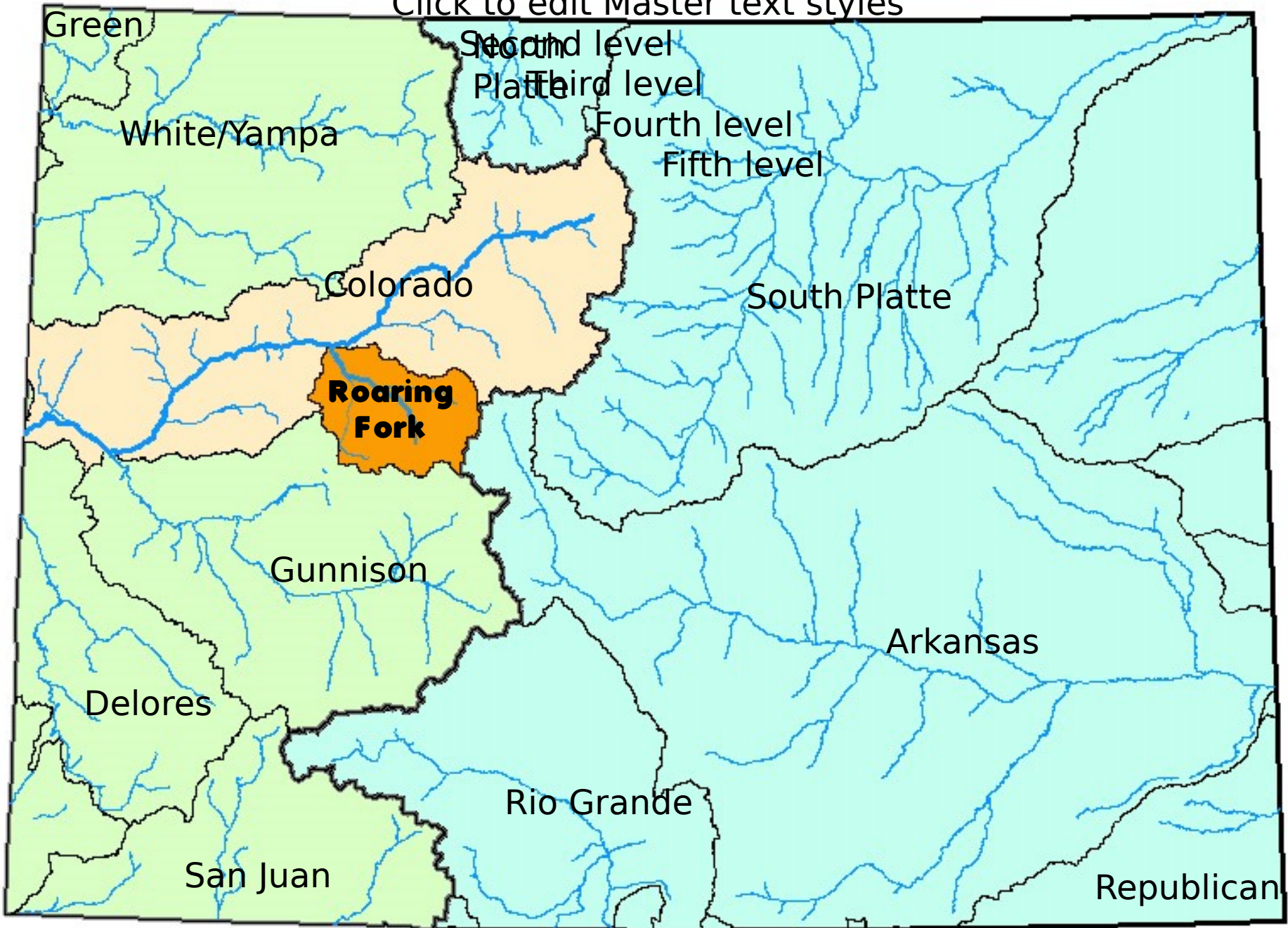


Flowing into the Future: The Roaring Fork Watershed Plan

Mark Fuller
Ruedi Water and Power Authority

Sharon Clarke
Roaring Fork Conservancy

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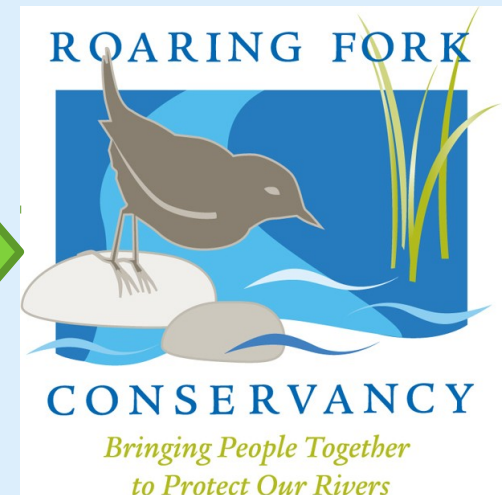


Roaring Fork Watershed Collaborative Water Group

Roaring Fork Watershed Plan

Lead Consultant

Sponsor



Why do we need a Watershed Plan?

Water is one of our most precious natural resources and one which can readily be physically removed from the watershed by transmountain diversions. Local water resources are also threatened by global climate change, pollution from both natural and man-made sources and overuse.

Specifically:

Colorado population to grow from of 5 to 8 million by 2030.

80% of population lives in half of state that receives about 20% of precipitation.

Need for more water: Studies show need for 600,000 to 1,000,000 acre-feet by 2030.

Energy development could consume up to 200,000 acre-feet of water.

Climate change may decline flows by 18% and water storage by 32%

Large Transmountain Diversions:

37% of Upper Roaring Fork Watershed (40,600 acre-feet) and

41% of Upper Fryingpan Watershed (61,500 acre-feet) already diverted to Front Range.

5th and 3rd largest transmountain diversions in Colorado.

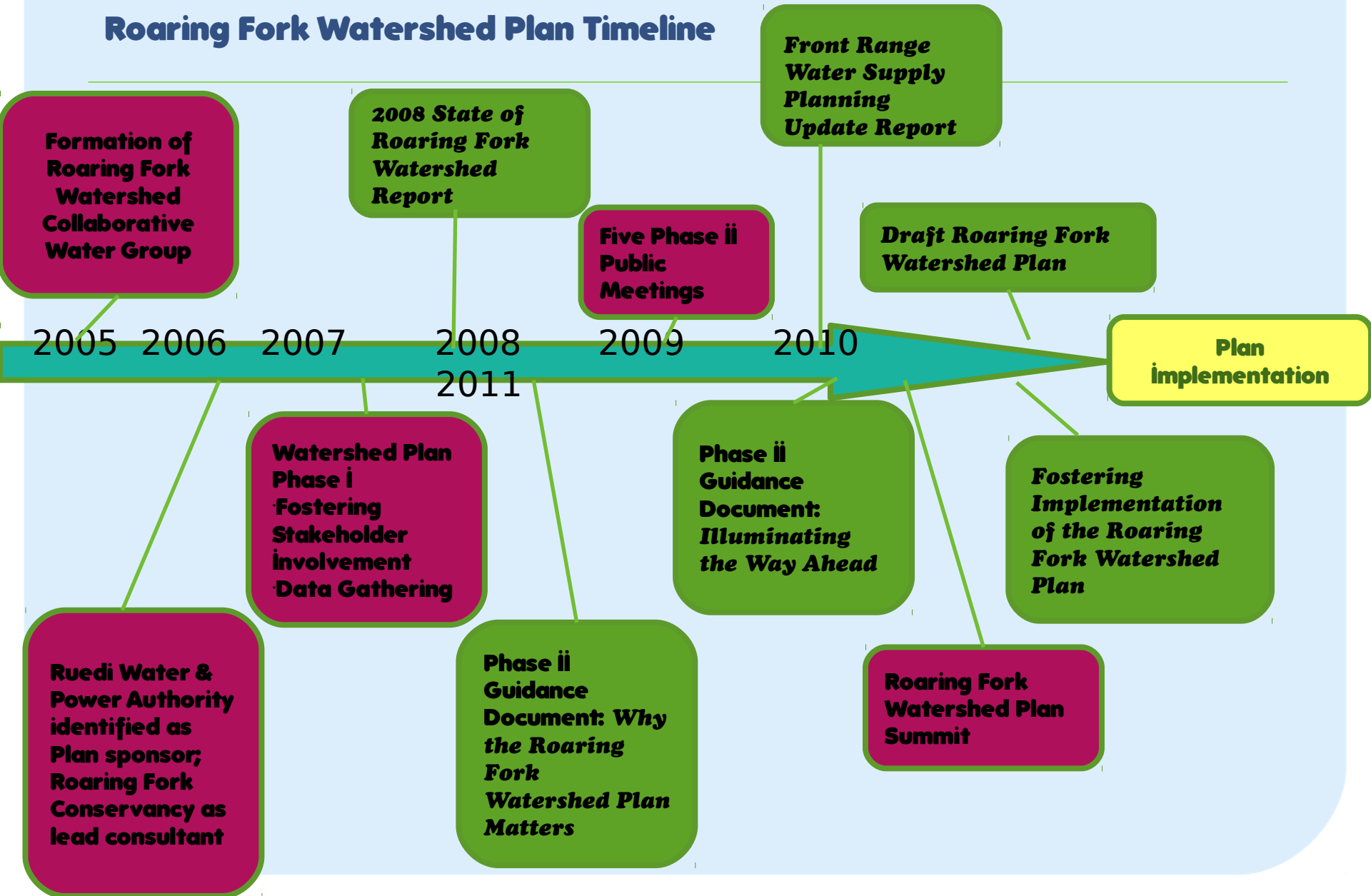
Habitat Degradation: 140 of 185 miles of streams surveyed in Roaring Fork Watershed have moderately modified to severely degraded riparian habitat.

