
- 2) Did we actually “fix” the watershed?



Water Monitoring Plan

- To measure improvement in water quality during the progression of the watershed management plan the Secchi Depth Trophic State Index (TSI) will be monitored. The current Secchi Depth TSI is 67 and the benchmark for “fullysupporting” is 60



9) Implementation Schedule

- Chart plan progress, and ensure goals and objectives are met in a timely manner.
- The Implementation schedule keeps the plan on track and shows measurable achievements.



Goal 1: RESTORE LAKE TO A HEALTHY AND SAFE PLACE FOR PEOPLE TO BOAT, FISH, AND SWIM		Milestone Metric	Milestone Totals	Phase 1 (2009-2011)			Phase 2 (2012-2014)		
				Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Objective 1 & 2	Reduce nutrient concentrations in the lake by 35% and sediment loading from near lake sources by 70%								
Task 1	No-Till Incentive	Acres	150			150			
Task 2	Manure Management Incentive	Acres	250			75	175		
Task 3	Cover Crop Incentive	Acres	100			30		70	
Task 4	Grassed Waterways	Acres	10				5	5	
Task 5	Tile Filters	Number	4		1		3		
Task 6	Sediment Basins or Grade Stabilization Structure	Number	6		2	2	1	1	
Task 7	Grade Stabilization Structures	Number	3			2		1	
Task 8	Wetlands	Number	3		1		1	1	
Task 9	Streambank Stabilization	Feet	1000		500			500	
Task 10	Timber Stand Improvement	Acres	150	25		25	25	50	25
Objective 3	Increase a sense on local ownership of the lake with stakeholders and the public.								
Task 1	Park Kiosk	Number	2	2					
Task 2	Informational BMP Signs	Number	8		2	2	2	2	



10) Resource Needs

- More than a just list of agencies involved in the watershed plan.
- How and to what extent are the groups involved.
- Identify appropriate resource needs for each task.



Goal	Remove Williamson Pond from 303(d) Impaired Waters List.	Funding Source*	Costs	Phase 1: 2009-2012			
				2009	2010	2011	2012
<i>Objective 1</i>	<i>Implement watershed restoration practices in targeted areas to reduce sediment delivery by 453 tons/year and increase water clarity.</i>						
Task 1	Construct 5 grade stabilization structures	319,SIDCA,POL,Landowners	\$120,000	\$15,000	\$15,000	\$45,000	\$45,000
Task 2	Construct 13 Sediment control basins	319,POL,Landowners	\$137,500	\$32,500	\$30,000	\$37,500	\$37,500
Task 3	Construct 5 acres of grass waterways	319,POL,Landowners	\$7,500	\$3,000	\$3,000	\$1,500	
Task 4	Construct 5000 feet of terraces	319,POL,Landowners,EQIP	\$45,000	\$18,000	\$18,000	\$9,000	
Task 5	Improve 1 livestock facility	319,Landowners	\$5,000		\$5,000		
<i>Objective 2</i>	<i>Promote the Williamson Pond Watershed project.</i>						
Task 1	Salary & Benefits for 1/4 time Project Coordinator	319	\$48,000	\$12,000	\$12,000	\$12,000	\$12,000
Task 2	Travel/Training	319	\$2,800	\$1,000	\$600	\$600	\$600
Task 3	Supplies	319	\$2,000	\$500	\$500	\$500	\$500
<i>Objective 3</i>	<i>Increase funding opportunities for projects in the watershed.</i>						
Task 1	Apply for public owned lakes funding.	District, DNR	Staff Time	x	x		
Task 2	Implement EQIP on private owned land.	District	Staff Time	x	x	x	X
<i>Objective 4</i>	<i>Evaluate progress in watershed.</i>						
Task 1	Water Monitoring	319	To be determined	To be determined	To be determined	To be determined	To be determined
Task 2	Reducing Sediment Delivery to Williamson Pond	District, DNR	Staff Time	x	x	x	x
Task 3	Update Watershed Management Plan (yearly)	District, DNR, IDALS-DSC	Staff Time	x	x	x	x
Task 4	Submit plan, proposals for additional funding, based on progress and need	District, DNR, IDALS-DSC	Staff Time			x	
TOTALS			\$367,800	\$82,000	\$84,100	\$106,100	\$95,600

How long does it take to develop a WMP?

- Dozens of variables. (Size of watershed, nature of impairment, level of funding/staffing, plus many others.)
- IA DNR Watershed planning grant - up to 2 years



Who approves the plan?

- 1) Local Watershed Group – The plan should be locally led and supported
- 2) IA DNR Watershed Improvement Staff
- 3) EPA Region 7



Appendix A

- EPA Watershed Management Plan Review Criteria
- Also used by Watershed Improvement Staff to approve the plan



How is this Guidebook Different ?

- Plan to update every year or as comments are received.
- Tested by Watershed Groups – Currently 4 watersheds are utilizing the document to write a watershed management plan and providing feedback.



Understanding WMPs

<http://www.iowadnr.gov/water/watershed/wmp.html>



Questions?

