Arkansas River Watershed Collaborative

STRATEGIC PLAN 2016

TABLE OF CONTENTS

ARKANSAS RIVER WATERSHED COLLABORATIVE

Founded in 2015 as a subcommittee of the Arkansas Basin Roundtable, the Arkansas River Watershed Collaborative was one of the outcomes of the Roundtable's *Watershed Health Working Group's* efforts when preparing the Basin Implementation Plan. Initially, the focus of their energies were heavily influenced by the Waldo, East Peak, and West Fork Complex fires, which brought attention to the need for watershed protection and community partnerships. After gathering feedback from several reaches of the basin, it was determined that watershed-health concerns spanned a wide variety of locally identified challenges, which helped to shape the Collaborative into what it is today. This plan is intended to guide the high-level, overarching activities of ARWC for a period coinciding with the State of Colorado's Water Plan, with annual operating plans laying out specific tasks year-by-year.

Effective Date

XXX Month, 2016

Mission Statement

The mission of the Arkansas River Watershed Collaborative is *to provide assistance to Arkansas Basin communities to address locally identified watershed issues for economic, ecological, and social benefit.*

Vision Statement

"Healthy Watersheds & Economic Prosperity"

Values

1. Seek representation from a wide diversity of basin stakeholders, including federal and state agencies, local government, private and non-governmental organizations, and citizens who are committed to maintaining healthy watersheds and economic prosperity in the Arkansas Basin.

2. Support locally-driven initiatives and implementation of action-oriented efforts.

3. Serve as a transparent champion for stewardship of resources, with an emphasis on best-available science, voluntary activities, and building funding availability and leverage for watershed health projects.

Strategic Imperatives and Direction

1. Work with the widest array of stakeholders by providing a forum in which to discuss watershed-health issues in a non-hostile environment, and work to reach consensus on strategies and approaches for protecting and restoring watershed health.
2. Recognize that watershed health depends on healthy communities, and healthy communities depend on economic prosperity.
3. Provide a central point for consistent review, mapping, and data sharing with respect to watershed-health.
4. Facilitate completion of prioritized watershed-health projects, particularly those that are identified as part of the Basin Implementation Plan.
5. Provide a conduit for local constituents to bring forward additional watershed-health projects for inclusion in the Basin Implementation Plan in the future.
6. Engage in public outreach and education (in concert with the Arkansas Basin Public Education, Participation, and Outreach workgroup—aka PEPO) that helps citizens and stakeholders understand and address water needs, uses, and watershed-health concerns.
7. Serve as a model for other basins in Colorado and beyond.

What exactly is *watershed health*

In a 1964 Supreme Court Opinion, Justice Potter Stewart said of pornography that it would be hard to define, "But I know it when I see it."

Watershed health is similar in that it may be hard to define, but it is easy to see. First, however, it helps to understand the concept of a watershed: it is all the area that drains to a certain point, and like Russian stacking dolls, small watersheds are embedded within bigger, and ever bigger watersheds. The Mississippi is the third largest watershed in the world, draining 41% of the contiguous United States (and a bit of Canada). The Arkansas basin is one of four main tributaries to the Mississippi. At its confluence with the Mississippi, it drains about 170,000 square miles. At the border of Colorado, the watershed drains 28,268 square miles.

Measuring the "vital signs" of a watershed to assess its health requires thinking of all the things that are happening, both on the land and in the river. We take the "temperature" of the watershed by assessing:

- **Water quality—typically a measure of pollution.**
- **Hydrology, hydraulics, and geomorphology—the quantity of water at different seasons, and how that water moves through the system. These are typically studied by evaluating flows at different seasons and weather patterns, bank stability, sinuosity (or how the river meanders), cross-sections, depth of pools, and similar physical features.**
- **Upland health and habitat—reflects a wide array of vegetation, climate, human disturbance, animal population dynamics, invasive species, and more.**

When a watershed is healthy, it is more resilient to floods, fires, and disturbances, and it provides critical "ecosystem services," such as clean and abundant water.

Driving Forces

1. Water rights and administration, including cross-basin and cross-state issues (Interstate Compact and Interbasin Compact issues).
2. Climate-driven impacts on hydrology, particularly associated with drought, wildfire, and flooding.
3. Population growth in Colorado.
4. Water-quality issues.

Stakeholders and Partners

Many individuals, representing a diversity of interests, participated in the development of this plan. The following organizations or individuals affiliated with these organizations have been involved, including members of the Arkansas Basin Roundtable (included below):

- Federal Agencies (Bureau of Reclamation; Bureau of Land Management; Environmental Protection Agency; Forest Service; US Geological Survey; Natural Resources Conservation Service)
- Counties (Baca, Bent, Chaffee, Cheyenne, Crowley, Custer, Elbert, El Paso, Fremont, Huerfano, Kiowa, Lake, Las Animas, Lincoln, Otero, Park, Prowers, Pueblo, Teller)
- Special Districts (Donala Water & Sanitation District; Fountain Creek Watershed Flood Control and Greenway District; Huerfano County Water Conservancy District; Lower Arkansas Valley Water Conservancy District (Fiscal Host); Purgatoire River Water Conservancy District; Southeastern Colorado Water Conservancy District; Upper Arkansas Water Conservancy District)
- Municipalities & Municipal Water Provicers (Buena Vista; La Junta; La Veta; Salida, Trinidad, Walsenburg; Aurora Water Department, Colorado Springs Utilities, Pueblo Water Department)
- State Agencies (Colorado Department of Public Health & Environment, Colorado Parks & Wildlife; Colorado State Conservation Board; Colorado State Forest Service; Colorado Water Conservation Board (Primary funder))
- Sub-basin Watershed Groups (Headwaters of the Arkansas Watershed Group; Purgatoire Watershed Partnership
- Nonprofit Organizations (Audobon Society; Coalitions & Collaboratives, Inc (Facilitation and Support); Colorado Association of Conservation Districts; Friends of Browns Canyon; Greater Arkansas Nature Association; Land Trust of the Upper Arkansas; Mile High Youth Corp; National Forest Foundation; Palmer Land Trust; San Isabel Land Protection Trust; Trout Unlimited (multiple chapters and state representatives)
- Other Organizations (Arkansas River Wetlands Focus Committee; Boggsville Historic Site; Colorado State University Extension Service; East Otero, West Otero Timpas & Olney Boone Conservation Districts; Ecometrics; El Paso Regional Watershed Collaborative; Huerfano County Economic Development; Upper Arkansas Area Council of Governments; Riverside Water Company; Round River Design; Western Colorado Landscape Collaborative; Western State University); Holbrook Mutual Irrigating Company.
- News Media attendees (LaJunta Tribune; LaVeta Signature; Mountain Mail; Pueblo Chieftain)
- Senator Corey Gardner and Senator Michael Bennet staff attendees

Roles for ARWC

During listening sessions and planning meetings, a number of themes came through with consistency. ARWC can and should assist with the following:

1. Communication Among Stakeholders—provide a system that allows participants to connect with each other and with other stakeholders.
2. Partnerships— support partnership development and help to connect potential project partners with each other.
3. Stakeholder Support—develop local and broad-based stakeholder support for projects.
4. Information—share information across the basin, such as data and successful project models.
5. Capacity—help develop human capacity to focus on watershed projects and local collaborative development.
6. Funding Sources—support identifying and bringing in funding sources.