Threats to water resources can impact: instream & riparian habitats; wildlife & recreation; local agricultural; water treatment costs; and our overall quality of life

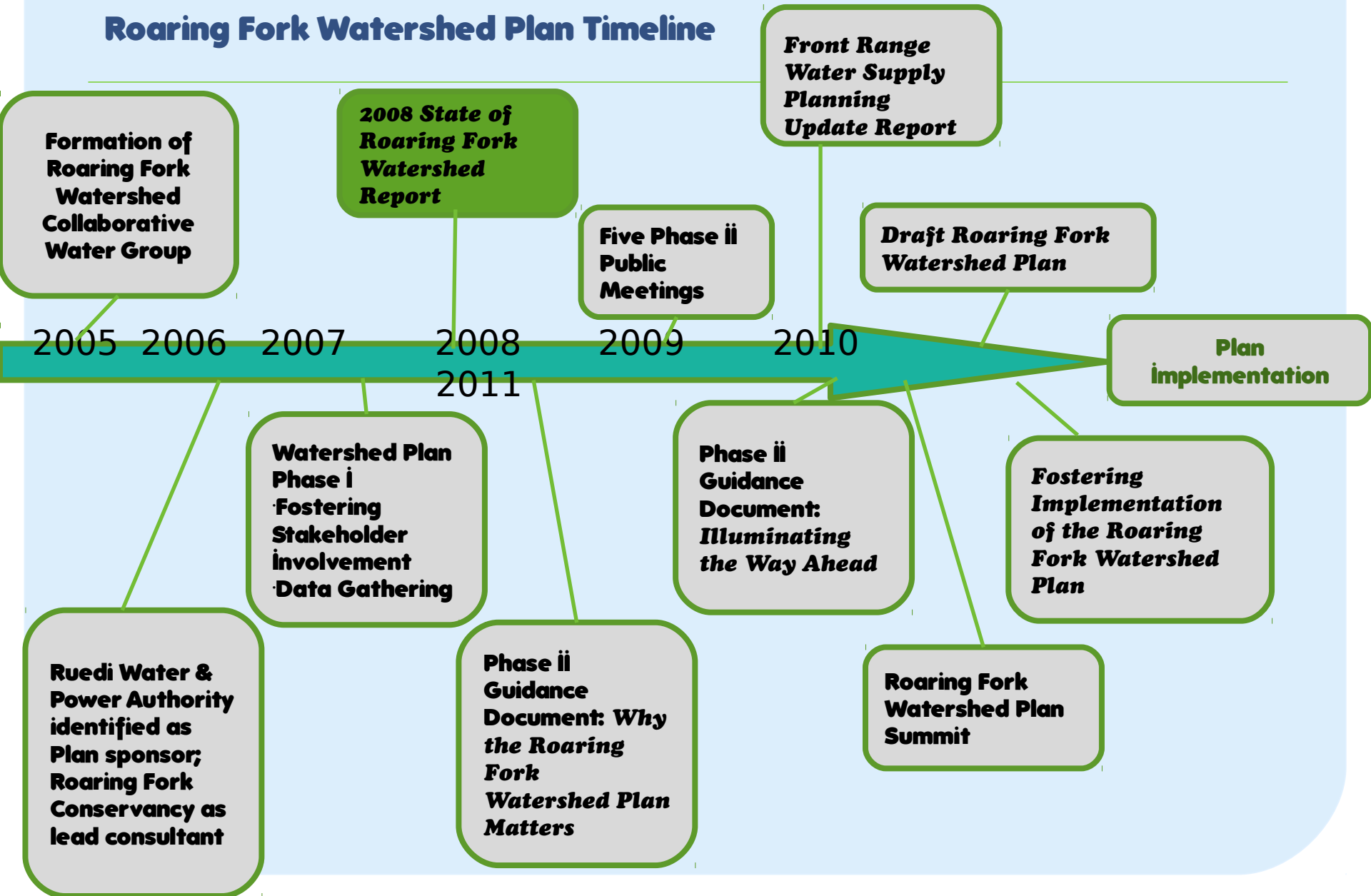
Benefits of a Watershed Plan

- ❖ Structure for input and dialogue between all stakeholders.
- ❖ Improve understanding, interest, and leadership in watershed issues.
- ❖ Encourage partnerships to identify and fund projects.
- ❖ Efficient use of financial resources and effective use of personnel.
- ❖ Guidance for protecting of water resources, while providing for a viable economic community.
- ❖ Information sharing to preclude duplication.
- ❖ Collaboration on public outreach and education.

