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United States Department of Agriculture

Natural Resources Conservation Service

Coon Creek Watersheds Design Alternatives Public Scoping Meeting

June 23, 2021 | M&E Consultant Team

Natural Resources Conservation Service

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Project Purpose

Flood prevention and damage reduction in the watersheds.

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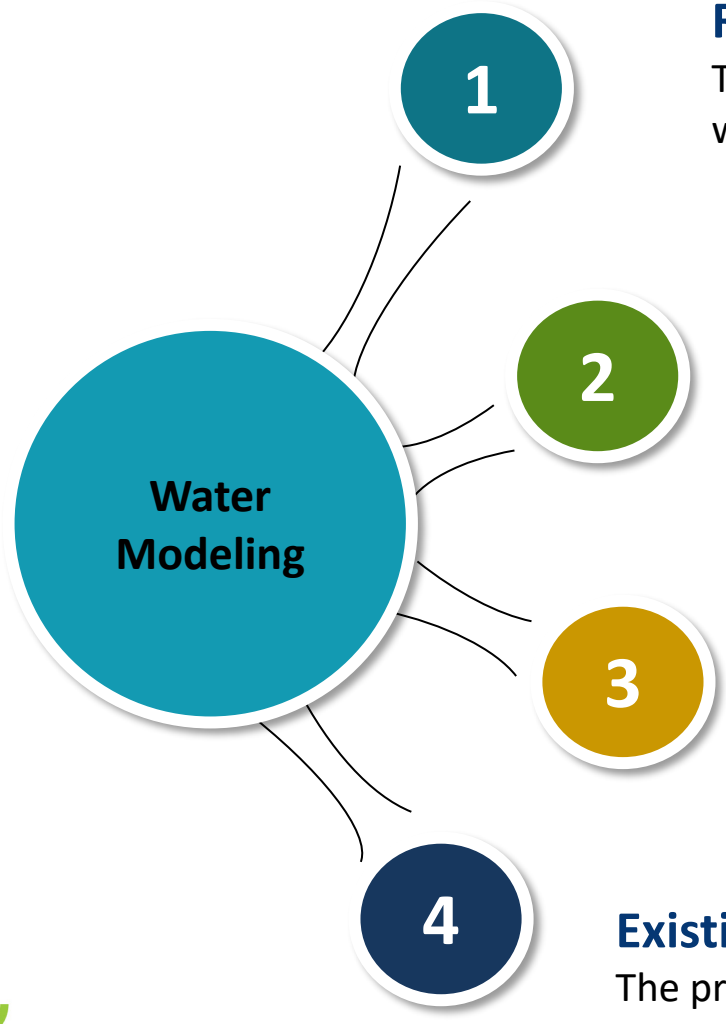
Focus Areas

1. 3 Failed Dams
2. 11 Remaining Dams

The Analysis



Retrospective B/C Ratio Analysis

The retrospective B/C Ratio for each watershed since 1958

As-Built Dams Analysis

The projected flood protection impact for each watershed with all dams in as-built condition

No Dams Analysis

The projected flood protection impact for each watershed with all dams decommissioned

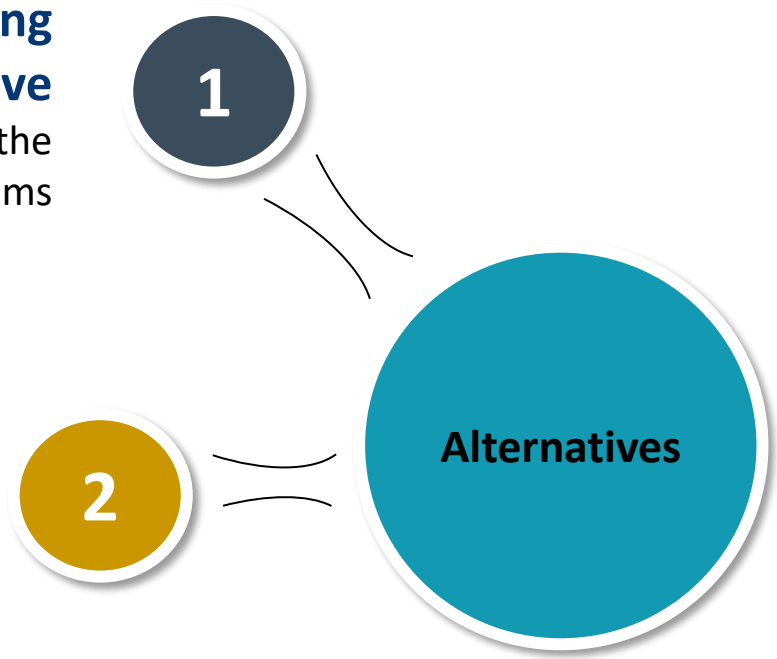
Existing Conditions Analysis

The projected flood protection impact for each watershed with the existing conditions

Viable Alternatives

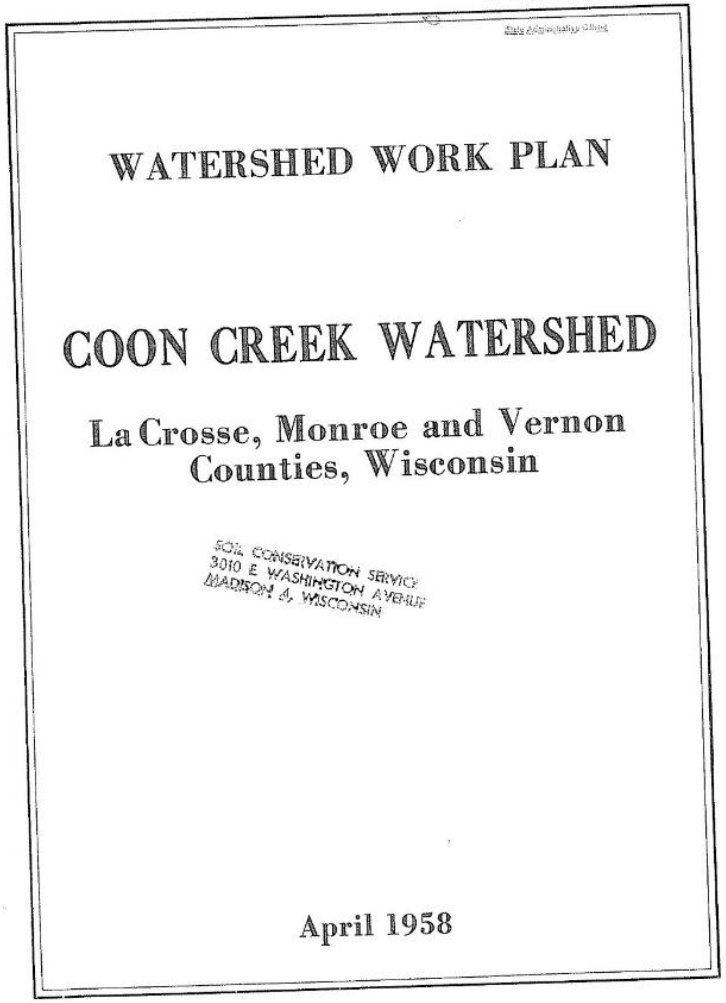
Decommissioning Alternative
Decommissioning the failed dams

