Stream Management Plans in Colorado: Progress at Five Years

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The information and recommendations in this report were compiled by the Colorado Water Conservation Board Watershed & Flood Protection Section, River Network, Strategic By Nature and Alba Watershed Consulting.

I. PROGRAM OVERVIEW AND REPORT PURPOSE

Stream Management Plans (SMPs) have been a priority activity in Colorado as a result of the state's 2015 Water Plan, which endeavors to set goals and measurable objectives for the future of Colorado's water, and calls for 80% of locally-prioritized streams to have a Stream Management Plan (SMP) by 2030.

SMPs are created when stakeholders convene to evaluate the biological, hydrological, geomorphological and other ecological conditions of their local river. Site-specific information is used to assess the flows, water quality, habitat and other physical conditions important to achieving and maintaining collaboratively-identified environmental and/or recreational values. SMPs also can take the form of Integrated Water Management Plans (IWMPs), which expand the planning to include other water uses (e.g., municipal, agricultural, industrial); in this report, SMPs and IWMPs both are cited as SMPs.

Stream management planning generally takes one to three years to complete, depending on geographic range and funding, which is available on a cost-share basis through the Colorado Water Conservation Board (CWCB) and its Colorado Watershed Restoration Program. Some SMPs focus on specific reaches of river, while others cover an entire basin. A wide array of short- and long-term goals, projects and outcomes have emerged from SMPs to address water management, revegetation and riparian restoration, public education, policy change and much more.

This report on the SMP program progress-to-date offers information on results and impacts, success factors and ongoing challenges, and offers recommendations to maximize the impact of SMPs throughout Colorado. It is based on conversations and surveys with SMP coalitions conducted by the River Network team, as well as interviews with state agency staff, nongovernmental organizations (NGOs) and funders.

Rio Grande River

Blue River

II. CELEBRATING RESULTS

While no standards are set for creating "prioritized lists" in each of Colorado's nine river basins, progress on Water Plan goals are readily identified by reviewing the results from SMPs and their implementation, such as providing notable data and knowledge, increasing capacity and improving methodologies, making conservation gains, and building communities.

26 Plans

To date, 26 SMPs have been completed or are underway. Of these, 21* have been ongoing through 2020 (Figure 1) and occur in 24 of Colorado's 92 HUC (Hydrologic Unit Code) 8 sub-basins (Figure 2). Note that the HUC 8 perspective may lead to overestimation of SMP coverage, as several SMPs encompass a limited number of stream miles within a large watershed; even those encompassing an entire HUC 8 river main stem may not include major tributaries. Five of the 26 SMPs, Boulder Creek, Clear Creek, North Fork Colorado River (Kawuneeche Valley), Upper Arkansas River, and White River, were started in 2021 and will be included in future editions of the map. Organized by river basin, **Grantee Project Summaries** provide an overview of each SMP's goals and timelines, geography, participants, planning approach, and budget.

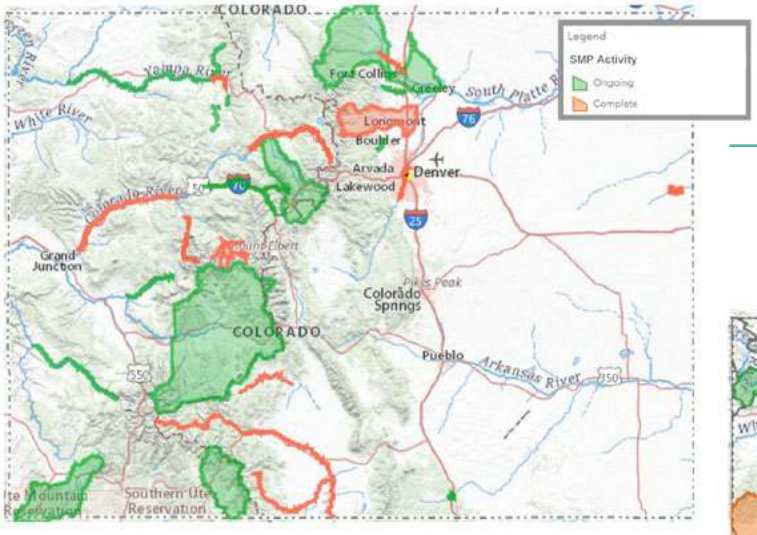


Figure 1. SMP Status and Geographic Scope

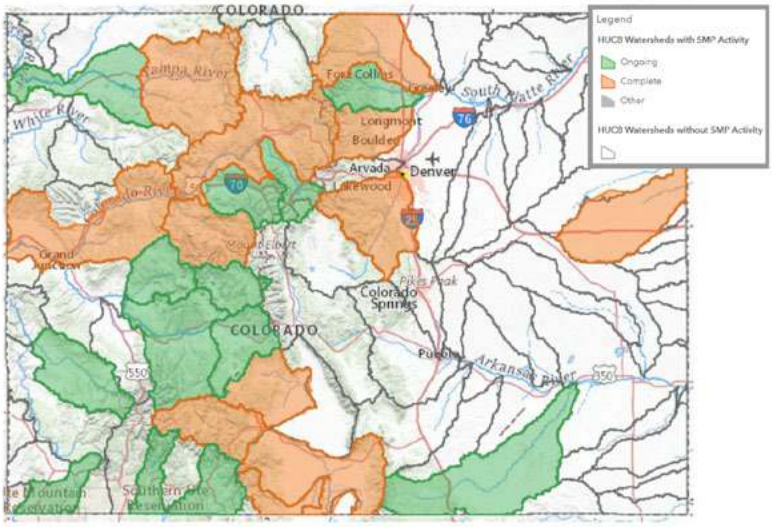


Figure 2. HUC 8 Sub-basins with SMP Activities

**Maps depict 21 SMPs in the following locations: Big Thompson River; Blue River; Cache la Poudre River; Colorado River (Grand County); Crystal River; Eagle River; Mancos River; Middle Colorado River (Glenwood Springs to De Beque); North Fork Gunnison River; Rio Grande, Conejos River and Saguache Creek; Roaring Fork River (Aspen); San Miguel River; South Fork Republican River; South Platte River (Chatfield); St. Vrain and Lefthand Creeks; Upper Gunnison River; Upper San Juan River; Yampa River (Steamboat); Yampa River Basin.*

269 Project Recommendations

In 2021, River Network created an SMP Outcome Tracking Tool (Appendix A) to identify project types and status from completed SMPs. Final reports (or similar) have been completed for 11 SMPs reporting 269 implementation project recommendations and status (Figure 3), with other SMPs in the process of identifying a project champion and acquiring funding. Among recommended projects, 82% have cost estimates, and full/partial funding has been obtained for 25%; among those funded, just under one-half (47%) are using CWCB funds. Six percent of projects have been completed through Grand County, Crystal, Upper Gunnison, Yampa Steamboat, and Rio Grande SMPs.