Roaring Fork Watershed Plan Timeline



Roaring Fork Watershed Plan Timeline



**Formation of
Roaring Fork
Watershed
Collaborative
Water Group**

2005 2006

**2008 State of
Roaring Fork
Watershed
Report**

2007

2008
2011

**Watershed Plan
Phase I
·Fostering
Stakeholder
Involvement
·Data Gathering**

**Ruedi Water &
Power Authority
identified as
Plan sponsor;
Roaring Fork
Conservancy as
lead consultant**

**Five Phase ii
Public
Meetings**

2009

**Phase ii
Guidance
Document: Why
the Roaring
Fork
Watershed Plan
Matters**

**Front Range
Water Supply
Planning
Update Report**

2010

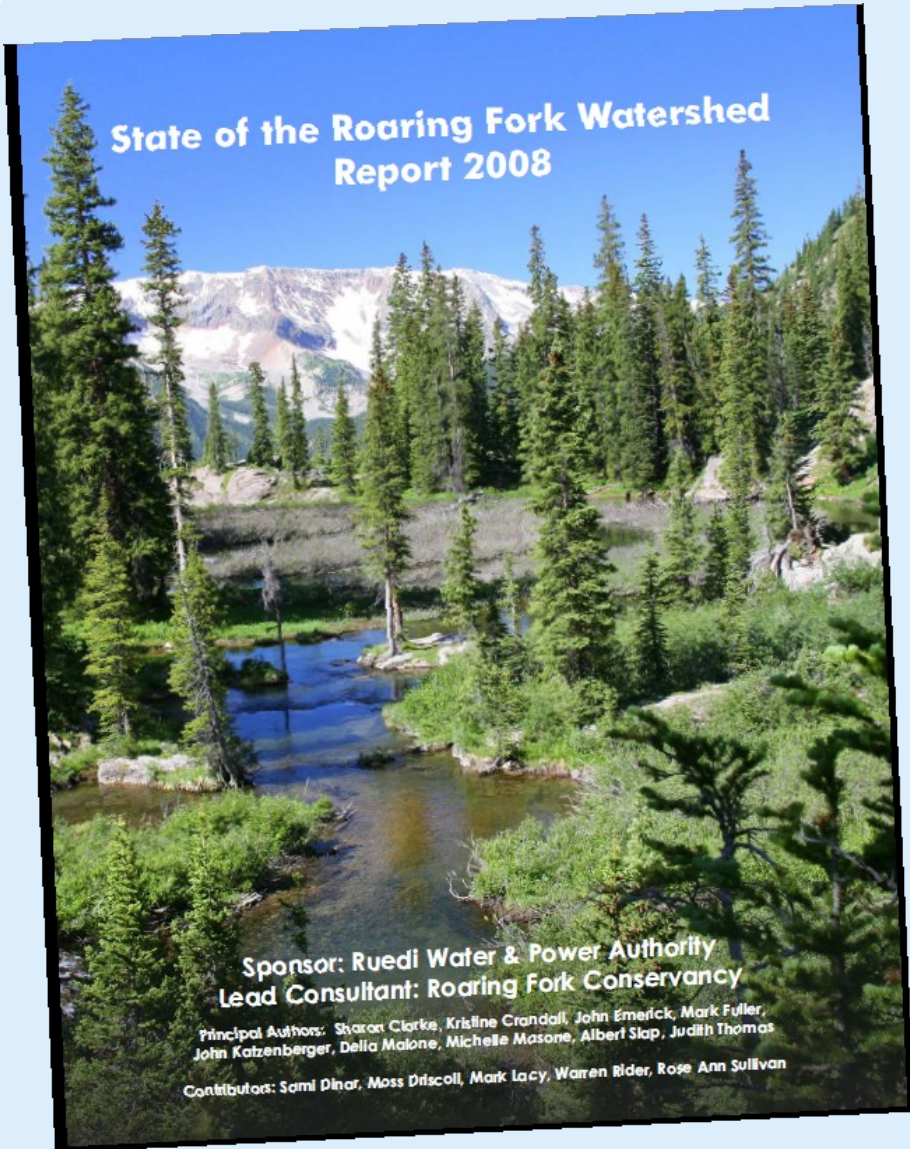
**Phase ii
Guidance
Document:
Illuminating
the Way Ahead**

**Draft Roaring Fork
Watershed Plan**

**Roaring Fork
Watershed Plan
Summit**

**Plan
Implementation**

**Fostering
Implementation
of the Roaring
Fork Watershed
Plan**

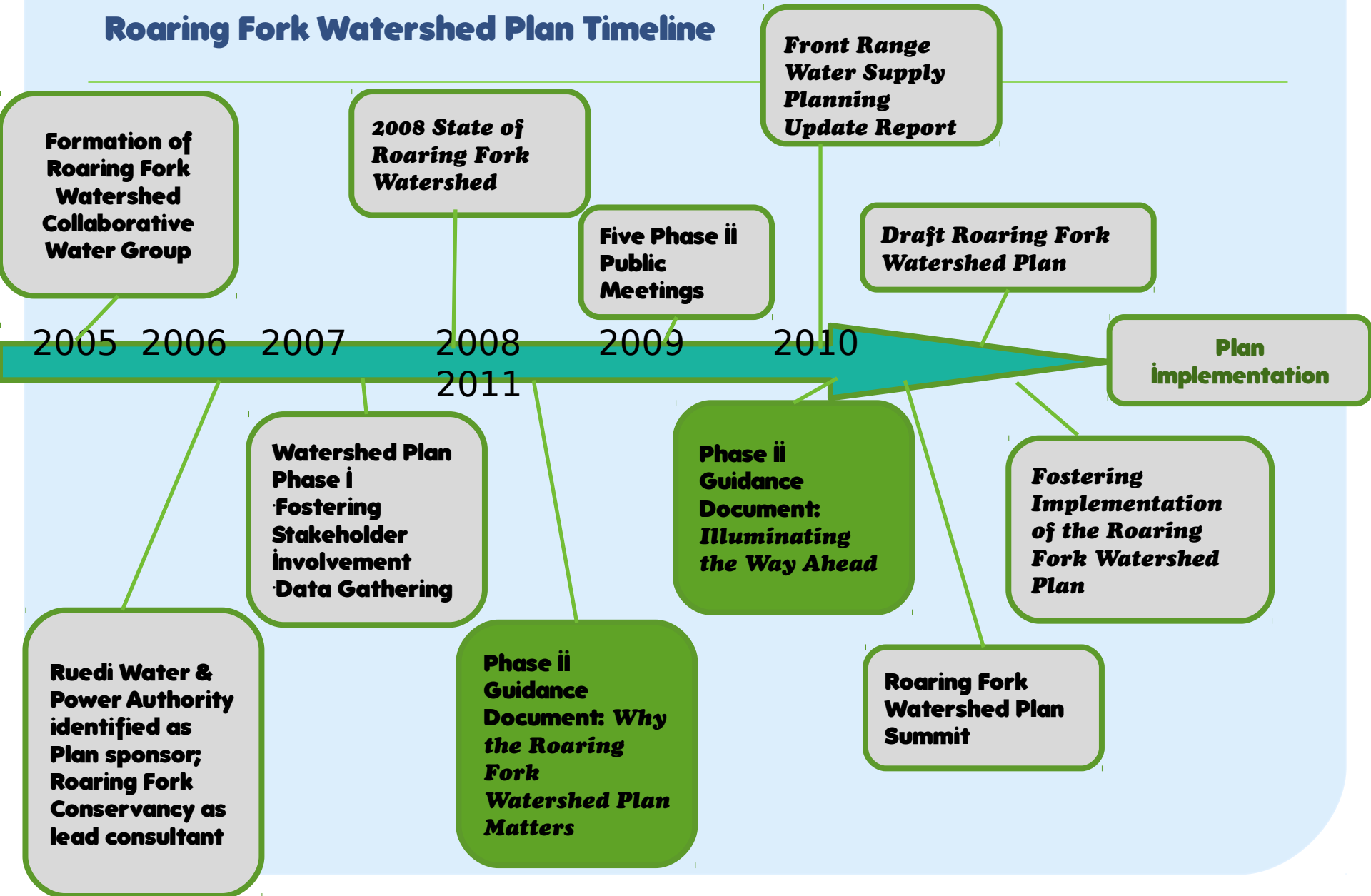


Identifies issues and data gaps:

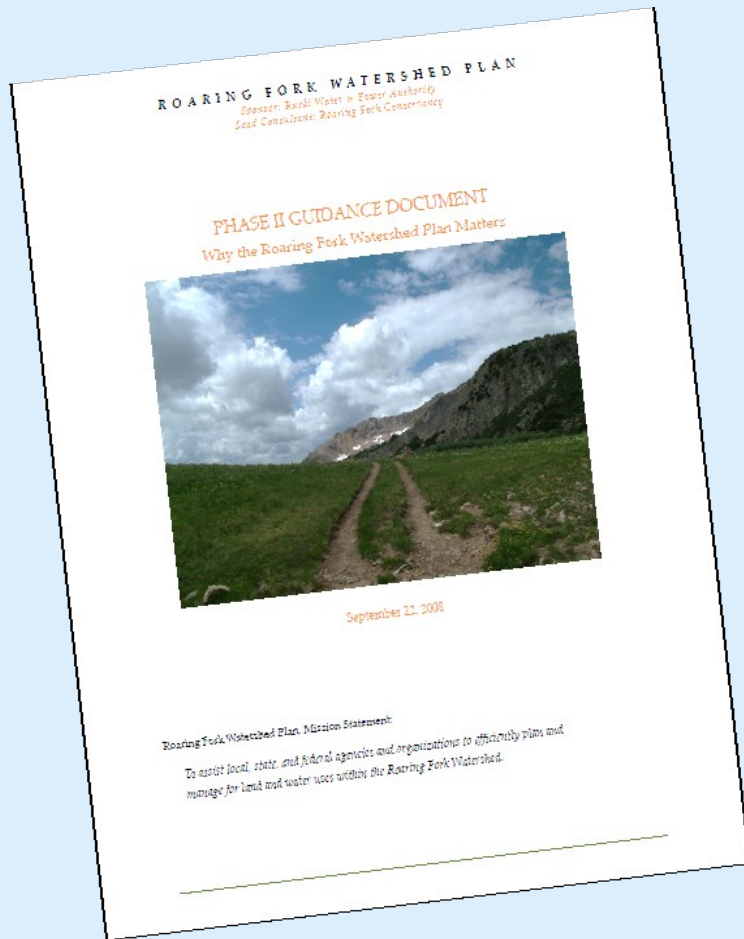
- ❖ Regional Water Management
- ❖ Water Quantity
- ❖ Water Quality
- ❖ Riparian Areas
- ❖ Instream Areas
- ❖ Climate Change