Replacement Downstream Alternative
Replacing the failed dams immediately downstream



Coon Creek Previous Studies

- **1958 Watershed Work Plan**
  - Watershed Plan B/C Ratio was 1.2
  - The 14 structures reduced the 50-year floodplain by 338 acres
    - ✓ 1,303 to 992 acres
  - 19% of the watershed controlled with the 14 structures
- **1996 Krug Rainfall-Runoff Characteristics Study**
  - The 14 structures reduced the 2-year peak discharge 13% and the 100-yr peak discharge 17%


WATERSHED WORK PLAN

COON CREEK WATERSHED

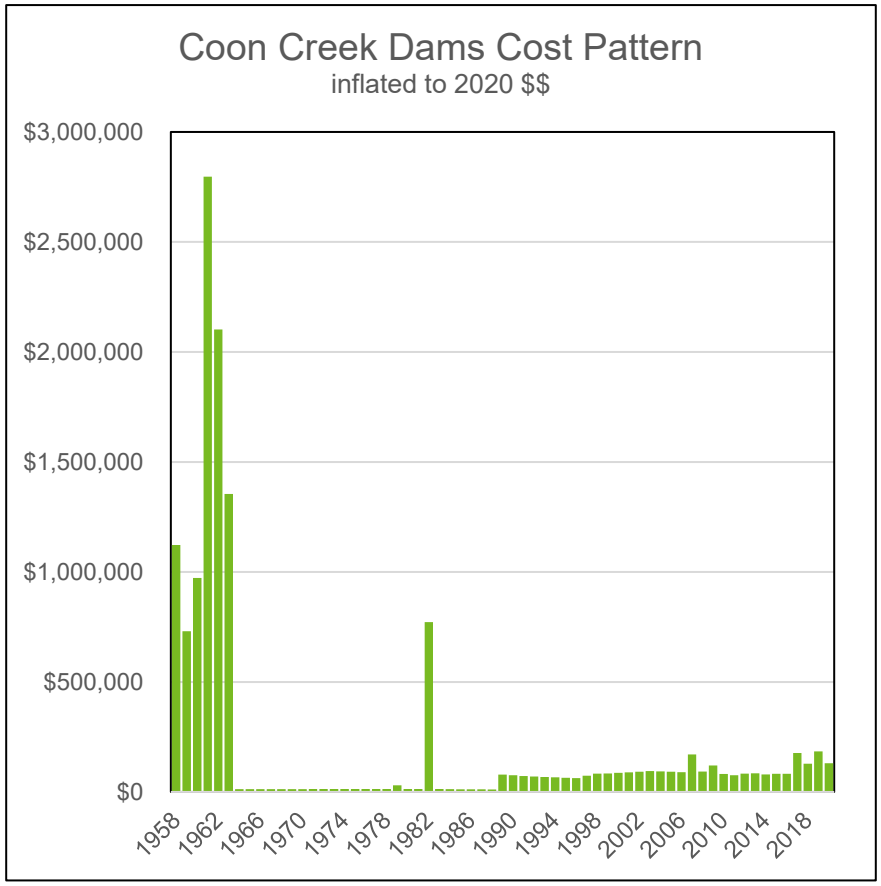
La Crosse, Monroe and Vernon Counties, Wisconsin