Figure 3. Number of Project Recommendations and Status by SMP

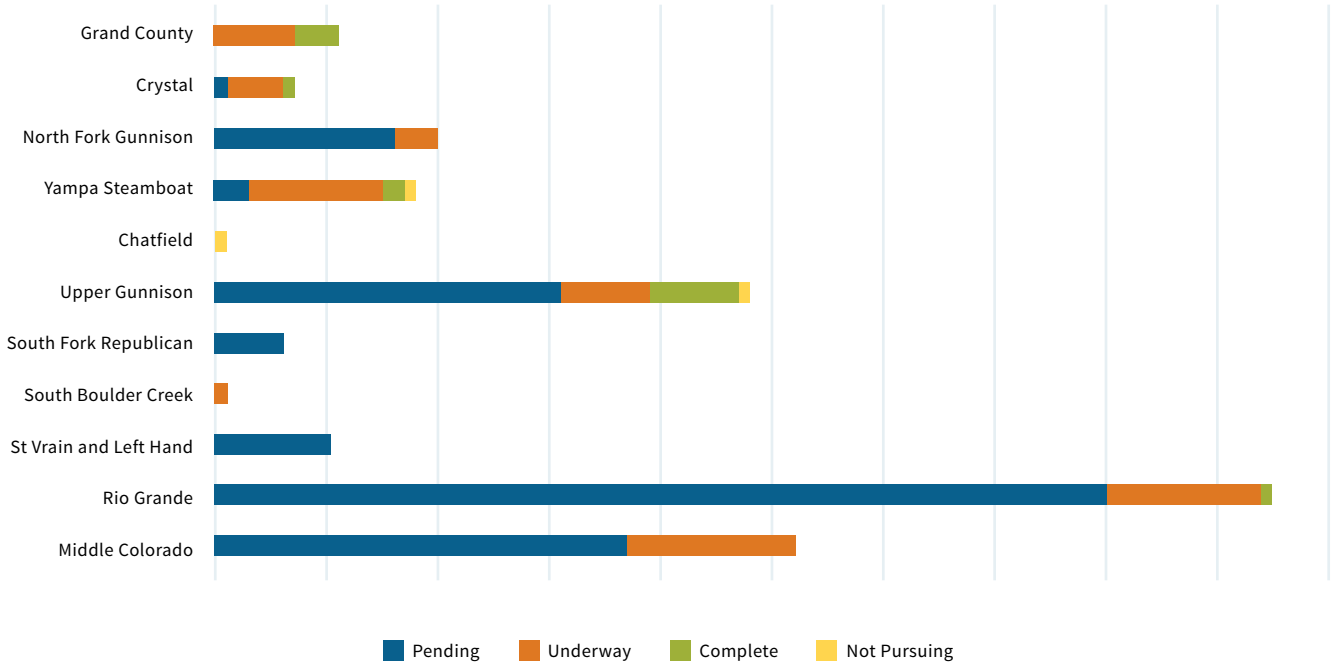
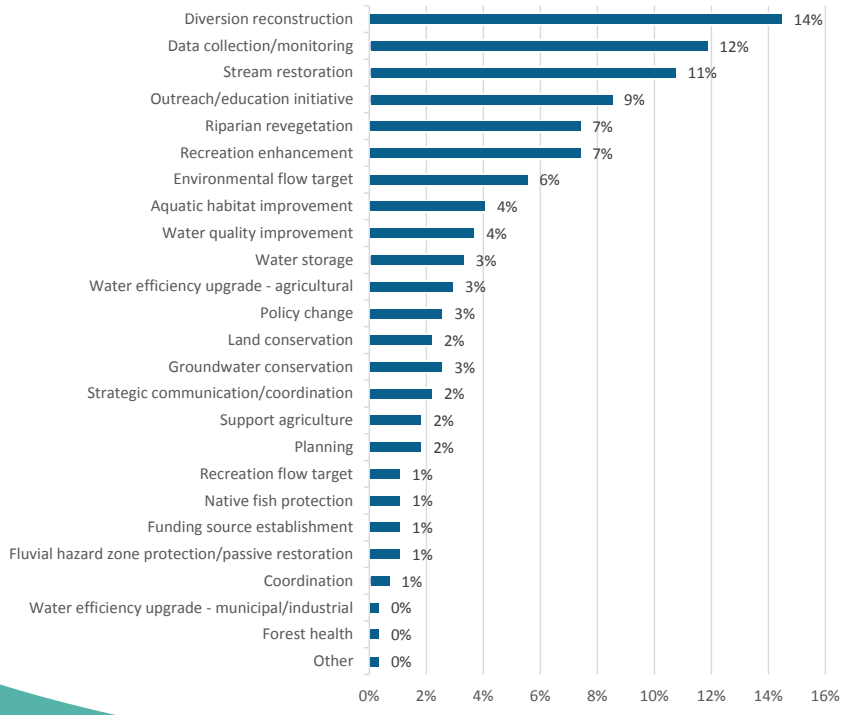


Figure 4. SMP Project Recommendations by Primary Project Type



SMP projects are categorized into 24 distinct types (Figure 4) based on a project's primary purpose, with nearly all projects (90%) including additional, ancillary benefits. The most common SMP project recommendations are diversion reconstructions, which include infrastructure reconstruction, retrofit, upgrade, or replacement (including identification/ planning projects) on head gates, ditches, trash racks, etc.; as well as installation of fish screens and other fish passage improvements, and rock ramps/ similar for safe boat passage. Recommendations for long-term monitoring programs and river restoration are also common. (Full definitions of all project types can be found in Appendix A.)

Innovations

Colorado's community-based coalitions rely on the many available SMP examples, modeling work after and integrating information learned from others. As each coalition customizes its approach, innovation occurs, improving stakeholder engagement, river health assessment, and development/implementation of projects.

Innovations in Stakeholder Engagement

- **Interactive Analysis of Stakeholder Priorities** – Yampa IWMP Stakeholder Assessment has surveyed and interviewed environmental, recreational, municipal, industrial, and agricultural water users/stakeholders—including 100+ irrigators—to identify priority reaches for improved river health, resulting in an interactive website incorporating Tableau, a data visualization platform, to analyze findings.
- **Online Community Engagement Platform** – Big Thompson Watershed Coalition utilized Maptionnaire, an online community engagement platform to collect and display community- and stakeholder-provided data.
- **Targeted Engagement of Agricultural Community** – The Mancos Watershed SMP hired an agricultural consultant to engage the ag community—representing a significant percentage of local water rights' holders—resulting in the active involvement of a producer throughout the SMP process.

Innovations in River Health Assessment

- **Use of Fluvial Hazard Zone Mapping in River Health Assessment** – Integration of fluvial hazard zone mapping with a FACStream river health assessment was piloted on 1.2 miles of the South Arkansas River, demonstrating how these two methods and information they provide effectively complement each other in prioritizing restoration work and land use policies.
- **Visually Compelling River Condition Scoring** – The River Health Assessment and Report Card was developed specifically to assess the Cache la Poudre River and watershed, with use of an online mapping tool that allows evaluation of river health by specific location.
- **Exploration of Interactions Between Water and Fire** – In the aftermath of regional wildfires, Upper San Juan Watershed Enhancement Partnership was encouraged to analyze the forest health and water nexus. The planned river health assessment will explore forest conditions, burn probability, and potential fire severity potential, creating a wildfire hazard index for water infrastructure and potential debris flow/water quality hazards during or after future wildfires.
- **Modeling Water Temperature to Inform Management Actions** – The Yampa River Health Assessment Report data highlighted a regular exceedance of water temperature standards, but could not pinpoint the exact cause. Wanting to understand the potential for streamflow management and riparian restoration as tools to control water temperature, a combination of models has succeeded in identifying types and locations of management activities most likely to yield decreased summer river temperatures.

Innovations in Project Work

- **Creative Native Fish Actions** – The Middle Colorado SMP calls for actions that support native fish: developing regional best management practices for reclamation of gravel pits (to minimize favorable habitat for invasive fish), creating an app for identifying fish and reporting the location of observed invasives, and prioritizing watershed-scale structural modifications for fish passage.
- **Temperature and Flow Restoration** – Yampa River Health Assessment and Streamflow Management Plan identifies activities to improve stream temperature through flow restoration and riparian reforestation, and is scoping a water quality trading program to ensure restoration work in perpetuity.
- **Reservoir Pool Optimization** – The Grand County SMP studied numerous river reaches, specifically identifying where additional water supply could help meet existing and future recommended flow targets. This work led to Grand County exercising an option to pump 1,000AF of water from Windy Gap for storage in Granby Reservoir. Released over a 25-day period in summer 2018, this action significantly enhanced Colorado River flows for aquatic and recreational benefits.