Issues for ARWC

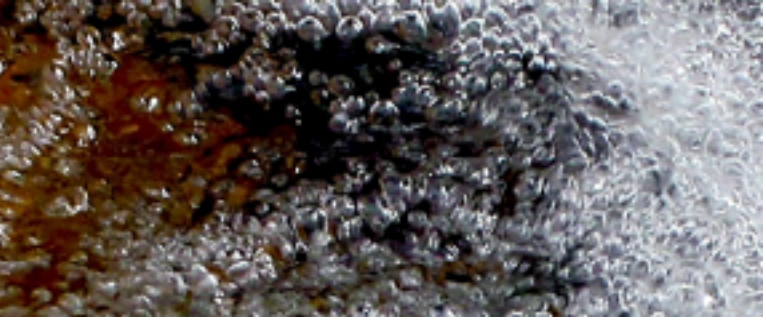
Issues that came up more than once in listening sessions include:

1. Forest Health, Fire, Flooding
2. Water Quality & Quantity (e.g. dams deemed unsafe to hold full amount of water)
3. Invasive Species, particularly phreatophytes
4. Healthy & resilient river corridors and uplands
5. Recreation & agriculture (maintaining rec and ag economies, while mitigating impacts).
6. Intersection of groundwater/surface water needs and challenges.

7. Storm water impacts.

Strategy…

is the deliberate coarse of action that the organization takes to achieve its stated goals and mission.



STRATEGIC PLAN

Goals

1. Protect and improve watershed health throughout the Arkansas Basin.
2. Work with the Nonconsumptive Committee and other stakeholders to support and implement the Basin Implementation Plan Nonconsumptive Goals (see page #):
3. Assist in, or support, the execution of watershed-health projects identified in the Basin Implementation Plan and the objectives for protecting water resources identified in the Colorado Water Plan (see page A 12).
4. Coordinate with stakeholders to assure that watershed-health considerations are recognized during planning and implementation for storage, municipal, and agricultural projects identified in the BIP, and in other types of projects that occur across the basin, as appropriate (e.g. in relation to things like a major highway project).
5. Support and aid local collaborative groups in sub-basins to further their watershed-health efforts throughout the basin, such as assisting with planning efforts, fundraising, or other functions identified by sub-basin groups.

Strategies

The strategies listed below are intended to provide a focus and basis for activities over the first five years following the effective date of this plan.

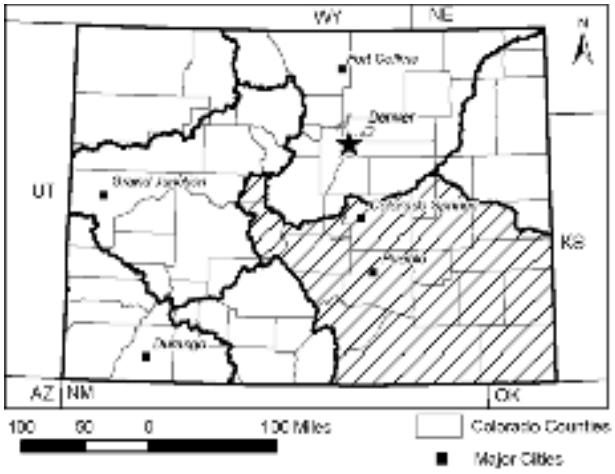
1. Governance and Organizational Strategies:
    - In conjunction with ABRT establish nonprofit with bylaws and board of directors.
    - Produce a annual operating plan (with a three-year look-out period).
2. Data Management Strategies:
    - Establish a web portal for Arkansas Basin information (e.g. reports, research papers, thesis, etc).

- Collaboration of GIS specialists from municipal, governmental, and NGO
- Continue efforts aimed at inclusion of water infrastructure information into Wildfire Decision Support System (WFDSS).

3. BIP Implementation Strategies:
    - Establish a review procedure for providing input to the Roundtable's Needs Assessment Committee of projects for benefit of watershed health.
    - Work with Roundtable Nonconsumptive Committee and local stakeholders to promote/implement at least one BIP Watershed Health project annually.
4. Community/Local Collaborative Support Strategies:
    - Identify existing watershed stakeholder groups in each sub-basin (typically HUC 12 units or similar scale groups) in annual operating plan. These may be formal

      (such as existing nonprofit watershed groups, or informal groups with broad participation of local governments and water interests.)
    - Provide staff support to Nonconsumptive Committee at their request.
    - Provide grant training/review/writing services to local groups upon request.
    - Provide support to groups as requested and approved by the Roundtable.
5. Planning:
    - Work with local stakeholders and agencies as appropriate (supported by Roundtable leadership), requested (by local stakeholders), and funded to prepare or update plans that support watershed health work, such as:
        - General Watershed Health Strategic Plans;
        - 9-Element Water Quality Plans (EPA/CDPHE planning approach);

- Stream Management Plans (CWCB Colorado Water Plan planning approach); or



- CWPPs (USFS/CSFS forest/fire planning approach).
- Project specific plans for implementation of watershed-health projects.
- Note that depending on goals and purposes of a planning process, one plan may cover more than one of the aforementioned elements

6.Education & Outreach Strategies:

- Work directly with the Roundtable PEPO (Public Education, Participation, & Outreach) Committee on educational events geared specifically toward watershed health (e.g. meetings on fire & protecting water supply).
- Assist the Arkansas Basin Watershed Forum with inclusion of watershed-health-related information.
- Other outreach, including maintaining a web page, interacting with stakeholders, attending Roundtable meetings, etc.

About the Arkansas Basin

Ecoregions	Southern Rockies (23%) High Plains (18%) Southwestern Tablelands (59%)	**Surface Area** **Stream Length**	28,268 square miles 25,592 miles
T&E Species	Threatened: 12 Endangered: 9 State Species of Concern: 27 Federal candidate: 1	**Major Land Covers**	Grasslands & Forests
Counties	Baca, Bent, Chaffee, Cheyenne, Crowley, Custer, Elbert, El Paso, Fremont, Huerfano, Kiowa, Lake, Las Animas, Lincoln, Otero, Park, Prowers, Pueblo, Teller	**No. Lakes/Reservoirs:** **Acres Lakes/Reservoirs**	24 60,171
Population	948,000	**No. Groundwater Aquifers**	6

Performance Measurements and Evaluation Plan

1. A simulation of a fire event using the WFDSS incorporated elements will take place to ensure ease of use.

2. For each of the ambassador projects, and such future projects as ARWC helps with, do a follow-up interview with the respective project managers to gain valuable information on what was successful and what lessons were learned to finish the projects.

3. Perform project-specific monitoring (pre- and post) as appropriate for all projects. Depending upon the type of project implemented, this may be based on things like photo points, water quality data collection, biological data collection, social-science data collection, etc.

4. Provide an annual report to the Roundtable and other stakeholders

APPENDIX

Watershed Description

The Arkansas Basin covers over 28,000 square miles in southeastern Colorado, emanating in the high peaks along the east side of the Continental Divide near Leadville, and flows generally east/southeast to the border with Kansas. Elevationally, it ranges from 14,443 feet at Mt. Elbert, to 3,340 feet at the state line. Precipitation averages 10-15 inches per year; however, the high mountains may see as much as 30 inches per year, much of it as snowpack. The basin is frequently subject to drought conditions that can be very extreme, causing hardship for both agriculture and recreations, which are the economic drivers in the basin. Land ownership is about 70% privately, 20% federal, and 10% state or local government. Approximately 67% is classified as grasslands, 13% as forest, 10% cultivated, and 10% as other cover types (development, shrublands, wetlands, reservoirs/water, etc.). There are 14 major sub-basins or sub-watersheds, including: Arkansas Headwaters, Upper Arkansas, Fountain, Apishipa, Chico, Lake Meridith, John Martin, Huerfano, Purgatoire, Horse, Rush, Big Sandy, and Two Buttes.

