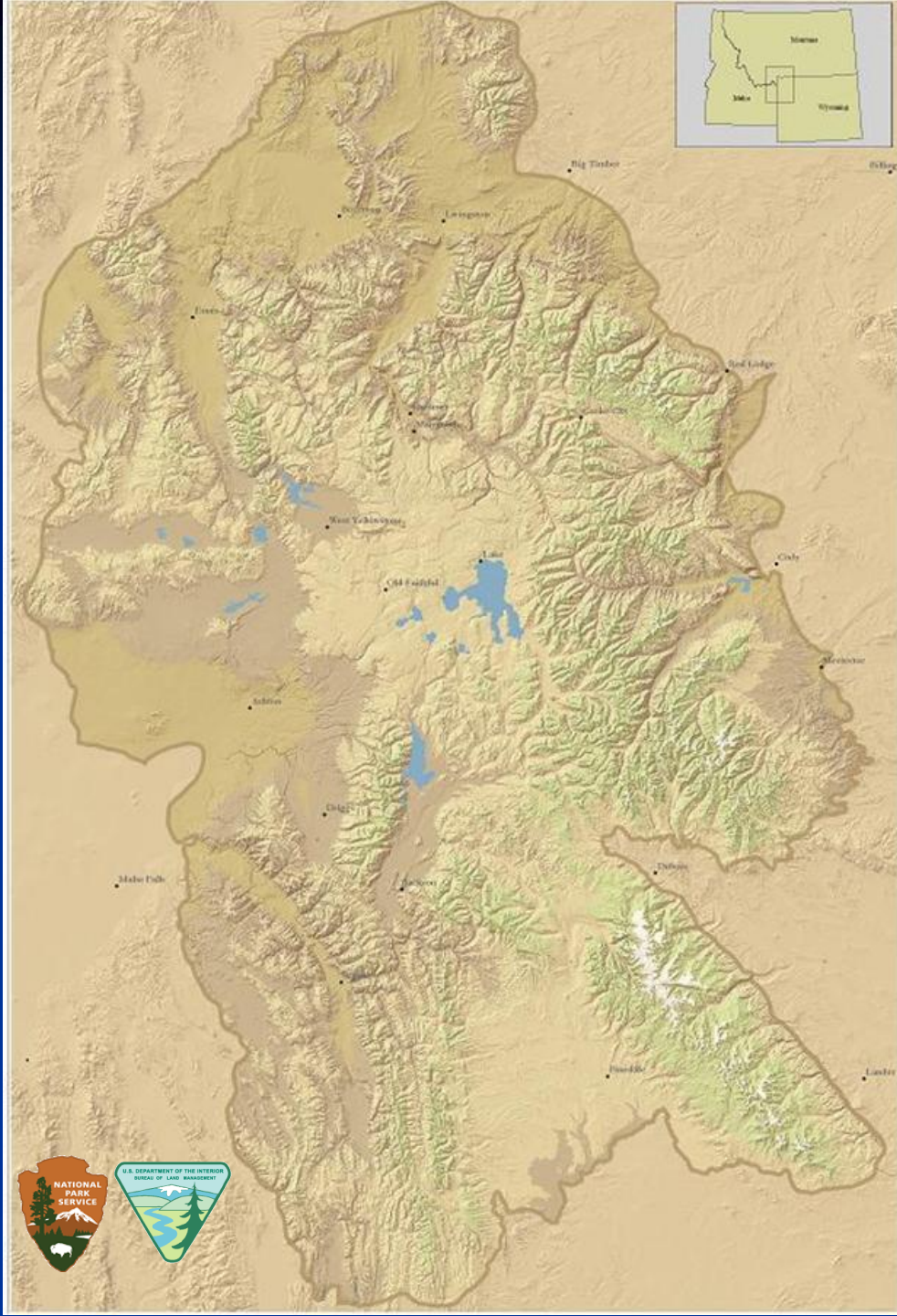


# Greater Yellowstone Hydrologists (GYH) Subcommittee

Louis Wasniewski

GYH Chairman &  
Forest Hydrologist  
Caribou-Targhee NF

GYCC Public Meeting  
Cody, WY  
April 29, 2015



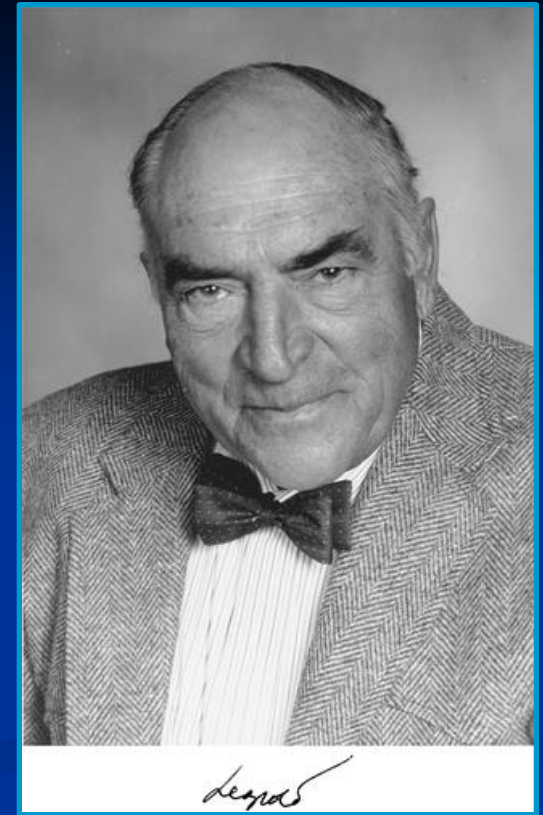
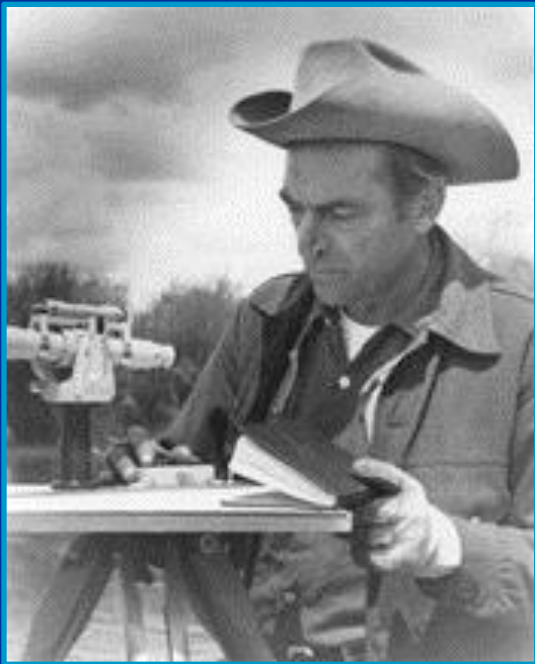
# Members



Members	Location
Louis Wasniewski (Chair)	Caribou-Targhee NF
Brad Higginson	Caribou-Targhee NF
Jim Laprevote	Caribou-Targhee NF
Kevin Weiner	Beaverhead-Deerlodge NF