SOIL CONSERVATION SERVICE
3010 E. WASHINGTON AVENUE
MADISON 4, WISCONSIN

April 1958

Historic Watershed Cost by Year

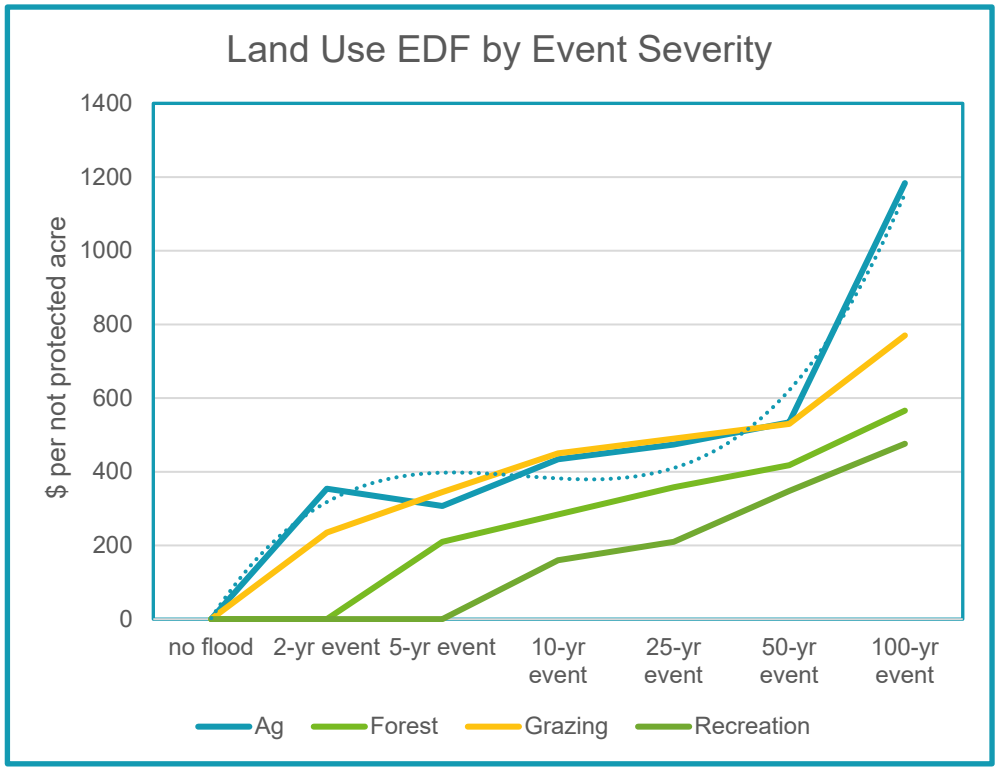
In 2020 Dollar Terms



Front End Loaded

Economic Damage Functions (EDF's)

- Dam protection benefits based on avoided flooding costs
- Avoided costs can be area, linear & per unit based
- We estimated:
  - 4 area EDF's
  - 5 linear EDF's
  - 2 per unit EDF's
- Example is 4 land use protections by event intensity by $ avoided cost/acre
- Units are 2020 $/acre



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Retrospective Benefit Cost Analyses

Measured by NPV & B/C ratios in 2020 Dollar Terms

- Dams avoided some flood costs over 60 years
- Original estimates were optimistic.
- Dams protect some land uses, roads, lines, structures, crossings & reduce emergency services
- Total benefits were low because dam shadows are small.
- Recreation protection is a surprise dominant benefit—41.7%

Present Values by Protection Type	Present Value
Land Uses	$2,027,530
Infrastructure	$3,461,536
Structures	$543,155
Crossings	$152,697
Recreation	$6,016,726
Protection Sum (2020$$)	$12,201,644
System Costs (2020$$)	$13,304,083
Net Present Value (2020$$)	-$1,102,439
Lifespan B/C ratio	0.92

Failed Dam Economic Analyses

In Millions of 2020 equivalent dollars

- Flood protection by itself does not meet economic criteria
- Avoiding decommission costs is a significant factor
- Recreation protection & production helps too

Criteria by Dam	CC 21	CC 23	CC 29
NPV Replace Dam	-$3.88	-$3.57	-$4.15
B/C Ratio Replace Dam	0.05	0.05	0.11
NPV Decommission	-$1.84	-$1.06	-$2.03
NPV Avoid Decommission	-$1.84	-$2.51	-$2.12
B/C Avoid Decommission	0.50	0.34	0.55

Baseline Condition with and without the Dams

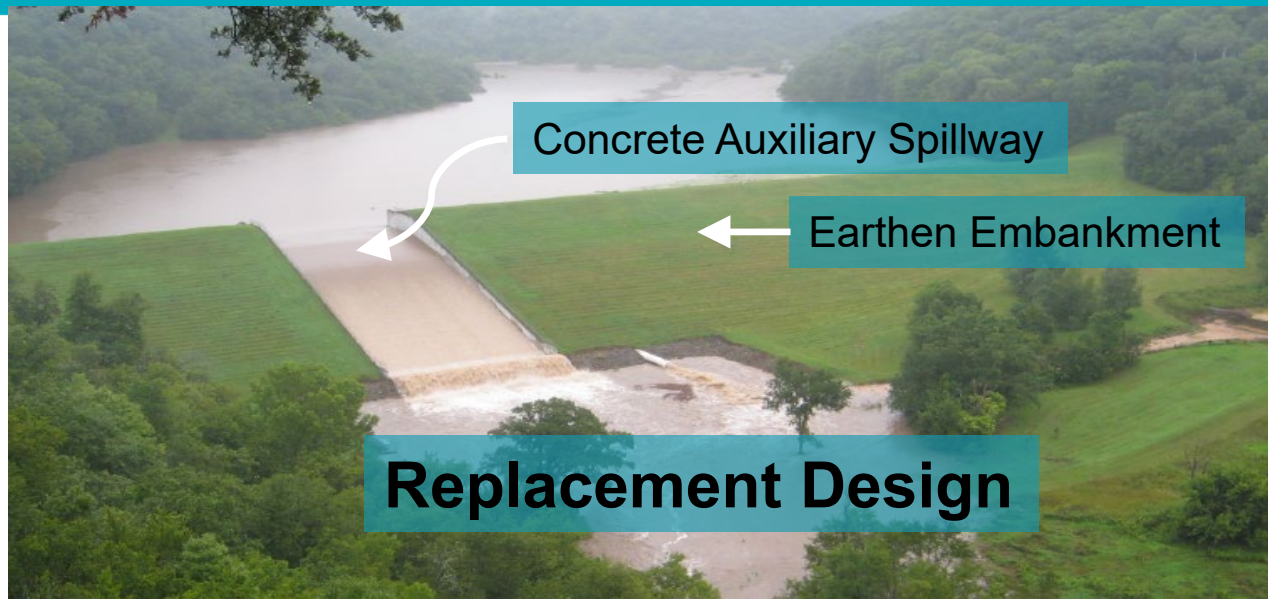
	100-year floodplain acres with dams	Increased floodplain acres
With all 14 Dams	2,705	-
Without any of the 14 Dams	2,933	228
Without 3 Failed Dams, Others Remain	2,796	91

Repair

Would result in replacement and is not feasible.