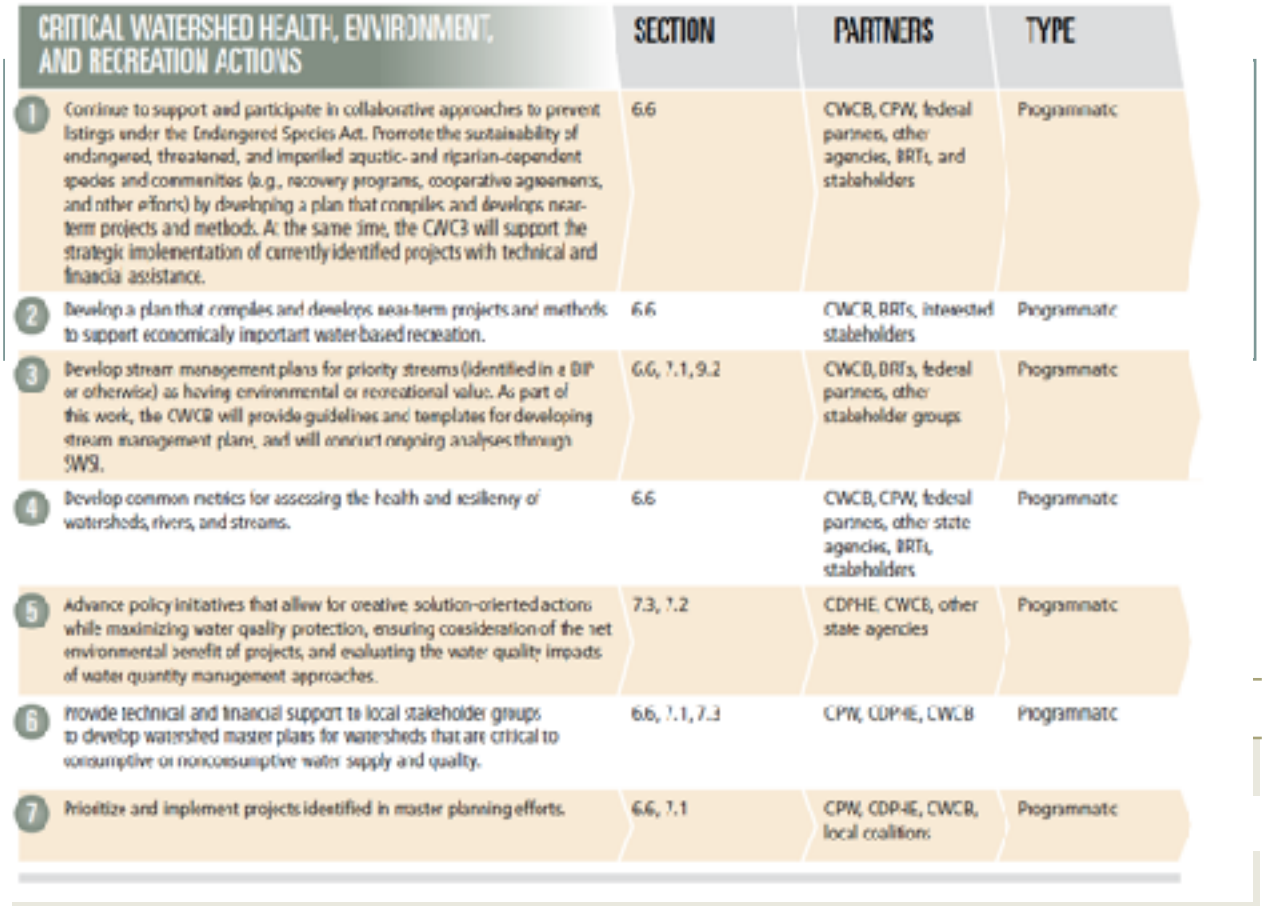
Colorado completed the first statewide Colorado Water Plan in 2015 (see more about the plan on the next page). The Plan identified a number of challenges and opportunities for the basin:

1. All new uses require augmentation. Increasing irrigation efficiency, i.e. conversion from flood to center-pivot irrigation for labor and cost savings, will require 30,000-50,000 acre-feet of augmentation water in the coming years. *[Note: improved irrigation efficiency is also an approach that is considered a Best Management Practice for improving water quality.]*
2. Replacement of municipal water supplies that depend on the non-renewing Denver Basin aquifer and declining water levels in designated basins is becoming critical, exacerbated by continued growth in groundwater-dependent urban areas.
3. Concerns over agricultural transfers and the effects on rural economies are substantial in the lower portion of the basin downstream of Pueblo Reservoir.
4. Collaborative solutions, as demonstrated in Alternative Transfer Methods pilot projects, are needed to forestall or avoid loss of irrigated acreage in agriculture.
5. As the most rafted river in the world, the Arkansas River Voluntary Flow Agreement provides a benchmark for cooperative integration of municipal, agricultural and recreational solutions in support of recreational boating and a gold medal fishery.
6. Concerns over water quality include drinking water in the Lower Valley and the impact of fires and floods in the Fountain Creek watershed.
7. Rural areas within the Arkansas Basin have identified water needs, but face challenges in marshalling resources to identify and implement solutions. Support from the Roundtable and CWCB is needed.
8. The great majority of surface storage reservoirs in the Arkansas Basin were constructed between 1890 and 1930. Many of these facilities are in need of repair or restoration.
9. Regional solutions are emerging, like the SECWCD Regional Water Conservation Plan, which can serve as a model for future regional initiatives.

Colorado Water Plan

As the Executive Summary of the Colorado Water Plan says, it is a "roadmap that leads to a productive economy, vibrant and sustainable cities, productive agriculture, a strong environment, and a robust recreation industry. It sets forth the measurable objectives, goals, and actions by which Colorado will address its projected future water needs and measure its progress—all built on our shared values. Just as it was created, this plan will be implemented by working collaboratively with the basin roundtables, local governments, water providers, other stakeholders, and the general public."

ARWC's strategic plan is very much an outgrowth of the Colorado Water Plan process, and as such, we intend to support objectives of the Colorado Water Plan that address the protection of water resources that our state, and out basin, depend upon. The state water plan calls for conservation, and seeking additional storage, seeing these two approaches as hand-and-glove aspects of meeting future demand. But the plan also considers the values propositions that support the productive economy, vibrant and sustainable cities, productive agriculture, a strong environment, and a robust recreation industry that the overwhelming majority of citizens recognize as critical to our future. The factors affecting these values are highlighted in Chapter 6, *Water Supply Demand for the Future,* and Chapter 7, *Water Resource Management & Protection.* Chapter 10, the *Critical Action Plan* lays out ground work that is critical to meet the overall goals of providing abundant and useable water for the future.



CRITICAL WATERSHED HEALTH, ENVIRONMENT, AND RECREATION ACTIONS	SECTION	PARTNERS	TYPE
1 Continue to support and participate in collaborative approaches to prevent listings under the Endangered Species Act. Promote the sustainability of endangered, threatened, and imperiled aquatic- and riparian-dependent species and communities (e.g., recovery programs, cooperative agreements, and other efforts) by developing a plan that compiles and develops near-term projects and methods. At the same time, the CWC3 will support the strategic implementation of currently identified projects with technical and financial assistance.	6.6	CWCB, CPW, federal partners, other agencies, BRTs, and stakeholders	Programmatic
2 Develop a plan that compiles and develops near-term projects and methods to support economically important water-based recreation.	6.6	CWCB, BRTs, interested stakeholders	Programmatic
3 Develop stream management plans for priority streams (identified in a BIP or otherwise) as having environmental or recreational value. As part of this work, the CWCB will provide guidelines and templates for developing stream management plans, and will conduct ongoing analyses through SWSI.	6.6, 7.1, 9.2	CWCB, BRTs, federal partners, other stakeholder groups	Programmatic
4 Develop common metrics for assessing the health and resiliency of watersheds, rivers, and streams.	6.6	CWCB, CPW, federal partners, other state agencies, BRTs, stakeholders	Programmatic
5 Advance policy initiatives that allow for creative solution-oriented actions while maximizing water quality protection, ensuring consideration of the net environmental benefit of projects, and evaluating the water quality impacts of water quantity management approaches.	7.3, 7.2	CDPHE, CWCB, other state agencies	Programmatic
6 Provide technical and financial support to local stakeholder groups to develop watershed master plans for watersheds that are critical to consumptive or nonconsumptive water supply and quality.	6.6, 7.1, 7.3	CPW, CDPHE, CWCB	Programmatic
7 Prioritize and implement projects identified in master planning efforts.	6.6, 7.1	CPW, CDPHE, CWCB, local coalitions	Programmatic