Conservation Gains

River Network asked SMP coalitions to report, post-project, conservation gains consistent with metrics set by the RESTORE Colorado grant program. While most groups were challenged in "backtracking" to provide data and respond in a timely matter, two SMPs report the following:

- Yampa River: 3,000 acre feet of water leased, one fish passage barrier rectified, and 10 acres of streambank restored to reconnect floodplain and/or reestablish native riparian vegetation.

Yampa River

Colorado River

- Upper Colorado River: .9 miles of stream geomorphology restored to increase aquatic species habitat; 1.9 miles of streambank restored to reestablish native riparian vegetation; .5 miles of fencing installed to exclude livestock and protect riparian habitat; and 22 substrate, 10 macroinvertebrate, and 10 temperature sites added to monitor for species.

Knowledge and Capacity Gains

Coalitions report that SMP processes have deepened their knowledge of their communities through enhanced relationships with stakeholders and other locals, enhanced understanding and affirmation of community values, new opportunities to work toward solutions, insights into complex issues of water use and environmental health, and new perspectives on water management:

> *"Meeting stakeholders and listening to their needs has provided new perspective for water management and better understanding of why management is done a certain way."*
>
> *Big Thompson River*

Big Thompson River

Yampa River

> *"Understanding the complexities and nuances of our river and water transit system, especially through engagement and participation of new/less involved stakeholders, has really developed our understanding of the river system, its history and establishment, and how it has come to be what it is."*
>
> *Yampa River Basin*

Data and Methodology Gains

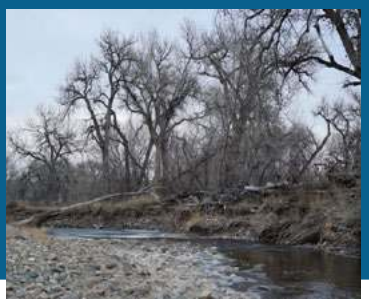
Project leads report that SMPs have resulted in better data access, use, and application for decision-making, noting an increase in use of varying types of data, greater accessibility due to data sharing, more holistic (vs. siloed) review of data, better identification of data gaps, and deeper understanding of the data and how stakeholders can best use it:

"We are using floodplain connectivity, riparian condition, and fishery data for the first time in a water management context, and many people are seeing this data for the first time."

Yampa River Basin

"This project has brought more transparent and shared data access and awareness to our participating stakeholders. It is our intent to consolidate the publicly-accessible data and make it easier to locate as a by-product of this project."

Big Thompson River

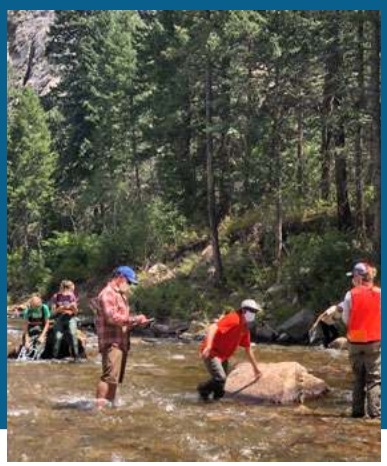


"Temperature and flow data have become much more commonly collected and referenced. Angler usage and flow preference data are new as a result of the SMP planning."

Upper Gunnison River

"Water quality is something that unites all community members: clean water is beneficial for everyone and has opened doors to speak with skeptics. River assessments provide the opportunity to work with individual landowners along the river corridor, to talk about possible improvements by reach. To be able to explain what is currently happening within a watershed and what the future might hold with climate, project or flow changes has made the greatest impact, and allowed deep conversations about what the future holds for water and flows in the river."

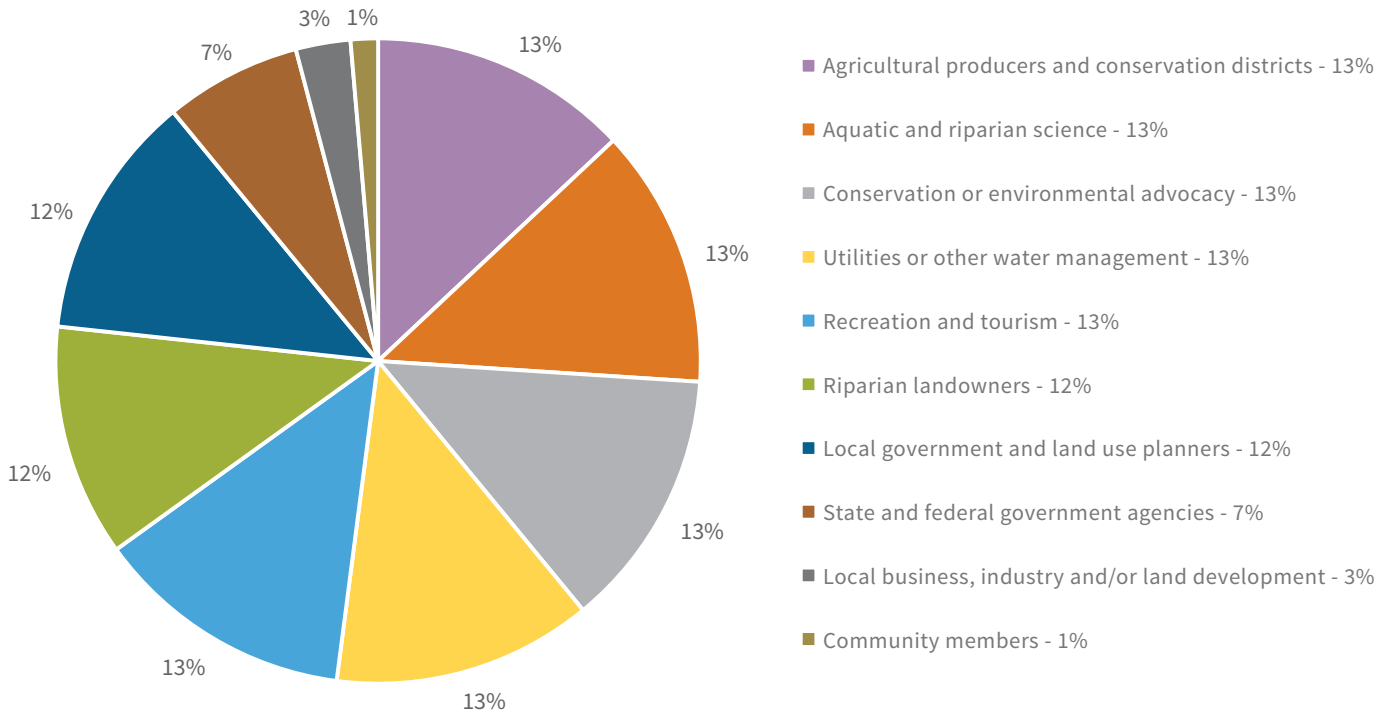
Mancos River



Community Building and Participation Gains

SMPs are as much about people and communities as they are about the functional health of the river; as such, community and stakeholder buy-in is critical to a successful SMP. Many SMPs report increased diversity of water interests represented by stakeholders, extending beyond environmental and recreational interests to catalyze collaboration amongst various water users, political jurisdictions, and expansive yet connected geographies, as illustrated in Figure 5. Twenty-one SMPs reported on stakeholder engagement, with the new 2021 grantees not yet included.