Dale J White	Gallatin NF
James Efta	Custer NF
Ronna Simon	Bridger-Teton NF
Trevlyn Robertson	Bridger-Teton NF
Karri Cary	Shoshone NF
Kathryn Mellander	Grand Teton NP
Jeff Arnold	Yellowstone NP
Dan Mahony	Yellowstone NP
David Harper	USGS
Steve Kallin	National Elk Refuge
Bryce Bohn	BLM
Michael Philbin	BLM
Stephen Armiger	BLM
Dennis Saville	BLM

# Formation

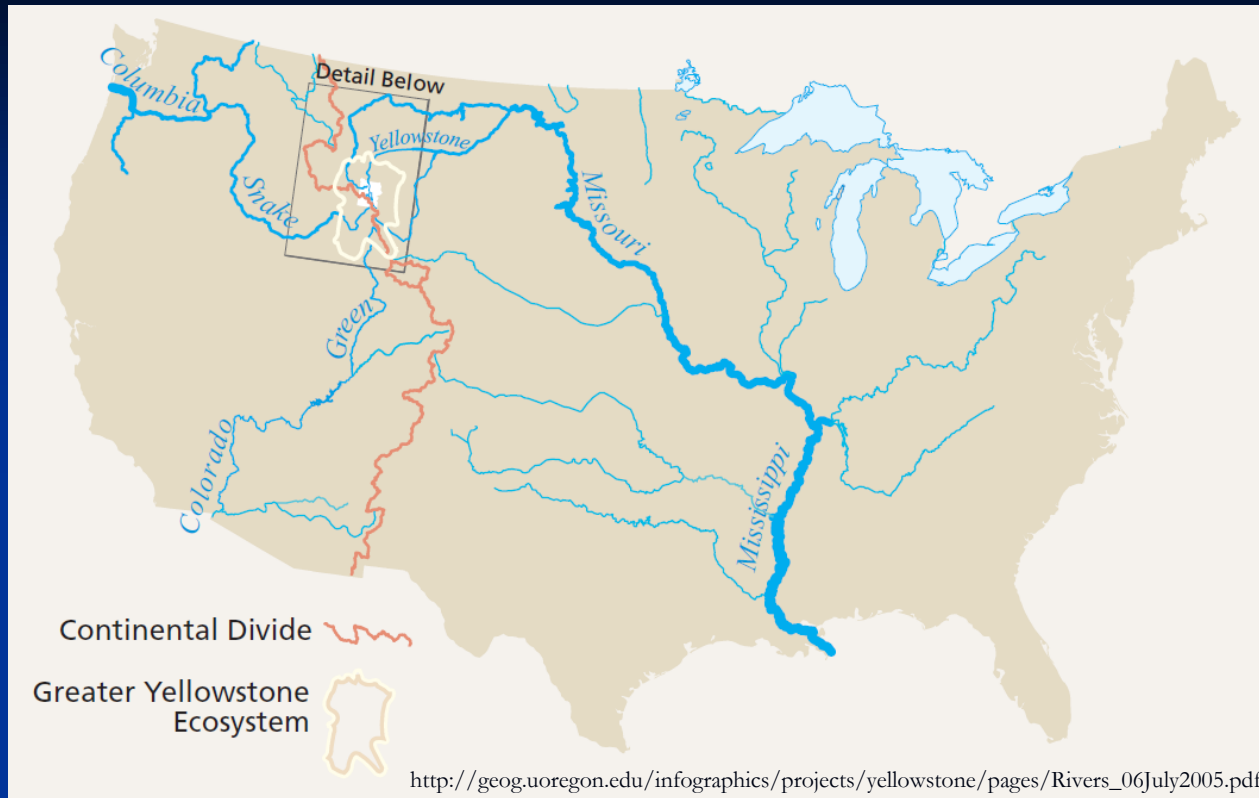
- The GYH formed in October of 1990 at the urging of Luna Leopold.