Dam Replacement Downstream

Replace structures immediately downstream to meet low hazard class



Dam Decommissioning

- **Excavate notch in the dam to pass 100-yr storm**
- **Grade slopes to a 2:1 slope**
- **Embankment not removed completely**
- **Remove riser and outlet then grout pipe shut**
- **No sediment removal included**
  - Annual CC Basin sediment produced = **98K tons** *(Based 2009 Trimble Study)*
  - Total sediment accumulated behind each failed structure = **12K tons**

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CC 21 – Luckasson

Annual CC Basin Sediment: 98,000 tons

Accumulated Sediment Behind each failed structure: 12,000 tons

Photo: June 2021

Replacement vs. Decommissioning Alternatives

With Replacement of Failed Dams

- Replaced dams provide 29 acres of flood protection
- B/C Ratio
  - CC 21 – 0.50
  - CC 23 – 0.34
  - CC 29 – 0.55
- $12,300,000 Construction Cost

Decommissioned Failed Dams

- $2,860,000 Construction Cost

FLOW DEPTH AT THE COON VALLEY BRIDGE

DECOMMISSIONED FAILED DAMS = 15.6’
REPLACE FAILED DAMS = 15.5’

FLOW DEPTH AT THE CHASEBURG BRIDGE

DECOMMISSIONED FAILED DAMS = 12.4’
REPLACE FAILED DAMS = 12.1’

Upland Treatments and Floodplain Improvements

Do not meet the project purpose alone

Conservation History

Productivity & Conservation Gains

1930's - Change

Conservation Practices

From left, Brian, Ruth and Greg Eirschele accept the Monroe County Tree Farmer of the Year Award at their R&R Ranch, a 540-acre farm in Tarr Valley. Herald photo by Pat Mulvaney. Also pictured is the late Ray Eirschele, who passed down his philosophy of environmental stewardship to his children. Contributed photo

A spirit in the woods

Tarr Valley tree farmers remember father's stewardship of the land

By PAT MULVANEY
Herald Editor

Ray and Ruth Eirschele spent over the last half century building their legacy.

It can be seen on their 540-acre farm in Tarr Valley west of Tomah as well as in their four children.

That legacy is environmental stewardship, for which the Eirschele farm, R&R Ranch, received recognition as the 2020 Monroe County Tree Farmers of the year.

R&R, of course, stands for Ray and Ruth and not as son Brian points out, rest and relaxation. He and his siblings, Greg, Steven and Kathe, were involved since their childhoods in populating the property with saplings that over time have grown into mighty oaks, black walnuts, spruces and balsam firs.

In the past 50 years, the Eirscheles planted over 100,000 trees on the land. Ruth credits her late husband, who passed away in 2019, for creating the wooded landscape.

"It's because of Ray all these trees got planted," she said.

Ruth grew up in South Dakota, a state more known for its wide-open spaces than its trees, and moved to Tomah to take a nursing position at the VA. She then ended up at Tomah Memorial Hospital, where she retired in 1995.

She met Ray, a Tomah native and veteran of the Marine Corps who was working as a lineman for Wisconsin Power & Light, where he spent a 39-year career. They married and in 1962, they bought the farm.

Ruth said Ray's original intent for purchasing the property was to plant trees since the land wasn't ideal for farming — although they did farm, too. She attributes her late husband's affinity for arboreal landscapes to his early childhood.

Ray lost his father when he was seven years old and planted a tree in his dad's honor at the cemetery where they both are laid to rest.

"His love of trees has to go back to a very early age," said Ruth.

"He just always loved trees," said Greg. "He was always a very strong environmental advocate."

Brian ascribes some his father's sense of environmental activism to the 1962 book by Rachel Carson, "Silent Spring", in which Carson exposed the damage chemical pesticides were doing to the planet and called on humans to be stewards of the earth. Brian said the book had a big impact on his father.

Both Brian and Greg, who still live in the area, are quick to point out that their mother also deserves credit.

"Everything he (Ray) did he could not have done without Mom," said Greg, with Ruth adding she dug the holes, while Ray planted the trees.

Clint Gilman, a forester for the Department of Natural Resources who nominated the Eirscheles for the award, indicated that in 1999 they enrolled the farm in the Tree Farm Program, which is a national program. The farm also has been in the Managed Forest Law Program since 1992.

While the Tree Farm Program is national, each county chooses a Tree Farmer of the Year and Gilman said he nominated the Eirscheles because of their sound forest management practices, their enrollment in multiple programs and for the number of trees they planted over the years.

He also pointed to the diversity on the property, which includes two restored prairies, totaling over 25 acres, which also serve as habitat for the endangered Karner blue butterfly, and 30 acres of organic-certified land, which is currently in hay.

The Monroe County Natural Resource and Extension Committee each year recognizes the Land Stewardship Award winners, which includes Conservationist of the Year, Conservation Farmer of the Year and Tree Farmer of the Year.

Winners are usually honored at a banquet in January but due to COVID, the event was cancelled and 2020 winners will be recognized along with the 2021 winners next January.

The winners are outstanding individuals, nominated and selected by their peers, who have a history of land stewardship and commitment to conservation.

The Eirscheles are the 2020 Tree Farmers of the Year. The 2020 Conservation Farmer of the Year is the David F. & Diane Brueggen Family, while Maurice Amundson is the 2020 Conservationist of the Year.

Cashton family named Conservation Farmers of the Year

By PAT MULVANEY
Herald Editor

Monroe County farmers David and Diane Brueggen have a strong tradition of conservation that comes not only from their family but is rooted deeply into the ridges and valleys of the Cashton area where they call home.

Diane's father, Lawrence Cashion, bought the farm west of Cashton, where she and her five brothers were raised in 1960. The 90-acre property, is located in the Coon Creek Watershed, which is the first sanctioned watershed in the U.S., and is a short distance from the farm that had the first conservation plan in Monroe County.

The land became a Discovery Farm, used as a testing site to measure the water quality of rain runoff from the fields that entered the streams below. It also was used by schools as a soil-judging classroom.

"Those are the kinds of things that make us know this is important land and very precious," said Diane.

Her father's stewardship of the land earned him the honor of Monroe County Conservation Farmer of the Year in 1966. That same honor was most recently bestowed on Lawrence's daughter and son-in-law and their family.

The Monroe County Land Conservation Department named the Brueggens the 2020 Monroe County Conservation Farmers of the Year.

David was raised on a farm on the east side of Cashton towards St. Mary's Ridge, where his father, Phillip, milked a small herd of cows.

But he says it was his grandfather, Edgar Williams, who influence him most. "He was an excellent cow person," he recalled.