Figure 5. Participant Stakeholder Interests Across 21 SMPs



Additionally, SMP leaders report an increase in communities' focus on river ecosystem science and/or flows, with stakeholders becoming more fluent in ecosystem science, engaging broad-based discussions that transcend singular issues, utilizing SMP-derived data to inform other planning efforts, focusing investment based on assessment results, legitimizing non-consumptive uses, and taking initiative to identify and seek solutions to river and infrastructure issues:

"Local residents and staff from City of Alamosa are more aware, educated, and interested in the Rio Grande's ecology, water quality, and flow patterns. Awareness among agricultural and municipal stakeholders has increased as a result of involvement in the river health assessment review process, and water-sharing agreements – such as the Conejos River Flow Program – are more widely understood as a result of the SMP process."

- Rio Grande

"I receive random emails from landowners within the watershed that might provide a photo of a dry riverbed, a water quality issue, or a restoration possibility. They usually start with, 'Hey, have you seen this?' There is greater awareness that someone is working on river health and flows, and we are seeing greater participation and buy-in."

- Mancos River

"The River Health Assessment Framework and associated 'report card' have definitely catalyzed more conversation on this topic, provided a clearly laid out rational/basis for funding for numerous projects, and supported the integration of river health conversations in more and more groups around the basin."

- Cache la Poudre River

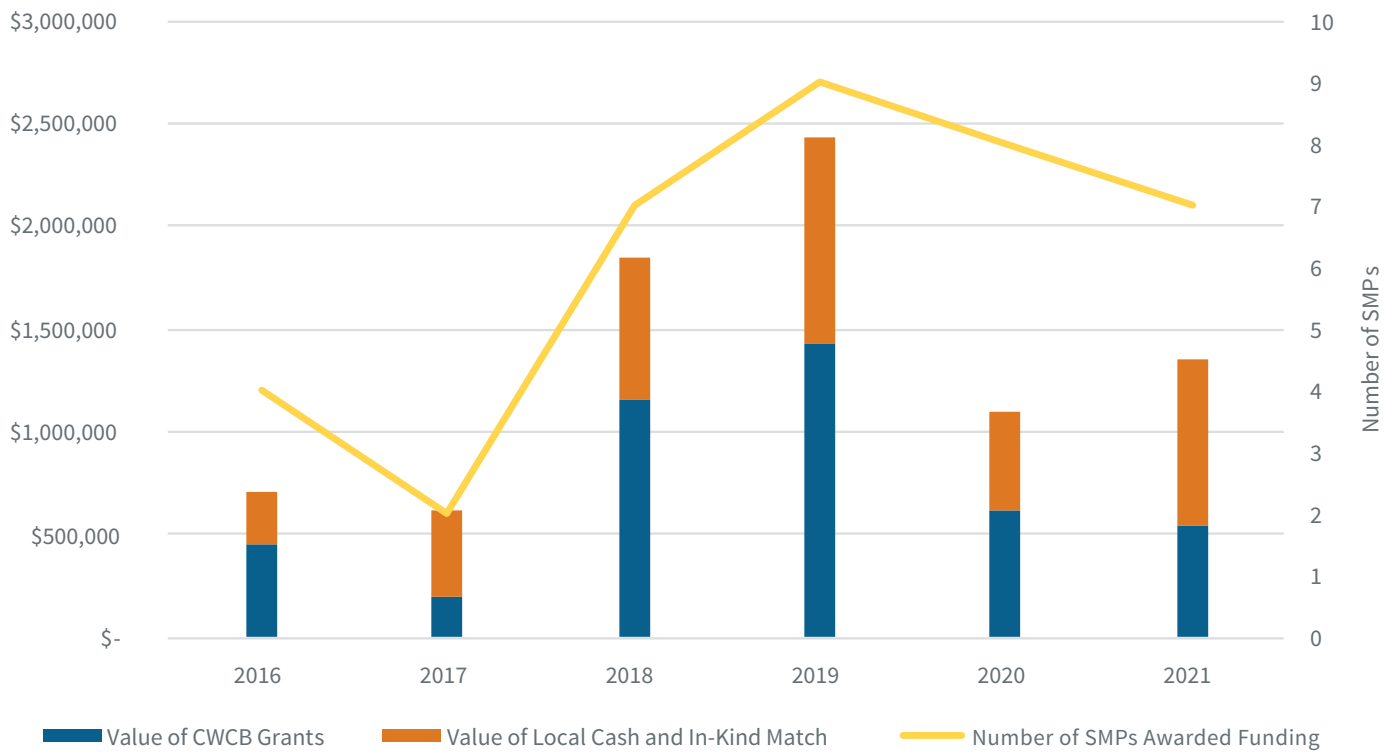
III. INGREDIENTS FOR SUCCESS

A breadth of strategic investments and other support have helped to achieve these positive SMP outcomes:

$8 Million in Funding

CWCB grants, at 55% of total funding, and matching local cash and in-kind resources (45%), have invested just over $8 million in SMP-guided efforts during 2016-2021 funding cycles (Figures 6). The large increase in SMP numbers and budgets in 2018 coincide with River Network's efforts to grow SMP activity (although River Network is not the only statewide NGO supporting SMP development).

Figure 6. SMP 5-Year Funding Summary



Customized Scope and Scale

The SMP program—by design—is not prescriptive, allowing communities to customize projects to address specific needs and values, and to broaden efforts beyond environmental and recreational considerations to accommodate consumptive water users. There are successful SMPs conducting narrowly-focused assessments determining how to meet needed environmental flows, manage environmental pools in storage projects, and maximize fishery health, while others involve consumptive users to pursue broader holistic improvements to and protections of river health.

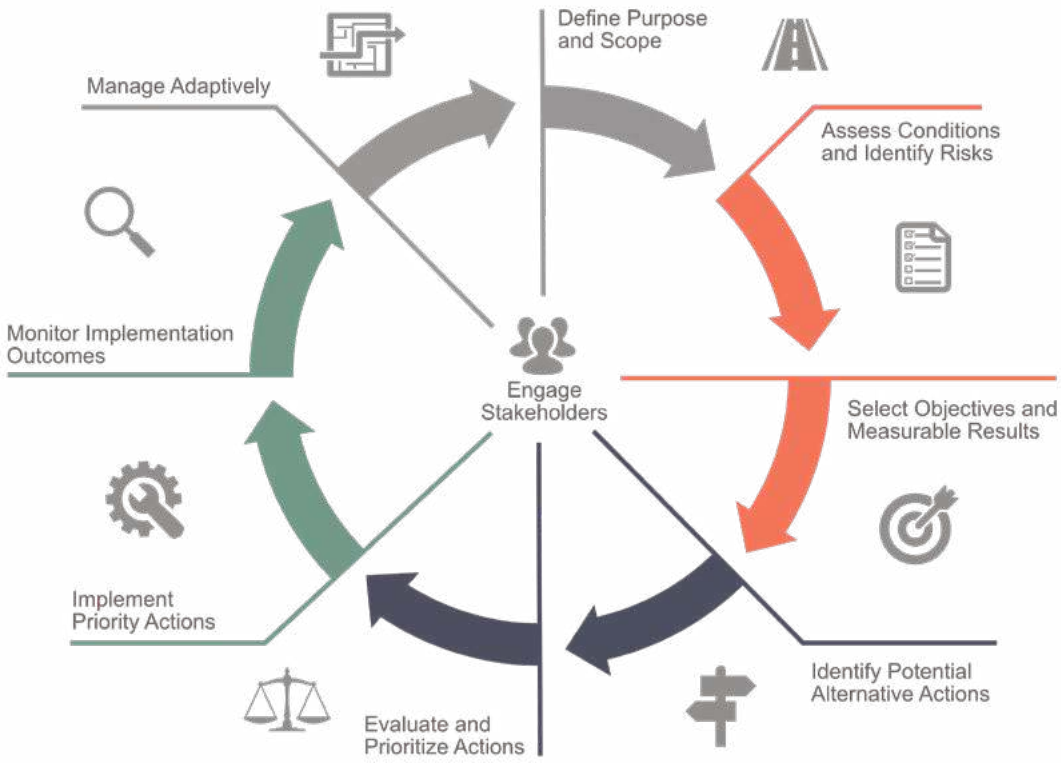
Rio Grande River

The flexibility afforded SMPs in considering geographic scope and scale is proving critical to project success. There are significant differences in the amount of work a coalition can assume when considering community values and buy-in, leadership capacity, river needs, and resources availability. Thus, while the **Rio Grande, Conejos River, and Saguache Creek** SMP endeavors to impact three sub-basins and nearly 340 river miles, the **South Boulder Creek** SMP is successfully studying a distinct nine-mile section of river.