- Leopold had the vision to see the utility of a collaborative group of hydrologists in the GYA.



# Headwaters of the Nation



**“Water may very well be the most valuable natural resource in the Greater Yellowstone Area”**

- Headwaters of three continental river systems: the Snake/Columbia, Green/Colorado, and Yellowstone/Missouri.
- Protection of water and the catchments remains critical to the environmental integrity and economics of the GYA and downstream areas.

# History

- **2001** - GYCC Commissioned the GYH to write a watershed management strategy to better position the Committee to provide effective stewardship of watersheds and aquatic ecosystems
- **2002** - GYH presented the 1<sup>st</sup> “Watershed Management Strategy for the GYA”
- **2006** - GYH updated the original strategy to be more concise, more issue driven and provide recommended action items
- **2007** - GYCC removed Watershed Management as a priority



# History

- **2009** - GYCC added Water Quality & Flow as a Priority.
  - **Outcome:** Landscapes that are managed to ensure healthy water flow and quality and reduction of water consumption.
- **2011** - GYH updated strategy more recent references with additional climate change, watershed assessment, and rehabilitation emphasis
- **2012+** – Annually Update of 5 Year Action Plan



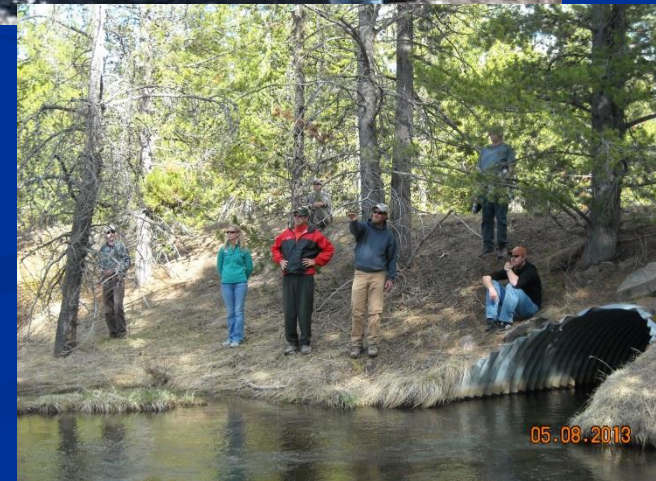
# Meetings

## 1. Winter: Office / Video Conf.

- Strategy & Project Coordination

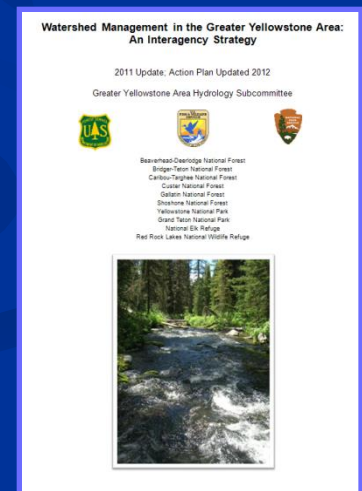
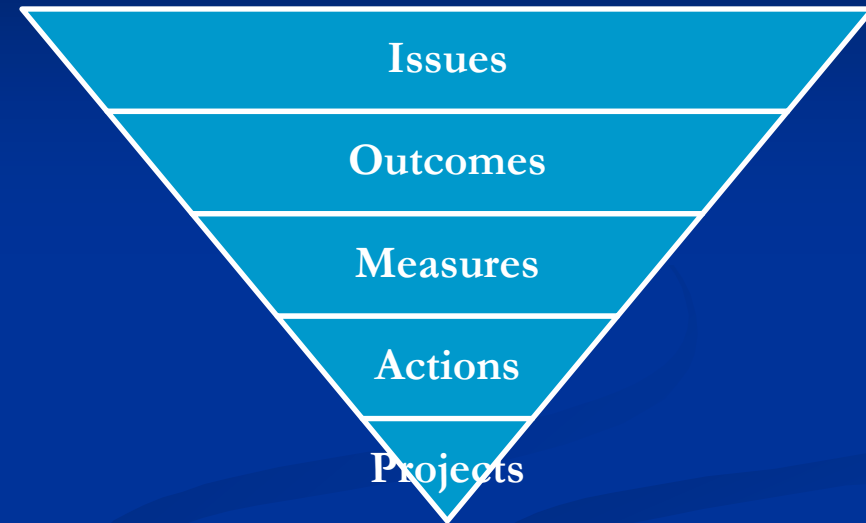
## 2. Late Spring: Office & Field Trips