David and Diane bought their own farm south of Cashton in 1979 and began their life in the dairy business. The farm consists of 287 acres, where the Brueggens milk 160 cows and raise all their replacement animals.

Having little money when they started out, their recreation consisted of taking the family fishing in Jersey Valley, a pastime that gave them a deeper connection to the land, and one that they still enjoy today.

"We do appreciate the clean water because our family loves using it," said David.

Over the years, they implemented a number of conservation practices, including promoting and using no-till farming. They also employed contour stripping, grass waterways, a waste storage system and their property has a water retention structure to slow rain runoff.

While their daughter Brenda, a physical therapist in Hudson, and son, Michael, a fireman for Cripit Roofing in West Salem, prefer life off the farm, son Travis, who trained as an electrician, couldn't resist the lure of the land pulling him back.

The Conservation Farmer of the Year honor extend to Travis and his wife Katie, who manage the farm, while raising their three young children, Avery, Abilene and Royal.

The Brueggens' efforts didn't go unnoticed by neighbors Rod and Mary Beth Smith, who nominated them for the honor.

"Together, these families conserve and preserve not only the fertile soil by using good crop growing techniques, they also pass onto the next generation the value of a hard day's work, the importance of strong

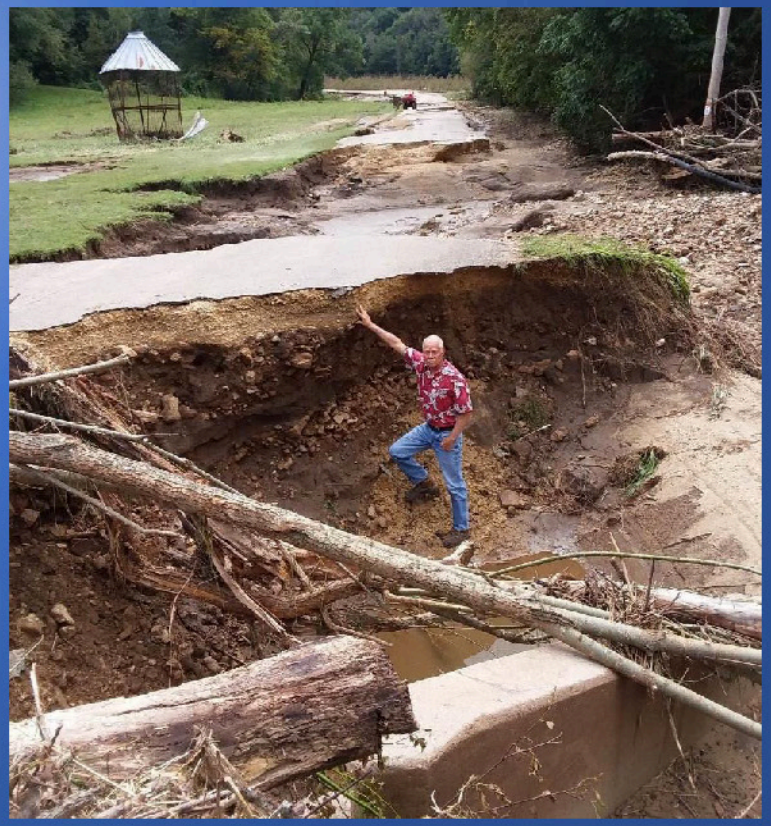
FARMERS cont. on pg. 5

The Brueggen Family of Cashton were named Monroe County Conservation Farmers of the Year. Back row, from left, Katie holding Royal, Travis, Diane and David. In front are Avery and Abilene. Contributed photo