River Health Assessments

The **Colorado River Basin Roundtable IWMP Framework** (Figure 7) provides a process for planning, implementing, monitoring, and adapting water management. In the case of SMPs, this process includes robust stakeholder engagement alongside technical river health assessment. In applying this framework to SMPs, **Assess Conditions and Identify Risks** involves stakeholders and/or researchers collecting and assessing river health.

Figure 7. IWMP Framework
(Adapted for the SMP Resource Library)



Again, CWCB is non-prescriptive on how best to approach a River Health Assessment. SMPs use a variety of approaches, often customizing these based upon data needs and availability, desired outcomes, and the ability to advance communication and decision making. The **Functional Assessment of Colorado Streams (FACStream)** is a reach-scale assessment tool developed for the U.S. Environmental Protection Agency that rates stream health according to the degree of impairment of several ecological variables. The **Colorado Stream Health Assessment Framework (COSHAF)** provides various iterations of a stream health assessment framework based on the FACStream variables.

Figure 8 summarizes the approaches used by 14 SMPs having completed or nearly completed river health assessments, and indicates assessed FACStream variables. Additional details on how each SMP customized or modified its assessment process are included in Appendix B.

Figure 8. River Health Assessment Framework and Variables Assessed By Select SMPs

River Health Assessment Framework	Stream Management Plan	Flow Regime	Sediment Regime	Water Quality	Floodplain Connectivity	Riparian Vegetation	Debris	Stream Morphology	Stability	Physical Structure	Biotic Structure	Other Variables Assessed
Adapted from FACStream 1.0/COSHAF	Big Thompson River	x	x	x	x	x	x	x	x	x	x	
	Crystal River	x	x	x	x	x	x	x	x	x	x	
	Lower South Boulder Creek	x	x	x	x	x	x	x	x	x	x	Landscape, Recreational Values, Resilience
	Poudre River (Fort Collins)	x	x	x	x	x		x	x	x	x	
	South Arkansas River	x	x	x	x	x			x	x	x	Fluvial Hazard Zone, Landscape Support
	St. Vrain and Left Hand Creeks	x	x	x	x	x	x	x	x	x	x	Landscape Connectivity
	Upper Roaring Fork River	x	x	x	x	x	x	x		x	x	
	Yampa River (Steamboat Springs)	x	x	x	x	x	x	x	x	x	x	Landscape
Custom approach or assessment	Middle Colorado River	x		x		x		x			x	Agricultural Production, Municipal Water Supply, Industrial Processing, Recreational Uses, Groundwater Recharge, Flood Regulation, Pest Regulation
	North Fork of the Gunnison River	Phase I included a qualitative ecological evaluation and environmental and recreational needs assessment. River characteristics, morphology, and riparian function were evaluated by reach; also assessed were environmental/recreational needs.										
	Rio Grande, Conejos, and Saguache Creeks	x	x	x		x		x			x	
	San Miguel River	x				x		x			x	Whitewater Boating, Angling
	Upper Colorado (Grand County)	Rated reaches based on U.S.F.S. Stream Reach Inventory/Challenge Stability Index, EPA Rapid Bioassessment Protocol, and Riffle Stability Index. Also looked at flow and temperature.										
	Upper Gunnison River	Included by sub-basin evaluation of streamflow/ climate data, irrigated acreage, irrigation practices; and by-reach evaluation of agricultural, domestic, environmental and recreational water uses.										

Process Supports

State agency and NGO support have been vital to the success of SMP processes, providing for:

- Funding through **Colorado Water Conservation Board and Basin Roundtables, private foundations** (e.g., Gates Family and Walton Family foundations), and **federal WaterSMART grants**.

- Engagement of **statewide and local NGOs (e.g., The Nature Conservancy, Trout Unlimited and River Network)**, which corresponds to the notable 2018 jump in CWCB's various grant awards to SMPs.

- Important local agency involvement (e.g., **Division of Water Resources** Water Commissioners and **Colorado Parks and Wildlife** staff) to assist with interpretation of technical information and to build trust in the process.

- Education and technical assistance through **River Network, Colorado Ag Water Alliance and Ag Water NetWORK**, successfully positioning agricultural organizations for involvement with and leadership of SMPs.

- Guidance, sharing of SMP approaches, and advancing knowledge through:

    - The **SMP Resource Library**, which uses and builds on the **Colorado River Basin Roundtable IWMP Framework** to capture real-world applications of the process. The Resource Library is becoming increasingly valuable to SMPs at all stages, continuously updating examples of methods, best practices, innovations, and lessons learned.

    - The **Peer Learning Network**, consistently engaging 40 individuals leading or involved in SMPs to promote knowledge sharing and innovative practices, and growing the number of coalitions capable of effectively undertaking an SMP.

St. Vrain and Left Hand Creeks

St. Vrain and Left Hand Creeks

IV. FURTHERING PROGRESS: CHALLENGES AND RECOMMENDATIONS

As CWCB updates the Colorado Water Plan, River Network believes that the number and quality of SMPs, and their impact, can be advanced by including initiatives that:

1. *Encourage strategic focus to achieve the outcomes and goals intended by the SMP program.*
2. *Advance tools and data for use in river health assessments.*
3. *Ensure interest and capacity to increase the occurrence of SMPs and implementation of recommended projects.*

Encourage Strategic Focus

Prioritize Locations of New SMPs

The original Colorado Water Plan goal for 80% of locally prioritized streams to have an SMP by 2030 is difficult to measure because no method to prioritize streams at a local level was created, leaving no baseline to measure progress against. It's recommended that the State of Colorado continue to encourage new SMPs by **setting specific goals for the number of new plans** and their implementation/progress, including **developing a standardized way to prioritize SMPs locations** across the state or by Basin.

Support Conditions for Meeting Flow Target Recommendations

A pillar of CWCB's grant guidance for stream management planning is to "identify flows needed to support environmental and recreational water uses." This pursuit—as a primary SMP focus—has not been consistent and has proven problematic and even unpopular among participating stakeholders. With a spectrum of flow analysis that can be undertaken, from reviewing existing patterns and predicting future changes to setting targets for specific values such as fish and recreation, SMPs vary in their approach. In reviewing 16 SMPs that have completed or are close to completing at least Phase I of their SMP, 15 are or plan to evaluate flow regime and five are or plan to evaluate future flow impacts from factors such as climate change and population growth. Three SMPs (Rio Grande, Chatfield, and Grand County) are clearly assessing flow needs and seven (Crystal River, South Boulder Creek, St. Vrain and Lefthand Creeks, Middle Colorado River, Upper Gunnison River, San Miguel River, and Roaring Fork River) are somewhat addressing flow needs by conducting minimum low flow analysis, determining limited-flow areas, and/or modeling fish habitat suitability but haven't taken the assessment far enough to identify specific targets by reach.