- Two day meeting with evening social
- Information sharing
- Projects site visits
- Brainstorming ideas and solutions
- GYA coordination & consistency



# Watershed Management in the GYA: An Interagency Strategy - 2011 Update

- Incorporates more recent references, climate change, watershed assessment, and rehabilitation emphasis
- Development of current issues, outcomes, measures, actions, projects, and project ranking criteria
- Added a Five Year Action Plan

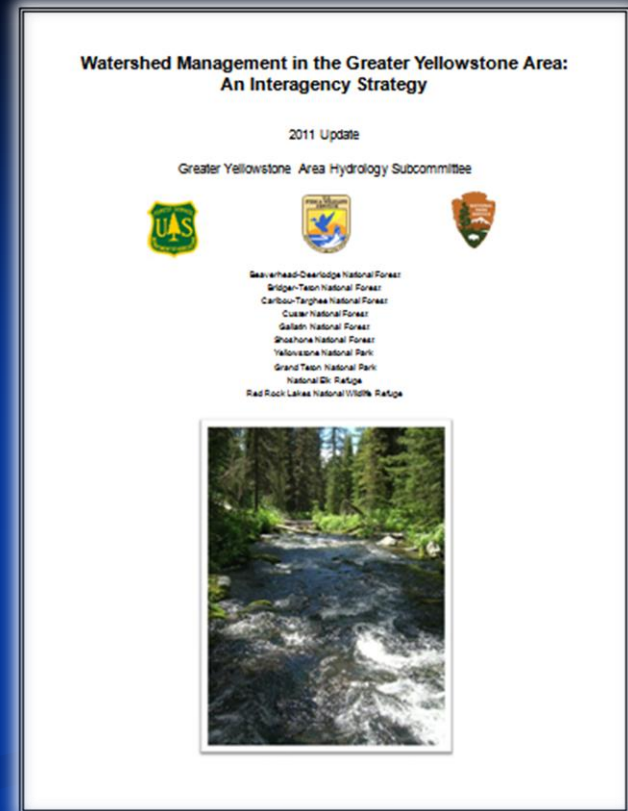


# Watershed Management Interagency Strategy

## Issues:

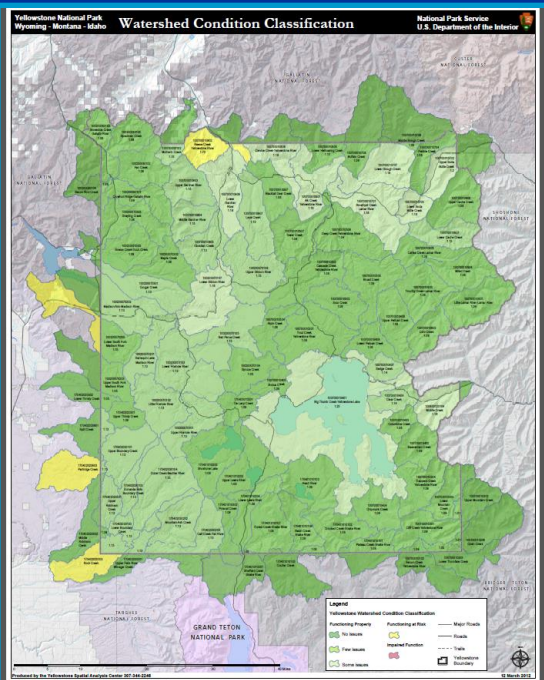
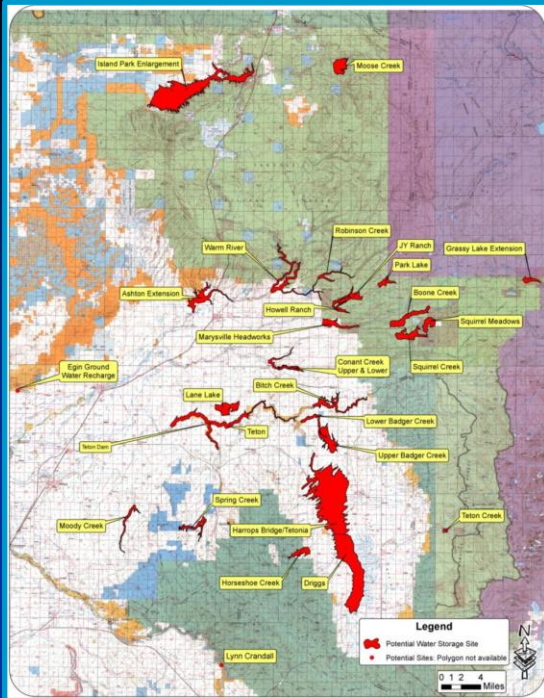
1. Interagency cooperation on a watershed scale
2. Watershed, riparian area, and geomorphic integrity
3. Water quality protection and enhancement
4. Water flow, water supply, and water rights