Aquatic Cold 1	47	6181	28%
Aquatic Cold 2	8	566	3%
Aquatic Warm 1	11	1405	6%
Aquatic Warm 2	26	13704	63%

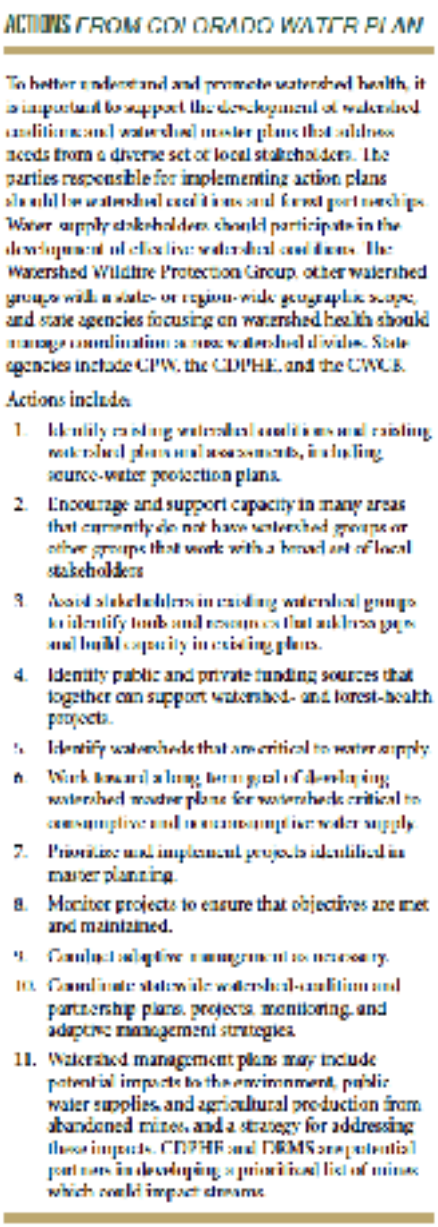
TMDLs

TMDL stands for Total Maximum Daily Load. A TMDL is a regulatory term within the Clean Water Act describing a value of the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards. The process addresses both point and nonpoint sources of pollution. It is a planning tool that helps pinpoint restoration and protection strategies for assuring that a water body meets standards. (See a full list of Segments with water quality concerns on page 18.

The plan details a number of measurable goals and objectives in Chapter 10. The goals that are most

Approved TMDLs	
Reach	**Contaminant**
COARUA01b: East Fork Arkansas	Lead, Zinc
COARUA02a: Arkansas Birdseye Gulch and California Gulch	Zinc
COARUA02b: Arkansas above Lake Fork	Cadmium, Zinc
COARUA02c: Arkansas Lake Fork to Lake Creek	
COARUA03: Arkansas Lake Creek to Pueblo Reservoir	Cadmium, Zinc
COARUA05: Half-moon Creek	Cadmium, Lead
COARUA07: Evans Gulch	Zinc
COARUA08b: Iowa Gulch	Cadmium, Lead, Zinc
COARUA10: Main Stem Lake Creek and all tributaries	Copper
COARUA11: South Fork Lake Creek	Aluminum, Cadmium, Copper, Zinc, pH
COARUA12: Chalk Creek	Lead, Zinc

significant to our efforts include:



ACTIONS FROM COLORADO WATER PLAN

To better understand and promote watershed health, it is important to support the development of watershed conditions and watershed master plans that address needs from a diverse set of local stakeholders. The parties responsible for implementing action plans should be watershed coalitions and forest partnerships. Water supply stakeholders should participate in the development of effective watershed conditions. The Watershed Wildfire Protection Group, other watershed groups with a state- or region-wide geographic scope, and state agencies focusing on watershed health should manage coordination across watershed divides. State agencies include CPW, the CDPHE, and the CWCB.

Actions include:

1. Identify existing watershed conditions and existing watershed plans and assessments, including source-water protection plans.
2. Encourage and support capacity in many areas that currently do not have watershed groups or other groups that work with a broad set of local stakeholders.
3. Assist stakeholders in existing watershed groups to identify tools and resources that address gaps and build capacity in existing plans.
4. Identify public and private funding sources that together can support watershed- and forest-health projects.
5. Identify watersheds that are critical to water supply.
6. Work toward a long-term goal of developing watershed master plans for watersheds critical to consumptive and nonconsumptive water supply.
7. Prioritize and implement projects identified in master planning.
8. Monitor projects to ensure that objectives are met and maintained.
9. Conduct adaptive management as necessary.
10. Coordinate statewide watershed-coalition and partnership plans, projects, monitoring, and adaptive management strategies.
11. Watershed management plans may include potential impacts to the environment, public water supplies, and agricultural production from abandoned mines, and a strategy for addressing these impacts. CDPHE and DRMS are potential partners in developing a prioritized list of mines which could impact streams.

- Recover Imperiled Species: Promote restoration, recovery, and resiliency of endangered, threatened, and imperiled aquatic and riparian dependent species and plant communities.
- Enhance Environmental and Recreational Economic Values: Protect and enhance river-based environments and recreational opportunities that support local and statewide economies and are important for the enjoyment of current and future generations of Coloradans.
- Protect Healthy Environments: Understand, protect, maintain, and improve conditions of streams, lakes, wetlands, and riparian areas to promote self-sustaining fisheries and functional riparian and wetland habitat to promote long-term resiliency.
- Promote Protection and Restoration of Water Quality: The protection and restoration of water quality should be a key objective when planning for Colorado's current and future consumptive, recreational, and environmental water needs.
- Protect and Restore Critical Watersheds: Protect and restore watersheds critical to water infrastructure, environmental or recreational areas.

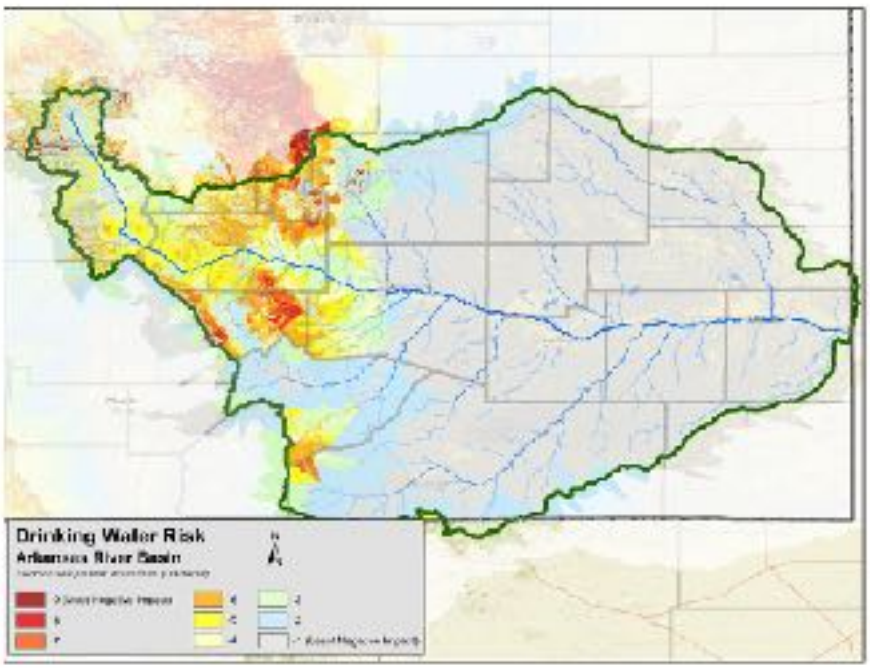
Those objectives that ARWC is likely to have direct engagement in include:

B. Conservation: *Colorado's Water Plan sets a measurable objective to achieve 400,000 acre-feet of municipal and industrial water conservation by 2050*

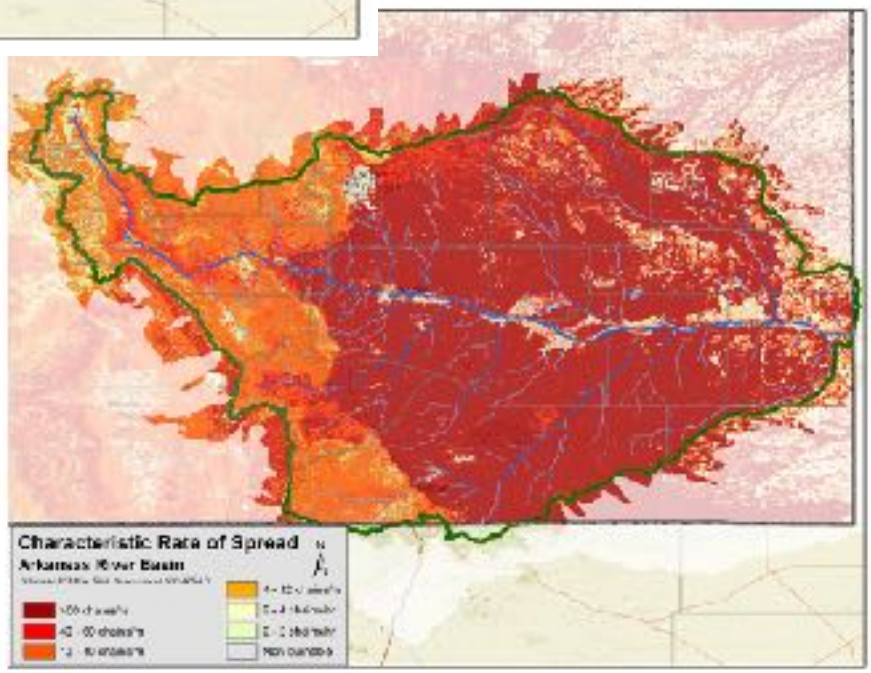
F. Watershed Health, Environment, and Recreation: *Colorado's Water Plan sets a measurable objective to cover 80 percent of the locally prioritized lists of rivers with stream management plans, and*

80 percent of critical watersheds with watershed protection plans, all by 2030.

***G. Funding:** Colorado's Water Plan sets an objective to sustainably fund its implementation. In order to support this objective, the State will investigate options to raise additional revenue in the amount of $100 million annually ($3 billion by 2050) starting in 2020. Such funds could establish a repayment guarantee fund and green bond program focused on funding environmental and recreational projects. In addition, such funds could further support conservation, agricultural viability, alternative transfer methods, education and outreach, and other plan implementation priorities.*



***H. Education, Outreach, and Innovation:** Colorado's Water Plan sets a measurable objective to significantly improve the level of public awareness and engagement regarding water issues statewide by 2020, as determined by water awareness surveys. Colorado's Water Plan also sets a measurable objective to engage Coloradans statewide on at least five key water challenges (identified by CWCB) that should be addressed by 2030.*



Community Wildfire Protection Plans (CWPPs)

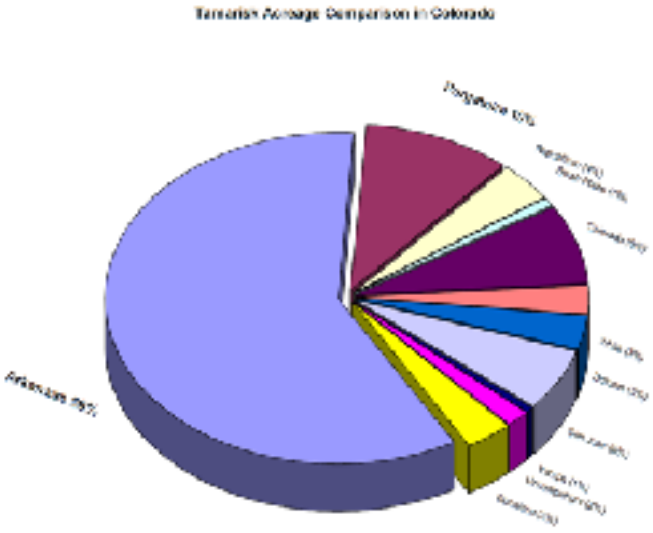
Each county, and many communities across the state have developed CWPPs to understand wildfire risk, and plan programs and projects to mitigate wildfire concerns. ARWC recognizes CWPPs as important tools, and will work with community members to support CWPP implementation, or for developing new/revised plans as appropriate. Plans may be reviewed at: http://csfs.colostate.edu/wildfire-mitigation/colorado-community-wildfire-protection-plans/

Water Quality

Water quality in the basin ranges from very good (with several segments identified as suitable for Wild & Scenic Designation and three segments identified as Outstanding Waters under the Clean Water Act), to poor, due to selenium, salts, nutrients or coliforms, with several covered or slated to be covered by TMDLs (total maximum daily loads, per the Clean Water Act, and as managed by the Colorado Department of Public Health & Environment, or CDPHE.) For planning purposes, CDPHE identifies the following classified uses:

Each classified use has a distinct set of standards that streams must meet to maintain the classification. Standards may be numeric or narrative, and may be specifically applied to specific reaches. The standard-setting water-quality regulation for the Arkansas Basin is *Regulation #32, Classifications and Numeric Standards for Arkansas River Basin.* Other regulations promulgated by the State may also apply, such as the new *Regulation #85, Nutrients Management Control Regulation.*

Sources of contaminates and specific constituents of concern, listed below, can alter aesthetic acceptability of the water or pose a threat to human health, aquatic life, and habitat. Contaminate sources are generally from either point sources (discharged from a pipe, for example from a wastewater treatment plant), or nonpoint sources that come from across the landscape and are not readily regulated and controlled.



1. **Sediment**—Both natural conditions and human activities contribute to sediment loads. Natural conditions that contribute to this problem include the results of wildfire, floods, and landslides, steep terrain, and geological characteristics. Sediment from

human activities is impacted by: Land use and development, Transportation, Agriculture, and Recreation

2. **Nutrients**—Nitrogen and phosphorous are also a concern due to wastewater discharges, septic systems, and fertilizers.
3. **Metals/acid mine drainage**—Traditionally, a great deal of mining took place in the headwaters of the basin, and mining is still active at the Cripple Creek Victor Gold Mine and the Climax Molybdenum Mine.
4. **Microorganisms**—These may come from natural sources (wildlife), livestock, septic systems, and/or wastewater treatment plants. E-coli is of particular concern.
5. **Selenium—**Selenium is a naturally occurring element, and an important nutrient in small quantities; however when selenium levels are high, it causes health concerns, issues with crop production, and taste issues in drinking water. It is an overly abundant constituent in soils in the Arkansas basin, resulting in water quality exceedances.
6. **Radionuclides—**The term radionuclides refers to radium (a breakdown product of uranium and thorium); gross alpha particles (a measure of all radioactive particles); and beta emitters (tritium and strontium). Radionuclides of particular concern in the basin include radon and uranium. The Arkansas Valley Conduit will to address this issue.