For each of the nine sub-watershed

Roaring Fork Watershed Plan Timeline

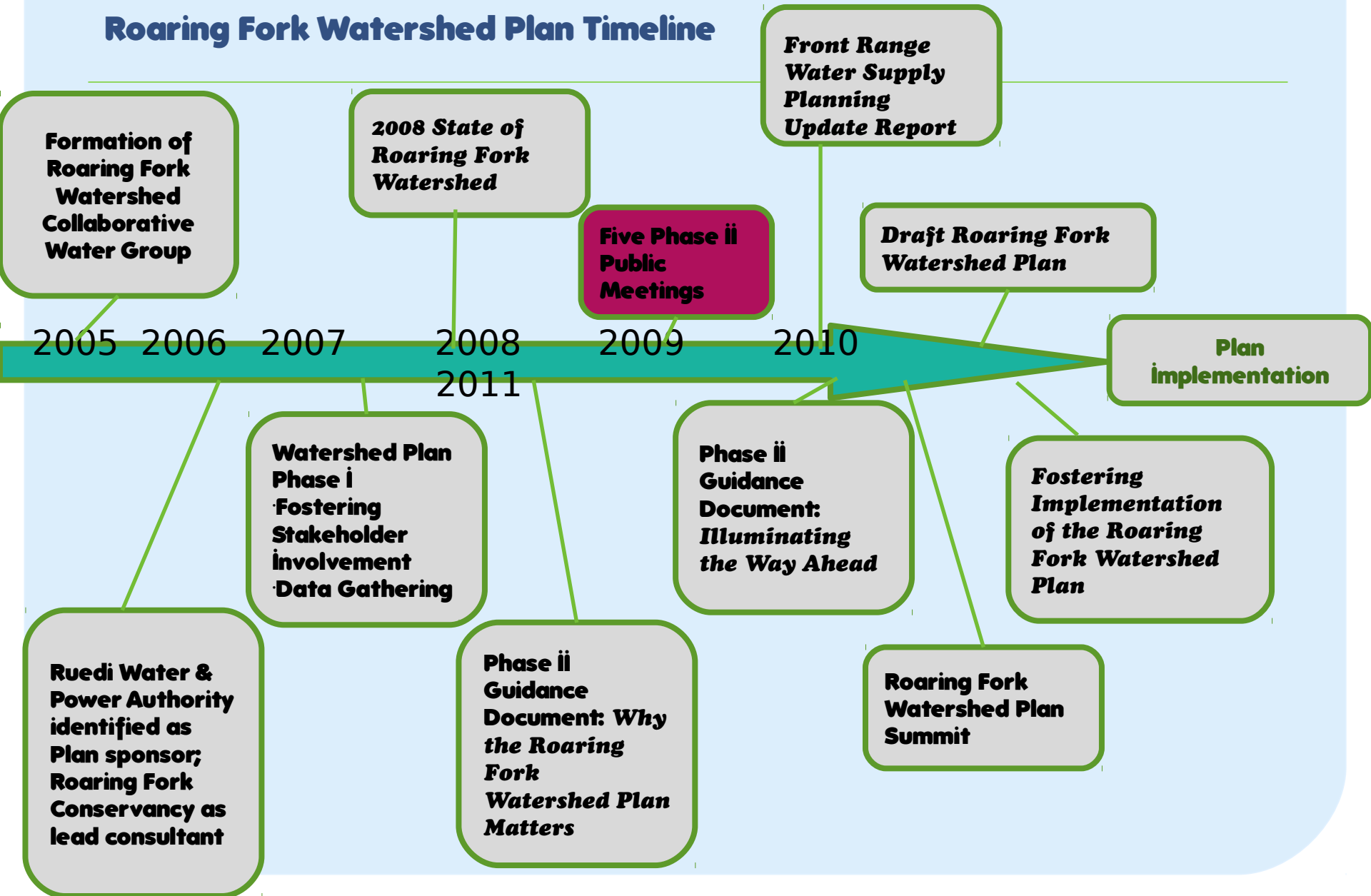


Phase II Guidance Documents



Provide background on the implications of watershed planning and outlined ways local governments can protect water resources.

Roaring Fork Watershed Plan Timeline



Formation of Roaring Fork Watershed Collaborative Water Group

2008 State of Roaring Fork Watershed

Front Range Water Supply Planning Update Report

Five Phase ii Public Meetings

Draft Roaring Fork Watershed Plan

Plan implementation

Watershed Plan Phase I
· Fostering Stakeholder Involvement
· Data Gathering

Ruedi Water & Power Authority identified as Plan sponsor; Roaring Fork Conservancy as lead consultant

Phase ii Guidance Document: Why the Roaring Fork Watershed Plan Matters

Phase ii Guidance Document: Illuminating the Way Ahead

Fostering Implementation of the Roaring Fork Watershed Plan

Roaring Fork Watershed Plan Summit

Get Involved in Your Water Future

Roaring Fork Watershed Plan

When the Roaring Fork watershed plan is adopted, you will have a say in how the watershed is managed. You will be able to help decide what projects are needed to improve water quality, protect riparian habitat, and restore the watershed's natural resources. The plan will also help us understand the watershed's future and how we can best manage it.

Phase I

- Gather Information
- Complete State of Watershed Report

Phase II

- Develop a Watershed Plan
- Complete Watershed Plan

Roaring Fork Watershed Plan

Phase II Public Meeting Dates

Get Involved!