*“A key role of GYA agencies is managing disturbances while sustaining watershed health.”*



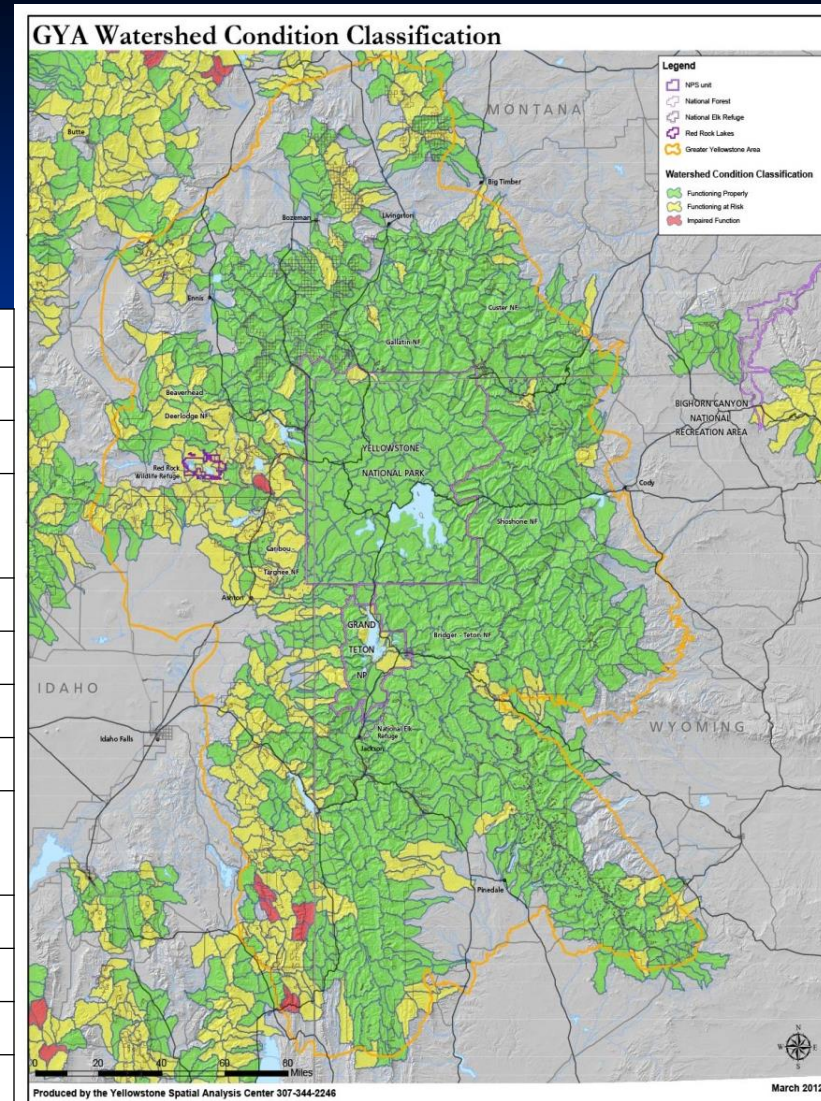
# Accomplishments

- THE GYA Watershed Vulnerability Modeling Project (2002)
- Reference Reach Database (2004)
- Inland West Water Initiative Summary of Ratings for GYA (2006)
- GYA Potential Dam Site Inventory (2012)
- Watershed Condition Class Framework for the GYA (2012)
- Reference Multiple Indicator Monitoring Stream Surveys (2014)