Wildfire

Wildfire has become a significant concern for watershed health since the 1996 Buffalo Creek fire (11,700 acres, and at that time the largest fire in modern Colorado history) resulted in massive post-fire flooding that substantially filled Strontia Springs Reservoir southwest of Denver with sediment from thirteen 100-year-plus flood events in 18 months. In 2012, as the BIP process was kicking off, the Waldo Canyon fire burned over 18,000 acres in the Arkansas Basin, on the edge of Colorado Springs, and was followed in 2013 by the East Peak Fire in Huerfano County, the Black Forest Fire in El Paso County, and the Royal Gorge Fire in Fremont County. These fires raised the profile of fires and forest health on the water plan process. The issue of wildfire relates directly to poor forest health. Forest health has declined for several reasons, including climate change, ~100 years of active fire suppression, and development patterns.

The impact early fires had on watersheds and water for municipal and agricultural use, led to efforts in planning and reducing fire impacts on water supplies. In 2007, the Pinchot Institute of Conservation produced the report *Protecting Front Range Forest Watersheds from High-Severity Wildfires.* This report was a first-level assessment of impacts to water supplies, but led to the formation of the Wildfire-Watershed Working Group. This group contracted with JW Associates to develop a protocol for evaluating watersheds and identifying zones of concern for where wildfire would likely impact water supplies. The process, first demonstrated in the Upper South Platte, was then completed across most forested acres in the state, including in several sub basins within the Arkansas Basin.

The Colorado State Forest Service launched CO-WRAP (the Colorado Wildfire Risk Assessment Portal) as a tool for fire managers, land managers, community members, and others to better understand potential impacts of wildfire. Utilizing this process, the three maps on this page help show the potential for wildfire. Note that although drinking water impacts of fire (map at left) are most severe in the forested portions of the western basin, fire intensity (at right) and rate of spread (below) can be very severe in grassland/shrubland environments, and these fires can

2015 BIP Nonconsumptive Goals

1. Maintain or improve native fish populations
2. Maintain, improve, or restore habitat for fish species
3. Maintain or improve recreational fishing opportunities
4. Maintain or improve boating opportunities, including rafting, kayaking, and other non-motorized and motorized boating
5. Maintain or improve areas of avian breeding, migrating and wintering
6. Maintain or improve riparian and aquatic habitat, and restore riparian and aquatic habitat that would support environmental features and recreational opportunities
7. Maintain or improve wetlands, and restore wetlands that would support environmental features and recreational opportunities

have significant impacts on riparian health and water quality throughout the basin, as well as on public safety.

Invasive Species

The challenge of invasive plant species, particularly invasive phreatophytes (a plant with a deep root system that draws its water supply from near the water table, particularly tamarisk and Russian olive), was a problem that received recognition in several of the ARWC listening sessions. This is for good reason: invasive species cause significant problems and cost a lot of money to begin controlling. The invasive phreatophytes add another dimension, in that they use excessive water with little or no beneficial purpose; the largest portion of invasive phreatophytes in the state are found in the Arkansas Basin.

Based on this, in 2007 the Tamarisk Coalition (a Grand-Junction-based nonprofit that focuses on addressing invasive phreatophytes and improving riparian lands) worked with the Southeastern Colorado Water Conservancy District and a variety of other governmental and nongovernmental stakeholders to form the Arkansas River Watershed Invasive Plants Partnership. The partnership developed a plan for addressing tamarisk and Russian olive.

Work is on-going on treatment of invasive phreatophytes, but there is still more to do.

General invasive weeds are addressed by the Upper Arkansas Cooperative Weed Management Association (UAWCMA), which was established in 1998 to form partnerships with multiple

organizations to raise awareness of noxious weeds through education and to identify, contain, and control the spread of noxious weeds throughout the upper Arkansas River watershed region.

ARWC will work with these and other partners to address issues associated with invasive

Reach	Concerns	TMDL Priority
COARFO01a: Fountain Creek and tributaries above Monument Creek	Fe(Trec), U E. coli, Mn, As	H/L/L
COARFO02a: Fountain Creek, Monument Creek to Hwy 47	Fe(Trec) E. coli	H
COARFO02b: Fountain Creek from Hwy 47 to the Arkansas River	E. coli (May-October)	H
COARFO03a: Tributaries to Fountain Creek within the National Forest or Air Force Academy lands, from Monument Creek to the Arkansas River	Aquatic Life (provisional)	L
COARFO03b: Bear Creek, and all tributaries, from the source to a point immediately upstream of Gold Camp Road.	Cu	H
COARFO04: All tribs to Fountain Creek, which are not on National Forest or Air Force Academy Land	E. coli, SE	H
COARFO05: Jimmy Camp Creek and unnamed tributary below Fort Carson and surrounding marshlands	Fe(Trec)	
COARFO06: Monument Creek from National Forest to Fountain Creek	E. coli (May-October), Temperature, Aquatic Life (provisional)	H/M/L
COARLA01a: Arkansas River, Fountain Creek to Colorado Canal headgate	E. coli	H
COARLA01b: Arkansas River, Colorado Canal headgate to John Martin Reservoir	Se, As, Mn	2017
COARLA01c: Arkansas River, John Martin Reservoir to stateline	Se, U, As, Mn	H/H/L/L
COARLA02a: All tributaries to the Arkansas River from the Colorado Canal headgate to the Colorado/Kansas border	SO4, Mn	
COARLA03a: Mainstem of the Apishapa River, including tribs from source to I-25	E. coli Temperature	H
COARLA04a: Apishapa River, Timpas Creek	Se, SO4, MN, Fe	2017
COARLA05a: Upper North Fork, Middle Fork, South Fork of the Purgatoire River, including all tributaries.	As	L
COARLA05b: Lower North, Middle and South Fork of the Purgutoire River, and the mainstem from source to Trinidad Reservoir.	Temperature, As, Mn	L

species throughout the basin.

Reach	Concerns	TMDL Priority
COARLA06a: All Tributaries to the Purgatoire River from the source to Interstate 25	Aquatic Life (provisional), Temp	M
COARLA06b: Wet Canyon and all tributaries from the source to the confluence with the Purgatoire River	Temperature	
COARLA07: Purgatoire River, I-25 to Arkansas River	Sediment, E. coli	
COARLA09a: Mainstem of Adobe Creek and Gageby Creek…	Mn, SO4 Fe(Trec), Fe(Trec) E. coliFe(Trec) E. coli, Se, As	2017
COARLA09b: Apache Creek, Breckenridge Creek, Little Horse Creek, Bob Creek, Wildhorse Creek, Wolf Creek, Big Sandy Creek, Rule Creek…	Mn, SO4, Se, Fe(Trec) , E. coli	2017
COARLA10: Two Buttes Res., Two Buttes Pond, Hasty Lake, Holbrook Res., Burchfield Lake, Nee-Skah (Queens) Res., Adobe Creek Res., Neeso Pah Res., Nee Nosha Res., Nee Gronda Res.	As Se	L
COARLA11: John Martin Reservoir	Se	2017
COARLA12: Lake Henry, Lake Meredith	Fe(Trec), Se	2017
COARLA15: Trinidad Reservoir, Long Canyon Reservoir, and Lake Dorothey	Aquatic Life Use (Hg Fish Tissue), D.O. (Temperature)	H
COARMA02: Mainstem of Arkansas River from the outlet of Pueblo Reservoir to Dry Creek arroyo	Temperature, Mn	H
COARMA03: Arkansas River from Wildhorse Creek to Fountain Creek	Se, As	H/L
COARMA04a: Wildhorse Creek	NO2 E. coli	2016
COARMA06a: Mainstem of the Saint Charles River from a point immediately above the CF&I diversion canal near Burnt Mill to a point immediately upstream of the confluence with Edson Arroyo.	Mn, SO4	
COARMA06b: Mainstem of the Saint Charles River from the confluence with Edson Arroyo to the confluence with the Arkansas River.	SO4 Mn	L
COARMA07b: Greenhorn Creek, including all tributaries, from San Isabel National Forest boundary to Greenhorn Highline Diversion Dam; Graneros Creek; North Muddy Creek	Temperature	
COARMA09: Greenhorn Creek, including tributaries, from Greenhorn Highline Diversion Dam to the St. Charles River	Mn As	L
COARMA10: Sixmile Creek	Fe(Trec), Se	L
COARMA11b: Huerfano River, including all tributaries, from 570 Road near Malachite to Highway 69 at Badito	As, Mn, Fe(Trec)	
COARMA12: Huerfano River, from Muddy Creek to the Arkansas River	Se	L
COARMA14: Cucharas River, from Walsenburg PWS to Cucharas Reservoir	Fe(Trec)	H
COARMA18a: Boggs Creek	Mn, SO4 Se, Zn, U	2016