- Attend a public meeting
- Review plans
- Share your input

Roaring Fork Watershed Plan

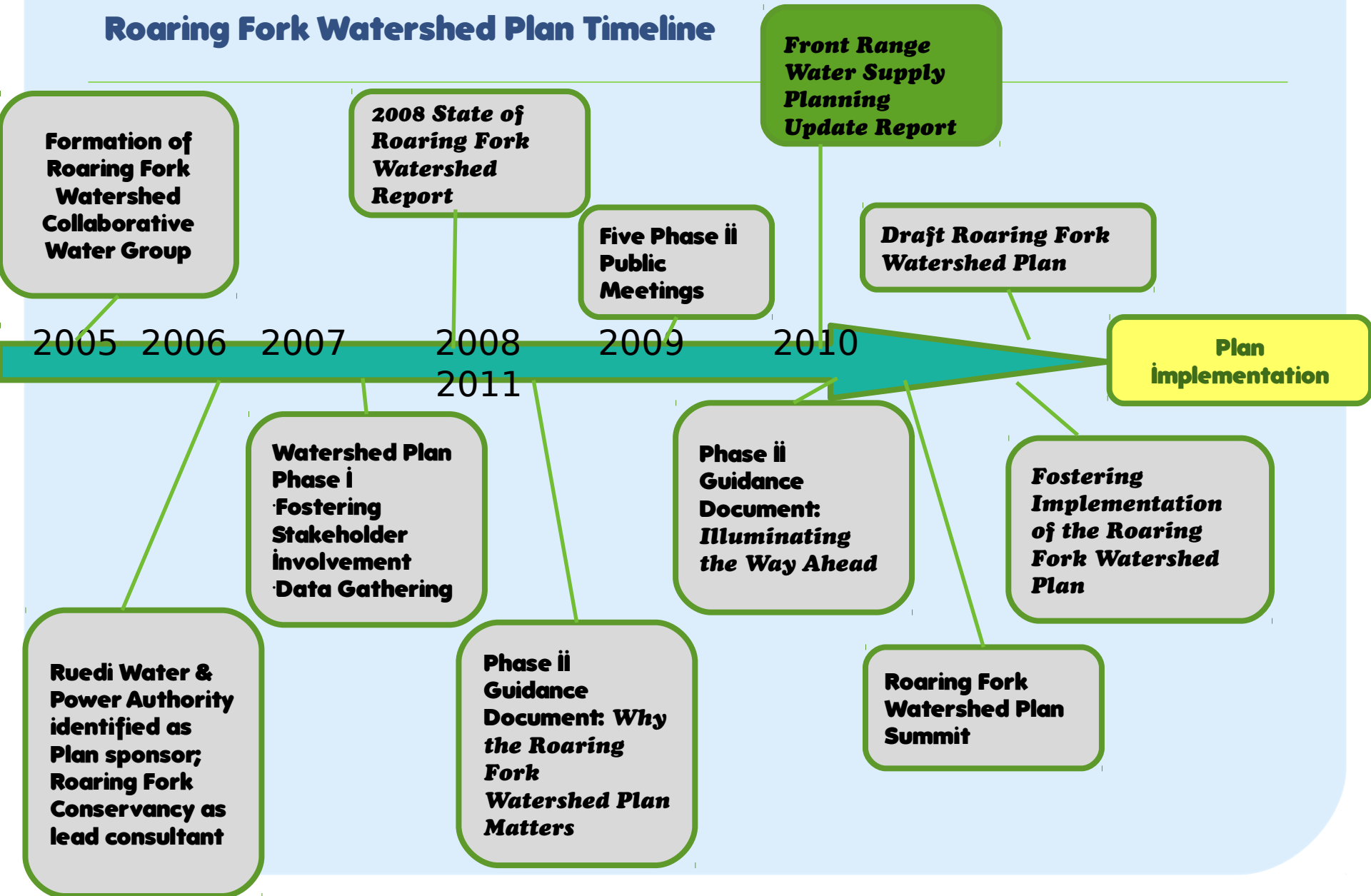
Roaring Fork Watershed



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 Second level
 Third level
 Fourth level
 Fifth level



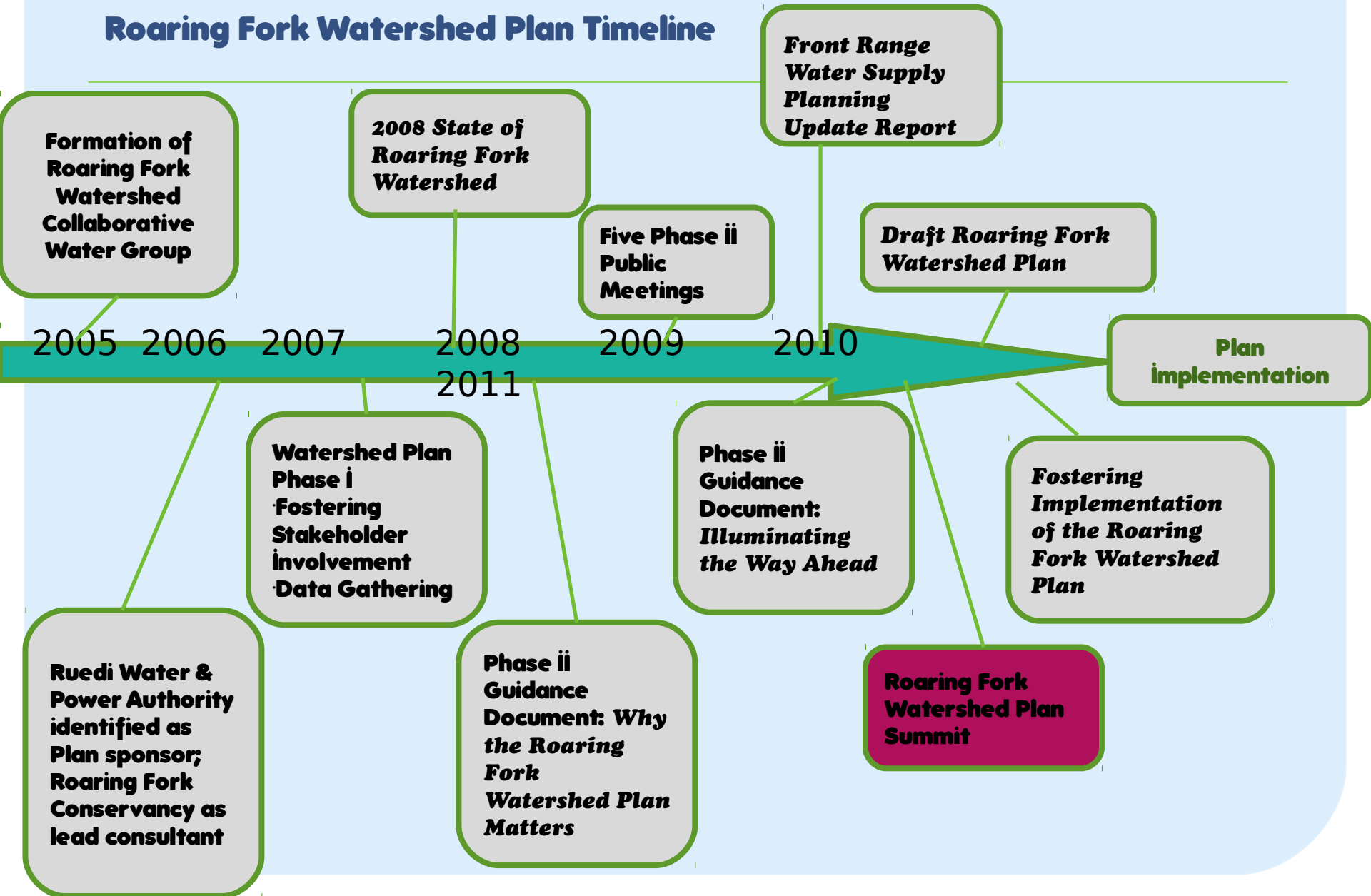
Roaring Fork Watershed Plan Timeline





Provided a comprehensive overview of the plans and options available to Front Range communities for further diversions of water from the Roaring Fork Watershed.

Roaring Fork Watershed Plan Timeline





RESOLUTION IN SUPPORT OF THE ROARING FORK WATERSHED PLAN

Whereas, water is a critical *natural* resource to the environmental, social and economic well-being of the Roaring Fork Watershed, and

Whereas, a collaboration of local governments, government agencies, non-profits, associations, and citizens have come together to form the Roaring Fork Watershed Collaborative Water Group, and

Whereas, this collaboration has undertaken the writing of the Roaring Fork Watershed Plan, and

Whereas, the Ruessli Water and Power Authority (RWAPA) is the sponsor of the Roaring Fork Watershed Plan, and

Whereas, the Municipal and County governments in the Roaring Fork Valley are members and supporters of the Ruessli Water and Power Authority, and

Whereas, RWAPA and Roaring Fork Conservancy have been working diligently on the Roaring Fork Watershed Plan since 2008 and have completed Phase I of the Plan, the State of the Watershed Report, and

Whereas, RWAPA and Roaring Fork Conservancy are currently in the midst of Phase II of the Plan which will produce recommendations for future water management in the Roaring Fork Valley, and

Whereas, the Plan has engaged and involved hundreds of citizens of the Roaring Fork Valley through many meetings, presentations and other activities publicizing the Plan and soliciting contributions to and discussions of the Plan and,

Whereas, those efforts have resulted in broad support for the planning process and significant and extensive public input into the Plan, and

Whereas, the local governments and agencies with responsibility for water management, treatment, delivery, development and conservation wish to formally endorse the concepts of resource sustainability, environmental quality, public safety, recreational value and aesthetic appeal that are the objectives of the Plan,