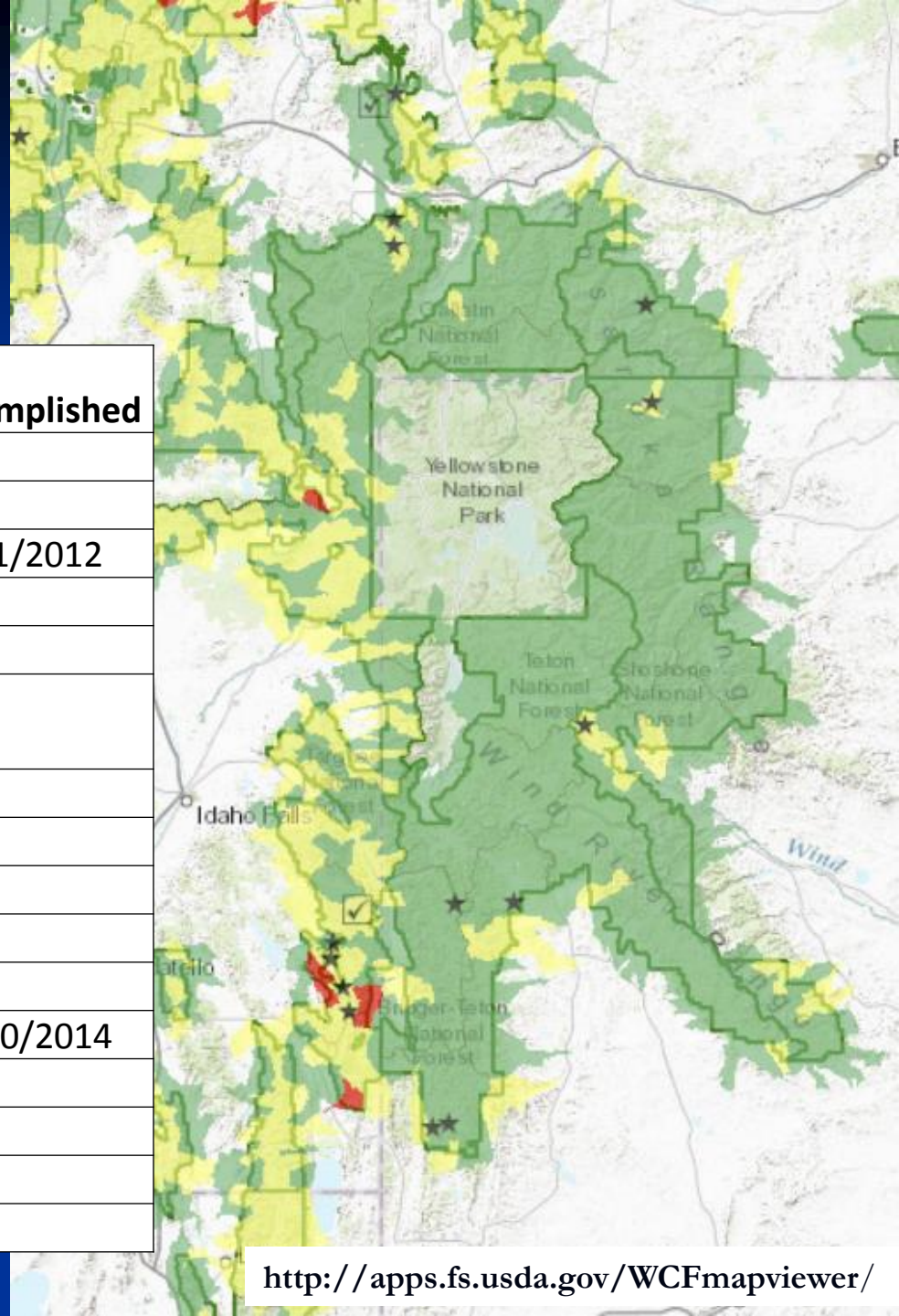
# Watershed Condition Classification

GYA Units	Watershed Classification			
	Good	Fair	Poor	TOTALS
Caribou-Targhee NF	71	87	6	164
Beaverhead-Deerlodge NF	29	27	0	56
Gallatin NF	143	28	0	171
Custer NF	30	2	0	32
Shoshone NF	124	16	0	140
Grand Teton NP	21	3	0	24
JDR Jr.Memorial Parkway	3	0	0	3
Yellowstone NP	94	1	0	95
National Elk Refuge	5	0	0	5
Red Rock Lake NWR	0	8	0	8
Bridger-Teton NF	158	13	0	171
<b>TOTALS</b>	<b>678</b>	<b>185</b>	<b>6</b>	<b>869</b>



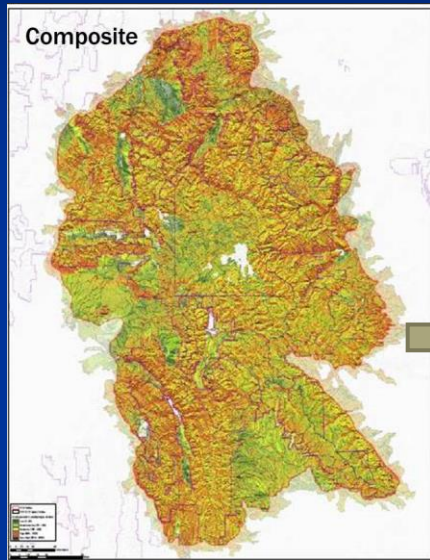
*Protecting & Improving Watershed Conditions  
Increases Their Resiliency*

# Preliminary Priority Watersheds



Unit	Watershed Name	Accomplished
Gallatin NF	Upper Hyalite Creek	
	Bozeman Creek	
	Pass Creek	6/1/2012
	Upper South Fork Sixteen Mile Cr	
Custer NF	Lower West Rosebud Creek	
Shoshone NF	Squaw Creek-Clarks Fork Yellowstone River	
	Brooks Lake Creek-Wind River	
Bridger-Teton NF	Muddy Creek	
	Upper Little Greys River	
	West Fork Hams Fork	
	East Fork Hams Fork-Hams Fork	
Caribou-Targhee NF	Jackknife Creek	9/30/2014
	Diamond Creek Headwaters	
	Diamond Creek	
	Upper Lanes Creek	
	Lower Lanes Creek	