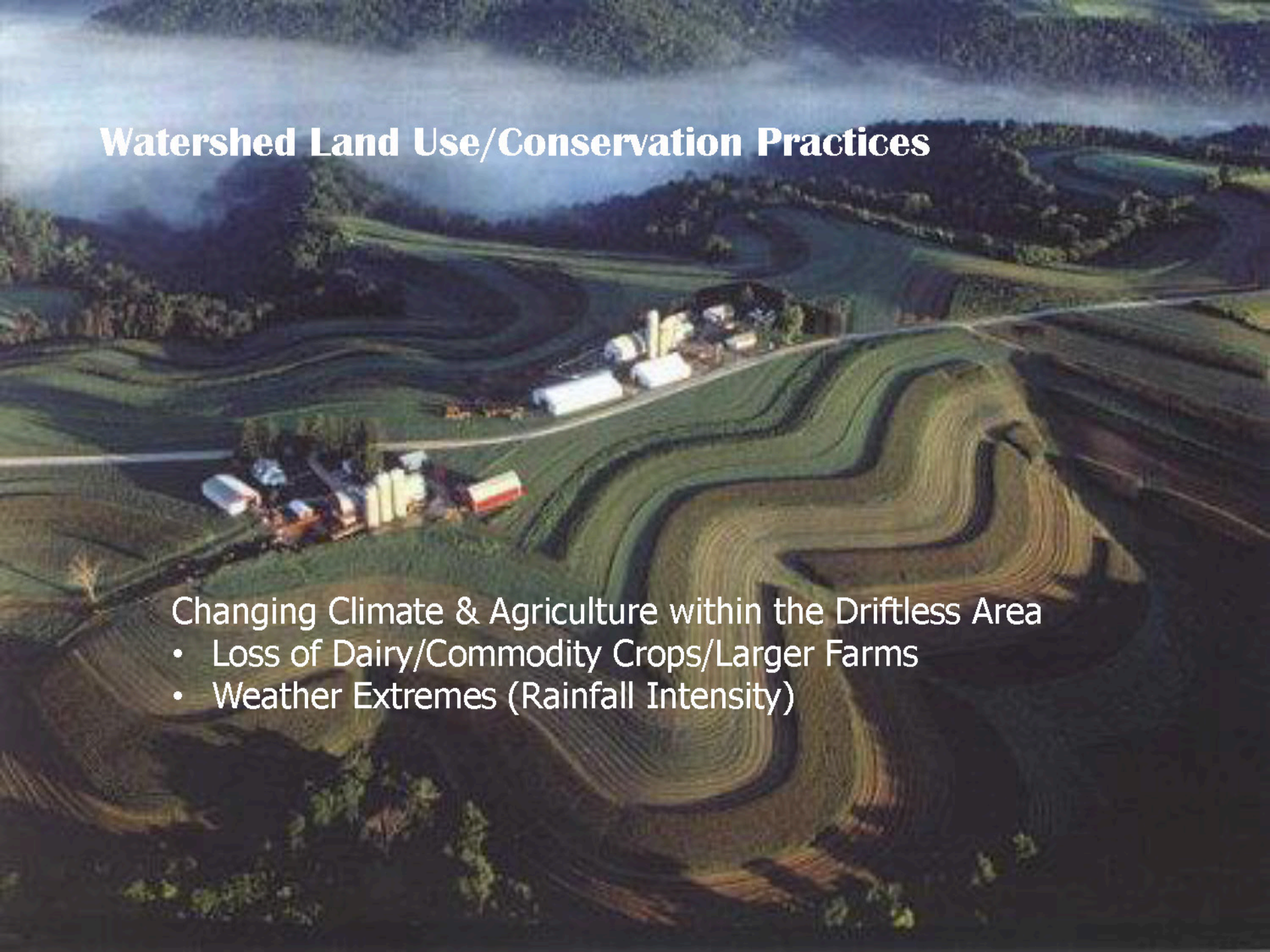
Land Stewardship: 1948 - Present

Extreme Events: 2007-2019

August 28, 2018 – Flood Event



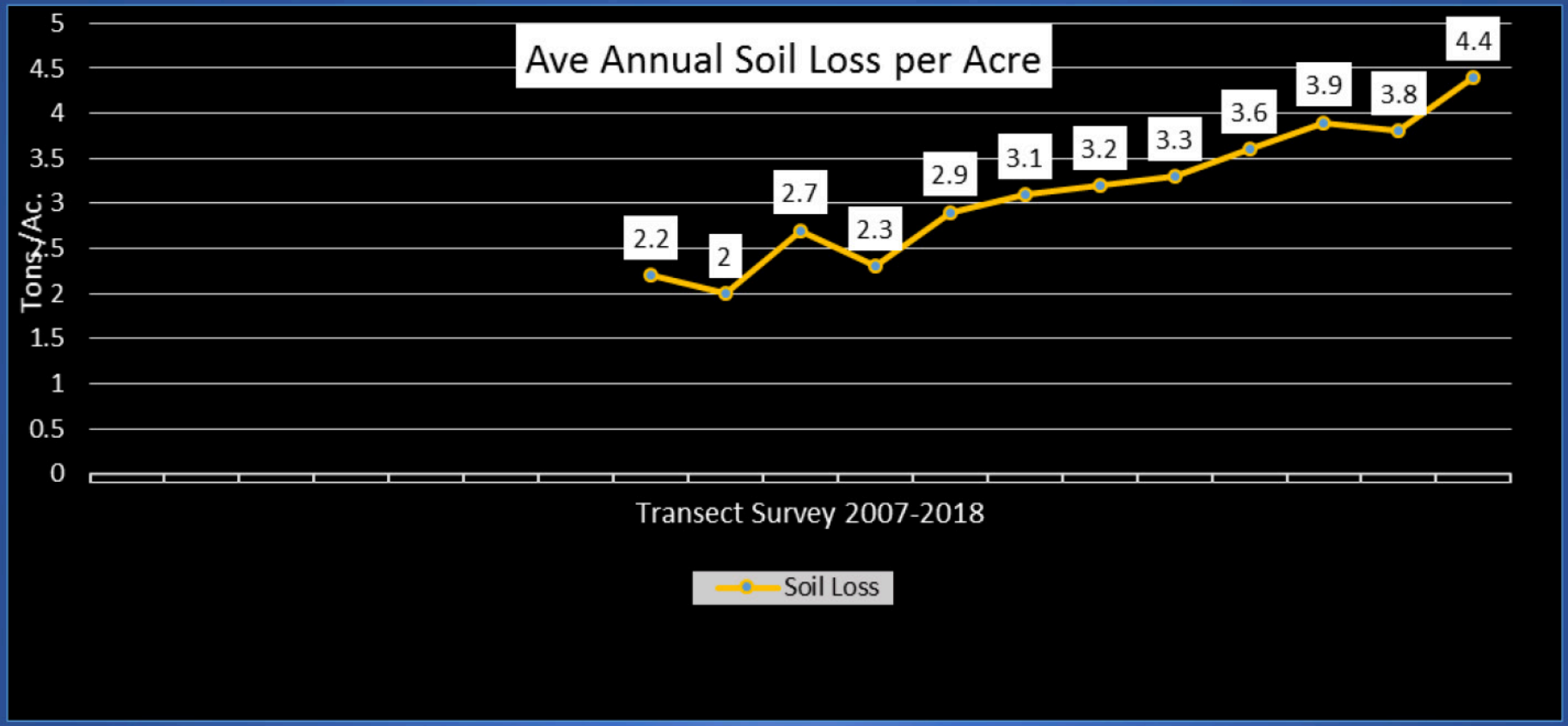
Watershed Land Use/Conservation Practices



Changing Climate & Agriculture within the Driftless Area

- Loss of Dairy/Commodity Crops/Larger Farms
- Weather Extremes (Rainfall Intensity)

Soil Erosion & Delivery - Cropland



2019	66,609 ac.	17,438 ac.	3.8 T/A
2020	64,894 ac.	18,296 ac.	3.9 T/A
2021	67,181 ac.	20,583 ac.	3.9 T/A

Climate Change: (Driftless Area)

- Rainfall Intensity 2”-6” hour

Investigating Paths to Increased Flood Resilience in the Coon Creek Watershed

Lead Advisor:
Eric Booth
Associate Scientist

Students:
Rajpreet Grewal, Cathryn Herlihey, Jackson Parr, Robert Rosner, Rachael Sodeman, Kayla Wandsnider

Advisory Committee:
Caroline Gottschalk-Druschke, Adena Rissman, Stephen Ventura

Rainfall Analysis Team: Daniel Wright, Zhe Li

Nelson Institute for Environmental Studies
WATER RESOURCES MANAGEMENT
Department of Agronomy
Civil and Environmental Engineering