Project recommendations focused on environmental and recreational flow targets comprise only a small percentage of the 269 recommendations to date (6% and 1%, respectively). Agricultural community engagement resulted in many agricultural project recommendations (19%) that have ancillary environmental and recreational benefits. However, there is an argument that focusing on multibenefit projects that primarily benefit water users dilutes environmental and recreational flow objectives.

SMPs that recommend flow targets tend to have existing infrastructure and/or project champions that allow for flexibility in flow management (e.g., upstream reservoirs with the ability to re-time releases, as with the Yampa River through Steamboat Springs and the Rio Grande, Conejos River and Saguache Creeks SMPs). In most communities, the only options for pursuing flow-driven outcomes are expensive infrastructure (e.g., ditch piping) or tools for leaving excess water in the river (e.g., water leasing). While some communities' SMPs are motivated by regulatory action requiring set flow targets (e.g., the Upper Colorado River through Grand County), this is not an impending or motivating reason in most cases.

RIVER NETWORK RECOMMENDS THE FOLLOWING ACTIONS:

- SMPs continue to **pursue multi-benefit projects** (e.g., continue to increase agricultural engagement in SMPs) and also ensure they conduct **strong assessments of environmental flow needs**.

- **Track and report primary and secondary environmental and recreational benefits** resulting from SMP recommendations to ensure a full picture of SMP recommendations is collected.

- **Provide education to stakeholders by sharing assessment approaches and highlight plans that are effective** in measuring current and future flow regime, and by **sharing flow target success stories**, demonstrating how flow targets can benefit multiple users with no harm. Engage NGOs focused on flow restoration such as the Colorado Water Trust early on in stakeholder processes to build relationships and provide education that can help position communities with adequate information to pursue flow target conversations.

- **Support development and use of standardized approaches to prioritization and development of flow restoration or protection projects** (e.g., use and expansion of CWP Environmental Flow Tool, use and expansion of Lease Fallowing Tool, or other tools to streamline project development).

- **Explore and recommend additional approaches to improve success in meeting flow targets** (e.g., incentives for water leasing, large infrastructure projects, significantly increased funding).

- **Advance alternatives to instream flow (ISF) water rights that can be utilized more broadly** when the ISF program is not culturally or politically viable or when a community is managing for values outside the scope of the ISF (e.g., ISF implementation fulfilled via augmentation plans, flow targets addressing community-driven management goals).

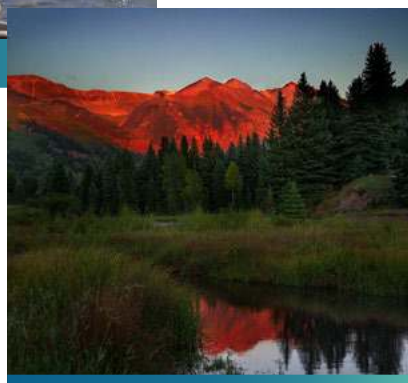
- **Identify opportunities to help communities be pro-active in staving off potential regulatory actions** (e.g., Clean Water Act compliance or species listing) which could motivate municipalities and utilities to implement innovative actions that benefit costs and the river.

Rio Grande River

Middle Colorado River

South Boulder Creek

North Fork Gunnison River



San Miguel River

Advance Tools and Data

Bolster Assessment Tools & Capacity

The IWMP Planning framework and SMP Resource Library catalogue of river health assessment approaches provide the most-followed process for SMPs to assess need and determine priority actions. And, there continues to be flexibility in how to approach an SMP—with the expressed benefit of adaptability and responsiveness to local needs and interests—which is an important success story.

However, the process is not without its challenges: One perspective is that coalitions spend a great amount of energy reinventing the process in each locale. There is frustration among those working in small watersheds that manipulating or customizing assessment frameworks is costly, with no "off-the-shelf" tool useful to operational decision-making and long-term monitoring. Meanwhile, some communities find themselves 'stuck' using a specific approach, unable to adjust timeframes and budgets, while others struggle to gain consensus on which assessment framework to use and data analysis methodologies to employ.

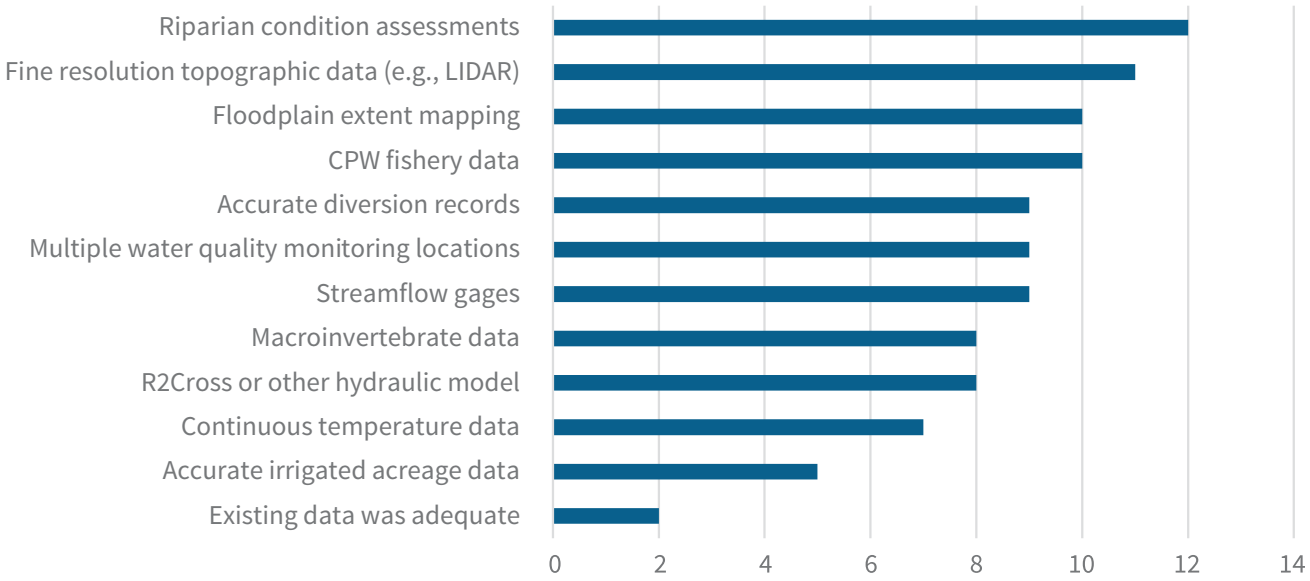
Ideally, there is a balance between data consistency and method flexibility among SMPs' river health assessments. While it is important to allow discretion in methodology, these processes could be furthered by **providing a standardized core list of variables for community consideration in river health assessment**. This resource would well align with the prevailing SMP use of FACStream, COSHAF, and IWMP Framework approaches, and provide further definition of CWCB's expectations of a "qualified" SMP.

Expand Data Collection Supports

River health assessments can be time consuming and expensive, especially in the case of large-scale SMP geographies. As a result, necessary/optimal data for quality decision-making often is not available within the allotted assessment timeframe or budget, leaving stakeholders without vital information on flows, recreational use, economic impacts, etc.

Among 19 SMPs responding to the 2021 River Network survey, just two found their existing datasets adequate to fully assess river health. These SMPs ranked the types of data/information that—if readily available—could improve/ease SMP initiation and development (Figure 9).

Figure 9. SMP Data Needs



THE FOLLOWING IDEAS AND RECOMMENDATIONS COULD ADDRESS DATA-AVAILABILITY CHALLENGES, PRODUCING ROBUST AND USEFUL DATA AT THE OUTSET:

- To bolster the technical capacity for completion of river health assessments, **consider developing State-sanctioned leadership** (via state agency staff or a consultant team) to complement local data-gathering efforts, advance technology, collect consistent river condition data, and encourage utilization of vetted assessment methodologies and prioritization approaches.