# Watershed Vulnerability Assessment



## Sensitivity Analysis

Based on  
Terrain and  
Soils/Geology

**Infrastructure**  
**Native Coldwater Fish**  
**Stream Ecology**



## Values at Risk

(More can be  
added in  
future)

**Combined Flow**  
(Base +Runoff)

Snowpack  
vulnerability

Base Flow

Average  
Summer Air  
Temperature

## Climate Exposure

(More can be  
added in future)

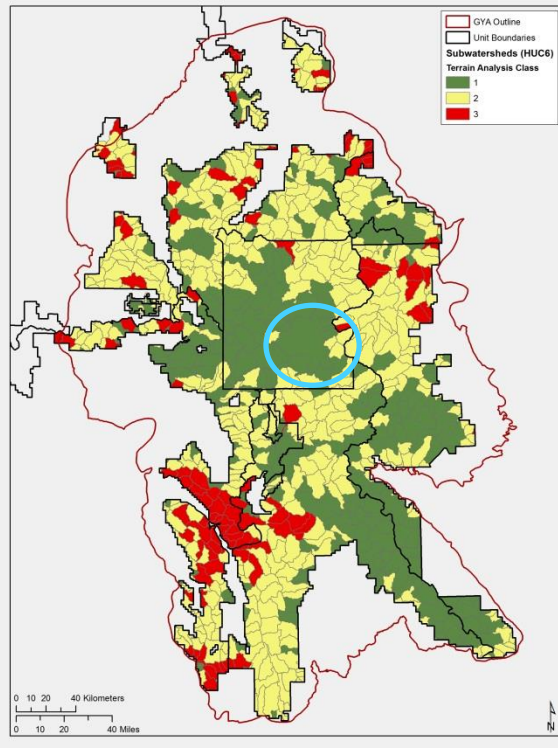
**Map of 6<sup>th</sup> Code  
HUC watersheds**  
with **relative  
ranking of  
vulnerability to  
climate change.**

Informs  
management  
actions, priorities

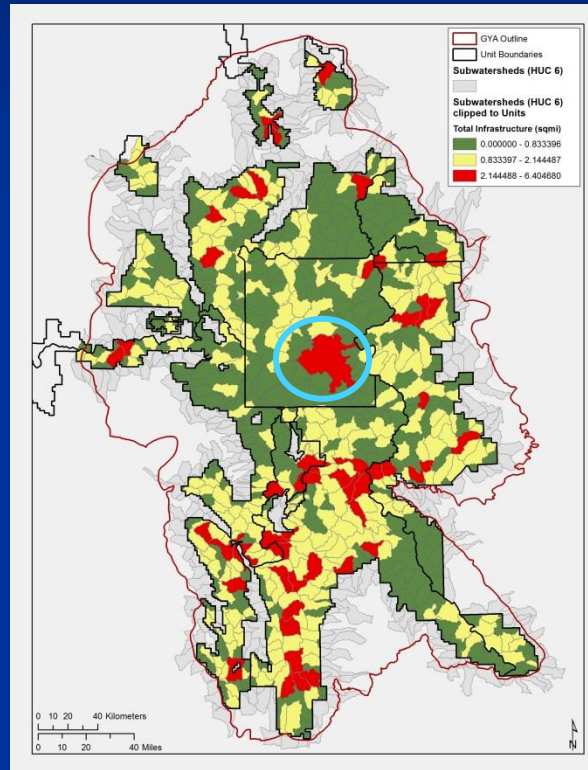
## Result:

Spring 2015

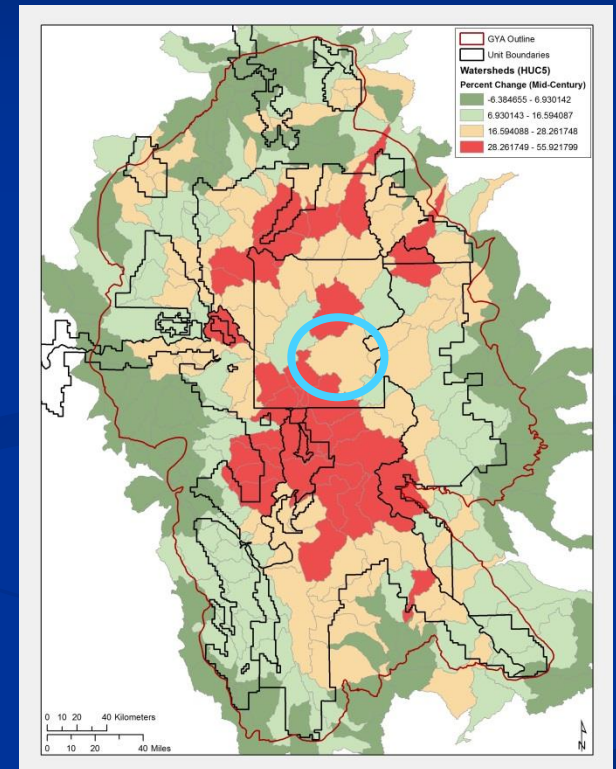
# Watershed Vulnerability Assessment



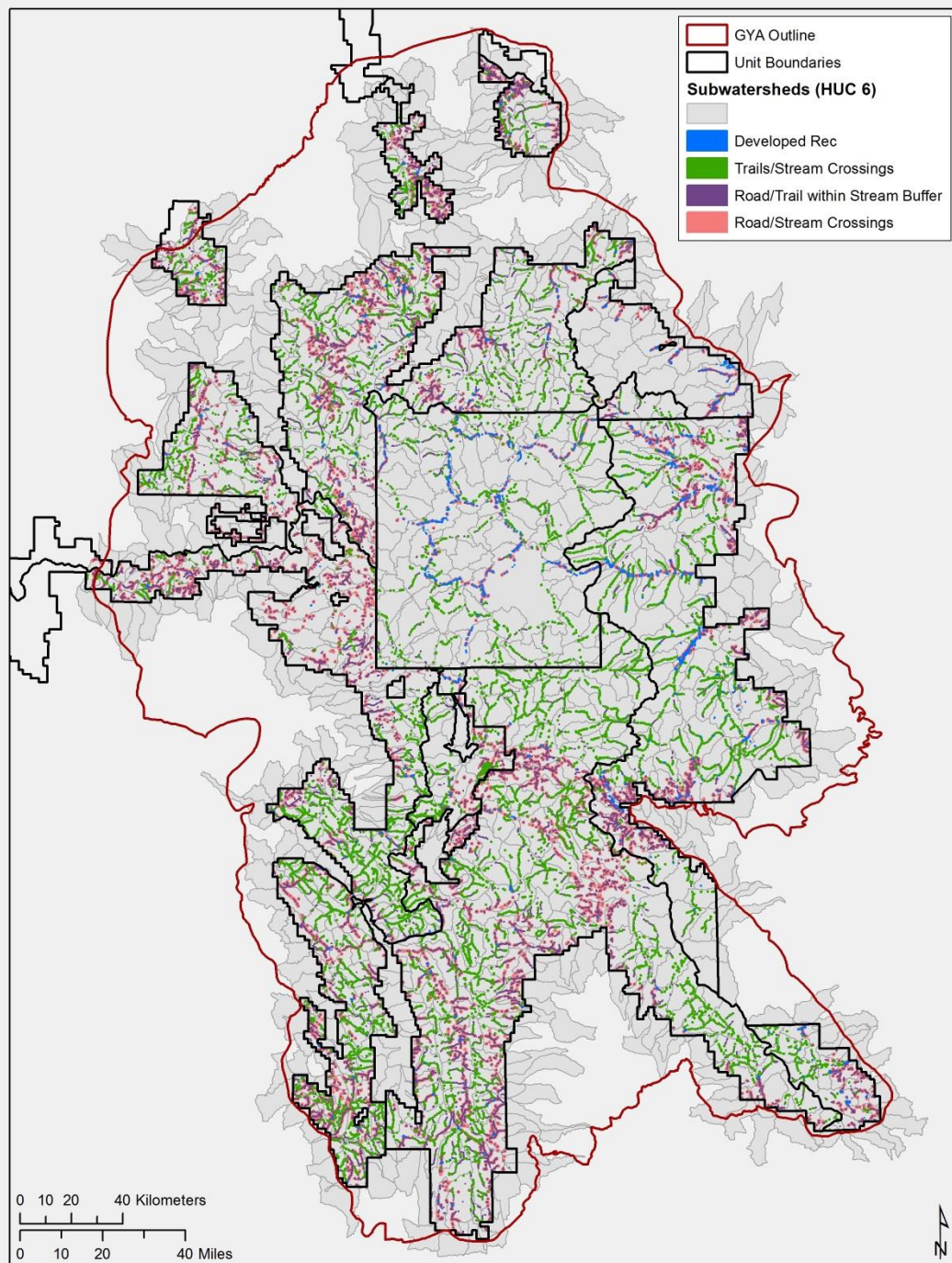
Terrain  
Sensitivity



Combined  
Infrastructure Value  
at Risk



Combined Flow  
Percent Change to Mid-Century  
(2030-2050)



# What's Next

- Complete Watershed Vulnerability Assessment (2015)
- Expanded WCC to cover BLM (Modified)
- Identify GYA Priority Watersheds for Targeted Improvement (2015+)
- Develop Watershed Action Plans for Priority Watersheds (2015 +)
- Implement Watershed Action Plan for Priority Watersheds (2015+)

# Thank You!!

## Questions