Enhancing Infiltration

Through Land Use & Land Management

- Literature Review
  - Cropland management: contour strips, buffer strips, prairie strips, and no-till can all increase infiltration
  - Land use: forest, prairie, well-managed pasture (perennials) can all increase infiltration relative to cropland
- Trend analysis
  - Land management: aerial photo analysis revealed a 28% decrease in area devoted to contour strips in Rullands Coulee watershed (2004-2018)
  - Land use: agricultural census data shows shift from dairy rotations to corn-soy (less opportunity for contour strips)

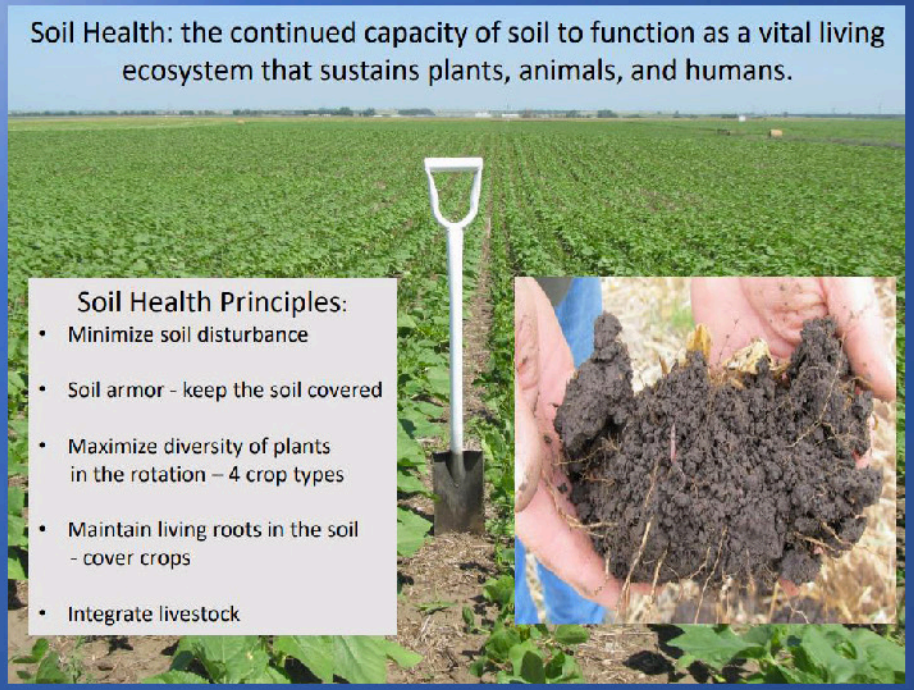
Climate Change: Empowerment

- Mitigate intense rain events on the landscape

- Manage runoff

Maintain & Improve Land Use

Soil Health: the continued capacity of soil to function as a vital living ecosystem that sustains plants, animals, and humans.



Soil Health Principles:

- Minimize soil disturbance
- Soil armor - keep the soil covered
- Maximize diversity of plants in the rotation – 4 crop types
- Maintain living roots in the soil - cover crops
- Integrate livestock

Flood Plain – Land Use

Flood Plain - Management

Conservation Reserve Enhancement Program (CREP)

Streambank Stabilization

Upper Watershed Land Management

Luckasson (CC 21) Subwatershed

- The Curve Number can realistically be lowered from 67 to 65 through land management practices
- Reduces the peak flow approximately 7% compared to CC 21 dam that reduces peak flow 55%

1958 Watershed Work Plan

Land treatment will reduce the peak discharge from the 50-year flood 11.7% and 5-year flood 15.7%

1996 Krug Rainfall-Runoff Characteristics Study (Coon Creek Watershed)

Agricultural practice changes from the 1930s to the 1980s reduced the 2-yr peak discharge 72% and the 100-yr peak discharge 53%

Mostly accomplished prior to the 1958 plan

Upper Watershed Small Dams/Farm Ponds

CC 21 Luckasson Subwatershed

- 11 Small Dams
- $650,000 Construction Cost
- Reduces the peak flow approximately 19% compared to CC 21 dam that reduces peak flow 55%

Floodplain Improvements

Coon Valley Bridge Pinch Point

- Will evaluate additional floodproofing diversions and berms as feasible

Coon Creek
Alternative Summary Table

Analyses		
1	Retrospective	0.92 Benefit Cost Ratio*
2	As-Built Dams	2,705 Acre 100 Year Floodplain
3	No Dams	2,933 Acre 100 Year Floodplain
4	Existing Conditions	2,796 Acre 100 Year Floodplain

*B/C Ratio of 0.41 without recreational benefits included

Alternative		Benefit Cost Ratio	Construction Costs	100-year Storm Flooded Acres
1	Repair of Failed Dams	Not Considered a Structurally Sound Alternative		
2	Replacement of Failed Dams	CC 21– 0.50 CC 23 – 0.34 CC 29 – 0.55	$12,300,000	2,767
3	Decommissioning of Failed Dams	-	$2,861,300	2,796