- **Encourage phasing in SMP development**. Advocate, potentially through revised CWCB grant guidance, for phased SMP development (e.g., stakeholder engagement and problem scoping using existing data, then a more detailed assessment) to help communities embark upon a planning process that fully takes into account the datasets they already have versus those they need.

- **Invest in statewide remote sensing**. To ease the burden on individual SMP data-gathering processes, support the development and use of statewide LiDAR—including full-spectrum or "green" LiDAR for bathymetry in medium- and large-sized rivers—and remote sensing/GIS tools and provide assistance to local coalitions in accessing and analyzing the datasets.

- **Leverage regulatory programs**. As possible, tie data collection methods and reporting to regulatory programs with established metrics and methods (e.g., Colorado Department of Public Health and Environment Multi-Metric Index datasets).

- **Create a data clearinghouse**. Archived and new data should be cached in a publicly-accessible location and format. For instance, a body of data was collected in 2018 for the mainstem Colorado River basin by the Hutchins Water Center at Colorado Mesa University, but has not since been updated; this particular effort could readily be enlarged to encompass all West Slope basin SMPs. The Colorado Data Sharing Network offers another example or potential platform that could support SMPs.

- **Connect SMPs to existing floodplain process, mapping and natural infrastructure**. As SMPs begin to consider natural processes (e.g., movement, erosion, deposition) in stream management decisions, the CWCB Colorado Fluvial Hazard Zone Delineation Protocol and quick-start guide provide a good starting point for consideration of floodplain dynamics. Additional outreach and training on available resources and their use would help broaden use of this tool.

San Miguel River

St. Vrain and Lefthand Creeks

Gunnison River

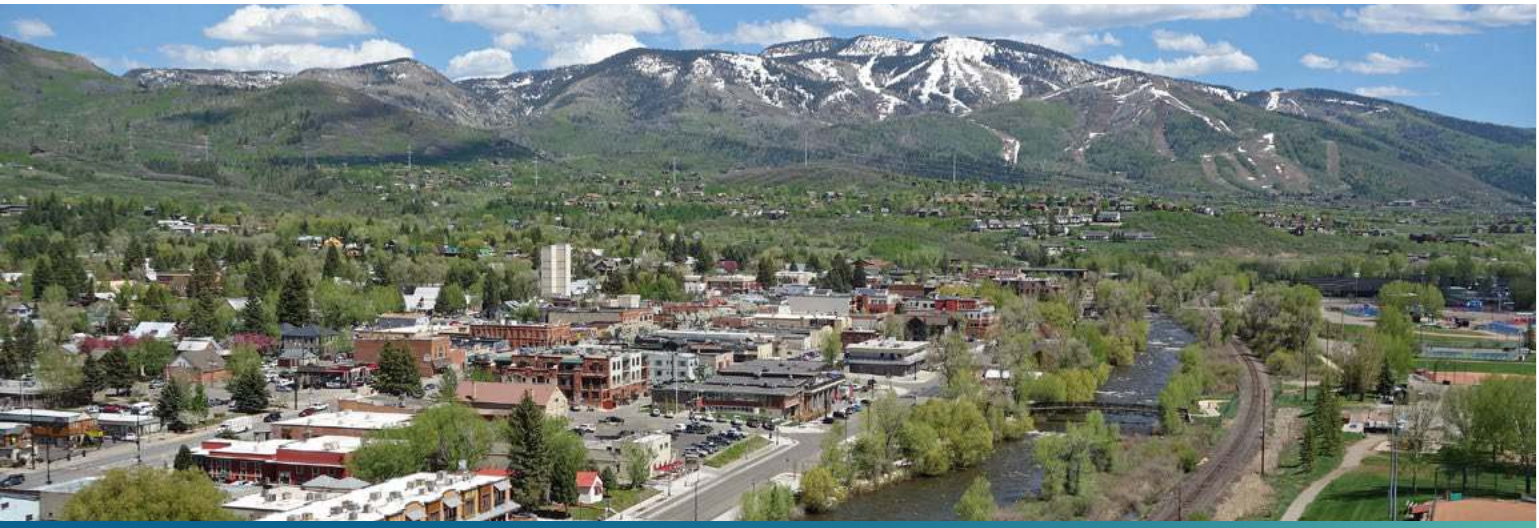
Cache la Poudre River

San Juan River

Measure and Track Results

The River Network SMP Outcome Tracking Tool reports on the outcomes realized by SMPs, including potential for future environmental and recreational impacts. The corresponding centralized database is useful for statewide reporting and stores project implementation information for SMPs without the capacity to maintain it on their own. For the Tracking Tool to realize its full potential, it is recommended that CWCB:

- **Commit to long-term outcome tracking** by annually collecting recommendations and progress made for at least the next 5 years.
- **Capture both primary and ancillary project benefits** in outcome tracking to understand the full impact of the SMP program.
- **Define how to track spatial extent of SMPs** as an improvement to the current system, which is ad hoc and inconsistent (e.g., some SMPs report their project area as an entire watershed, though the river health assessment was limited to mainstem reaches, while others limit mapping to the river miles where assessment was completed).



Yampa River

To increase SMP stakeholder understanding of how their efforts fit into the larger context of water planning, and to fully integrate SMP efforts in the state's inventory of projects, SMPs could **incorporate resulting projects into Basin Roundtable Identified Projects and Processes (IPP) Lists**, tracked and tiered (whenever possible) based on status, potential yield, cost estimates, etc. Fifty-six percent of SMP projects are included in current IPP Lists but, for most basins, there is no way to differentiate SMP projects from others; a further recommendation is to **add an SMP category to the statewide IPP database**. (As a note of caution, CWCB will need to consider whether information will be duplicated between the Outcome Tracking Tool and IPP Lists, and what impacts or difficulties this may create.)

Measuring and tracking conservation gains presents a difficult conundrum: While funders and NGOs desire consistent outcome metrics (e.g., acre feet of flow restored, number of fish passage barriers rectified), CWCB is wary of impressing this type of reporting on grantees. River scientists often agree that seeing this type of evaluative measure is a slippery slope and ultimately not beneficial to rivers or communities, and argue that universally-applied outcome metrics lead to ineffective one-size-fits-all solutions (as example, willow recruitment in one river system may be viewed as evidence of riparian health, but could negatively affect stream channel dynamics elsewhere). While it may be unreasonable to create common outcome metrics, it would be useful to **create an expectation and consistent methodology for tracking conservation gains**, to be reported from SMP-derived metrics. This form of reporting would require oversight and long-term capacity for quality control, data storage and reporting, with knowledge that accomplishments likely will be slowly realized. The IWMP Framework may provide a starting point for such a system in its recommendation for evaluation of ecosystem services.

Ensure Interest and Capacity

Increase the Pace

Every year, 3-5 new coalitions join those working on SMPs, representing more sluggish growth than some expected. To catalyze community buy-in, and encourage willingness to assume the long-term effort and commitment required, **reinvigorate outreach promoting the basics of SMPs, how they are approached and where to find support, and the community benefits**. This can be pursued either by River Network (which led a robust outreach effort in 2018 and 2019) or others as critical to sparking interest and engaging new communities in SMPs. It is further recommended that the Colorado Water Plan update **set a goal to expand public knowledge of SMPs, and consider a more robust outreach plan to support SMPs as an 'effort,'** providing presentations to consumptive water users highlighting on-the-ground successes to inspire the next generation of plans, and an SMP101 "how-to" for potential stakeholders.