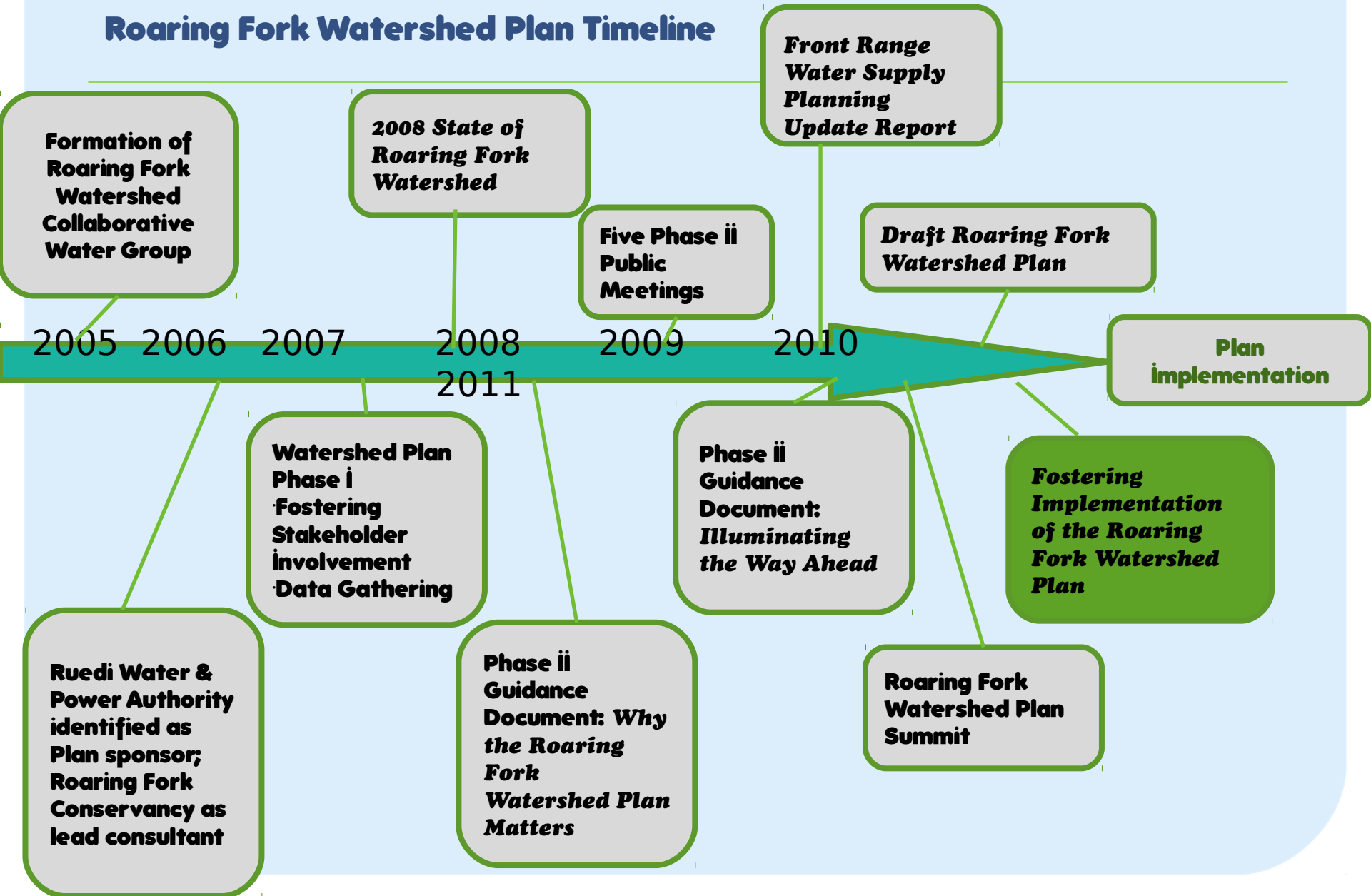
Therefore, Let It Be Resolved

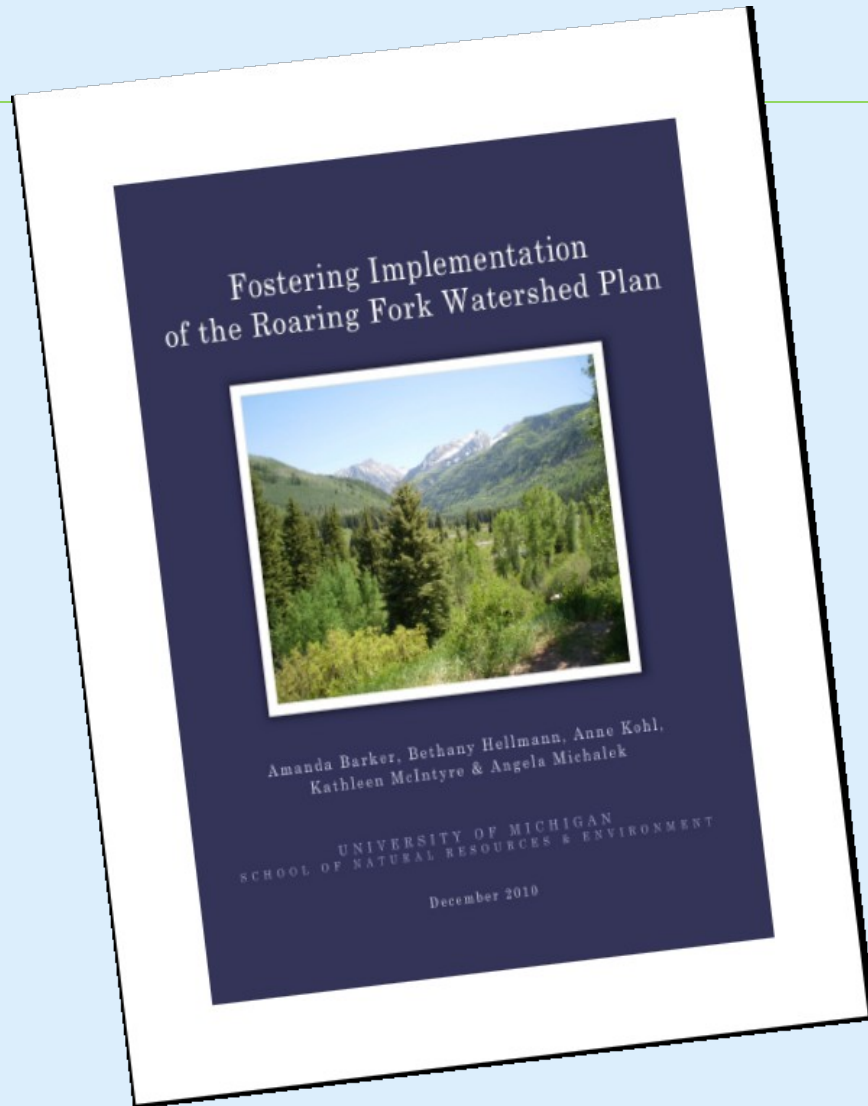
That the (County Commissioners, City Council, Board, etc.) of (Jurisdiction Name Here) hereby express their support for the watershed planning process and their intent to thoughtfully consider the recommendations of the Plan and to adopt those recommendations which they may find appropriate, feasible and beneficial to their respective communities and the watershed as a whole.

A RESOLUTION SIMILAR TO THE ONE ABOVE WAS ADOPTED BY THE FOLLOWING:

Aspen City Council	May 24, 2010	Garfield County	May 17, 2010
Basalt Town Council	April 27, 2010	Glenwood Springs City Council	May 20, 2010
Carbondale Town Council	May 18, 2010	Ft. Collins City Council	May 26, 2010
Eagle County	May 18, 2010	Snowmass Village Town Council	May 3, 2010

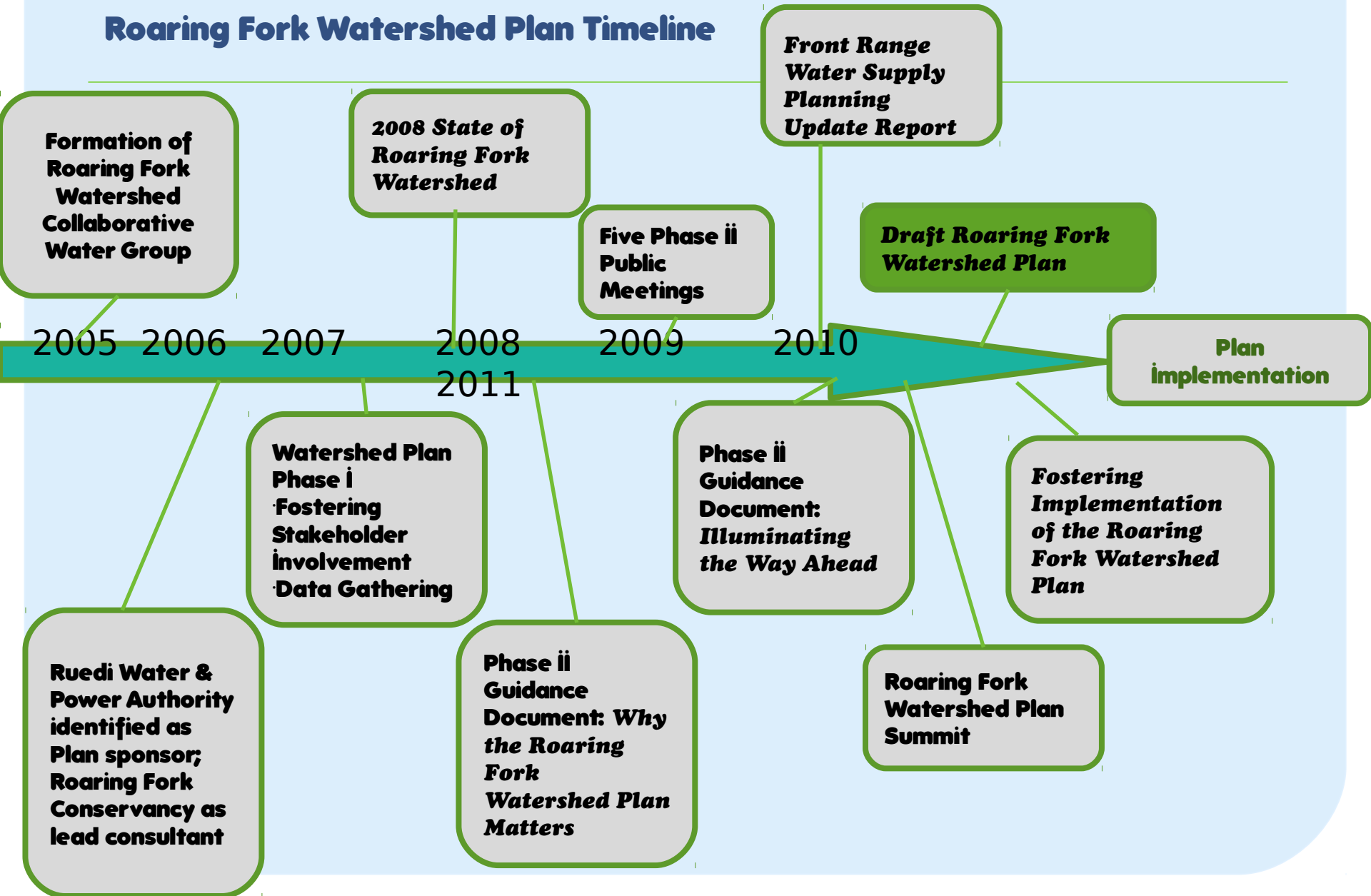
Roaring Fork Watershed Plan Timeline





Identified models of watershed-scale governance systems to promote collaborative management and identified approaches to public outreach and education.

Roaring Fork Watershed Plan Timeline



**Formation of
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Water Group**

**2008 State of
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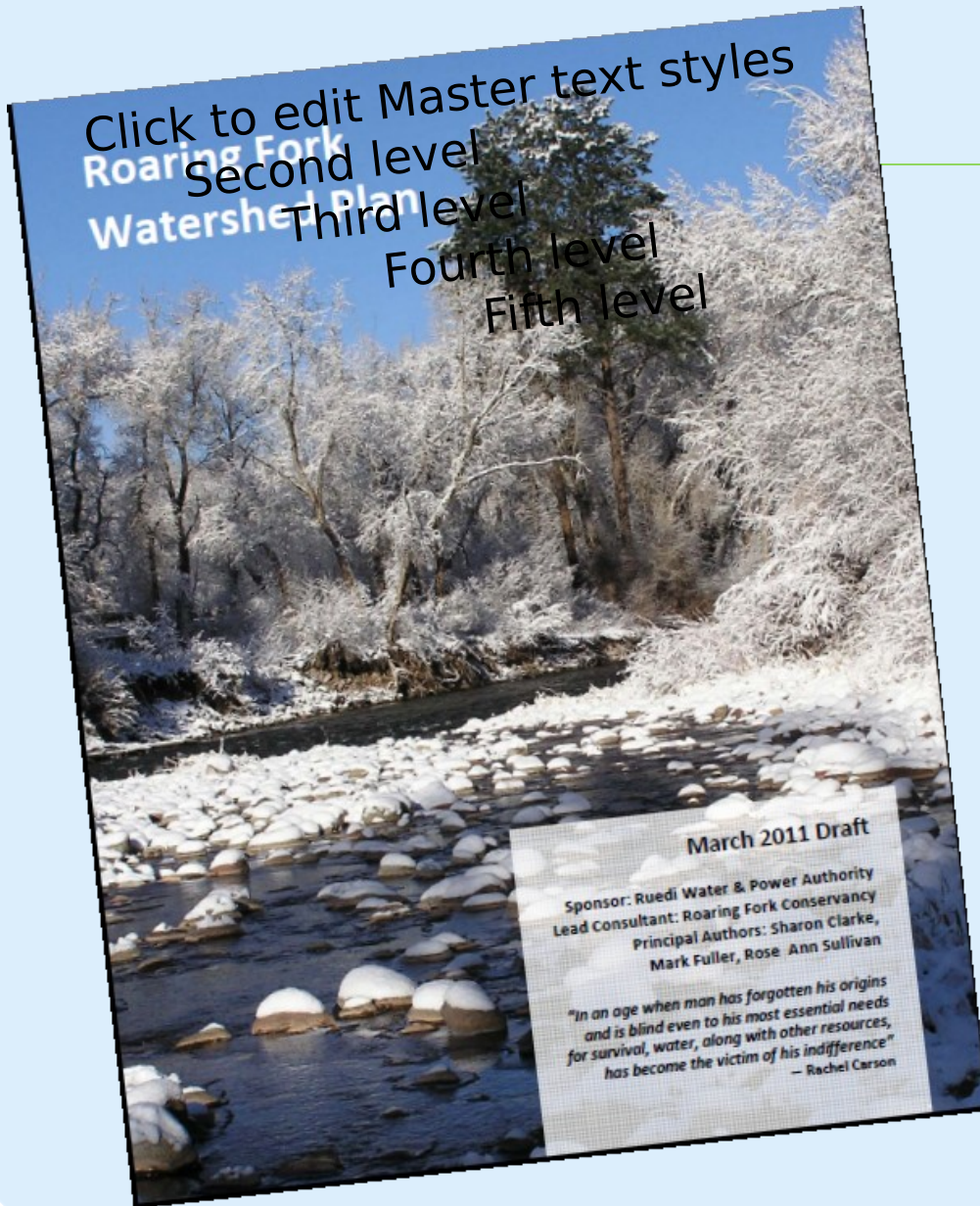
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**Roaring Fork
Watershed Plan
Summit**

Purpose of the Roaring Fork Watershed Plan

To plan for and work toward an environmentally and economically healthy watershed that benefit all who have a stake in it.