Reach	Concerns	TMDL Priority
COARMA26: Horseshoe Lake, Martin Lake (Ohem Lake) and Walsenburg Lower Town Lake.	Aquatic Life Use (Hg Fish Tissue)	H
COARMA27: Teller Reservoir	Aquatic Life Use (Hg Fish Tissue)	
COARUA02c: Mainstem of the Arkansas River from the confluence with the Lake Fork to the confluence with Lake Creek	As	H
COARUA04a: Mainstem of the Arkansas River from the Chaffee/ Fremont County Line to a point immediately above	Temperature Cu	H
COARUA05: All tributaries to the Arkansas River from the source to immediately below the confluence with Browns Creek	Aquatic Life, Cd, Mn, Zn, Ag, Pb As, Fe(dis)	H
COARUA10: Mainstem of Lake Creek and all tributaries from source to Arkansas River	pH, D.O., Fe(Trec), Se	H
COARMA11b: Huerfano River, including all tributaries, from 570 Road near Malachite to Highway 69 at Badito	As, Mn, Fe(Trec)	
COARMA12: Huerfano River, from Muddy Creek to the Arkansas River	Se	L
COARMA14: Cucharas River, from Walsenburg PWS to Cucharas Reservoir	Fe(Trec)	H
COARMA18a: Boggs Creek	Mn, SO4 Se, Zn, U	H
COARMA26: Horseshoe Lake, Martin Lake (Ohem Lake) and Walsenburg Lower Town Lake.	Aquatic Life Use (Hg Fish Tissue)	H
COARMA27: Teller Reservoir	Aquatic Life Use (Hg Fish Tissue)	
COARUA02c: Mainstem of the Arkansas River from the confluence with the Lake Fork to the confluence with Lake Creek	As	H
COARUA04a: Mainstem of the Arkansas River from the Chaffee/ Fremont County Line to a point immediately above	Temperature Cu	H
COARUA05: All tributaries to the Arkansas River from the source to immediately below the confluence with Browns Creek	Aquatic Life, Ag, Pb As, Cd, Cu, Mn, Zn, Fe(dis)	H
COARUA10: Mainstem of Lake Creek and all tributaries from source to Arkansas River	pH, D.O.	H
COARUA12a: Mainstem of Chalk Creek from the source to the confluence with the Arkansas River.	Cd	H
COARUA14c: Mainstems of North and South Hardscrabble Creeks, including all tributaries , from their sources to their confluences.	Aquatic Life	
COARUA21a: Mainstem of Cripple Creek from the source to a point 1.5 miles upstream of the confluence with Fourmile Creek.	Aquatic Life (provisional)	L
COARUA24: Mainstem of East and West Beaver Creeks, including all tributaries; mainstem of Beaver Creek from the source to the point of diversion to Brush Hollow Reservoir.	Mn	
COARUA30: Turquoise Reservoir, Clear Creek Reservoir, Twin Lakes and Mt. Elbert Forebay	Cu	H
COARUA35: DeWeese Reservoir	As D.O.	H
COARUA38: All lakes and reservoirs tributary to the mainstem of East and West Beaver Creeks from source to the confluence with Beaver Creek. Skagway and Bison Reservoirs	Fe(dis), Mn, As	
COARUA40: Brush Hollow Reservoir	Aquatic Life Use (Hg Fish Tissue)	H

Other Issues

Many other issues came up during planning and listening sessions with stakeholders, ranging from dam safety and insufficient water storage to recreation and transportation. ARWC will evaluate what role it is best suited to play on these issues over time, and will identify projects in its annual operating plans that support its mission, vision and goals, and bring value to local community stakeholders.

DOCUMENTS REVIEWED

Color Key
Strategies

Strategies
Governance
Data Management
BIP Implementation
Community & Collaborative Support
Planning
Education & Outreach

Colorado Water Plan (http://www.coloradowaterplan.com)
Arkansas Basin Implementation Plan (http://www.arkansasbasin.com/draft-basin-implementation-plan.html)

Community Wildfire Protection Plans (http://csfs.colostate.edu/wildfire-mitigation/colorado-community-wildfire-protection-plans/)
Wildfire Watershed Reports (http://www.jw-associates.org/projects.html)

Purgatoire Watershed Plan (http://www.usbr.gov/watersmart/cwmp/docs/plans/Spanish-Peaks-Purtgatoire-Conservation-District.pdf

Data Management	Community & Collaborative Support	Planning

Item	17 Q1	17 Q2	17 Q3	17 Q4	18 Q1	18 Q2
Develop Understanding						
Seek Funding				TBD	TBD	TBD
Assist with plans	TBD	TBD	TBD	TBD	TBD	TBD

WATER QUALITY CONCERNS

Education & Outreach	Community & Collaborative Support	Planning	BIP Implementation

ACKNOWLEDGEMENTS

This strategic plan represents the cumulative efforts of people from diverse backgrounds, multiple viewpoints, and various locations through our beautiful Arkansas River Basin. Much like the members of our hardworking basin communities, this document strives to be efficient and outcome driven. We are the grateful recipients of the Water Supply Reserve Account Grant and operate under the expert guidance of the Arkansas Basin Roundtable.

Special thanks to the following individuals for their support of ARWC and their efforts in helping to make this plan come to fruition:

Jim Broderick
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Gwen Happ
Matt Heimerich
Amy Jacobis
Mark Shea
Sandy White

Jay Winner

Item	17 Q1	17 Q2	17 Q3	17 Q4	18 Q1	18 Q2
Track existing					TBD	TBD
Review new projects					TBD	TBD

Item	17 Q1	17 Q2	17 Q3	17 Q4	18 Q1	18 Q2
Seek Funding				TBD	TBD	TBD
Prepare Design Doc	TBD	TBD	TBD	TBD	TBD	TBD
Outreach	TBD	TBD	TBD	TBD	TBD	TBD

Education & Outreach	Community & Collaborative Support	Planning	BIP Implementation

Item	17 Q1	17 Q2	17 Q3	17 Q4	18 Q1	18 Q2
Assessment & prioritization						
Funding				TBD	TBD	TBD
Implementation	TBD	TBD	TBD	TBD	TBD	TBD
CMAT						

ARWC Plan 2017 TO FIRST HALF 2018

1.) STREAM MANAGEMENT PLANS:

a) Develop a process and deep understanding of what stream management plans are, and how to do them. Provide a report on Stream Management Plans to RT by second quarter with presentation at RT meeting.