SMP coalitions often rely on local and statewide NGOs for staffing capacity, funding, technical expertise and stakeholder relationships. It is important to maintain/increase this support for future and in-progress SMPs, and thus River Network recommends intentional collaboration between the Department of Natural Resources (DNR) and private funders (e.g., the public-private philanthropic partners that created the RESTORE Colorado grant program) **to encourage private investment in statewide NGO staff time to support SMPs**. Without DNR stressing the value and importance of this support to the foundations active in Colorado, the NGOs are left to advocate for themselves, which is not as effective.

Develop Local Capacity

SMP coalitions face a significant challenge in providing adequate project management/coordination due to lack of funding, capacity and/or interest. Most typically, this task falls to already-stretched NGOs, where staff turnover also can be a challenge. Recommendations to develop this local capacity include:

- **Fund local, paid champions or basin coordinators** (in addition to neutral facilitators) to initiate, oversee and maintain SMPs in locations where there is a capacity gap. (While currently-available grants can help fund this need, the match can be problematic; flexibility in matching requirements could be beneficial.)

- **Enhance local NGO administrative capacity** to maintain ongoing projects beyond initial construction, and when additional fundraising efforts are required of the NGO to maintain a long-term program (e.g., public education).

- **Establish formal conservation partnerships (rather than single organizations) with a mandate to implement and sustain projects**, sharing the burden and benefit of project implementation.

Yampa River

Yampa River

Foster Stakeholder Engagement

Quality stakeholder engagement often is the determining factor of a successful SMP. Identified as a challenge by many of the early SMPs, much energy has been invested to engage, specifically, the agricultural community. As a result, significant benefits have been realized in community buy-in and, in turn, positive conservation outcomes.

An involvement gap still exists, with economic and development interests underrepresented. It is important to **continue nurturing broad-interest involvement, promoting the value of and path for engagement**, and to cultivate understanding that all voices are important to the SMP process. CWCB and NGO partners must continue in sensitivity to each basin's uniqueness, emphasizing the importance of community and stakeholder-driven efforts employing customized approaches and decisions based on local needs and values.

The COVID-19 pandemic has had real impacts on stakeholders' ability to connect and make decisions. Particularly in rural regions, coalitions are struggling to engage meaningful participation using a remote meeting format, while the SMP progress slows and stalls, and there is anticipated difficulty in keeping people focused and engaged long enough to see through SMP planning and execution of recommended actions.

To address engagement challenges, it is recommended that CWCB, supporting NGOs and SMP leaders:

- **Provide standard SMP101 materials** to be used with the various sectors/interests of a community without necessity of local, individualized modification.
- **Enhance sharing of stakeholder engagement tactics** across SMPs, providing information on helpful incentives (addressed below) and specifics for working with identified stakeholder groups.
- **Consider providing incentives or compensating stakeholders** to encourage involvement from all types of underrepresented interests.
- Continue to **learn from and share research/approaches in effective management of place-based collaborations**.
- **Target outreach to specific interest areas** to encourage engagement.

Rio Grande River

Gunnison River

Invest in Peer Learning

The SMP Resource Library and Peer Learning Network are consistently cited as critical tools to implementation of quality, effective SMPs. Coordinating the Peer Learning Network requires significant River Network resources: updating the Library, staying up-to-date on ongoing and emerging SMP needs, tailoring events for those leading coalitions. At the same time, coalition feedback indicates a lack of widespread knowledge of available Resource Library content, with some believing such resources do not exist. It is important to **continue investing in the Resource Library, Peer Learning Network and other information sharing opportunities, augmenting resources as helpful**.

Incentivize SMPs

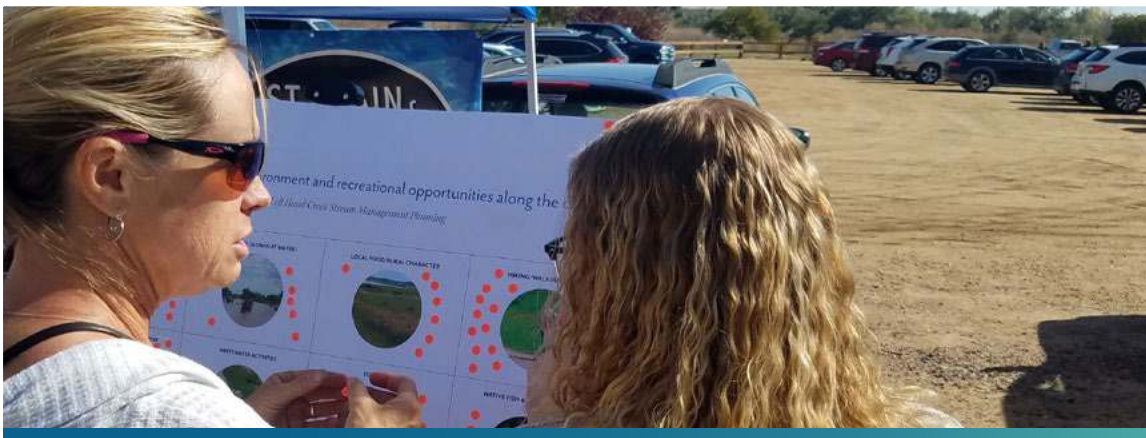
Recognizing the significant investment of time, effort and funding required by the SMP process, it would be useful to **incentivize stakeholders with the knowledge that SMP-recommended projects are realizing prioritized funding support**. Concurrently, Basin Roundtables are encouraged to continue initiating and prioritizing funding for SMP processes and associated project implementation.

Increase and Ensure Flexibility in Funding

A notable benefit of CWBC efforts is the ability for SMPs to leverage funding from variously-designated sources. SMPs have been and will continue to be able to access multiple CWCB grant programs (Watershed Restoration Program, Water Supply Reserve Account and Water Plan Grants) to secure up to 75% of project funding from State sources. This is particularly helpful in accommodation of broader follow-up to the planning process (e.g., irrigation infrastructure assessments, inventory of municipal water rights). Thus, it is important for CWCB to **continue flexibility in SMP-accessible funding sources and the allowable uses of funds**.

The estimated total cost of current SMP recommendations/projects (including only those providing cost estimates) approaches $216 million. Assuming 75% CWCB funding, an additional $54 million will be needed for full implementation. Match requirements for a single plan or project can exceed $100,000—an unattainable figure for many organizations, given their current fundraising capacity. This underscores the need for broad support from diversified sources, including development of local funding (e.g., Chaffee, Pitkin and Park County tax revenue initiatives). The Colorado Water Plan should set goals to **develop additional revenue sources, making additional funds available for SMP-recommended project implementation**.

Middle Colorado River



St. Vrain and Left Hand Creeks

V. CONCLUSION

SMP pursuits over the past five years have net numerous benefits for Colorado. There is clear evidence of increased quality and quantity of SMP efforts across the state, with coalitions providing favorable on-the-ground outcomes resulting from improved data and knowledge, methodologies, innovation and recommendations in conservation work and community building. This progress has been made possible by the tremendous investment of local SMP stakeholders and water users; NGOs, local governments and Basin Roundtables; CWCB, and other funders and state agencies.

These early years have proven SMPs as both challenging and beneficial mechanisms for communities to engage water users in a meaningful way, and to encourage deeper understanding and ownership of local water resource management. Input from state leaders, funders, SMP coalitions and leadership shed light on the difficulties still facing SMPs in their efforts to recommend and implement projects. To continue the upward trajectory of SMP contributions and to maximize their impact, additional investment to ensure adequate leadership, capacity and resources is vital.

Blue River

APPENDIX

APPENDIX A

SMP Outcome Tracking Tool – Background and Results

APPENDIX B

River Health Assessment Framework and Variables, By SMP