


## Components of an Effective Watershed Management Plan

and Incorporation into a Comprehensive Land Use Plan

Iowa Watershed Planning for Communities Program (I-WPCOP)




MSA Professional Services


## Watershed Planning is Community Planning

Iowa Code Section 13B.2(3), Revised in 2010

*“A municipality’s comprehensive plan developed using the guidelines under this section shall address prevention and mitigation of, response to, and recovery from a catastrophic flood.”*



Lake Delhi Flood  
July 24, 2010



## Watershed Planning is Community Planning

### Iowa Code Section 18B, Land Use-Smart Planning

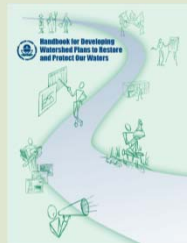
#### 13 Comprehensive Planning Guidelines

1. Public Participation
2. Community Characteristics
3. Current Land Use
4. Housing and Neighborhoods
5. Utilities (*e.g. storm water management*)
6. Transportation
7. Economic Development and Employment
8. Preservation of Agriculture & Natural Resources
9. Education
10. Unique Characteristics Important to Heritage & Quality of Life
11. Natural & Other Hazards, and Risk Mitigation Steps
12. Joint (Regional) Planning and Decision Making
13. Implementation

*Construction projects and/or land (re)development regulations; ordinances, management standards*




## EPA/IDNR 9 Elements of a Watershed Plan



1. Identify causes/sources of pollution
2. Determine necessary load reductions
3. Develop management measures to achieve goals
4. Develop implementation schedule
5. Develop milestones for measuring progress
6. Develop criteria to measure progress
7. Develop monitoring component
8. Develop information/education component
9. Develop Implementation Plan (*technical/financial assistance*)


## EPA/IDNR 9 Elements of a Watershed Plan

### *...Really 6 Critical Components...*

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## Local Participation

*The successful long-term implementation of the plan depends on public support*

### Social assessment

- What does public want?
- What do landowners want?
- What will landowners endorse?
- What does public need to see to embrace project?



Begin with the end in mind  
- Stephen Covey

## Watershed Inventory

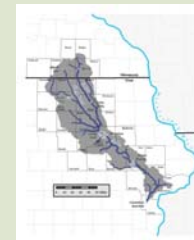
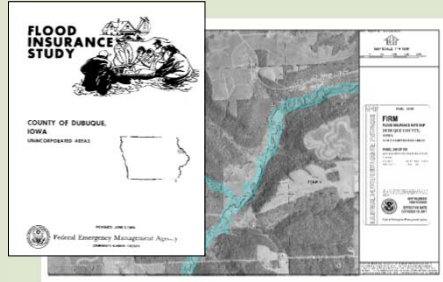
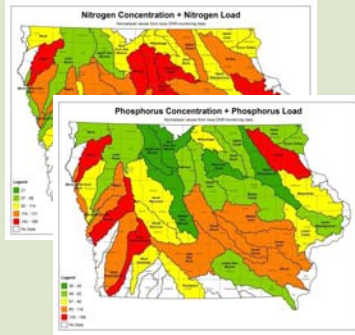
*Begins with accumulation of existing data*

### Accounting of Watershed Vital Statistics

- Land Use
  - Natural/Rural/Urban
    - Vegetative cover
    - Impervious cover (DCIA)
- Natural Water Resources Systems
  - Streams/Lakes/Wetlands/Groundwater Resources
- Constructed Water Resources Systems
  - Culvert/Bridges/Storm Sewers
  - Drain Tiles
  - Stormwater Management Practices
  - Dams/Levees

## Watershed Inventory

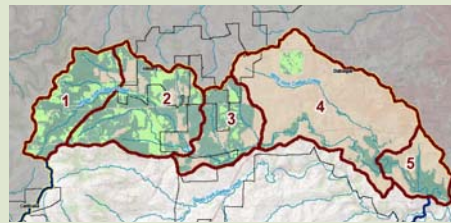
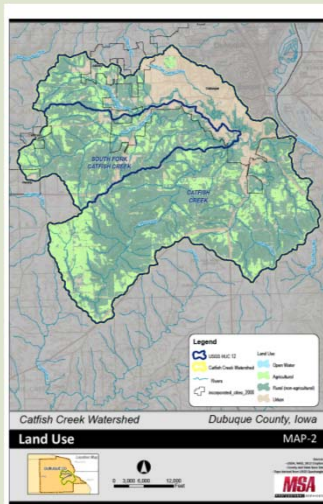
*TONS of available data on the internet!*



- USDA** – Soil Atlases
- USGS** – Topographic maps, stream flow
- Counties** – Topographic, land use, parcel ownership maps; aerial photography, agricultural data
- IOWATER** – Water quality data
- NOAA/State Climatology** – Rainfall Data

## Watershed Inventory

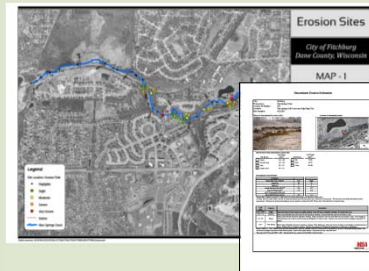
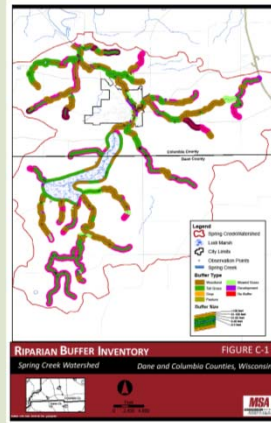
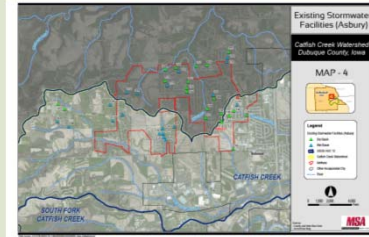
*Transitions to Mapping Exercises*



Acres	1	1-2	1-3	1-4	1-5
<b>Agricultural</b>	338.9	897.6	1011.2	1107.1	1107.1
<b>Rural/Non-Agricultural</b>	868.7	2088.7	2773	3044.5	3335.7
<b>Urban</b>	123.9	525.4	892.2	4173.2	4670.3
<b>Open Water</b>	0.4	11.7	11.7	12.1	12.1
<b>TOTAL</b>	1331.9	3523.4	4688.1	8336.9	9125.2
<b>Rv</b>	0.1	0.1	0.1	0.2	0.2
<b>Approximate DCIA</b>	3.7	5.7	6.8	15.7	16.0

## Watershed Inventory

*Continues with Field Reconnaissance*

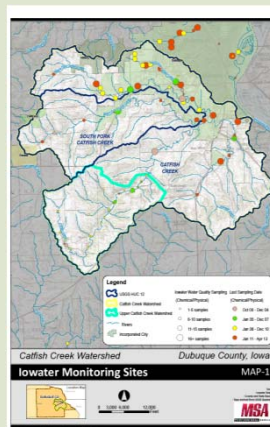


You can observe a lot by just watching  
- Yogi Berra

## Watershed Assessment

*The inventory tells us what we have,  
The assessment tells us what condition things are in*

- Public attitudes and awareness
- Nutrient/Pollutant Loads (monitoring)
- Surface and groundwater hydrology
- Stream conditions (hydraulics)
- Urban stormwater runoff
- Agricultural runoff conditions



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→ Watershed Modeling



## Problem Identification

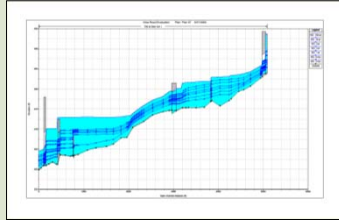
### *Known/Documented Issues*

- Water Quality Advisories (beach closures – Bacteria/Algae)
- Algae Blooms/Poor Clarity
- Trash
- Fish Kills
- EPA listed as impaired (303d)
- Bank Failures/Scour
- Fish Passage/Breeding (Temp)
- Flooding

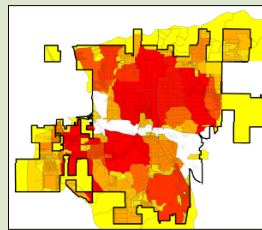


## Problem Identification

### *Predicted/Modeled Issues*

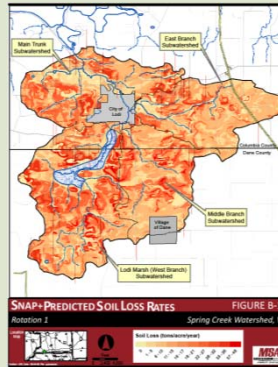


**Future Flooding**



**Urban Pollutant Loading 'Hot Spots'**

### *Rural Soil Loss*



**Existing undocumented issues & Future potential issues**

## Solution Evaluation

With little effort, a person can develop a list of 'good' management practices that would improve watershed quality, but how does one decide what the 'best' management practice is?

Urban	Rural	Watershed/Riparian
Detention Ponds	Detention Ponds	Bank Stabilization Repair
Bio-Infiltration Practices	Bioreactors	Wetland Restoration
Street Sweeping	Tillage Practices	Stream Restoration
Leaf Collection	Riparian Buffers	Buffer Strips
Housekeeping	Nutrient Management	
(Re)Development Standards	Livestock exclusion	
Septic Systems	Terracing	
	Filter Strips	

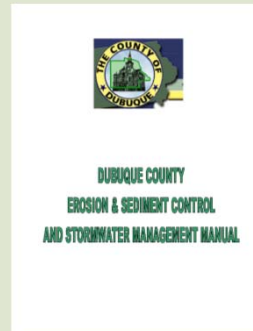


*Permeable Pavers Infiltration Practice*



## Solution Evaluation

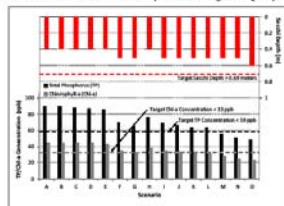
- Management Policies
- Stormwater Ordinance, Other Ordinances
- Low Impact Development
- Environmental Site Design
- Comprehensive Land Use Plan
- Hazard Mitigation Plan
- Voluntary Landowner Practices



## Implementation Plan

Alternative	Alternative Management Practice										
	Benefits	Costs	Water Quality	Stormwater	Water Quality	Water Quality	Water Quality	Water Quality	Water Quality	Water Quality	Water Quality
A	X										
B		X									
C			X								
D				X							
E					X						
F						X					
G							X				
H								X			
I									X		
J										X	
K											X
L											
M											
N											
O											

CHART 20 - Results of Alternatives Analysis for Achieving Water Quality Load



*More than just solution prioritization*

1. Schedule
2. Milestones
3. Criteria for measuring progress
4. Information/Education
5. Financing

## Local Participation

*The successful long-term implementation of the plan depends on public support*

### Public Buy-In

- Engagement in Process?
- Believers in Action Plan?
- Visible Action?
- Measureable Success?
- Regular Communication?
- Plan Revisions?
- Changing Goals?



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