Urgent Actions Narrative

- Regional Water Management
- Surface Water Quantity
- Ground Water Quantity
- Water Quality
- Riparian and Instream Areas

Matrices

- Coordinating Entities/
Key Participants
- Geographic Area
- Action Type

Implementation

- Strategies
- Grants

Roaring Fork Watershed Plan Contents

1. Introduction/Overview

2. Urgent Actions

3. Watershed Management Topics

i. Recommended Actions to Achieve Regional Water Management Goals and Objectives

RWM A. Objective: Improve public education and understanding concerning complex federal and state water policies/programs affecting management of our rivers and streams.

ii. Recommended Actions to Achieve Surface Water Management Goals and Objectives

iii. Recommended Actions to Achieve Groundwater Management Goals and Objectives

iv. Recommended Actions to Achieve Water Quality Goals and Objectives

v. Recommended Actions to Achieve Riparian and Instream Goals and Objectives

4. Key

5. Matrices

6. Implementation

i. Potential Implementation Strategies

ii. Potential Grant and Other Opportunities for Funding Implementation of the Roaring Fork Watershed Plan's Recommended Actions

7. Acronyms, Abbreviations, and Glossary

Roaring Fork Watershed Plan Contents

1. Introduction/Overview

2. Urgent Actions

3. Watershed Management Topics

- I. Recommended Actions to Achieve Regional Water Management Goals and Objectives
- II. Recommended Actions to Achieve Surface Water Management Goals and Objectives
- III. Recommended Actions to Achieve Groundwater Management Goals and Objectives
- IV. Recommended Actions to Achieve Water Quality Goals and Objectives
- V. Recommended Actions to Achieve Riparian and Instream Goals and Objectives

Roaring Fork Watershed Plan Contents

4. Key

5. Matrices

6. Implementation

I. Potential Implementation Strategies

II. Potential Grant and Other Opportunities for Funding Implementation of the Roaring Fork Watershed Plan's Recommended Actions

7. Acronyms, Abbreviations, and Glossary

iii. Recommended Actions to Achieve Groundwater (GW) Management Goals and Objectives

GW Goal: To protect the availability and sustainability of our groundwater

Understanding the connection between surface water and groundwater is vitally important as our water resources continue to be developed. Withdrawing water from streams may affect groundwater and pumping water from groundwater may affect streams. The dynamic interaction between groundwater and surface water influences water supply, water quality, and aquatic ecosystems.

The *State of the Roaring Fork Watershed Report 2008* consistently identified the lack of comprehensive groundwater information as an issue. Little reference was made to groundwater in the report because of the lack of information available about specific groundwater tables, aquifers and connections with surface water in the Roaring Fork Watershed. Lack of groundwater information was called out as a data gap for each of the nine sub-watersheds.

GW A. Objective: Obtain, compile and utilize information on groundwater availability and sustainability in local land use and development decisions.

Generally, the process of modeling a groundwater system requires identifying and quantifying inputs and outputs from multiple variables, including geology, soils and geomorphology, climatic factors (e.g., precipitation and snowmelt), stream functions (e.g., water gains and losses), vegetation (e.g., loss to evapotranspiration), topography (e.g., slope steepness and aspect) and human activity (e.g., wells and irrigation). Any modeling effort in the Roaring Fork Watershed can be a frustrating exercise - as the Valley continues to experience periods of drought, water rights are transferred and land uses change, all of which affect groundwater resources.

GW A1. Summary of Action Required: Conduct hydrogeological assessments of all sub-watersheds lacking detailed hydrogeologic information.

- **Coordinating Entities: Local jurisdictions**
- **Key Participants: CDWR, major water diverters, USGS, water conservancy districts, water and sanitation districts**

GW A1a. Identify all sub-watersheds lacking detailed hydrogeologic information and prioritize the sub-watersheds for study on the basis of threats posed to the groundwater supply. Conduct hydrogeological assessments of all sub-watersheds lacking detailed hydrogeologic information, working collaboratively across sub-watershed jurisdictional boundaries. (S&P)

HIGH-LEVEL HYDROGEOLOGICAL ASSESSMENTS WHICH HAVE BEEN COMPLETED:

- The Upper & Middle Roaring Fork Valley,
- The Capitol & Snowmass Creek watersheds,
- The East Sopris Creek watershed,
- The West Sopris Creek watershed,
- The Sopris Creek watershed below the confluence of East & West Sopris Creeks and
- The Crystal River.

Reasons to formalize commitments

- ❖ Provide sense of legitimacy
- ❖ Instill confidence in the collaborative process
- ❖ Guide actions
- ❖ Obtain grants

Urgent Actions

- ❖ Ability to be successfully completed
- ❖ Environmental and economic value of the resource to be protected or restored
- ❖ Threat of future impacts
- ❖ Provide benefits throughout the watershed
- ❖ Opportunities for collaboration and education
- ❖ Opportunistic (ongoing work, public perception, political will)

Urgent Actions

- ❖ **Regional Water Management**
 - ❖ **Create a Unified Voice for Regional Water Management**

- ❖ **Surface Water**
 - ❖ **Ensure that Water Availability Studies include Environmental and Rec Water Needs.**

 - ❖ **Quantify Non-consumptive Flow Needs**

 - ❖ **Pursue Water Conservation Campaign that Benefits River**
- ❖ **Groundwater**
 - ❖ **Ensure Adequate Groundwater Supply for New Land Uses and Developments**
- ❖ **Water Quality**
 - ❖ **Onsite Wastewater Treatment System Education Campaign**
- ❖ **Riparian and Instream Areas**
 - ❖ **Plan and Implement Key Riparian/Instream Protection and Restoration Projects.**

 - ❖ **Provide Adequate Stream Setbacks Throughout the Watershed**

 - ❖ **Increase Awareness of Importance of Riparian Areas**

Urgent Actions

- ❖ **Regional Water Management**

- ❖ **Create a Unified Voice for Regional Water Management**

- ❖ **Surface Water**

- ❖ **Ensure that Water Availability Studies include Environmental and Rec Water Needs.**

- ❖ **Quantify Non-consumptive Flow Needs**

- ❖ **Pursue Water Conservation Campaign that Benefits River**

Urgent Actions (cont)

- ❖ **Groundwater**

- ❖ **Ensure Adequate Groundwater Supply for New Land Uses and Developments**

- ❖ **Water Quality**

- ❖ **Onsite Wastewater Treatment System Education Campaign**

- ❖ **Riparian and Instream Areas**

- ❖ **Plan and Implement Key Riparian/Instream Protection and Restoration Projects.**
- ❖ **Provide Adequate Stream Setbacks Throughout the Watershed**
- ❖ **Increase Awareness of Importance of Riparian Areas**

The key to successful implementation of the plan will be a willingness to push forward with implementation measures as opportunities arise, in spite of the unknowns, unintended consequences and inevitable setbacks that will arise. Nine urgent actions are identified by the plan. These were identified based on various criteria including feasibility, environmental and economic values at stake, urgency of threats, potential benefits, partnership opportunities and public profile. Despite the uncertainty about the specific mechanisms that will drive implementation, the Plan was introduced to local governments and other agencies on the premise that much can be done to effect implementation by the stakeholders that are already in place. As implementation by various entities goes forward, the need for a long-term implementation structure and the ideal form of that structure will be clarified.

Funding Sources

Towns

Counties

CWCB

CBRT/Water Supply Reserve Account

RWAPA

RFC

CRWCD

USFS

Kootenay Resources, LLC

Healthy Rivers Fund

Environment Foundation

National Fish and Wildlife Foundation

319 Grant

ESRI

Colorado Watershed Protection Fund

Lots of in-kind time

Possible structures

- ❖ Roaring Fork Watershed Collaborative Water Group: status quo
- ❖ Roaring Fork Watershed Collaborative Water Group: with authority
- ❖ RWAPA/RFC Partnership
- ❖ New Organization
- ❖ Other thoughts?

Recommendations-Implementation

- ❖ Establish a Memorandum of Understanding between partner organizations
- ❖ Trust and relationship-building
- ❖ Pursue an initial voluntary project
- ❖ Think creatively about solutions
- ❖ Pursue varied funding opportunities

Questions



More information: www.roaringfork.org/watershedplan