Remaining 11 Dams

A Path Forward

Geologic Assessment and Risks

Assessment of Remaining Structures

Principal spillways Pipe Condition

Excessive join separation

Foundation Drains

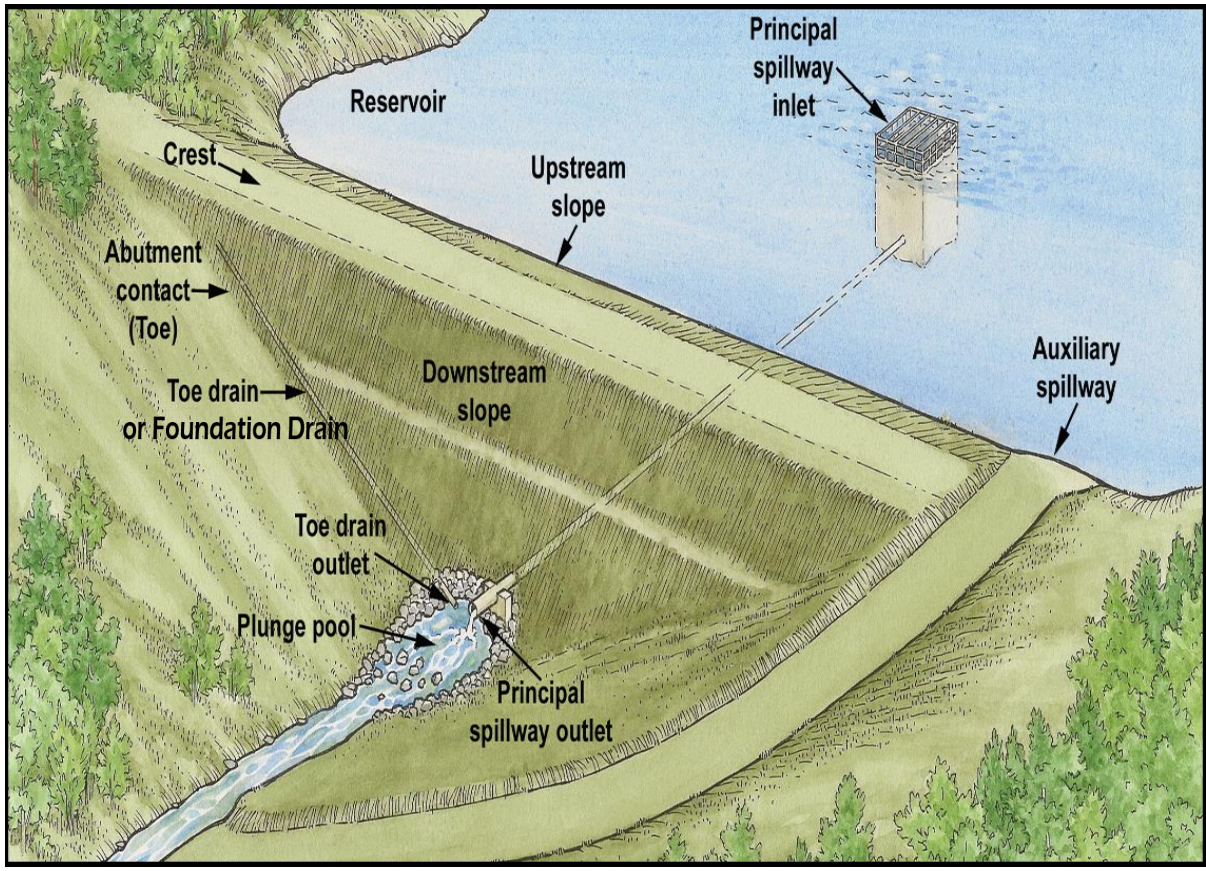
All foundation drains at least partially plugged

Drawdown Pipe

Some plugged or corroded

H&H Analysis

Analyzed the structures according to current NRCS criteria



Coon Creek Condition Assessment

Site	Year Constructed	Remaining Structure Life without Repairs	Priority
Coon Creek 14 (Struxness)	1962	10-15 years	Moderate
Coon Creek 15 (Swenson)	1962	5-10 years	High
Coon Creek 16 (Garlick)	1962	15-20 years	Low
Coon Creek 17 (Melby) – High Hazard Dam	1962	5-10 years	High
CC-24 (Peterson)	1963	15-20 years	Low
CC-25 (Baltz) – High Hazard Dam	1961	5-10 years	High
CC-31 (Mashak)	1961	5-10 years	High
CC-33 (Korn Coulee) – High Hazard Dam	1960	5-10 years	High
CC-35 (Cornell)	1962	15-20 years	Low
Coon Creek 41 (Dahlen) – High Hazard Dam	1962	5-10 years	High
CC-53 (Berg)	1963	15-20 years	Low

High Hazard Dams

CC 17 Melby Dam

- Rod & Gun Club Campground

CC 25 Baltz-Amundson Dam

- Small cabin

CC 33 Korn Coulee Dam

- County working on flood proofing dike

CC 41 Dahlen Dam

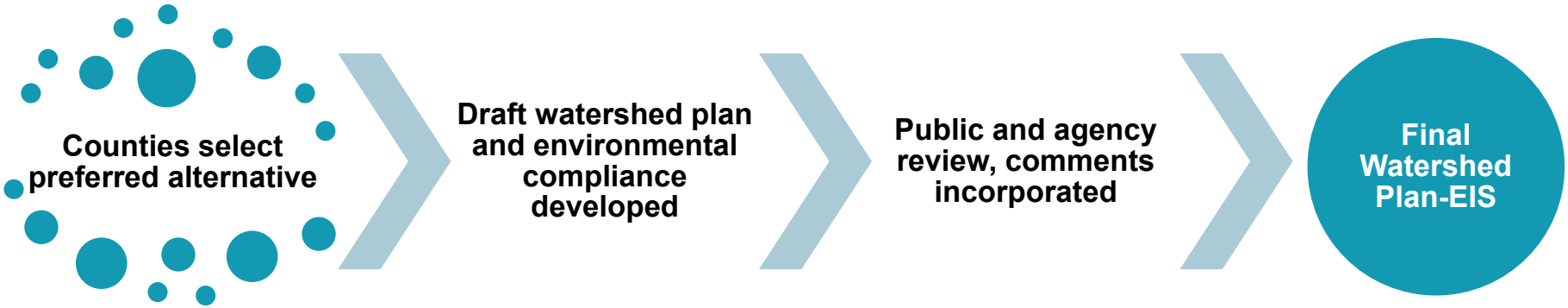
- House and Golf Clubhouse

Environmental Compliance

National Environmental Policy Act (NEPA)

- Water Resources
- Topography, Geology and Soils (including erosion and sedimentation)
- Land Use
- Wetlands
- Climate and Air Quality
- Utilities
- Biological Resources (vegetation, wildlife, fisheries, threatened and endangered species)
- Recreation
- Socioeconomics
- Public Health and Safety
- Historic, Scientific, and Cultural Resources
- Aesthetic Considerations

What's next?


Counties select preferred alternative
Draft watershed plan and environmental compliance developed
Public and agency review, comments incorporated
Final Watershed Plan-EIS

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Questions?

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