Education & Outreach | Community & Collaborative Support | Planning | BIP Implementation

b) Working in partnership with PWP, Trinidad water, and other upper Purgatoire stakeholders, work toward finding funding and assisting in developing a WARSSS analysis and Stream Management Plan.

Item	17 Q1	17 Q2	17 Q3	17 Q4	18 Q1	18 Q2
Close-out WSRA acres						
Implement DNR/Cohesive Strategy acres						
WFDSS	TBD	TBD	TBD	TBD	TBD	TBD

c) Working in partnership with LAVWCD and other upper lower basin stakeholders, work toward finding funding and assisting in developing a Stream Management Plan on XXX and YYY.

d) If successful in identifying funding and stakeholders request assistance, provide assistance

FUNDING: No funding is currently secured for work on this item.

Community & Collaborative Support

STRATEGIES ADDRESSED:

Item	17 Q1	17 Q2	17 Q3	17 Q4	18 Q1	18 Q2
Investigate						
Write up						

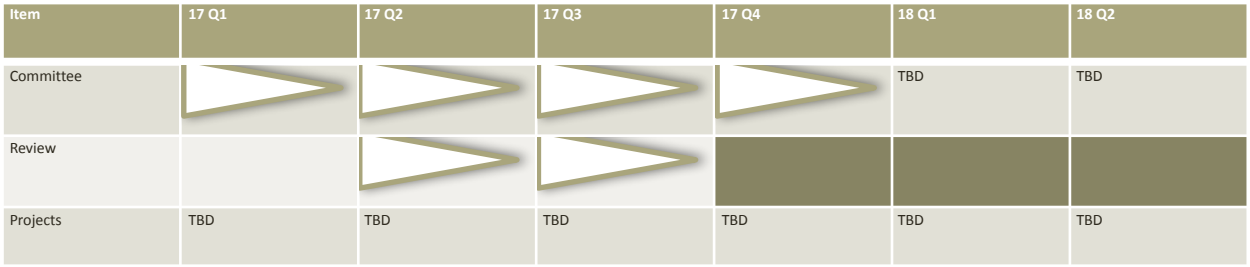
TIMING:

2.) LOWER ARK WATER QUALITY WORKING GROUP:

a) Participate in LAWQWG monthly meetings and calls.
b) Sponsor water quality workshop for farmers as part of group efforts in February, 2017, and possible future workshops and outreach to ag community and Lower Ark stakeholders,

Data Management | Community & Collaborative Support | Planning | BIP Implementation

Note: TBD in all Timing Charts means that ARWC's funding and item. involvement will be determined based on available stakeholder interest in having ARWC involved in the



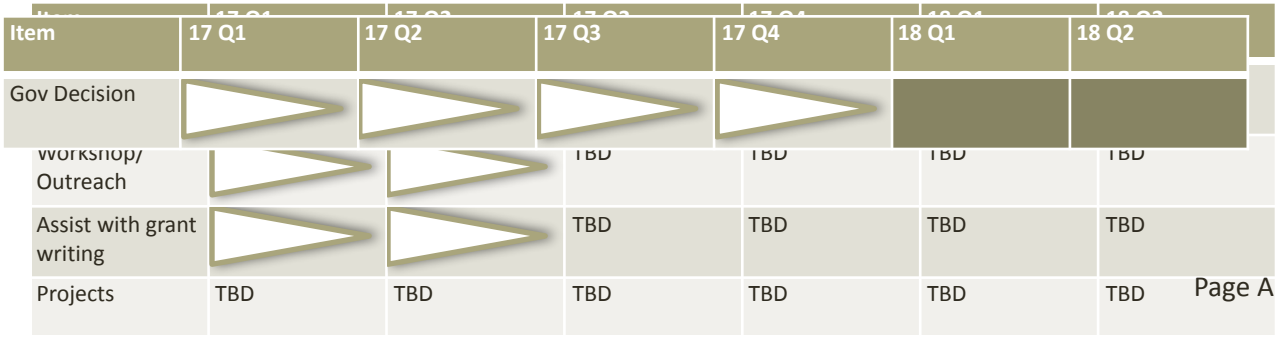
depending on success of the first workshop.
c) Assist with grant applications.
d) Assist with projects in the basin as requested by stakeholders and funding is secured.

FUNDING: Funds are available for the workshop, and partners are working on funding for ARWC to continue its participation and assistance through a grant to Colorado Department of Ag from Colorado Department of Public Health & Environment.

STRATEGIES ADDRESSED:

Governance

TIMING:



3.) PROJECT REVIEWS:

a) Coordinate with BIP Coordinator to track projects currently underway that ARWC may have input to, or be able to support. We will monitor process and progress on, and assist if needed, projects such as Grape Creek, Oil Creek, Cucharas Storage, etc.
b) Establish review process for providing input to Needs Assessment or Executive Committees to identify and share thoughts on items that improve watershed health aspects of proposed work.

FUNDING: Funds are not currently available for this item.

STRATEGIES ADDRESSED:

TIMING: 

4.) BMP DESIGNS DOCUMENT:

a) Seek funds to prepare BMP Design Document
b) Prepare a BMP Design Document for Project Proponents (e.g. road crossings, head gate restoration, etc.)
c) Provide Outreach around BMP Design Document

FUNDING: Funds are not currently available for this item.

STRATEGIES ADDRESSED:

TIMING:

5.) POST-FIRE:

a) Perform assessment and project recommendation/prioritization for post fire recovery projects.
b) Assist communities as requested and funding is available with post-fire analysis and implementation to protect downstream values at risk from post-fire flooding, including working with Pueblo Reservoir stakeholders.
c) Assist with post-fire implementation as desired by stakeholders and funding available.
d) Community Mitigation Assistance Team follow-up. CMAT came into Pueblo and Custer Counties during Junkins to help increase future mitigation efforts. Provide CMAT follow up report in late 2017

FUNDING: Currently have $50k for post-fire coordination and $100,000l for implementation from LAVWCD. CWCB has committed $250k toward post-fire efforts based on a request from Alan Hammel. Working with stakeholders (such as State Department Homeland Security &Emergency Management on additional funding.) Currently have some external funding for Community Mitigation Assistance Team follow up with Pueblo & Custer Counties.

STRATEGIES ADDRESSED:

TIMING:

6.) PRE-FIRE/FOREST HEALTH:

a) Close out final acres from 2015 grant (USFS has contracted the federal land acres committed as part of the match; anticipated implementation in 17).
b) Continue working in Lake County on implementation around significant water resources.
c) WFDSS: Continue working with stakeholders on getting water values-at-risk data into WFDSS. ARWC role TBD.

FUNDING: Currently have $70k for 2017 projects in Lake County from a DNR grant and a USFS Cohesive Strategy grant. This funding will implement at least 45 additional acres, build capacity, and provide outreach to the community.

STRATEGIES ADDRESSED:

TIMING:

7.) IDENTIFY ALL PARTNERSHIPS:

a) Investigate and make sure we know who local collaborative partnerships are now (for example, PWP, HAWG, others?). Reach out to key contacts for each to understand their partnership, projects, etc.
b) Provide a write-up to Executive Committee on the partnerships.

FUNDING: Funds are not currently available for this item.

STRATEGIES ADDRESSED:

TIMING:

8.) NONCONSUMPTIVE COMMITTEE:

a) Participate in the Committee meetings.
b) Review status of the existing projects that were put forth in BIP for nonconsumptive with proponents
c) Assist with projects as requested by committee.

FUNDING: Funds are not currently available for this item.

STRATEGIES ADDRESSED:

TIMING:

9.) GOVERNANCE STRUCTURE:

Finalize decisions with Roundtable Executive Committee and membership on future governance approach.

FUNDING: Funds are not currently available for this item.

STRATEGIES ADDRESSED:

TIMING: