4/17/2015

Basin Implementation Plan

Southwest Basin Roundtable

Ann Oliver and Carrie Lile
HARRIS WATER ENGINEERING, INC.

EXECUTIVE SUMMARY

The Southwest Basin Roundtable (Roundtable) is unique for the complexity of hydrography, political entities, water compacts and treaties, and distinct communities that it encompasses. The Roundtable provides a forum for water discussions pertaining to nine distinct sub-basins, including the San Juan, the Piedra, the Pine, the Animas (including the Florida River), the La Plata, the Mancos, McElmo Creek, the Dolores rivers and the San Miguel River, eight of which flow out of Colorado.

Many communities, agricultural producers, and natural systems depend on the water produced by these sub-basins. The Southwest Basin is home to the Southern Ute Indian Tribe and the Ute Mountain Ute Indian Tribe, the only two Indian Reservations in Colorado. Neighboring these tribal lands are 10 counties including Archuleta, La Plata, San Juan, Montezuma, Dolores, San Miguel and portions of Mineral, Hinsdale, Montrose, and Mesa. These tribal areas and counties represent distinct communities and landscapes, with their own specific and unique social, economic and environmental values, challenges and opportunities.

The Southwest Basin is a region of diverse natural systems, agricultural heritage, outstanding beauty, and extensive recreational opportunities. The area supports many water-dependent species of wildlife, including warm and cold water fish species addressed by three different multi-state conservation agreements, and four terrestrial species that are currently listed under the Endangered Species Act. Many towns within the area rely heavily on tourism and the recreational industry as a primary economic driver. Agriculture and the open spaces it maintains contribute to the culture, economy and quality of life of the Southwest Basin. Municipal and industrial activities round out the economic and social values and help support the diverse and vibrant communities of the region.

The Roundtable has developed this Basin Implementation Plan (BIP) based on the best available information and current conditions. The Roundtable plans to employ and maintain the BIP as a living document to be reviewed and updated periodically as conditions evolve and new information becomes available. The Roundtable takes a balanced and cooperative approach to include and address all water supply needs. While acknowledging that they sometimes represent competing demands and conflicting interests, the Roundtable treats agricultural, municipal, industrial, environmental and recreational needs equally, and is open to new projects and processes that can help address the Southwest Basin's goals.

Through its consensus-based discussions, the Roundtable has developed agreement around several salient aspects of both Southwest Basin-wide and state-wide water supply. Highlights of these agreements include conditions under which the Roundtable can consider a new trans-mountain diversion project, goals for statewide municipal water conservation measures, and the Basin's outstanding data needs.

The Roundtable is concerned about any new trans-mountain diversion (TMD). A new TMD would increase the risk of a Colorado River Compact call, as well as the risk of contingency measures to address serious conditions such as the inability to generate power from Lake Powell or levels of Lake Mead dropping below Las Vegas's municipal water supply intake. An increase in such risks jeopardizes the Southwest Basin's ability to develop water supplies to meet needs in the Southwest Basin and puts additional pressure on the Basin's agriculture to meet downstream water needs for compact compliance and/or obligations. Therefore, the Roundtable agrees on eight factors to be addressed prior to considering a new TMD.

The Roundtable supports the idea that on a statewide basis we all need to be more efficient with our water use and achieve high conservation. Recognizing that municipal demand is one of the driving forces behind agricultural dry-up and that outdoor urban irrigation is one of the highest consumptive uses of municipal water. The Roundtable agrees that before it will consider a new TMD, outdoor irrigation by water providers using agricultural buy–up and dry-up and/or pursuing a TMD should meet the higher goal of 70/30 ratio of inside to outside use of municipal water by the year 2030.

In development of Colorado's Water Plan and the Southwest BIP, the Roundtable has discussed water supply "gaps" that exist for various uses throughout the State. In evaluating those needs for southwestern Colorado, it is important that future uses and needs for the Western Slope be recognized and preserved. The Roundtable also acknowledges that uses in other parts of the state, especially demands on the Front Range, may develop sooner than those in southwestern Colorado, and that, prior to consideration of any TMD, an allocation for future uses shall be recognized for development in the San Juan and Dolores River basins.

In Colorado, the authority to establish water policies of the state, determine the beneficial uses of the water resources, and administer water rights pursuant to the Doctrine of Prior Appropriation fall under the jurisdiction of state government. It is recognized that there is a significant amount of land administered by the federal government in Colorado, which creates the potential for conflicts between state and federal laws and policies. Congress and Federal agencies have a long standing deference to state water allocation systems, and Colorado continues to promote state-federal cooperation to avoid contentious water rights issues. Federal policies and actions could affect existing and future water supplies and planning efforts in southwestern Colorado.

Therefore, the Roundtable supports Colorado's system of water rights administration and allocation and the full recognition of tribal rights under the Colorado Ute Indian Water Rights Settlement. The Roundtable also encourages and supports creative solutions sought through collaborative efforts, negotiated settlements, and strengthening the use of State-Federal MOUs, to limit conflicts between state, tribal and federal polices, laws and land management plans. Maintaining opportunities that allow for management solutions that provide for multiple beneficial

uses and are protective of environmental and recreational values are critical for the planning and strategic development of the water resources in the State of Colorado.

With respect to the Southwest Basin's Environmental and Recreational values and water needs, the Roundtable recognizes that there are significant gaps in the data and understanding regarding the flows and other conditions necessary to sustain these values. The Roundtable also recognizes that the tools currently available to help maintain those conditions are limited. The Roundtable has identified two methods that it hopes can help address and bridge this need for additional information and tools. These are:

1. Evaluation of environmental and or recreation gaps is planned to be conducted for improvement of non-consumptive resources and/or in collaborative efforts with development of consumptive IPPs. The evaluations may be conducted by a subgroup of the Roundtable or by individuals, groups, or organizations with input from the Roundtable. The evaluation may utilize methodologies such as the southwest attribute map, flow evaluation tool, R2 Cross, and any other tools that may be available.

2. Where environmental and/or recreational gaps are identified, a collaborative effort will be initiated to develop innovative tools to protect water identified as necessary to address these gaps.

The Roundtable has adopted 21 goals and 30 measureable outcomes to meet identified gaps and water supply needs. Since SWSI 2010, the Roundtable success rate for completing IPPs is 44%. A total of 55 projects were completed since the drafting of the SWSI 2010 list. Through the BIP outreach process over 80 new projects were added to the list. The list totals about 160 IPPs for all sub-basins. Of these 160, about 50% of the IPPs are for needs such as agricultural, municipal and industrial while the remaining 50% of the IPPs are for environmental and recreational needs.

At the end of 2014, the Roundtable had granted $1,906,626 from the Southwest Basin account and $5,162,859 from the statewide account; for a total of $7,069,485 granted to projects and processes aimed at meeting water needs within the Southwest Basin (See Appendix A – Final WRSA Annual Report).

TABLE OF CONTENTS

APPENDICES

Appendix A – Draft Identified Projects and Processes Lists and supporting documents

- Draft IPP list as of March 2015
- Completed IPP list as of July 2014

Appendix B – Public Outreach Efforts and supporting documents

- Public Outreach Meetings BIP PowerPoint Presentation
- Public Outreach Meetings CWP PowerPoint Presentation
- Pagosa Springs Public Meeting Notes
- Bayfield Public Meeting Notes
- Mancos Public Meeting Notes
- Placerville Public Meeting Notes
- Sub-basin Map for Outreach and associated Sample of Basin IPPs Bullet List
- Summation of Public Comments

Appendix C – Education Action Plan

- Education Action Plan for 2015

Appendix D – Supporting Documents

- Colorado Water Plan – SWCD Statement of Importance January 2014
- Water Rights Analysis
- Final WSRA Annual Report October 2014

FIGURES

TABLES

ABBREVIATIONS

AF – Acre-feet

BIP – Basin Implementation Plan

BOR – Bureau of Reclamation

CDPHE – Colorado Department of Public Health and Environment

CDSS – Colorado Decision Support Systems

CFWE – Colorado Foundation for Water Education

CPW – Colorado Parks and Wildlife

CWCB – Colorado Water Conservation Board

CWP – Colorado Water Plan

CU – Consumptive Use

EAP – Education Action Plan

ESA – Endangered Species Act

gpcd – gallons per capita day

IBCC – Interbasin Compact Committee

IPP – Identified Projects and Processes

ISF – Instream Flow

IWR – Irrigation Water Requirement

Roundtable – Southwest Basin Roundtable

SJRIP – San Juan River Basin Recovery Implementation Program

SWCD – Southwestern Water Conservation District

SWSI 2010 - SWSI 2010 Southwest Basin Report Basinwide Consumptive and Nonconsumptive Water Supply Needs Assessments

TMD – Trans-mountain Diversions

Upper Program – Upper Colorado River Endangered Fisheries Recovery Program

USFWS – Untied States Fish and Wildlife Services

USFS – Untied States Forest Service

WIP – Water Information Program

WQCD – Water Quality Control Division

WSL-CU – Water Supply Limited Consumptive Use

SECTION 1: BASIN GOALS & MEASURABLE OUTCOMES

The Southwest Basin Roundtable is unique for the complexity of hydrography, political entities, water compacts and treaties, and distinct communities that it encompasses. Although the name suggests only one basin, the Roundtable actually provides a forum for water discussions pertaining to nine distinct sub-basins, including the San Juan, the Piedra, the Pine, the Animas (including the Florida River), the La Plata, the Mancos, McElmo Creek, the Dolores and the San Miguel rivers, eight of which flow out of Colorado. Together these nine sub-basins make up the interdependent landscape of Southwest Colorado.

Many communities, both natural and human, depend on the water produced by these sub-basins. The Southwest Basin is home to the Southern Ute Indian Tribe and the Ute Mountain Ute Indian Tribe, the only two Indian Reservations in Colorado. Neighboring these tribal lands are 10 counties including Archuleta, La Plata, San Juan, Montezuma, Dolores, San Miguel and portions of Mineral, Hinsdale, Montrose and Mesa. Each of these tribal areas and counties represent distinct communities and landscapes, with their own specific and unique social, economic and environmental values, challenges and opportunities.

Vallecito Reservoir (Pine River basin)

Multiple layers of legal agreements govern water use in the Southwest Basin's area, adding additional complexity, opportunity and challenge. All of the nine sub-basins are tributary to the Colorado River and therefore fall under the Colorado River Compact and the Upper Colorado River Basin Compact: seven are part of the San Juan River sub-basin and two, the Dolores and San Miguel rivers, are part of the Colorado River sub-basin. All of the water to which the State of New Mexico is entitled under the Upper Colorado River Compact has its origins in those basins that are part of the San Juan River sub-basin (e.g. the San Juan, Piedra, Pine, Animas, La Plata, Mancos and McElmo rivers).

A treaty and settlement with both Ute Indian tribes pertain to waters within specific sub-basins. The La Plata River Compact apportions La Plata River water between Colorado and New Mexico with a daily delivery requirement to New Mexico. The San Juan/Chama Project delivers water trans-mountain from the San Juan River sub-basin in Colorado to the Rio Grande River in New Mexico to provide a portion of New Mexico's Colorado River entitlement (annual average of 85,000 to 100,000 AF). These New Mexico obligations are met by the waters of the Southwest Basin, and affect the water available to meet the needs of the area's communities. The Animas La Plata Compact provides for diversion and storage of flows for use in both Colorado and New Mexico.

The area supports many water-dependent species of wildlife, including warm and cold water fish species addressed by three different multi-state conservation agreements, and four terrestrial species that are currently listed under the Federal Endangered Species Act.

Finally, the Southwest Basin is a region of diverse natural systems, agricultural heritage, outstanding beauty, and extensive recreational opportunities. Many communities within the area rely heavily on tourism and the recreational industry as a primary economic driver. Agriculture and the open spaces it maintains contribute to the culture, economy and quality of life of the Southwest Basin. Municipal and industrial activities round out the economic and social values and help support the diverse and vibrant communities of the region.

These geographic, political, economic and legal complexities lead to unique challenges and opportunities. Appreciation of this context is basic to the development of the Roundtable's goals and to its BIP. Therefore, the Roundtable prefaces its BIP Goals with the following underlying principles. Many of these are also stated in the Southwestern Water Conservation District's Statement of Importance January 2014 (Appendix D), which was adopted by the Roundtable on January 8, 2014.

The Roundtable:

- *Intends to develop, use, and maintain the Basin Implementation Plan as a living document.*
- *Agrees that all water uses are important to the future of this region.*
- *Identifies specific and unique projects that are important to maintaining the quality of life in this region and should accommodate the development and maintenance of flows, including domestic supplies, environmental needs, agriculture, recreation, and commercial/industrial needs to provide for further economic development.*
- *Supports multi-purpose projects when possible and when they can be accomplished in a manner that is protective of the values present.*
- *Recognizes and upholds the unique settlement of tribal reserved water rights claims in the Colorado Ute Indian Water Rights Final Settlement Agreement of December 10, 1986, as authorized by Congress in the Colorado Ute Indian Water Rights Settlement Act of 1988, Pub. L. No. 100-585, and as amended by the Colorado Ute Settlement Act Amendments of 2000, Pub. L. No. 106-554 and Pub. L. No, 110-161 (2007); and the 1991 Consent Decrees.*
- *Recognizes and addresses the downstream challenges faced by water users in southwest Colorado due to continued development and pressures from users in the State of New Mexico; protect interests in southwest Colorado, while complying with existing Compact obligations. The entitlement to Colorado River flows for New Mexico will be based on deliveries from southwest Colorado.*
- *Intends to preserve the Southwest Basin's ability to develop Colorado River Compact entitlements and to meet our water supply gaps.*
- *Recognizes and addresses the challenges to all water uses that future drought and/or climate variability may bring.*

- *Recognizes that the flows necessary to support the full complement of values are not currently well understood.*
- *Limit Conflicts and Promote Collaboration within the Framework of State, Tribal and Federal Plans, Policies, Authorities and Rights.*

The Roundtable has established 21 goals (Table 1) to address the following seven themes (in no particular order):

A. Balance All Needs and Reduce Conflict
B. Maintain Agriculture Water Needs
C. Meet Municipal and Industrial Water Needs
D. Meet Recreational Water Needs
E. Meet Environmental Water Needs
F. Preserve Water Quality
G. Comply with CO River Compact and Manage Risk

In order to clarify the desired results of these goals and to help the Roundtable gauge progress toward meeting the goals over the planning horizon of this BIP (thru 2050), the Roundtable has agreed upon 31 Measureable Outcomes (Table 1). While recognizing the value of identifying measureable outcomes, the Roundtable is also cognizant of its limitations.

One limitation is that the development of ambitious but realistic measurable outcomes requires an understanding of the extent to which the Roundtable's stated goals are already being met. Measurable outcomes in this BIP were developed without a thorough understanding of the current status of those measures and of water supply needs, particularly for environmental and recreational values.

An additional limitation is that there are factors which may complicate the attainment of these outcomes. These factors include uncertainty around the ability of sponsors to implement Identified Projects and Processes (IPPs) due to issues with funding, permitting, partner support, etc.; lack of sufficient support/interest in implementing a Measureable Outcome, concern for unintended consequences, as well as difficulty in obtaining the necessary data to assess some of the identified outcomes.

Given these limitations and consistent with its principle that this BIP be a "living document," the Roundtable intends periodic reviews and updates of its Measurable Outcomes as more reliable information is developed and attainment is better understood.

TABLE 1. GOALS AND MEASUREABLE OUTCOMES FOR THE SOUTHWEST BASIN IMPLEMENTATION PLAN

A. BALANCE ALL NEEDS AND REDUCE CONFLICT

ID	Goals	Measurable Outcomes (by 2050)
A1	Pursue a high success rate for identified specific and unique IPPs to meet identified gaps and to address all water needs and values.	1. 100% of IPPs shall consider from the initial planning stage maintaining and enhancing environmental and recreational needs. 2. Complete 27 multipurpose IPPs to meet identified gaps. 3. Support and participate in 10 IPPs (such as processes) that promote dialogue, foster cooperation and resolve conflict. 4. At least 50% of identified watersheds have existing or planned IPPs that are protective of critical infrastructure and/or environmental and recreational areas. 5. All towns and major water supply systems with water supply infrastructure have watershed/wildfire assessments that identify strategies/treatments necessary to mitigate the impacts that occur to hydrology in a post-fire environment. 6. All major reservoirs have watershed/wildfire assessments that identify strategies/treatments necessary to mitigate the impacts that occur to hydrology in a post-fire environment.
A2	Support specific and unique new IPPs important to maintaining the quality of life in this region, and to address multiple purposes including municipal, industrial, environmental, recreational, agricultural, risk management, and compact compliance needs.	
A3	Implement multi-purpose IPPs (including the creative management of existing facilities and the development of new storage as needed).	
A4	Promote dialogue, foster cooperation and resolve conflict among water interests in every basin and between basins for the purpose of implementing solutions to Southwest Colorado's and Colorado's water supply challenges *(SWSI 2010).*	
A5	Maintain watershed health by protecting and/or restoring watersheds that could affect critical infrastructure and/or environmental and recreational areas.	

*Note that several of these outcomes, indicated by an asterisk, pertain directly to supporting implementation of the projects and processes, either planned or in progress, that are currently on the Southwest Basin's IPP list. They will be periodically reviewed and updated in the future.

TABLE 1. CONTINUED…

B. MEET AGRICULTURAL NEEDS		
ID	Goals	Measurable Outcomes (by 2050)
B1	Minimize statewide and basin-wide acres transferred.	1. Implement projects (e.g. ATMs, efficiency, etc.) in order to help preserve agriculture and open space values, and to help address municipal, environmental, recreational, and industrial needs; while respecting private property rights. 2. Implement strategies that encourage continued agricultural use and discourage permanent dry-up of agricultural lands. 3. The water providers in the state that are using dry- up of agricultural land (defined as requiring a water court change case) and/or pursuing a new TMD (as defined by IBCC to be a new west slope to east slope diversion project) shall have a higher standard of conservation. The goal for these water providers is a ratio of 70% in-house use to 30% outdoor use (70/30 ratio). 4. Implement at least 10* agricultural water efficiency projects identified as IPPs (by sub-basin).
B2	Implement efficiency measures to maximize beneficial use and production.	
B3	Implement IPPs that work towards meeting agricultural water supply shortages.	

*Note that several of these outcomes, indicated by an asterisk, pertain directly to supporting implementation of the projects and processes, either planned or in progress, that are currently on the Southwest Basin's IPP list. They will be periodically reviewed and updated in the future.

TABLE 1. CONTINUED…

C. MEET MUNICIPAL AND INDUSTRIAL WATER NEEDS		
ID	Goals	Measurable Outcomes (by 2050)
C1	Pursue a high success rate for identified specific and unique IPPs to meet the municipal gap.	1. Complete 40* IPPs aimed at meeting municipal water needs. 2. Consistently meet 100% of residential, commercial and industrial water system demands identified in SWSI 2010 in each sub-basin, while also encouraging education and conservation to reduce demand. 3. Implement at least 1* IPP that protects or enhances the ability of public water supply systems to access and deliver safe drinking water that meets all health-based standards. 4. Change the ratio of in-house to outside treated water use for municipal and domestic water systems (referred to as water providers herein) from the current ratio of 50% in-house use and 50% outside use, to 60% in-house use and 40% outside use (60/40 ratio) for Southwest Colorado and the entire State by 2030. 5. Implement 3 informational events about water reuse efforts, tools and strategies. 6. The water providers in the state that are using dry-up of agricultural land (defined as requiring a water court change case) and/or pursuing a new TMD (as defined by IBCC to be a new west slope to east slope diversion project) shall have a higher standard of conservation. The goal for these water providers is a 70/30 ratio by 2030. This is a prerequisite for the Roundtable to consider support of a new TMD.
C2	Provide safe drinking water to Southwest Colorado's citizens and visitors.	
C3	Promote wise and efficient water use through implementation of municipal conservation strategies to reduce overall future water needs.	
C4	Support and implement water reuse strategies.	

*Note that several of these outcomes, indicated by an asterisk, pertain directly to supporting implementation of the projects and processes, either planned or in progress, that are currently on the Southwest Basin's IPP list. They will be periodically reviewed and updated in the future.

TABLE 1. CONTINUED…

D. MEET RECREATIONAL WATER NEEDS		
ID	Goals	Measurable Outcomes (by 2050)
D1	Maintain, protect and enhance recreational values and economic values to local and statewide economies derived from recreational water uses, such as fishing, boating, hunting, wildlife watching, camping, and hiking.	1. Implement 10* IPPs to benefit recreational values and the economic value they provide. 2. At least 80% of the areas with recreational opportunities have existing or planned IPPs that secure these opportunities and supporting flows/lake levels within the contemporary legal and water management context. Based on the map of recreational attributes generated for SWSI 2010 (Figure 1) 80% of each specific value equates to approximately 428 miles of whitewater boating, 185 miles of flat-water boating, 4 miles of Gold medal Trout Streams, 545 miles of other fishing streams and lakes, 3 miles of Audubon Important Bird Area, 143 miles of waterfowl hunting/viewing parcels, and 6 miles of Ducks Unlimited projects. 3. Address recreational data needs.

*Note that several of these outcomes, indicated by an asterisk, pertain directly to supporting implementation of the projects and processes, either planned or in progress, that are currently on the Southwest Basin's IPP list. They will be periodically reviewed and updated in the future.

TABLE 1. CONTINUED…

E. MEET ENVIRONMENTAL WATER NEEDS		
ID	Goals	Measurable Outcomes (by 2050)
E1	Encourage and support restoration, recovery, and sustainability of endangered, threatened, and imperiled aquatic and riparian dependent species and plant communities. *(See list of such species in the Southwest Basin)***	1. Implement 15* IPPs to directly restore, recover or sustain endangered, threatened, and sensitive aquatic and riparian dependent species and plant communities. 2. At least 95% of the areas with federally listed water dependent species have existing or planned IPPs that secure the species in these reaches as much as they can be secured within the existing legal and water management context. 3. At least 90% of areas with identified sensitive species (other than ESA species) have existing or planned IPPs that provide direct protection to these values. Based on the map of environmental attributes generated for SWSI 2010 (Figure 1) 90% for individual species equates to approximately 169 miles for Colorado River cutthroat trout, 483 miles for roundtail chub, 794 miles for bluehead sucker, 700 miles for flannelmouth sucker, 724 miles for river otter, 122 miles for northern leopard frog, 921 miles for active bald eagle nesting areas and 229 miles for rare plants. 4. Implement 26* IPPs to benefit the condition of fisheries and riparian/wetland habitat. 5. At least 80% of areas with environmental values have existing or planned IPPs that provide direct protection to these values.
E2	Protect, maintain, monitor and improve the condition and natural function of streams, lakes, wetlands, and riparian areas to promote self-sustaining fisheries, and to support native species and functional habitat in the long term, and adapt to changing conditions.	

*Note that several of these outcomes, indicated by an asterisk, pertain directly to supporting implementation of the projects and processes, either planned or in progress, that are currently on the Southwest Basin's IPP list. They will be periodically reviewed and updated in the future.

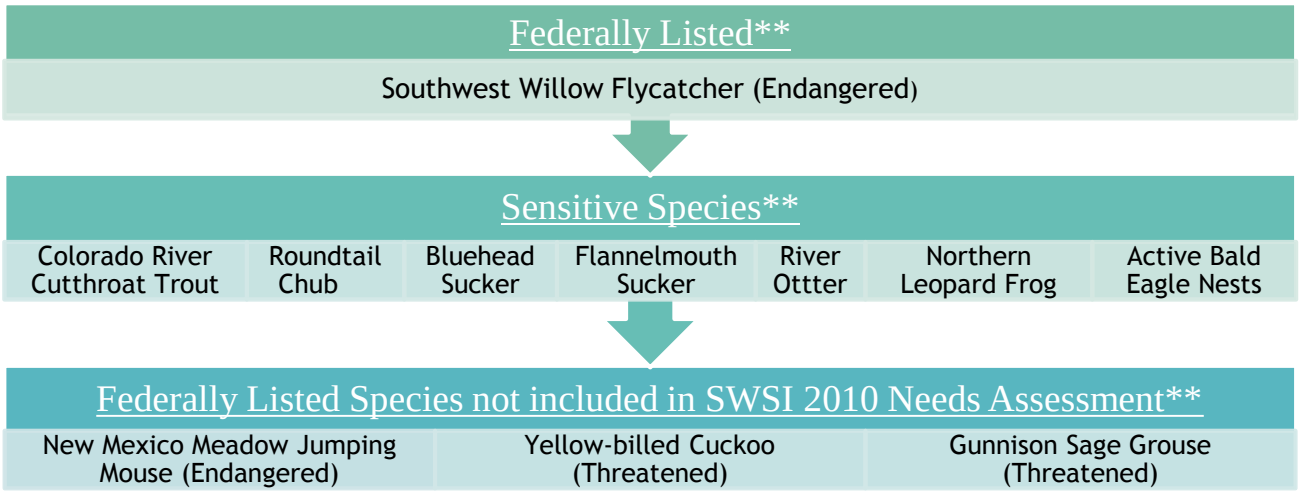


TABLE 1. CONTINUED…

F. PRESERVE WATER QUALITY		
ID	Goals	Measurable Outcomes (by 2050)
F1	Monitor, protect and improve water quality for all classified uses.	1. By 2016, replace the following statewide outcomes with outcomes based on the current status of these measures in the Roundtable area, followed by a periodic status review every five years. a. 60% of stream miles and 40% of reservoir acres attain water quality standards and support all designated uses. b. 15% of impaired stream miles and reservoir acres are restored to meet all applicable water quality standards. c. 50% of stream miles and 30% of reservoir acres are attaining water quality standards. d. 100% of existing direct use and conveyance use reservoirs attain the applicable standards that protect the water supply use classification. 2. Implement 6* IPPs to monitor, protect or improve water quality.

*Note that several of these outcomes, indicated by an asterisk, pertain directly to supporting implementation of the projects and processes, either planned or in progress, that are currently on the Southwest Basin's IPP list. They will be periodically reviewed and updated in the future.

TABLE 1. CONTINUED…

G. COMPLY WITH CO RIVER COMPACT AND MANAGE RISK		
ID	Goals	Measurable Outcomes (by 2050)
G1	Plan and preserve water supply options for all existing and new uses and values.	1. Water providers proposing a new TMD shall achieve a 60/40 ratio by 2020 and 70/30 ratio by 2030 as a prerequisite for the Roundtable to consider support of a new TMD. 2. A conceptual agreement is developed between roundtables regarding how to approach a potential future TMD from the West Slope to the East. 3. Protect 100% of pre-compact water rights in the Southwest Basin Area. 4. Implement 2* IPPs aimed at utilizing Tribal Water Rights Settlement water. 5. Implement 2* IPPs aimed at meeting La Plata River compact. 6. Participate in Compact Water Bank efforts.
G2	Recognize and address the challenges faced by water users in southwest Colorado due to continued development and pressures from users in the State of New Mexico; protect interests in southwest Colorado, while complying with existing Compact obligations. New Mexico's entitlement to Colorado River flows are based on deliveries from southwest Colorado (*SWCD Statement of Importance).*	
G3	Preserve Southwest Basin's ability to develop CO River compact entitlement to meet our water supply gaps. *(SWCD Statement of Importance).*	
G4	Recognize and uphold the unique settlement of tribal reserved water rights claims in the 1988 Tribal Water Rights Settlement and the 1991 Consent Decree. *(SWCD Statement of Importance).*	
G5	Support strategies to reduce demand in the Colorado River Basin to ensure levels in Lake Powell are adequate to produce power.	
G6	Support strategies to mitigate the impact of a Colorado River Compact curtailment should it occur.	

*Note that several of these outcomes, indicated by an asterisk, pertain directly to supporting implementation of the projects and processes, either planned or in progress, that are currently on the Southwest Basin's IPP list. They will be periodically reviewed and updated in the future.

SECTION 2: EVALUATE NEEDS

2.1 ENVIRONMENTAL & RECREATIONAL NEEDS

Identifying environmental and recreational water needs within the Southwest Basin poses a significant challenge. In SWSI 2010 the Roundtable was able to identify and map the location of environmental and recreational values defined by the Roundtable and by public input received at Roundtable hosted outreach meetings in Durango, Telluride, Cortez and Pagosa Springs. (Appendix C, SWSI 2010). However, the water, habitat or infrastructure needed to support the identified values has not been quantified or identified so the Southwest Basin's environmental and recreational supply needs cannot be fully defined.

Hesperus Mountain (Mancos River basin)

Given the constraints of time to develop this BIP, the Roundtable has chosen to address the issue by supporting an IPP that contemplates the development of this information:

> "Evaluation of environmental and or recreation gaps is planned to be conducted for improvement of non-consumptive resources and/or in collaborative efforts with development of consumptive IPPs. The evaluations may be conducted by a subgroup of the Roundtable or by individuals, groups, or organizations with input from the Roundtable. The evaluation may utilize methodologies such as the southwest attribute map, flow evaluation tool, R2 Cross, and any other tools that may be available."

Any changes resulting from the information gathered through the IPP will be considered in the future, consistent with the Roundtable's principle that the BIP is a "living document."

In developing this BIP, the Roundtable conducted numerous interviews to update the Basin's list of IPPs (Appendix A). Guided by the goals and measureable outcomes identified in Section 1, the Roundtable then used mapping to assess the stream miles of environmental and

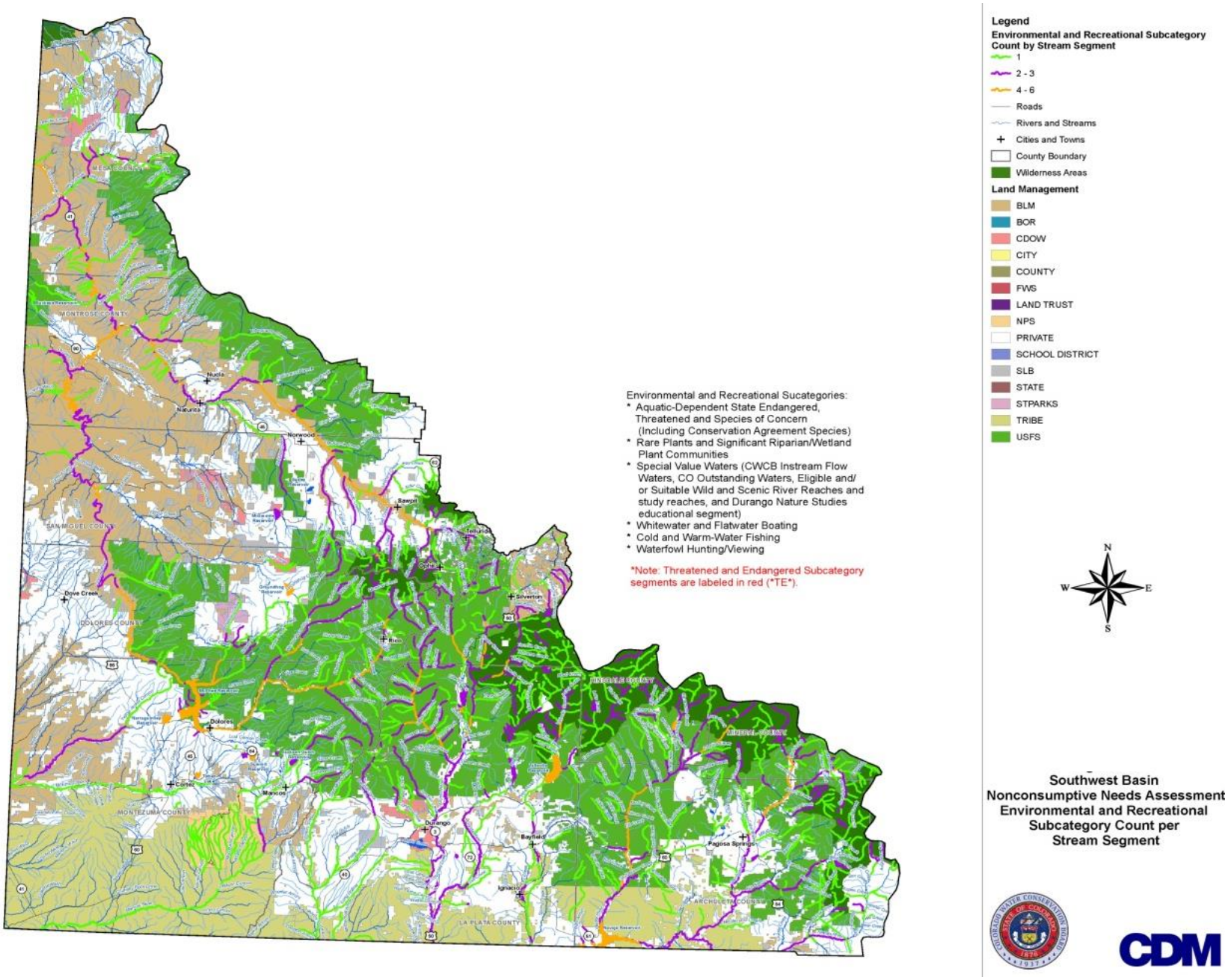
recreational values on reaches and water bodies in the Southwest Basin that are benefiting, to some unknown extent, from existing protections or IPPs, and the stream miles of these values that currently do not appear to be benefitting from protections or IPPs.

Appendix C of SWSI 2010 presented the results of the Roundtable's extensive inventory of its environmental and recreational attributes, or values. This inventory identified the following 22 environmental (15) and recreational (7) attributes or values, which were then grouped into six subcategories (Table 2) and mapped (Figure 1) (CWCB 2011).

TABLE 2. SOUTHWEST BASIN ENVIRONMENTAL AND RECREATIONAL ATTRIBUTES AND CATEGORIES IDENTIFIED IN SWSI 2010 (CWCB 2011)

SUB-CATEGORY	CATEGORY	ATTRIBUTE
Aquatic-Dependent State Endangered, Threatened and Species of Concern.	1	Colorado River Cutthroat Trout
	2	Roundtail Chub
	3	Bluehead Sucker
	4	Flannelmouth Sucker
	5	River Otter
	6	Northern Leopard Frog
	7	Active Bald Eagle Nests
	8	Southwestern Willow Flycatcher
Special Value Waters	9	Outstanding Waters
	10	Wild and Scenic Eligibility/Suitability
	11	CWCB ISF Water Rights
	12	CWCB Natural Lake Level Water Rights
	13	Durango Nature Studies
Rare Plants and Significant Riparian/Wetland Plant Communities	14	Rare Plants
	15	Significant Plant Communities
Whitewater and Flat-water Boating	16	Whitewater Boating
	17	Flat-water Boating
Cold and Warm water Fishing	18	Gold Medal Trout Streams
	19	Other Fishing Streams and Lakes
Waterfowl Hunting/Viewing	20	Audubon Important Bird Areas
	21	Waterfowl Hunting/Viewing Parcels
	22	Ducks Unlimited Projects

FIGURE 1. SOUTHWEST BASIN NONCONSUMPTIVE NEEDS ASSESSMENT ENVIRONMENTAL & RECREATIONAL SUBCATEGORY COUNT PER STREAM SEGMENT (CWCB 2011, FIGURE 2-4, PG 2-6)



Three species that are currently listed under the Federal Endangered Species Act, but that were not included in SWSI 2010 are the New Mexico Meadow Jumping Mouse (Endangered), the Yellow-billed Cuckoo (Threatened) and the Gunnison Sage Grouse (Threatened).

Complete or partial protections for environmental or recreational flows that exist in the Southwest Basin include the following:

- CWCB ISF reaches (decreed, pending, and recommended)
- Reaches found Suitable for Wild & Scenic designation
- Recreational in-channel diversion
- Wilderness Areas
- National Parks

In addition to these protections which are easily mapped to specific reaches or areas, water management, water administration (e.g. senior water rights), and compact administration in the Basin, as well as two Programmatic Biological Opinions issued under Section 7 of the Endangered Species Act function to maintain some level of flow in some rivers under certain circumstances. These protections are not specific to reaches or flows, and therefore do not lend themselves to mapping. They cover several rivers within and outside of the Basin and provide some level of long term maintenance of flows out of the state. However, the level of flow maintained in a given reach of river in a given year is dependent on conditions elsewhere in the Colorado River basin, and therefore difficult to know or plan on for the maintenance of a given environmental or recreational value. Programmatic Biological Opinions, water management, and water administration will be discussed in detail in Section 3.

Map layers reflecting the stream reaches where the bulleted protections exist were overlaid onto the map of Southwest Basin environmental and recreational attributes. The resulting maps (Figures 2 and 3) allow an assessment of the stream reaches where environmental and recreational values currently exist with some level of protection that may benefit the values at some unknown level, as well as the stream reaches where no such protections appear to exist.

FIGURE 2. MAP OF REACHES WITH ENVIRONMENTAL VALUES WITH NO IDENTIFIED FLOW PROTECTIONS

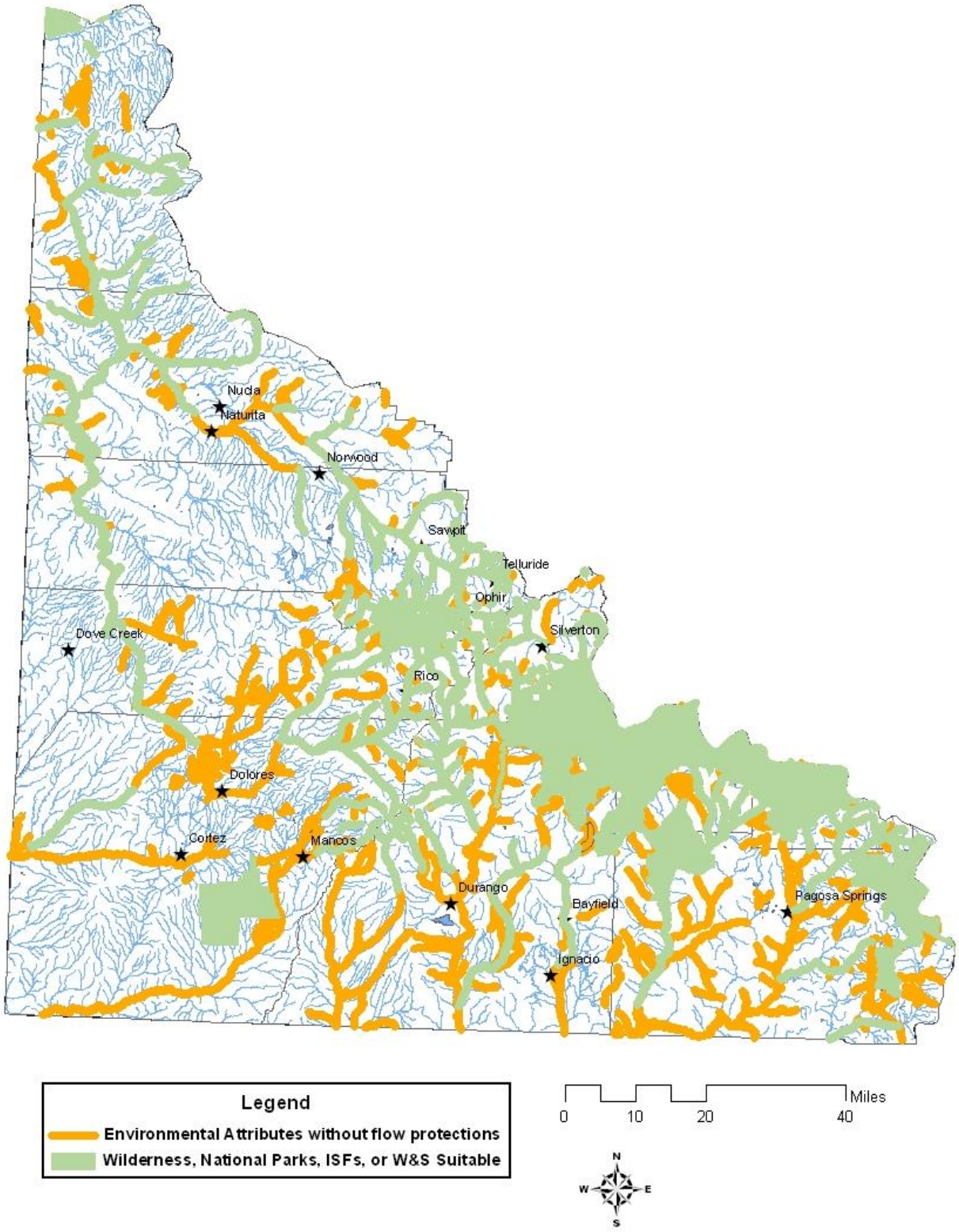
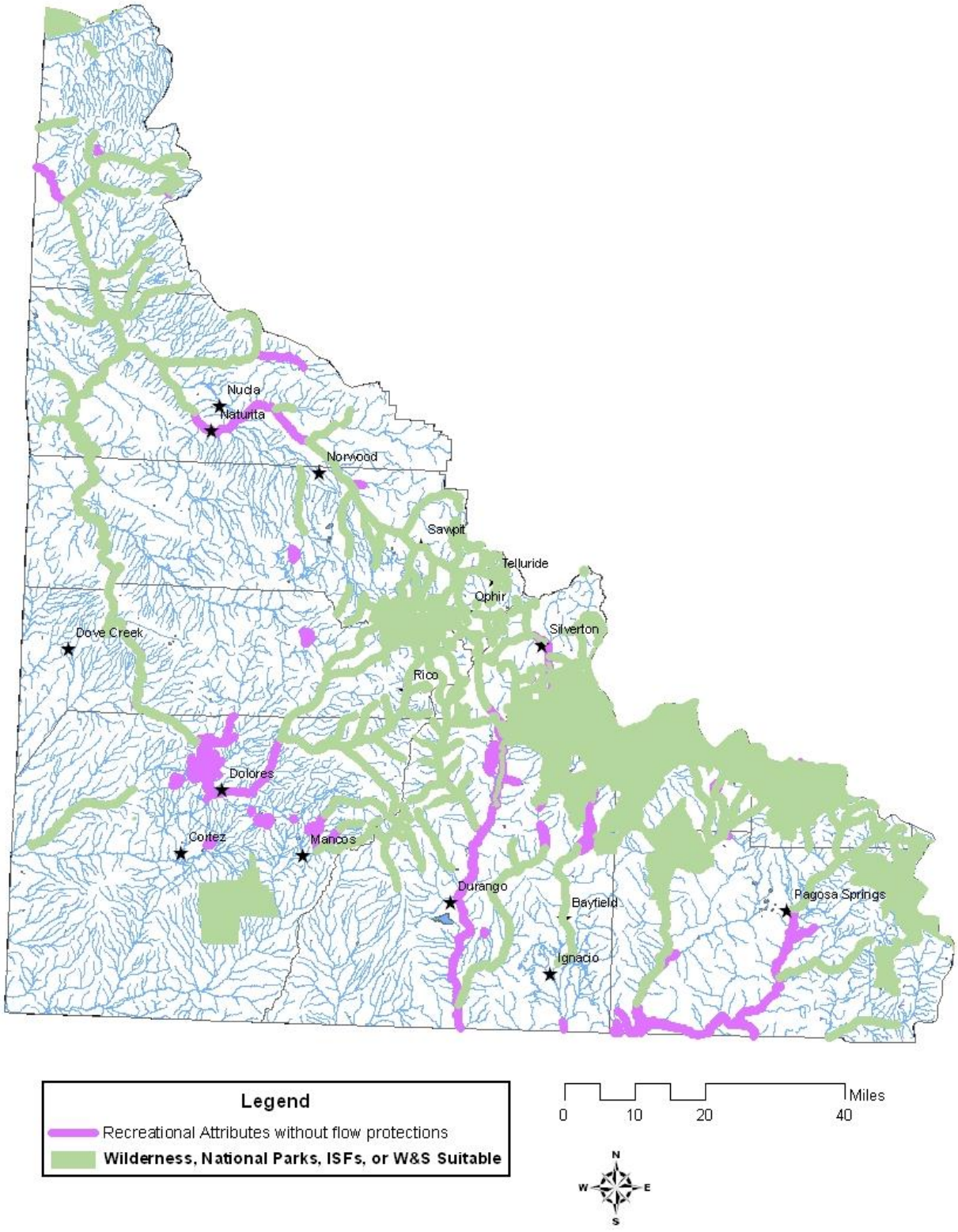


FIGURE 3. MAP OF REACHES WITH RECREATIONAL VALUES WITH NO IDENTIFIED FLOW PROTECTIONS



The Roundtable recognizes that there are significant gaps in the data and understanding regarding the flow regimes (stream flow frequency, magnitude, duration and timing) and other conditions necessary to sustain many of the environmental and recreational values identified in the Southwest Basin. The Roundtable also recognizes that the tools currently available to help maintain those conditions are limited. Therefore the Roundtable cautions against any assumption that the presence of an existing protection (e.g. ISF) is sufficient to maintain or sustain the attribute(s) identified in that reach. Assessment of the sufficiency of such measures depends on the particular attributes, the condition of the stream reach and the measures in place. The Roundtable has identified two IPPs that it hopes can help address and bridge these needs for more information and additional tools (Sections 4 and 5).

2.2 AGRICULTURAL, MUNICIPAL AND INDUSTRIAL NEEDS

2.2.1 AGRICULTURAL

SWSI 2010 provided information about the methodologies used to develop estimates of current irrigated acres, estimates of 2050 irrigated acres, and estimates of the average annual agricultural demand by basin for the year 2050.

Current irrigated acres were estimated using the CDSS program's spatial databases which include crop types, irrigation practices, and water source (e.g. locations of wells or diversion structures). The most recent year of data collected that is provided as a spatial database is 2005. According to SWSI 2010, the Southwest Basin has the third highest percentage of irrigated acres of Colorado's west slope basins (seventh overall in the state).

To develop estimates of 2050 irrigated acres the baseline of current irrigated acres was used. Multiple factors (a total of 8) were qualitatively addressed, while three factors (urbanization of existing irrigated lands, agricultural to municipal water transfers, and water management decisions) were quantified. For detailed explanation of the quantification of factors reference SWSI 2010 Section 4.3.1.2 Irrigation Acres Methodology. Table 3 provides a comparison of current irrigated acres to estimated future irrigated acres.

Lemon Reservoir (Animas River basin)

Lemon Reservoir is a main feature of the Florida Project on the Florida River northeast of Durango. The reservoir was completed in 1963, and the canal rehabilitation was completed in 1965. The reservoir can store about 40,000 AF, and provides supplemental irrigation for approximately 20,000 acres. Through recent agreements, efficiency improvements, and court changes, the storage can also provide domestic and augmentation requirements while continuing to meet the irrigation demand. The Florida Water Conservancy District manages the project, which is identified as a multipurpose IPP.

TABLE 3. CURRENT AND ESTIMATED FUTURE IRRIGATED ACRES BY SUB-BASIN (CWCB 2011)

	CURRENT IRRIGATED ACRES (ACRES)	ESTIMATED DECREASE IN IRRIGATED ACRES DUE TO URBANIZATION (ACRES)*		ESTIMATED DECREASE IN IRRIGATED ACRES DUE TO AGRICULTURAL TO MUNICIPAL TRANSFERS TO ADDRESS M&I GAP (ACRES)*		ESTIMATED 2050 IRRIGATED ACRES*		ESTIMATED DECREASE IN IRRIGATED ACRES BY 2050*	
		Low	High	Low	High	Low	High	Low	High
San Juan	15,840	626	799	200	413	15,014	14,628	826	1,213
Piedra	7,074	129	165	89	185	6,856	6,725	219	350
Pine	46,755	934	1,347	590	1,220	45,231	44,188	1,524	2,567
Animas	32,193	578	854	406	840	31,209	30,499	984	1,694
La Plata	21,305	382	565	269	556	20,654	20,184	651	1,121
Mancos	11,617	54	72	147	303	11,417	11,242	200	375
McElmo	11,394	43	57	131	270	11,220	11,067	173	327
Dolores	80,368	479	634	943	1,949	78,946	77,784	1,422	2,584
San Miguel	32,879	921	1,314	415	858	31,543	30,708	1,336	2,171
Total	**259,400**	**4,100**	**5,800**	**3,200**	**6,600**	**252,100**	**247,000**	**7,300**	**12,400**

*Estimates based on projected level of population growth.

The Southwest Basin has numerous reservoirs (e.g. Animas La Plata Project, Electra Lake, Lemon Reservoir, Vallecito Reservoir, Pagosa Area Water and Sanitation District reservoirs, Jackson Lake, McPhee Reservoir, Norwood Water Commission reservoirs, Gurley Reservoir, etc.) that provide or plan to provide municipal and industrial water. While some extent of urbanization is inevitable, the Southwest Basin does not assume that current irrigation water supply will be transferred to meet the municipal and industrial gap. A minor exception is augmentation planning. Augmentation plans are developed on a case by case basis where a water rights holder is drying-up (taking out of production) their own land in order to provide additional water supply for a different use (such as domestic water).

The estimated average annual agricultural demand is based on the estimated 2050 irrigated acres and the average amount of water consumptively used by crops on irrigated lands. The consumptive use (CU) for a crop is the amount of water provided to the crop during the growing season. The irrigation water requirement (IWR) is the amount of water the crop would use if it were available. To quantify a crop's CU, the IWR is compared to the average water supply, the minimum of these two values over a period of time (typically months) is the water supply limited consumptive use (WSL CU). The WSL CU is assumed to represent the water necessary to sustain existing levels of agricultural acreage.

In addition to agricultural consumptive demands, SWSI 2010 estimated non-irrigation agricultural consumptive demands, such as stock ponds. For detailed explanation of the agricultural demand methodology see Section 4.3.1.4 2050 Agricultural Demand Methodology in SWSI 2010.

Two types of agricultural need were identified during the outreach efforts for the BIP. One of these we will term as an "annual shortage". This shortage can be quantified by comparing the WSL-CU to the IWR for a specific basin to indicate how often throughout the season a crops potential water use (IWR) is met. As an example, Table 4 provides estimates of current and 2050 annual agricultural demands. The Annual Shortage is calculated by subtracting the WSL-CU from the IWR.

TABLE 4. ESTIMATED CURRENT & FUTURE AGRICULTURAL DEMANDS IN THE SOUTHWEST SUB-BASINS

	IRRIGATED ACRES		IRRIGATION WATER REQUIREMENT (AF/YR)		WATER SUPPLY LIMITED-CU (AF/YR)		ANNUAL SHORTAGE (AF/YR)		NON-IRRIGATION DEMAND* (AF/YR)	
	SWSI 2010	2050 Estimate	SWSI 2010	2050 Estimate	SWSI 2010	2050 Estimate	SWSI 2010	2050 Estimate	SWSI 2010	2050 Estimate
San Juan	15,840	14,821	34,693	32,460	22,597	21,139	12,096	11,321	2,941	2,752
Piedra	7,074	6,790	14,839	14,243	8,595	8,250	6,244	5,993	946	908
Pine	46,755	44,710	103,096	98,586	90,515	86,555	12,581	12,031	9,311	8,904
Animas	32,193	30,854	74,431	71,336	53,817	51,579	20,614	19,757	5,843	5,600
La Plata	21,305	20,419	44,493	42,643	14,286	13,692	30,207	28,951	1,757	1,684
Mancos	11,617	11,329	31,560	30,779	16,060	15,663	15,499	15,116	2,716	2,649
McElmo	72,463	11,144	157,219	26,732	110,571	23,016	46,648	3,717	6,547	6,403
Dolores	19,298	78,365	48,728	174,195	28,050	112,190	20,678	62,005	11,925	11,623
San Miguel	32,879	31,125	71,167	67,371	37,396	35,402	33,770	31,969	3,937	3,727
Total	**259,400**	**249,557**	**580,200**	**558,345**	**381,900**	**367,486**	**198,300**	**190,859**	**45,900**	**44,250**

* includes stock ponds, ditch losses, etc.

Table 5 shows the shortage in water supply on an annual basis that is needed to meet the IWR for the existing irrigated acreage identified in SWSI 2010. Percentages shown represent the SWSI 2010 Annual Shortage value as a percent of the SWSI 2010 IWR provided in Table 4. It can be seen from Table 5 that the La Plata River basin shows the largest discrepancy between the amounts of water that the existing irrigated crops could use if it were available and the amount of water they are supplied with annually.

TABLE 5. ANNUAL SHORTAGE IN WATER SUPPLY NEEDED TO MEET CROPS IWR

SUB-BASIN	SHORTAGE
San Juan	35%
Piedra	42%
Pine	12%
Animas	28%
La Plata	68%
Mancos	49%
McElmo	30%
Dolores	42%
San Miguel	47%

The La Plata River basin has about 21,305 acres of existing irrigated lands (CWCB 2011). The average annual water supply is 23,153 AF. Based on this acreage and average annual water supply, about 0.71 AF per acre is supplied to the crops, assuming a high efficiency of delivery (e.g. conveyance losses of 10% and on-farm losses of 25%), as used by Bureau of Reclamation (BOR). The IWR is 2.09 AF per acre, so this annual water supply on average is meeting the IWR about 32% of the time for a single irrigation season.

The La Plata River is also unique in that it is administrated according to the La River Compact, as well as Colorado water law. See Section 3.2 for details of the compact. The compact requires half of the measured flow, not to exceed 100 cubic feet per second, at the Hesperus gaging station be delivered to the state line.

The second type of agricultural need identified in the Southwest Basin is the amount of irrigable land that is either not currently irrigated or not currently under production. We term this an "irrigation gap". As part of the Animas La-Plata Project the BOR conducted land classifications of the Animas and La Plata river drainage areas and found many acres that are dry-land farmed that are potentially irrigable (DPR Appendix B, 1979). Of the present dry-land farming acreage, approximately 30,000 acres could be irrigated, in addition, 13,000 acres are presently not in crop production that could be irrigated as well. Assuming an IWR of 1.9 AF per acre (conveyance losses of 10% and on-farm losses of 25%, as assumed by BOR) the water supply needed to irrigate these new lands would be about 110,295 AF. This is well out of range for the average annual water supply in the La Plata Basin to provide for these new lands in addition to the existing lands' needs. However, extensive studies identify trans-basin water as a source of potential water supply. The

McPhee Reservoir (Dolores River basin)

trans-basin water would be used to meet the demands of the existing lands in addition to the development of these new lands. Examples of trans-basin agricultural water development exist in the Southwest Basin today.

In some regions the needs of one basin have been met through a trans-basin diversion. An example is the McElmo River basin which receives irrigation water diverted out of the Dolores River through the Dolores Project. The Dolores Project irrigates about 28,500 acres of land from Yellow Jacket to Dove Creek, to the north, and about 7,600 acres around the toe of Ute Mountain (operated by Ute Mountain Ute Farm and Ranch). The Dolores Project also provides supplemental irrigation water to 26,300 acres in the Montezuma Valley Irrigation Company's service area that are classified as irrigable by the BOR. The Ute Mountain Ute Farm and Ranch has identified additional needs for irrigation water (see Appendix A) in the amount of 4,000 AF. This is a known, quantifiable irrigation gap. Please see Section 5 for proposed strategies and tools that could potentially meet a portion or all of this need.

2.2.2 MUNICIPAL

SWSI 2010 provided information about the methodologies used to develop population projections and future municipal demands by 2050. For a detailed explanation of municipal demands, reference Section 4.2 M&I and SSI Consumptive Needs in SWSI 2010 (CWCB 2011). Population projections were estimated using standard methods and forecasting processes utilized by the Colorado State Demographer's Office. Due to uncertainties in projections, low, medium, and high scenarios for population projections were developed. The State of Colorado is estimated to grow from approximately 5.1 million people to between 8.6 (low) and 10 (high) million people by 2050.

TABLE 6. POPULATION PROJECTIONS (CWCB 2011)

	2008	2035	2050 LOW	2050 MEDIUM	2050 HIGH	% AVERAGE ANNUAL GROWTH RATE
Archuleta County	12,870	28,295	32,180	34,602	37,517	2.23-2.58
Dolores County	1,993	3,127	3,455	3,692	3,977	1.37-1.69
La Plata County	51,454	87,929	95,803	105,276	116,996	1.49-1.95
Montezuma County	26,127	41,306	45,560	48,529	52,062	1.32-1.62
Montrose County*	4,177	7,787	8,577	9,037	9,661	1.80-2.07
San Juan County	588	683	830	1,098	1,395	0.78-1.95
San Miguel County	7,966	15,509	17,602	22,028	27,368	1.93-2.93
Total	**105,180**	**184,640**	**20,4010**	**224,260**	**248,980**	**1.6-2.1**

*Southwest portion of Montrose County

To estimate current and future municipal demands, water demands were based on the per capita water use rates (provided by water providers throughout the state) multiplied by the projected population for each county. Numerous factors contribute and affect the estimated per capita water use. For a detailed explanation on how these values were determined please reference SWSI 2010 Section 4.2.2.1 2050 M&I Water Demands Methodology. In summary, local water providers provided per capita water use based on their existing customers, which was in turn used

to estimate county-wide water use. Passive water conservation was also taken into consideration and assumed to range from 19 to 33 gallons per capita through the year 2050. The municipal and industrial demands of the Southwest Basin are expected to be between 40,000 and 50,000 AF per year by 2050 (CWCB 2011).

TABLE 7. 2050 MUNICIPAL WATER DEMAND ESTIMATES (CWCB 2011)

	WATER DEMAND (AF/YR)	2050 BASELINE WATER DEMAND (AF/YR)		
	2008	Low	Medium	High
Archuleta County	2,600	6,600	7,100	7,700
Dolores County	540	940	1,000	1,100
La Plata County	9,800	18,000	20,000	22,000
Montezuma County	5,000	8,800	9,400	10,000
Montrose County*	870	1,800	1,900	2,000
San Juan County	120	170	220	280
San Miguel County	2,600	5,700	7,100	8,900
Total	**21,530**	**42,010**	**46,720**	**51,980**

*Southwest portion of Montrose County

An M&I gap within Montrose County (Southwest Basin portion) was identified during the outreach efforts for the development of the BIP. Montrose County representatives provided two IPPs to meet the municipal and industrial needs over the next 50 years; please see Section 4.4 for a summary of the IPPs and Appendix A for the full IPP list. The two Montrose County projects will address the potential 3,200 AF gap between existing water supplies and demands projected to occur by the year 2050 in the west portion of Montrose County.

Another M&I gap that exists throughout the Southwest Basin is the need for water delivery infrastructure. This is not a quantifiable water supply gap but rather related to delivery of safe, reliable potable drinking water. Approximately 35% of the population within the basins are served by covered entities (public water systems serving at least 2,000 AF of water annually), approximately 40% are served by community public water systems (e.g. 15 connections or 25 residents; served year around), with the reminder of the population served by wells, non-community water systems, water hauling, surface water diversions or some combination of these (S. Harris, pers. comm.). Many residents are in need of safe, reliable drinking water that are not living within the service area of an existing water system. The formation of water districts, water authorities, or other entities to serve and construct rural water delivery systems is necessary to serve current residents of the Southwest Basin and to provide for future growth projections. A rural water system can provide reliability and safe drinking water to residents whose needs might otherwise not be met. The Southwest Basin has multiple existing or planned reservoirs to serve

M&I water demands. These reservoirs can provide long term water supply for public water systems.

2.2.3 INDUSTRIAL

SWSI 2010 estimated future self-supplied industrial water needs (SSI) which includes water used by self-supplied industries and municipal water provided to large industries. Subsectors that are included are:

- Large industries such as mining, manufacturing, brewing, and food processing
- Water needed for snowmaking
- Thermoelectric power generated at coal and natural gas fired facilities
- Energy development; such as natural gas, coal, uranium, and oil shale

Snowmaking in Telluride, CO (San Miguel River basin)

For the Southwest Basin, the industries specifically noted were snowmaking (within La Plata and San Miguel counties) and thermoelectric power generation (within Montrose County). SWSI 2010 reported snowmaking water demands are expected to remain constant through 2050 because no resort expansions were planned at time of data collection. For thermoelectric power generation baseline estimates generated through the SWSI I efforts were assumed until 2035, while 2050 estimates were made based on predetermined percent increase for low (5 percent), medium (25 percent) and high (50 percent) range. SWSI 2010 did not include projections of water demands for energy development within the Southwest Basin. Such demands might be worth estimating if drilling of shale beds moves from exploration to production.

SWSI 2010 included these SSI projections within the M&I water demand projections. These projections also include reductions for passive conservation (a range of 19 to 33 gpcd by 2050 was used). Please see the below Table 8 for a quantification of these values.

TABLE 8. 2050 M&I DEMAND PROJECTIONS FOR COUNTIES IN THE SOUTHWEST BASIN (CWCB 2011)

	2008 WATER DEMAND (AF/YR)	2035 WATER DEMAND* (AF/YR)	2050 INCREASE IN M&I AND SSI DEMAND* (AF/YR)		
			Low	Medium	High
Archuleta County	2,600	5,400	3,500	4,000	4,600
Dolores County	540	790	300	400	500
La Plata County	9,800	15,000	6,800	8,600	10,800
Montezuma County	5,000	7,300	3,000	3,500	4,200
Montrose County**	870	1,500	3,000	3,900	5,000
San Juan County	120	120	30	90	100
San Miguel County	2,600	4,800	2,900	4,300	6,000
Southwest Total	**21,530**	**34,910**	**19,500**	**24,800**	**31,200**

*Water demand including passive conservation

**Southwest portion of Montrose County

SWSI 2010 describes the M&I and SSI water supply gap as the difference between the 2050 net new water needs minus the 2050 IPPs (based on the IPP's yield and success rate). SWSI 2010 describes meeting the future M&I demand through growth into existing supplies, as well as through achieving regional in-basin IPPs having a success rate of 100%. A number of IPPs exist to meet the M&I demand projections. For the complete list of IPPs see Appendix A. Within each sub-basin, current municipal IPPs have the potential to meet identified needs if completed as currently described.

Archuleta County has a projected demand increase of 3,500 to 4,600 AF per year. This potential gap could be met by the IPP described as regional in-basin IPPs which is the Dry Gulch Water Storage Facility Project. Infrastructure gaps could be met by the proposed IPPs for the Aspen Springs Distribution System and the Snowball Booster Station with Snowball to Dutton Diversion Pipeline Project.

Dolores County has a projected demand increase of 300 to 500 AF per year. This potential gap could be met by growth into existing supplies and regional in-basin IPPs. The Rico Alluvial Pipeline Water Supply Project was recently completed; the Town of Rico constructed a new groundwater source to meet demands while keeping the existing surface water diversion in place to provide redundancy. The Dolores Project has existing M&I water that is not permanently allocated. The Dolores Project already provides M&I water to the City of Cortez, Montezuma Water Company, Dove Creek, and Towaoc. In addition, a new reservoir is proposed, the Upper Plateau Reservoir decreed for M&I and fisheries purposes, which could also supply M&I demands.

La Plata County has a projected demand increase of 6,800 to 10,800 AF per year. This potential gap could be met by growth into existing facilities and regional in-basin IPPs. The Animas-La Plata Project currently has water allocated for M&I use for the City of Durango, La Plata Archuleta Water District, La Plata West Water Authority, Ute Mountain Ute Tribe, and Southern Ute Tribe. The Florida Water Conservancy District has a multi-purpose IPP providing augmentation water and M&I water for the Florida River basin. New regional in-basin infrastructure IPPs include the Animas Airpark Water Distribution System, La Plata Archuleta Water District Distribution System and the La Posta Road Water Distribution System.

Rico Alluvial Municipal Pipeline Project (Dolores River basin)

Montezuma County has a projected demand increase of 3,000 to 4,200 AF per year. This potential gap could be met by growth into existing facilities. Again, the Dolores Project provides M&I water to water providers within Montezuma County. In the future, Totten Reservoir could be a potential water source to provide M&I water. Within the Mancos watershed, reservoirs currently providing M&I water have enlargements planned to increase capacity and provide additional water supply.

Montrose County has a projected demand increase of 3,000 to 5,000 AF per year. This potential gap could be met by growth into existing supplies and by regional in-basin IPPs. Existing providers are investigating means of providing additional water, firming of existing supplies, and enlargement of distribution systems. The regional in-basin IPP consists of a two-phased IPP; the first phase is to conduct a feasibly study to determine reservoir sites and expected yield, and the second phase is to construct one or more reservoirs.

San Juan County has a projected demand increase of 30 to 100 AF per year. This potential gap can be met by growth into existing supplies. Currently, there are no IPPs listed that provide additional water supply. The existing IPPs relate to infrastructure not supply.

San Miguel County has a projected demand increase of 2,900 to 6,000 AF per year. This potential gap can be met by growth into existing supplies. Existing providers are investigating means of providing additional water, firming of existing supplies, and enlargement of distribution systems.

SECTION 3: CONSTRAINTS & OPPORTUNITIES

3.1 ANALYSIS OF CONSTRAINTS & OPPORTUNITIES BASED ON EXISTING DATA

The purpose of this section is to understand where there appear to be opportunities for new IPPs to meet remaining needs (e.g. gaps) and what some of the constraints may be, based on existing data.

Examples of physical and administrative conditions that may act as constraints and/or present opportunities include:

- Water management and water rights administration (see Section 3.2),
- Current and future hydrology (see Section 3.5),
- Sensitive species and habitat location and quality (see Section 3.3)
- Flows and river gradient (e.g. for whitewater and flat-water boating)
- Reservoir capacity and operation agreements
- Regulations/ Permitting
- Water Quality
- Public Land Management laws or policies (e.g. W&S suitability, Wilderness)

Table 9 provides a summary of general opportunities and constraints that the Roundtable has identified to-date for accomplishing the Goals and Measureable Outcomes in Section 1.

The Roundtable has not yet, but could in the future, consider reviewing existing spatial data to study locations around the Southwest Basin that might present opportunities for attaining all or some of the measureable outcomes. Moreover, as more information about environmental and recreational water needs is gathered, additional IPPs may be identified to meet any updated measurable outcomes. The following sections provide more detail on some of these conditions.

Dusk in the San Juan Mountains (Animas River basin)

TABLE 9. SUMMARY OF OPPORTUNITIES AND CONSTRAINTS ASSOCIATED WITH SOUTHWEST BASIN MEASUREABLE OUTCOMES

THEME	MEASUREABLE OUTCOME	OPPORTUNITIES	CONSTRAINTS
A	1. 100% of new IPPs shall consider from the initial planning stage maintaining and enhancing environmental and recreational needs.	• Incorporate into Southwest Basin funding criteria and expectations. • Partnerships could assist in funding opportunities, and achieving the desired outcomes.	• Jurisdictions. • Timing. • Difficult to assess. • Some of projects have already passed through their initial planning and have reached a stage where difficult; options may be limited for achieving all needs within a given project, requires prioritizing. • Permitting requirements.
A	2. Complete 19 multipurpose IPPs to meet identified gaps.	• Look for project specific opportunities. • Support implementation, to help meet water supply gaps.	• Project specific. • Water availability. • Funding. • Water management and administration. • Permitting. • Legal obligations.
A	3. Initiate and participate in 10 IPPs that promote dialogue, foster cooperation and resolve conflict.	• Areas with high demand for multiple uses and values but which are over appropriated. • Areas with lower demand and more opportunity for common ground among uses, values and jurisdictions.	• Hydrology past present and predicted • Physical realities (topographic, habitat, hydrology). • Habitat. • Water administration (Critical areas map). • Reservoir capacity and contracts. • Compact requirements.

TABLE 9. CONTINUED…

THEME	MEASUREABLE OUTCOME	OPPORTUNITIES	CONSTRAINTS
A	4. At least 50% of sub-basins have existing or planned IPPs that are protective of critical infrastructure and/or environmental and recreational areas and watershed health.	• Although the goal has been met for portions of each sub-basin, additional opportunities exist for forest health, community wildfire protection, water quality, and source water protection planning in portions of each sub-basin.	• Action depends on collaboration between various private, tribal, federal, state and local jurisdictions.
A	5. All towns and major water supply systems with water supply infrastructure have watershed/ wildfire assessments that identify strategies/ treatments necessary to mitigate the impacts that occur to hydrology in a post-fire environment.	• Smaller entities can also benefit. • While each county has a Community Wildfire Protection Plan in place, not every town or major supply system has a CWPP or Source Water Protection Plan specific to its operations.	• Action depends on various private, tribal, federal, state and/or local jurisdictions outside of town or water suppliers' control. • Cost of such assessments.
A	6. All major reservoirs have watershed/ wildfire assessments that identify strategies/treatments necessary to mitigate the impacts that occur to hydrology in a post-fire environment.	• While every county has a CWPP in place, there is opportunity for reservoir specific fire and disaster planning and management efforts.	• Action depends on various private, tribal, federal, state and/or local jurisdictions outside reservoir operators' control.

TABLE 9. CONTINUED…

THEME	MEASUREABLE OUTCOME	OPPORTUNITIES	CONSTRAINTS
B	1. Implement projects (e.g. ATMs, efficiency, etc.) in order to help preserve agriculture and open space values, and to help address municipal, environmental, recreational, and industrial needs; while respecting private property rights.	• These tools could be explored and be useful at some point. • Southwest Basin will take the opportunity to learn from such projects elsewhere in the state.	• Water rights administration. • Tools are still in development. • Not currently active within Southwest Basin.
B	2. Implement strategies that encourage continued agricultural use and discourage permanent dry-up of agricultural lands.	• These tools could be explored and be useful at some point. • Southwest Basin will take the opportunity to learn from such projects elsewhere in the state.	• Water rights administration. • Tools are still in development. • Not currently a high priority need within our basin.
B	3. The water providers in the state that are using dry-up of agricultural land (defined as requiring a water court change case) and/or pursuing a new TMD (as defined by IBCC to be a new west slope to east slope diversion project) shall have a higher standard of conservation. The goal for these water providers is a ratio of 70/30.	• Opportunity for Southwest Basin to achieve outcome and help build support; • Join with Colorado Basin Roundtable in supporting this measure. • Participate in conservation discussions and pursue future legislation.	• Political support/opposition at State level.

TABLE 9. CONTINUED…

THEME	MEASUREABLE OUTCOME	OPPORTUNITIES	CONSTRAINTS
B	4. Implement at least 10 agricultural water efficiency projects identified as IPPs (by sub-basin).	• Many more ditches and districts may also have interest or plans.	• Resources (e.g. funding and match, manpower, expertise). • State water policy. • Lack of financial incentive for efficiency. • Need to adapt state water policy.
C	1. Complete 41 IPPs identified in 2015 IPP list (includes all basins) aimed at meeting municipal water needs.	• Many more public or non-community suppliers may also have need/interest or plans. • Roughly 25% of the population (Harris and Lile, pers. comm.) are not covered by a public water system (e.g. wells, hauling, non-community systems).	• Non-community water systems have not been identified. • Funding.
C	2. Consistently meet 100% of residential, commercial and industrial water system demands identified in SWSI 2010 in each sub-basin.	• Complete the currently listed IPPs, and newly identified needs. • Connect available M&I water supplies with areas of need. • Opportunity for increased outreach to suppliers.	• Funding. • Source water quality. • No central place for data • Depends on hydrology, water rights and administration. • Capital cost versus return ratio.
C	3. Implement projects that protect or enhance the ability of public water supply systems to access and deliver safe drinking water that meets all health-based standards.	• Engage more public water suppliers in Source Water Protection Planning. • Support implementation of identified BMPs from existing plans.	• Funding for implementation. • Interest. • Lack of urgency. • Jurisdictions.

TABLE 9. CONTINUED…

THEME	MEASUREABLE OUTCOME	OPPORTUNITIES	CONSTRAINTS
C	4. Change the ratio of in-house to outside treated water use for municipal and domestic water systems (referred to as water providers herein) from the current ratio of 50/50 to 60/40 for southwest Colorado and the entire State by 2030.	• More useful measure of conservation than per capita use, because per capita use does not fit the same for all communities, and because consumptive use is highest with outside use. • Legislation	• Concerns that one size does not fit all.
C	5. Implement 3 informational events about water reuse efforts and strategies.	• Highlight current reuse efforts in and out of the basin. • Educate about grey water use law and opportunities.	• Legal. • Return flow demand and quality. • State water policy. Historical use.
C	6. The water providers in the state that are using dry-up of agricultural land (defined as requiring a water court change case) and/or pursuing a new TMD (as defined by IBCC to be a new west slope to east slope diversion project) shall have a higher standard of conservation. The goal for these water providers is a ratio of 70/30. Water providers proposing a new TMD shall achieve a 60/40 ratio by 2020 and 70/30 by 2030 (high conservation) as a prerequisite for the Roundtable to consider support of a new TMD.	• Legislation.	

TABLE 9. CONTINUED…

THEME	MEASUREABLE OUTCOME	OPPORTUNITIES	CONSTRAINTS
D	1. Implement 10 projects to benefit recreational values and the economic value they provide.	• Education. • Funding. • Providing safe and appropriate access and address data gaps on flow needs. • Partnerships.	• Hydrology and water administration, private property concerns. • Funding. • Poor recreational etiquette. • Lack of data on flow needs.
D	2. At least 80% of the areas with recreational opportunities have existing or planned IPPs that secure these opportunities and supporting flows/lake levels within the contemporary legal and water management context.	• Incorporating benefits from water administration and management. • Developing data on range of flows to support values.	• Difficult to quantify. • Assessing sufficient protection. Private property rights. • Water availability. • Water quality. • Lack of data.
E	1. Implement 15 IPPs to directly restore, recover or sustain endangered, threatened, and imperiled aquatic and riparian dependent species and plant communities.	• Participation in SJRIP. • Partnerships. • Dialogue. • Developing data on range of flows to support values.	• Water rights. • Private property. • Lack of data on flow needs.
E	2. At least 95% of the areas with federally listed water dependent species have existing or planned IPPs that secure the species in these reaches as much as they can be secured within the existing legal and water management context.	• Partnerships. • Dialogue. • Developing data on range of flows to support values. • Update attribute map. • Jointly identify reaches where opportunities exist.	• Water Rights. • Private Property. • Lack of data on flow needs. • Not currently mapped as attributes (or incorrect). • Difficult to assess sufficiency of IPPs.

TABLE 9. CONTINUED…

THEME	MEASUREABLE OUTCOME	OPPORTUNITIES	CONSTRAINTS
E	3. At least 90% of areas with identified imperiled species (other than ESA species) have existing or planned projects and methods that provide direct protection to these values.	• Partnerships and dialogue. • Update attribute list, mapping. • Developing data on range of flows to support species. • Jointly identify reaches where opportunities exist.	• Water rights. • Private property. • Lack of data on flow needs. • Not currently mapped as attributes (or incorrect). • Difficult to assess sufficiency of IPPs.
E	4. Implement 26 IPPs to benefit condition for fisheries and riparian/wetland habitat.	• Partnerships • Dialogue • Update attribute list and mapping. • Developing data on range of flows to support species. • Jointly identify reaches where opportunities exist.	• Water rights • Private property • Lack of data on flow needs. • Not currently mapped as attributes (or incorrect) • Difficult to assess sufficiency of IPPs.
E	5. At least 80% of areas with environmental values have existing or planned projects and methods that provide direct protection to these values.	• Partnerships. • Dialogue. • Update attribute list/ mapping. • Developing data on range of flows to support species. • Jointly identify reaches where opportunities exist.	• Water rights. • Private property. • Lack of data on flow needs. • Not currently mapped as attributes (or incorrect). • Difficult to assess sufficiency of IPPs.

TABLE 9. CONTINUED…

THEME	MEASUREABLE OUTCOME	OPPORTUNITIES	CONSTRAINTS
F	1. By 2016, replace the following statewide outcomes with outcomes based on the current status of these measures in the Roundtable area.	• Partnerships. • Funding. • More consistent and comprehensive periodic monitoring.	• Funding. • Legislation. • Regulatory policy.
F	2. Implement 6 IPPs to monitor, protect or improve water quality.	• Funding. • Consistent periodic monitoring. • Identifying sources.	• Funding. • Consistency. • Jurisdictions. • Access. • Identifying sources is challenging.
G	1. Water providers proposing a new TMD shall achieve a 60/40 ratio by 2020 and 70/30 by 2030 (high conservation) as a prerequisite for the Roundtable to consider support of a new TMD.	• Opportunity for Southwest Basin to achieve outcome and help build support. • Join with Colorado Basin Roundtable in supporting this measure. Participate in conservation discussions and pursue future legislation.	• Political support/opposition at State level.
G	2. A conceptual agreement is developed between roundtables regarding how approach a potential future TMD from the West Slope to the East.	• IBCC working on it. • Future Use Allocation (FUA). • Develop alternative sources to a TMD to meet future water needs.	• Water supply. • Compact curtailment. • Risk management. • Future west slope development. • Funding.

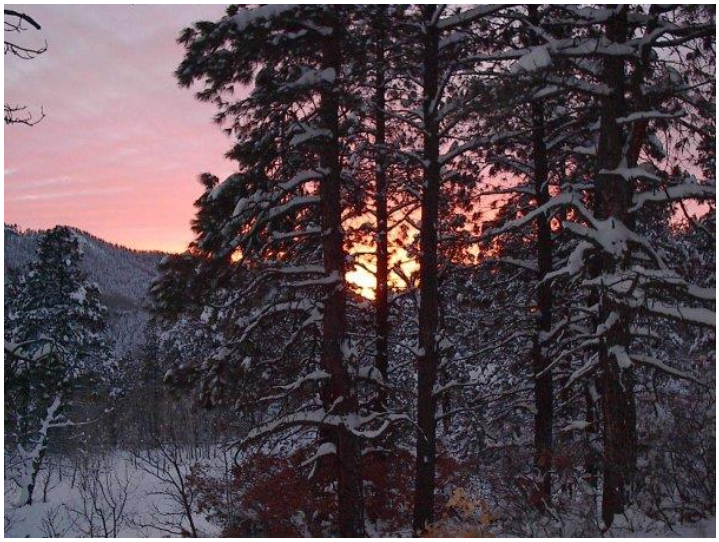
TABLE 9. CONTINUED…

THEME	MEASUREABLE OUTCOME	OPPORTUNITIES	CONSTRAINTS
G	3. Protect 100% of pre-compact water rights in the Southwest Basin.	• Put to beneficial use. Protect historic consumptive use.	• Listing on abandonment list is a risk. Ability to put to beneficial use in some cases.
G	4. Implement 2 IPPs aimed at utilizing Tribal Water Rights Settlement water.	• Support implementation.	
G	5. Implement 2 IPPs aimed at meeting La Plata River compact.	• Support implementation.	
G	6. Participate in Compact water bank efforts.	• Demand management. • Includes most entities in state interested in water development in CO River.	• Data needs. • Water rights, administration and policy. • Voluntary participation. • Funding.

3.2 WATER MANAGEMENT & WATER ADMINISTRATION

The Southwest Basin encompasses approximately 216,075 irrigated aces (in 2005). These acres are served by rivers, ditches, springs, wells and other bodies of water. Approximately 6,797 decreed points of diversion exist within the Southwest Basin. Another 1,850 decreed wells exist and require administration (CDSS 2014). The Southwest Basin has a variety of water uses that all require proper water management and water administration.

The Southwest Basin's major water export is the San Juan Chama Project. This project is a component of the Upper Colorado River Compact and allows an average annual diversion ranging from 85,000 to 100,000 AF to be provided to New Mexico. In addition there are a number of relatively small, high elevation TMDs from the Southwest Basin to the Rio Grande and Gunnison basins. However, within the Southwest Basin there are many trans-basin diversions from one sub-basin to another.



Winter sunset in the San Juan Mountains (Animas River basin)

In Colorado, the authority to establish water policies of the state, determine the beneficial uses of the water resources, and the administration of water rights pursuant to the Doctrine of Prior Appropriation fall under the jurisdiction of state government. It is recognized that there is a significant amount of land administered by the federal government in Colorado, which creates the potential for conflicts between state and federal laws and policies. Congress and Federal agencies have a long standing deference to state water allocation systems, and Colorado continues to promote state-federal cooperation to avoid contentious water rights issues. Federal policies and actions could affect existing and future water supplies and planning efforts in southwestern Colorado.

Therefore, the Roundtable supports Colorado's system of water rights administration and allocation and the full recognition of tribal rights under the Colorado Ute Indian Water Rights Settlement. The Roundtable also encourages and supports creative solutions sought through collaborative efforts, negotiated settlements, and strengthening the use of State-Federal MOUs, to limit conflicts between state, tribal and federal polices, laws and land management plans. Maintaining opportunities that allow for management solutions that provide for multiple beneficial uses and are protective of environmental and recreational values are critical for the planning and strategic development of the water resources in the State of Colorado.

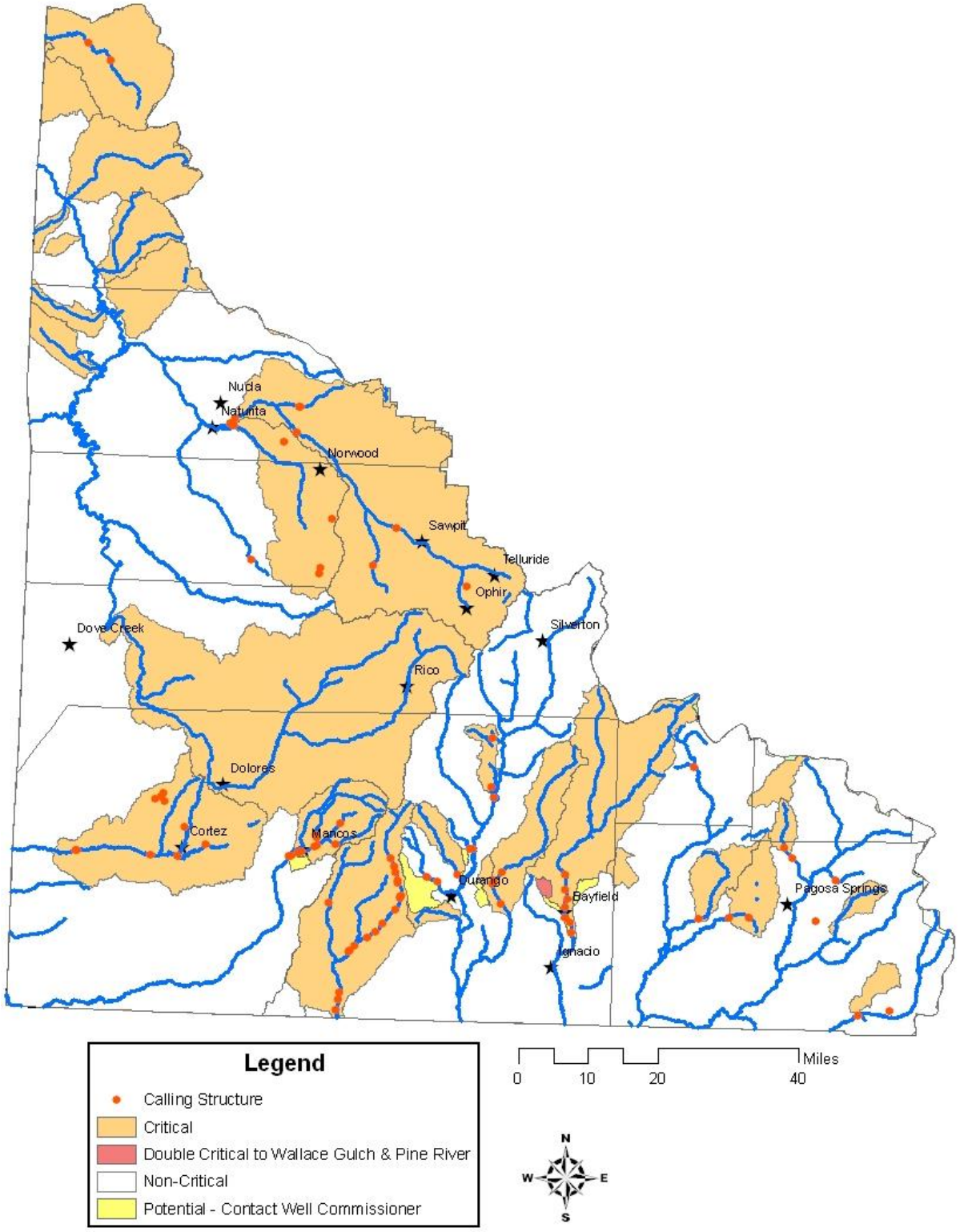
COLORADO DIVISION OF WATER RESOURCES ADMINISTRATION

Two Divisions of Water Resources (DWR) have jurisdiction within the Southwest Basin. The majority of sub-basins are within Division 7, while the San Miguel River and portions of the Dolores River are administered by Division 4.

Water critical areas exist throughout the Southwest Basin and its sub-basins (Figure 4). When an area is designated as critical (e.g. over-appropriated) the State Engineer cannot issue a well permit without water being made available for appropriation by means of an approved augmentation plan (Policy 2004-3: Use of evapotranspiration credit within substitute water supply plans involving the exposure of ground water in ponds or reservoirs not located within the stream bed).

DWR tracks calling structures along with the time period of administration, the water source, structure location, appropriation date, and water amount called. Figure 4 also shows the location of structures that placed calls between November 1, 2000 and October 31, 2013.

FIGURE 4. WATER CRITICAL BASINS AND STRUCTURES PLACING CALLS BETWEEN NOVEMBER 1, 2000 AND OCTOBER 31, 2013 (SOURCE: DIVISION OF WATER RESOURCES)



TRIBAL WATER RIGHTS

In a period from the 1970s through 2006, the Ute Mountain Ute Tribe and the Southern Ute Indian Tribe resolved federal Indian water rights litigation claims through negotiated settlement with the State of Colorado, the United States, water districts, and local water users. The negotiated settlement was viewed as an approach preferable to litigating large, senior priority federal reserved water rights that could potentially disrupt existing, non-Tribal water users upstream of the reservations.

The Settlement established quantities of water rights, priorities of tribal rights, permitting requirements, conditions for changing water rights, conditions for leasing, and other terms including cooperative and coordinated administration of water rights arising under State and federal law. Also as part of the negotiated settlement, each Ute Tribe took new water allocations in federal water storage projects (the Dolores Project and the Animas-La Plata Project) and confirmed their allocations in existing facilities such as Vallecito and Lemon Reservoirs. These facilities and the municipal and agricultural uses developed from them are important parts of southwest Colorado's water management scenario.

The tribal water rights established in the settlement have the potential to play an important role in not only addressing water management issues for the Tribes themselves, but also serving the greater interests of the community of southwest Colorado. Furthermore, the special nature of Tribal water rights may provide opportunities in the future that other water rights do not allow.

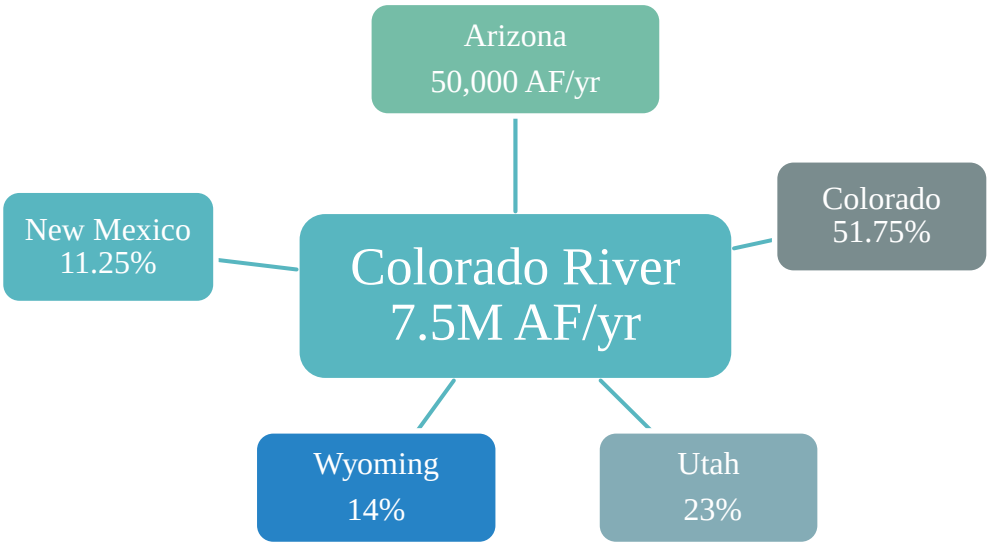
COMPACT COMPLIANCE

The Colorado River Compact of 1922 allocates 7.5M AF of CU annually to: Upper Basin states (parts of AZ, CO, NM, UT, WY above Lee Ferry, AZ) and Lower Basin states (parts of AZ, CA, NV below Lee Ferry, AZ). The compact requires the Upper Basin states to provide on average 7.5M AF during any period of ten consecutive years. The major purposes of this compact are:

- *"Provide for the equitable division and apportionment of the use of the waters of the Colorado River System;*
- *To establish the relative importance of different beneficial uses of water, to promote interstate comity;*
- *To remove cause of present and future controversies;*
- *And to secure the expeditious agricultural and industrial development of the Colorado River Basin, the storage of its waters, and the protection of life and property from floods."*

The Colorado River Basin is thus divided into two basins, with an apportionment of use of portions of the Colorado River System waters is allocated to each of them with provision that future equitable apportionments may be made.

The Upper Colorado River Compact of 1984 allocates 7.5M AF apportionment of consumptive use available to the Upper Basin states as follows:



The La Plata River Compact was signed in 1922 and approved by Congress in 1925. It requires dividing the waters of the La Plata River between Colorado and New Mexico. The river is administered daily except from December 1 through February 15. The Colorado DWR maintains two stream gages, one near Hesperus, CO and one at the Stateline, for administration purposes. The flow of the river between February 15 and December 1 of each year is apportioned between the two states as follows:

- *"Each state shall have the unrestricted right to use all the waters within its boundaries on each day when the mean daily flow at the Interstate station is one hundred cubic feet per second, or more;*
- *On all other days the State of Colorado shall deliver at the Interstate station a quantity of water equivalent to one-half of the mean flow at the Hesperus station for the preceding day, but not to exceed one hundred cubic feet per second;"*

The Animas-La Plata Compact implements the operation of the Animas-La Plata Federal Reclamation Project. This project is a part of the Colorado River Storage Project Act. The Compact allows:

- *"the right to store and divert water in Colorado and New Mexico from the La Plata an Animas River systems, including return flow to the La Plata River from Animas River diversions, for uses in New Mexico under the Animas-La Plata Federal Reclamation Project shall be valid and of equal priority with those rights granted by decree of the Colorado state courts for uses of water in Colorado for that project providing such uses in New Mexico are within the allocation of water made to state by articles III and XIV of the Upper Colorado River Basin Compact." (37-64-101. Animas-La Plata Project Compact)."*

BIOLOGICAL OPINIONS

Razorback sucker (USFWS)

Under Section 7 of the Endangered Species Act (ESA) of 1973, federal agencies must consult with the US Fish and Wildlife Service (USFWS) to avoid jeopardizing listed species or harming critical habitat. When possible, the USFWS does a programmatic consultation that addresses multiple projects. These consultations require that applicants take specific steps to protect endangered species, while also allowing multiple projects to go forward. Two such Biological Opinions touch upon water management in the Southwest Basin: Final Biological Opinion for Navajo Reservoir Operations (USFWS 2005) and the Gunnison River Basin PBO (USFWS 2009).

The actions of two recovery programs provide compliance with the ESA for water development and water management activities. The Upper Colorado River Endangered Fish Recovery Program (Upper Program) and the San Juan River Basin Recovery Implementation Program (SJRIP) are charged with using adaptive management and measures to recover four species of endangered Colorado River fishes while allowing water development activities to continue to meet the needs of the people. Program partners include: State and federal agencies, water and environmental organizations, power customers, and American Indian tribes.

The Dolores River is a tributary to the Colorado River and thus a part of the Gunnison River Basin PBO (USFWS 2009). Releases from the Aspinall Unit reservoirs provide reasonable and prudent alternatives for the Dolores Project as described in the Aspinal Unit operations EIS of 2012.

Colorado pikeminnow (USFWS)

The two recovery programs combined have provided ESA compliance for 2,354 federal, tribal, and non-federal water projects. The Upper Program has provided 1,176 projects ESA compliance for Colorado since 1988 through 2012. These projects total annual depletions are about 2,122,140 AF. The SJRIP has conducted 293 consultations since 1992 through 2012 within Colorado. These projects total annual depletions are about 217,797 AF. ESA consultation is required within the San Juan basin if a proposed project's estimated annual depletions are greater than 100 AF.

3.3 SENSITIVE SPECIES

COLORADO RIVER CUTTHROAT TROUT CONSERVATION STRATEGY

CHECK IT OUT!

http://ndismaps.nrel.colostate.edu/stockingrestrictions/

Maps located at the above website show numerous populations of CRCT that are being managed in accordance with CRCT Conservation Strategy

Colorado River Cutthroat Trout (CRCT) is a state-listed Species of Special Concern in Colorado, Wyoming, and Utah, and also is characterized as a Sensitive Species by federal land management agencies (BLM and USFWS). Colorado Parks and Wildlife (CPW) works closely with UT, WY, and federal land managers to manage for the recovery and persistence of CRCT throughout their historic range, guided by "Conservation strategy for Colorado River cutthroat trout in the states of Colorado, Utah, and Wyoming (CRCT Coordination Team, 2006)".

Implementation of the CRCT Conservation Strategy and showing progress on measurable benchmarks has allowed the USFWS to maintain its opinion that CRCT is 'not warranted' for listing under the ESA. Such a finding has been beneficial to state wildlife management agencies, but is also of critical importance to water managers so that consultation with the USFWS under Section 7 of the ESA is not required for projects in CRCT occupied waters.

Colorado River Cutthroat Trout

THREE SPECIES AGREEMENT

Three native fish species, roundtail chub, bluehead sucker, and flannelmouth sucker, occupy some lower portions of most of the sub-basins represented within the Southwest Basin. Concerns about declines in the three species within the entire Upper Colorado River Basin (including the San Juan River drainage) prompted resource agencies to draft and adopt a multi-state, multi-agency, range-wide conservation, and strategy agreement. Known as "The Three Species Agreement", the agreement provides the framework for conservation actions designed to preserve these species across their historic Colorado and five other Colorado River Basin states. Signatories to the agreement include the Colorado River Basin states, the United States Forest Service (USFS), BLM, BOR, and sovereign tribes.

The range-wide declines described in the Three Species Agreement speak to the species' potential for listing by the USFWS. The Three Species Agreement articulates that within their jurisdictional authority, signatories are responsible for taking action to conserve native fish. The agreement is predicated on the concept that collectively, local, state, federal agencies, and other willing partners can work together with the communities most affected by a potential listing to develop and implement voluntary actions that pre-empt the need for federal listing of any of these species under the ESA.

Roundtail chub (USFWS)

Within the Southwest Basin, these species are present in many low-elevation tributaries to the San Juan River. The Ute Mountain Ute and Southern Ute tribes have been active participants in habitat and flow restoration projects on behalf of these native fish, and a fairly intensive effort was launched in 2010 to preserve these species below McPhee Dam in the Dolores River drainage.

CPW is currently developing a state-specific strategy that describes how Colorado is implementing management actions that will help conserve these species. Monitoring of populations remains critical to determine the status of the fishery and the persistence of threats to these populations.

While these fish tend to be located lower in watersheds that have already undergone upstream water development, it is imperative that fishery managers work cooperatively with water managers to continue to implement the voluntary actions articulated in the Three Species Agreement. In the Southwest Basin, flow protection provided by downstream compact deliveries, ISF appropriations, or voluntary flow agreements may be an important means of maintaining the native fishery.

3.4 HISTORICAL STREAMFLOW

The historical streamflow in the sub-basins of the Southwest Basin has laid the foundation for the values and levels of water use that exist in the Southwest Basin today. The CWCB Historical Streamflow Analysis Tool was used to provide a summary of historical streamflow at key gages (selected by CWCB) within the Southwest Basin for the study period of 1950 through 2012. Hydrologic classifications of "drought", "dry", "average", "wet", and "flood" were given for water years based on the criteria shown in Table 10. Figure 5 shows the Key Stream Flow Gages in Southwest Basin. This tool allows for a snapshot of the last 50 years hydrology.

TABLE 10. HYDROLOGIC CLASSIFICATION CRITERIA

PERCENTILE RANGE	HYDROLOGIC CLASSIFICATION
0.00 – 0.05	Drought
0.06 – 0.24	Dry
0.25 – 0.75	Average
0.76 – 0.94	Wet
0.95 – 1.00	Flood

AVERAGE MONTHLY HYDROLOGIC CLASSIFICATION

The average monthly flows by hydrologic classification are graphed for each stream gage. While this does not tell the whole story, it does show the variability between drought and wet years and the different volumes between average and wet years. The following series of graphs for each stream gage were generated by the Historical Streamflow Analysis Tool.

FIGURE 5. KEY STREAM FLOW GAGES IN SOUTHWEST BASIN

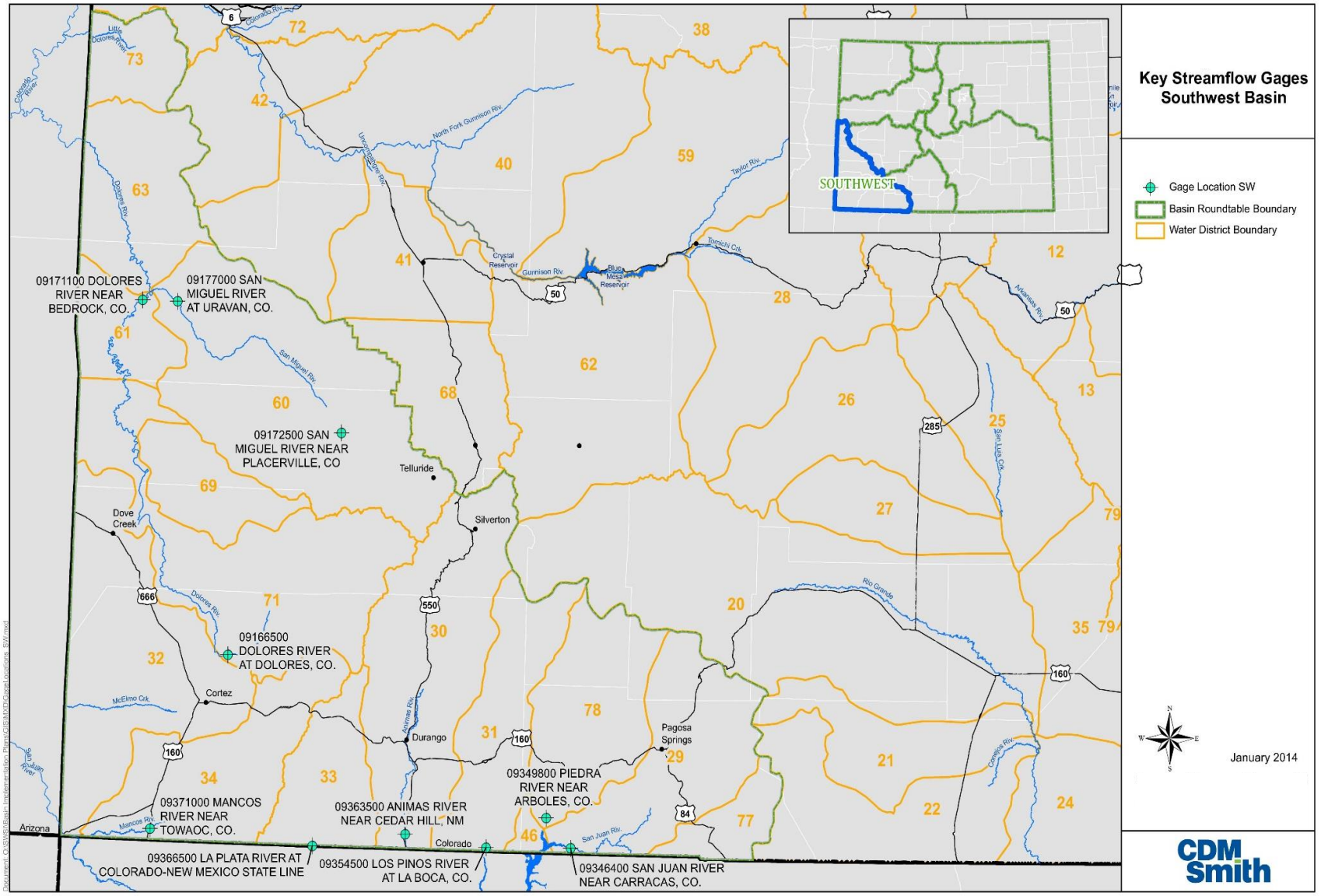
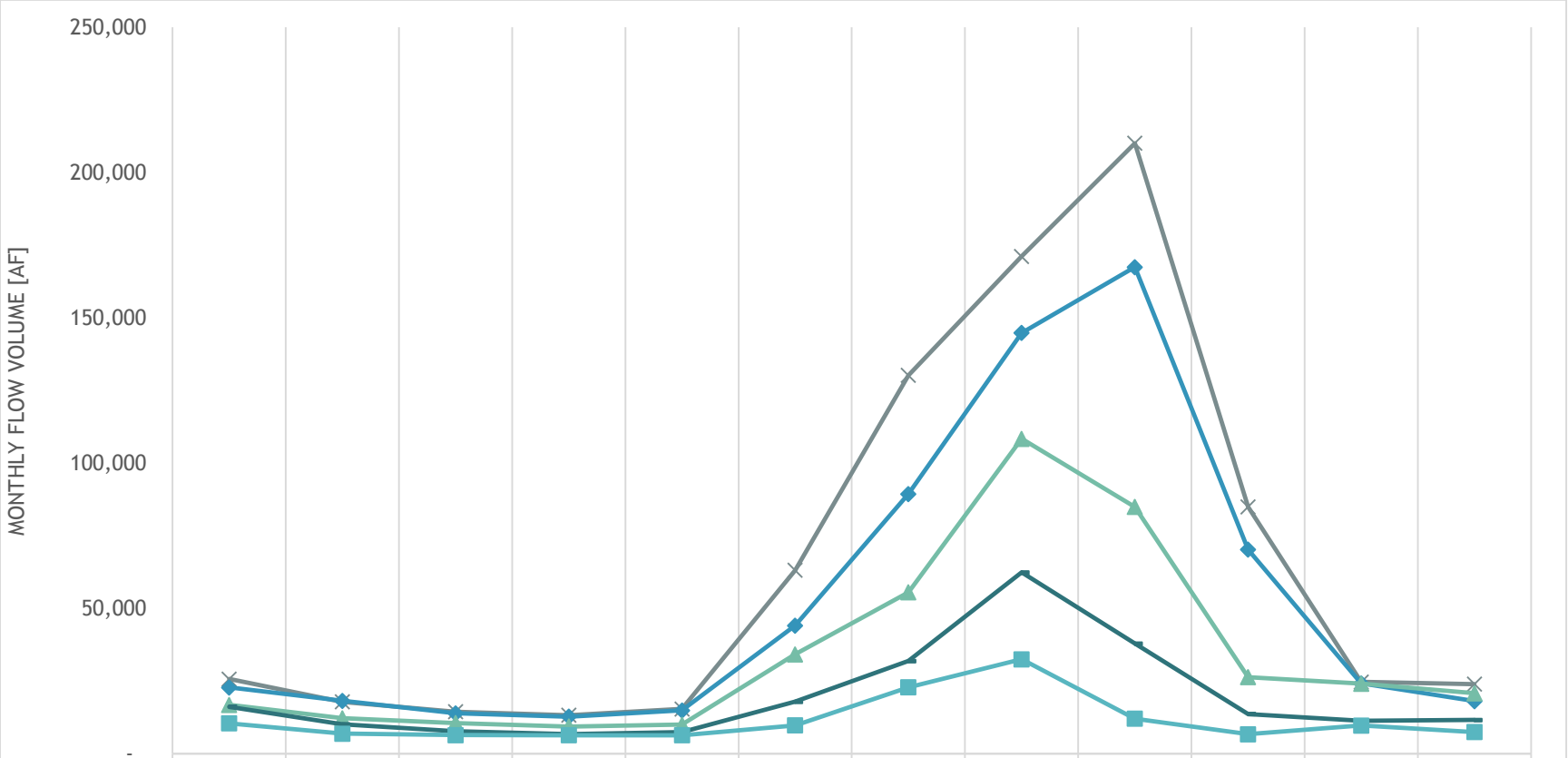


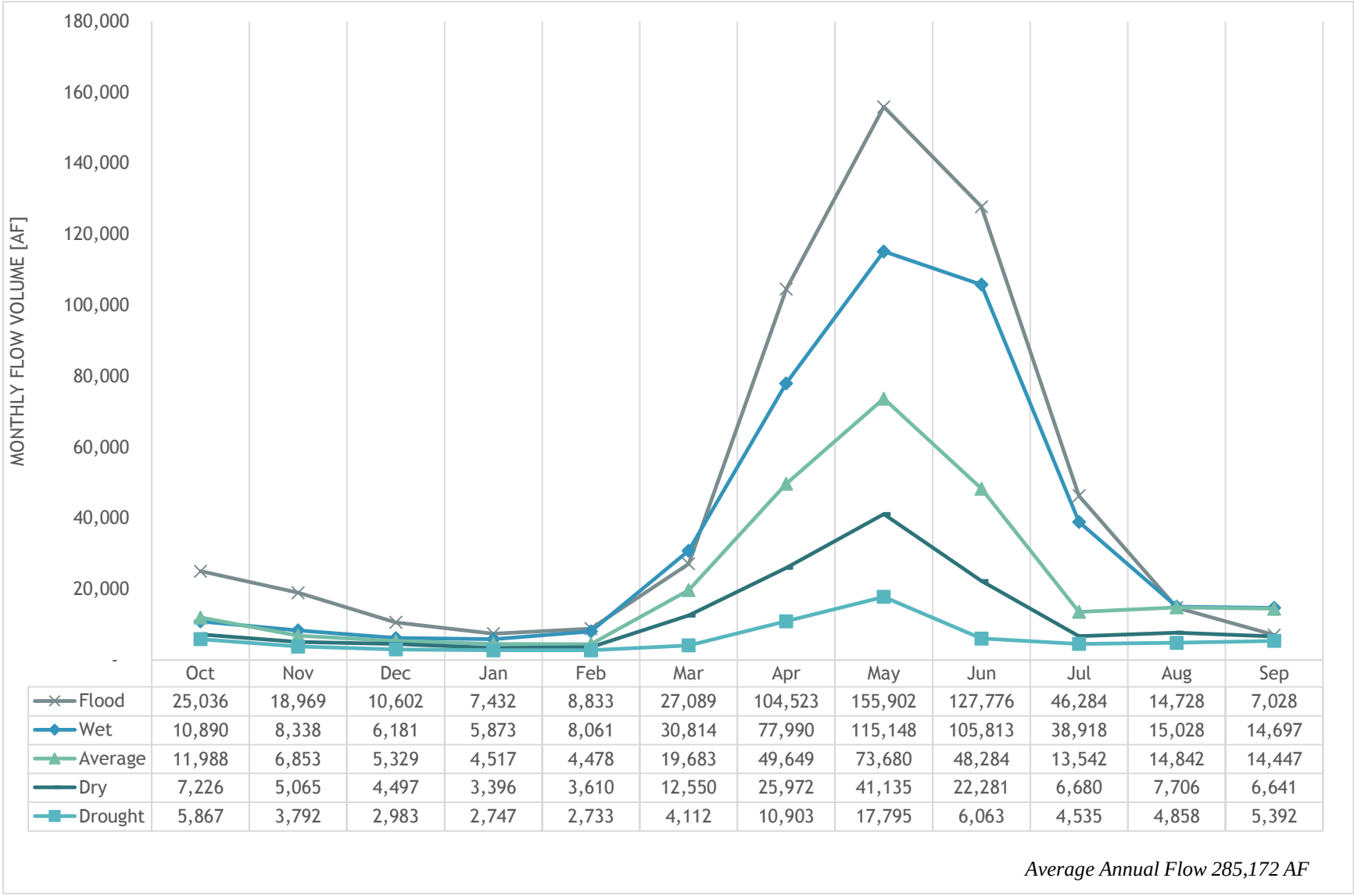
FIGURE 6. SAN JUAN RIVER AT NAVAJO – AVERAGE MONTHLY FLOWS BY HYDROLOGIC YEAR CLASSIFICTAITON (WY 1963-2012)



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Flood	25,733	17,902	14,519	13,301	15,470	63,186	130,272	171,196	210,132	84,992	24,775	24,015
Wet	22,850	18,252	13,974	12,832	14,963	44,152	89,403	144,857	167,483	70,281	24,258	18,165
Average	16,882	12,245	10,595	9,409	10,084	34,237	55,568	108,402	85,000	26,383	24,149	20,857
Dry	16,236	10,172	7,830	6,743	7,496	17,957	31,956	62,441	37,944	13,734	11,365	11,654
Drought	10,523	6,963	6,454	6,440	6,407	9,836	22,910	32,541	12,100	6,748	9,740	7,538

Average Annual Flow 433,617 AF

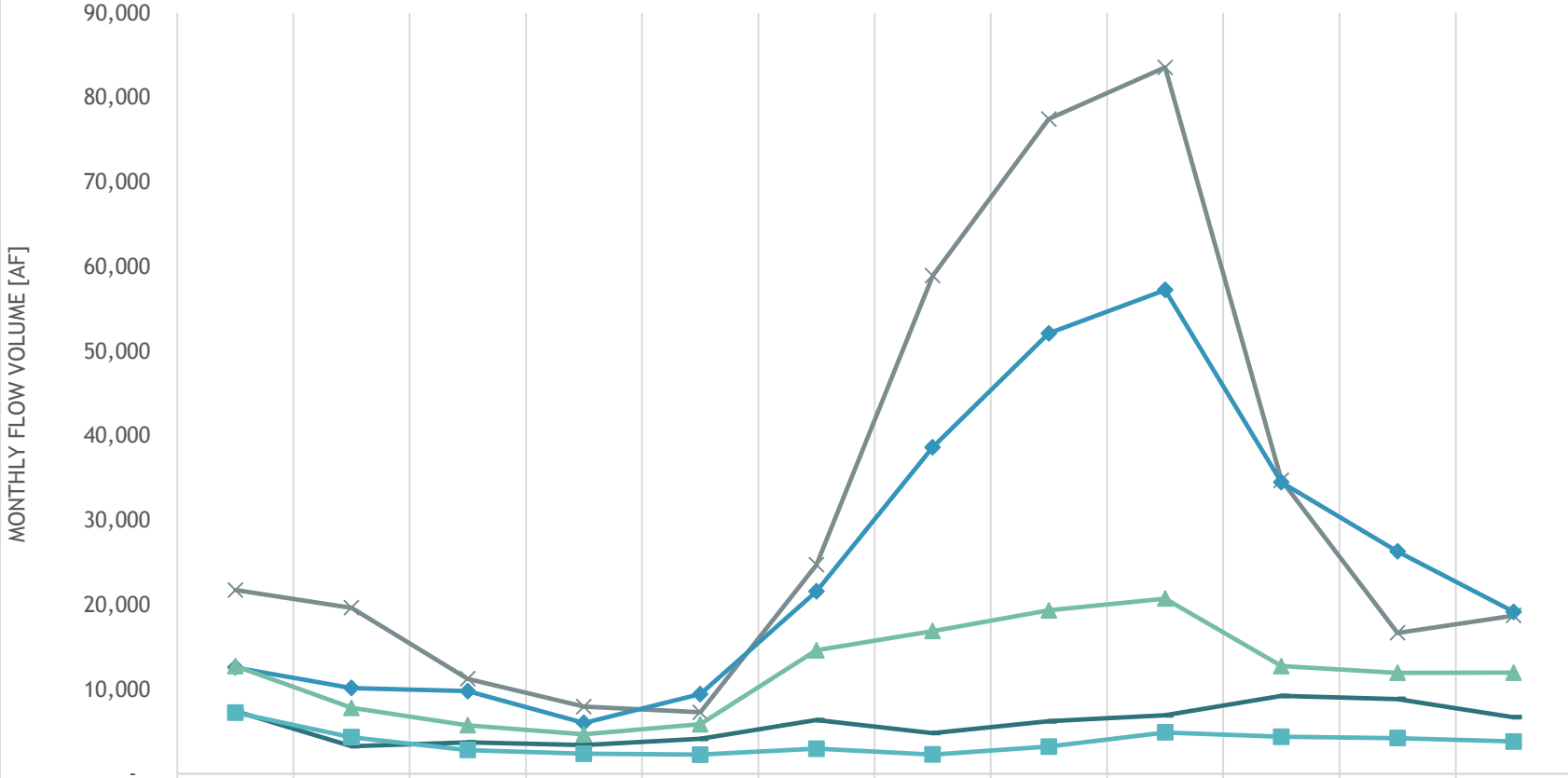
FIGURE 7. PIEDRA RIVER AT ARBOLES – AVERAGE MONTHLY FLOWS BY HYDROLOGIC YEAR CLASSIFICATION (WY 1963 TO 2012)



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Flood	25,036	18,969	10,602	7,432	8,833	27,089	104,523	155,902	127,776	46,284	14,728	7,028
Wet	10,890	8,338	6,181	5,873	8,061	30,814	77,990	115,148	105,813	38,918	15,028	14,697
Average	11,988	6,853	5,329	4,517	4,478	19,683	49,649	73,680	48,284	13,542	14,842	14,447
Dry	7,226	5,065	4,497	3,396	3,610	12,550	25,972	41,135	22,281	6,680	7,706	6,641
Drought	5,867	3,792	2,983	2,747	2,733	4,112	10,903	17,795	6,063	4,535	4,858	5,392

Average Annual Flow 285,172 AF

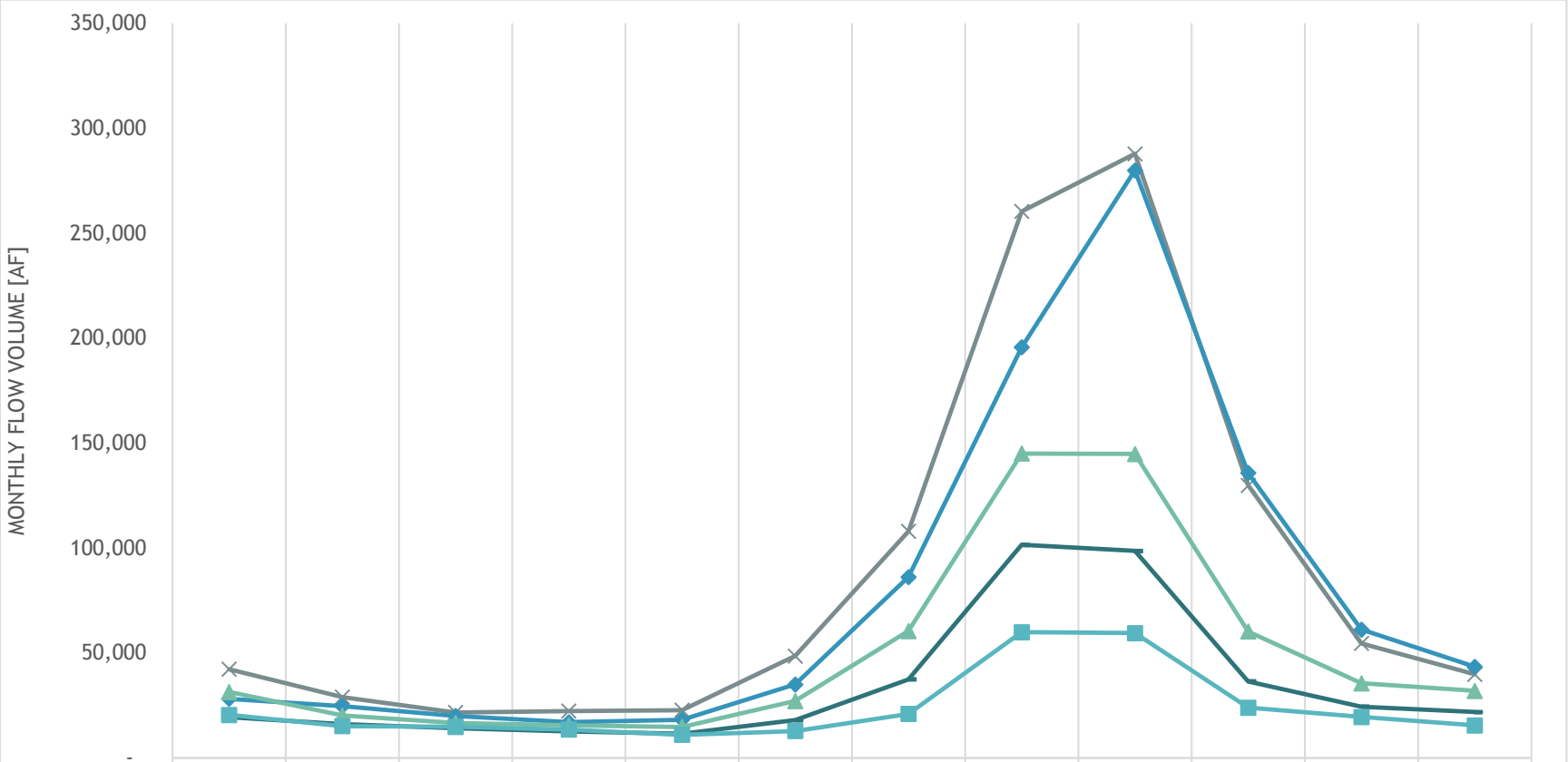
FIGURE 8. PINE RIVER AT BOCA - AVERAGE MONTHLY FLOWS BY HYDROLOGIC YEAR CLASSIFICATION (WY 1952 TO 2012)



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Flood	21,752	19,640	11,248	7,959	7,280	24,722	58,940	77,467	83,575	34,731	16,678	18,740
Wet	12,586	10,154	9,792	6,044	9,445	21,588	38,638	52,111	57,240	34,491	26,308	19,173
Average	12,752	7,817	5,758	4,681	5,876	14,629	16,890	19,340	20,744	12,746	11,965	11,975
Dry	7,438	3,293	3,721	3,402	4,152	6,368	4,841	6,222	6,937	9,223	8,863	6,700
Drought	7,256	4,337	2,827	2,386	2,286	2,993	2,295	3,230	4,912	4,400	4,234	3,839

Average Annual Flow 168,316 AF

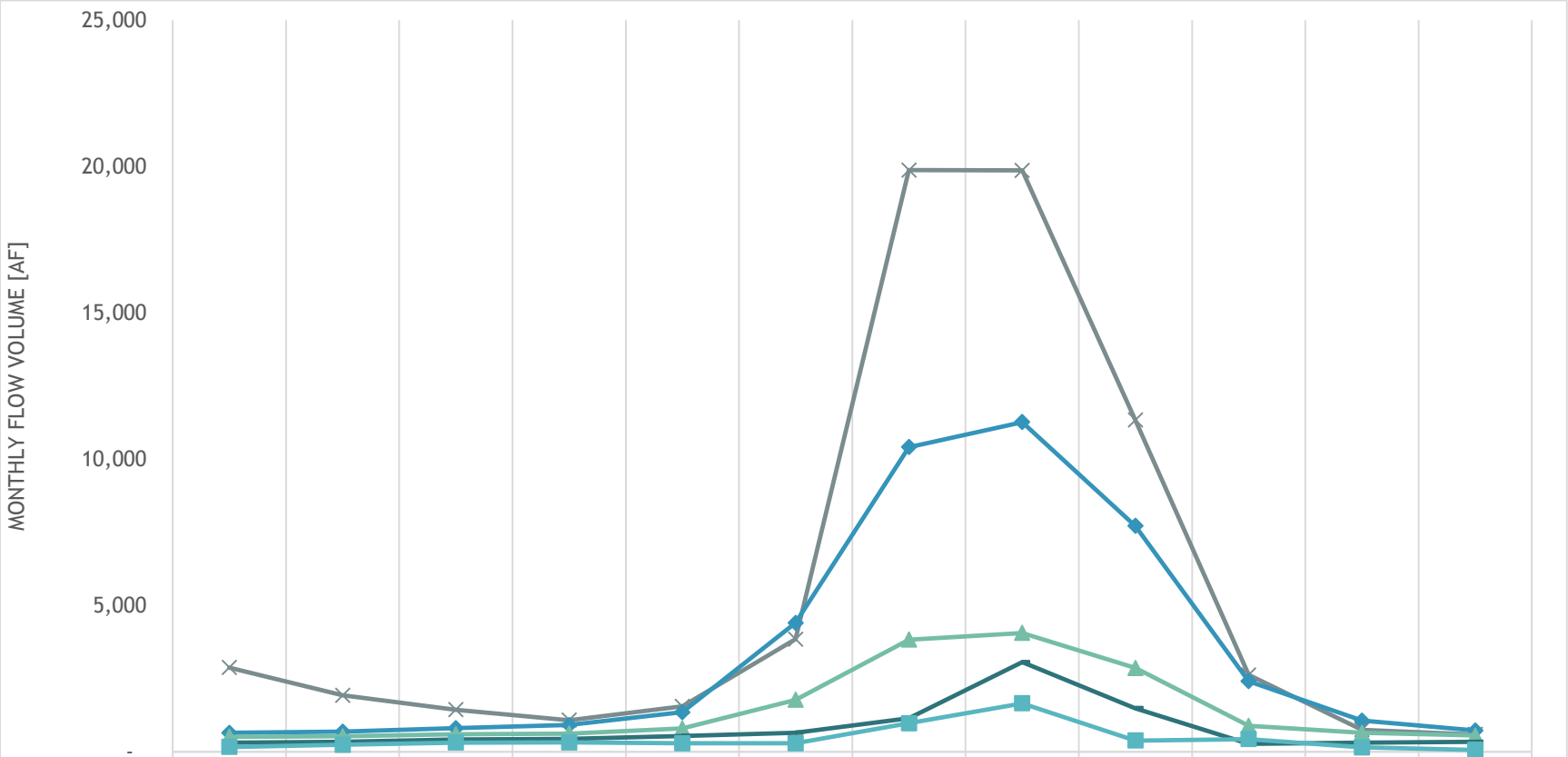
FIGURE 9. ANIMAS RIVER AT THE STATE LINE - AVERAGE MONTHLY FLOWS BY HYDROLOGIC YEAR CLASSIFICATION (WY 1950 TO 2012)



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Flood	42,264	28,973	21,601	22,323	22,726	48,540	107,890	260,344	287,766	129,853	54,519	39,848
Wet	28,125	24,668	20,002	17,033	18,208	34,954	86,135	195,587	279,900	135,705	61,122	43,443
Average	31,372	20,206	16,671	15,511	14,728	27,098	60,388	144,984	144,748	60,213	35,538	31,928
Dry	19,451	16,028	14,099	12,676	11,486	17,997	37,387	101,520	98,604	36,415	24,407	21,839
Drought	20,442	15,165	14,794	13,502	10,995	12,781	20,931	59,859	59,456	23,900	19,496	15,489

Average Annual Flow 641,273 AF

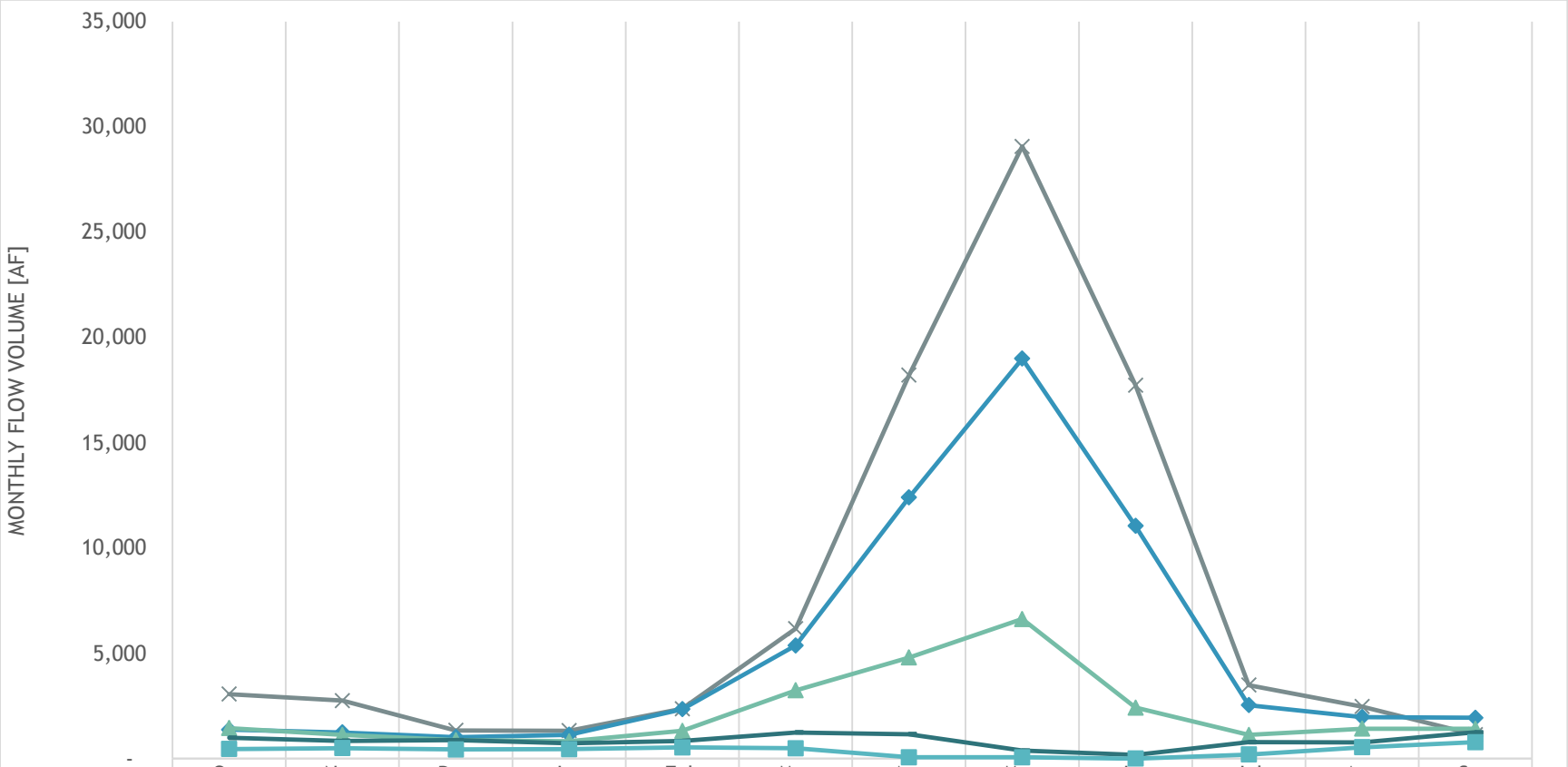
FIGURE 10. LA PLATA RIVER AT THE STATE LINE - AVERAGE MONTHLY FLOWS BY HYDROLOGIC YEAR CLASSIFICATION (WY 1950 TO 2012)



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Flood	2,878	1,925	1,434	1,077	1,548	3,843	19,875	19,866	11,332	2,623	750	589
Wet	643	683	802	912	1,349	4,400	10,411	11,263	7,717	2,410	1,061	724
Average	508	527	597	620	791	1,773	3,827	4,056	2,862	882	643	553
Dry	307	335	422	435	538	651	1,139	3,060	1,484	267	305	335
Drought	164	238	311	317	289	287	975	1,654	379	432	150	64

Average Annual Flow 23,153 AF

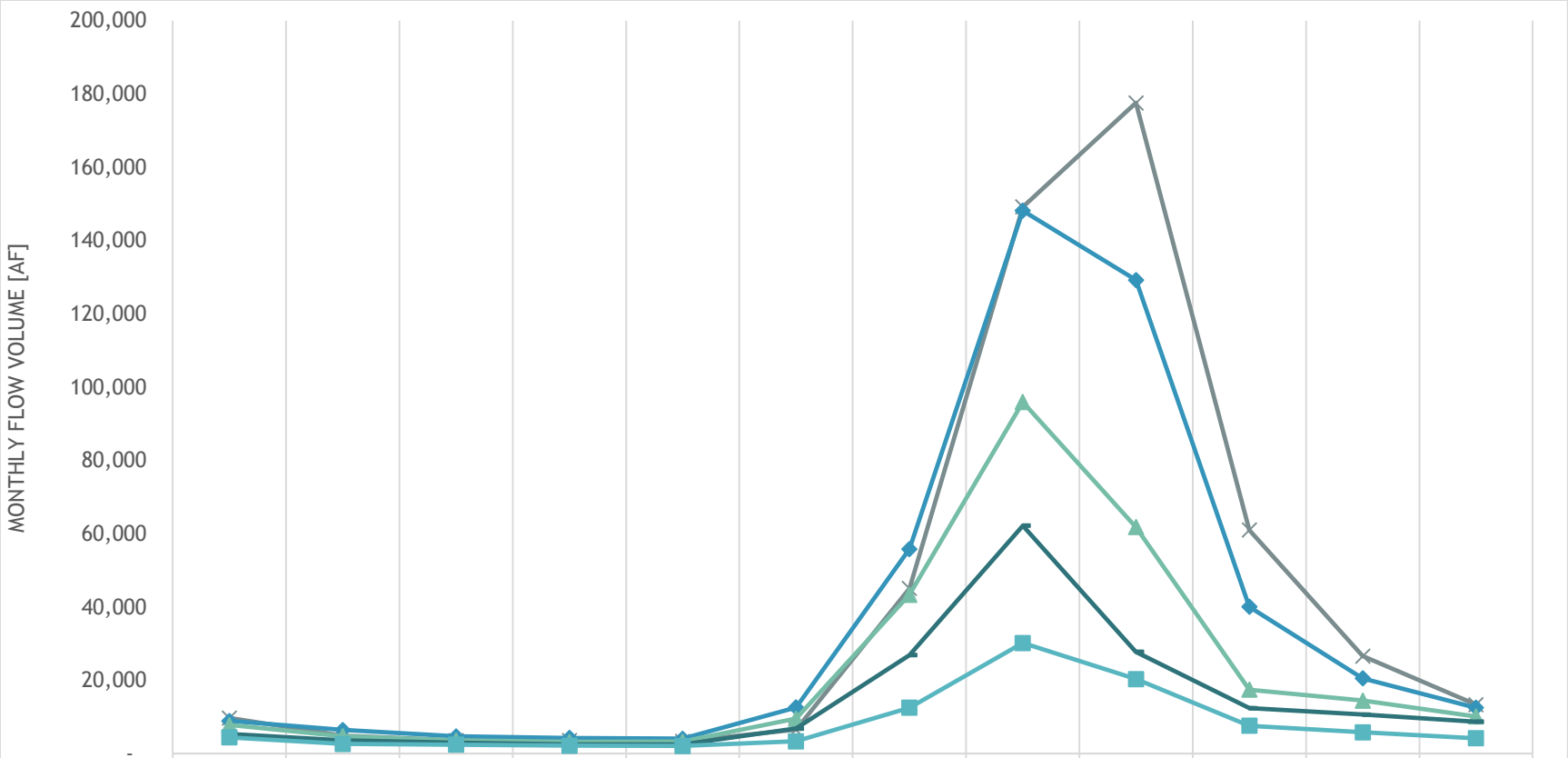
FIGURE 11. MANCOS RIVER AT TOWAOC - AVERAGE MONTHLY FLOWS BY HYDROLOGIC YEAR CLASSIFICATION (WY 1952 TO 2011)



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Flood	3,065	2,757	1,342	1,322	2,369	6,176	18,210	29,072	17,733	3,494	2,469	1,135
Wet	1,377	1,244	1,020	1,134	2,344	5,375	12,400	18,997	11,049	2,539	1,977	1,942
Average	1,451	1,123	878	819	1,322	3,240	4,805	6,629	2,423	1,127	1,424	1,413
Dry	989	842	875	733	835	1,245	1,157	384	178	781	775	1,248
Drought	459	495	439	447	532	493	62	66	-	195	538	779

Average Annual Flow 32,688 AF

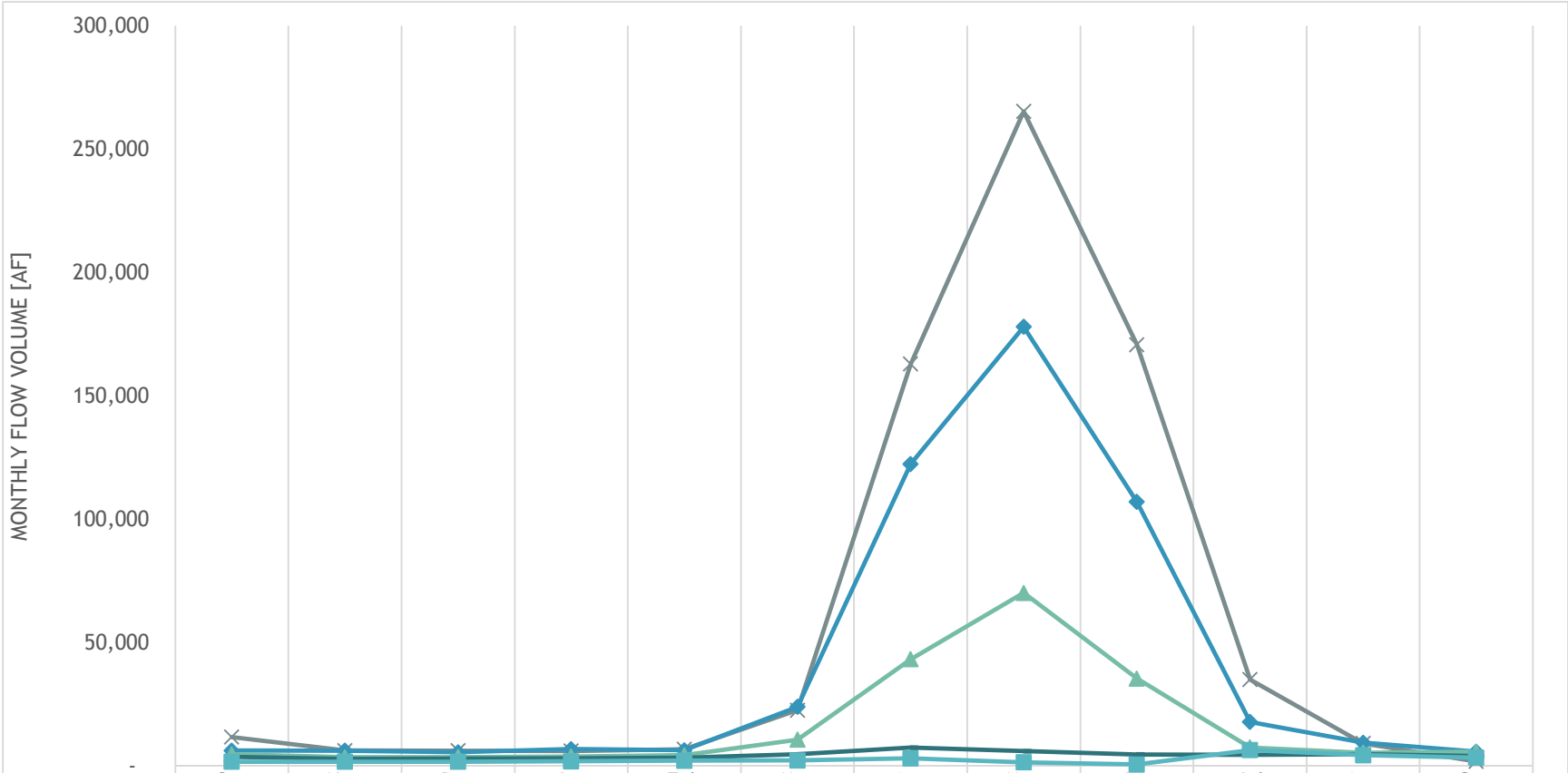
FIGURE 12. DOLORES RIVER NEAR DOLORES - AVERAGE MONTHLY FLOWS BY HYDROLOGIC YEAR CLASSIFICATION (WY 1950 TO 2012)



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Flood	9,679	4,872	3,550	3,564	3,308	6,497	45,047	149,167	177,543	60,996	26,586	13,317
Wet	8,898	6,409	4,672	4,223	4,026	12,591	55,816	148,135	129,226	40,054	20,519	12,514
Average	7,777	4,726	3,559	3,187	3,235	9,518	43,317	95,929	61,800	17,435	14,458	10,111
Dry	5,334	3,563	2,989	2,484	2,471	6,826	26,848	62,168	27,724	12,385	10,650	8,694
Drought	4,419	2,630	2,416	2,134	2,048	3,317	12,515	30,166	20,335	7,568	5,804	4,156

Average Annual Flow 291,488 AF

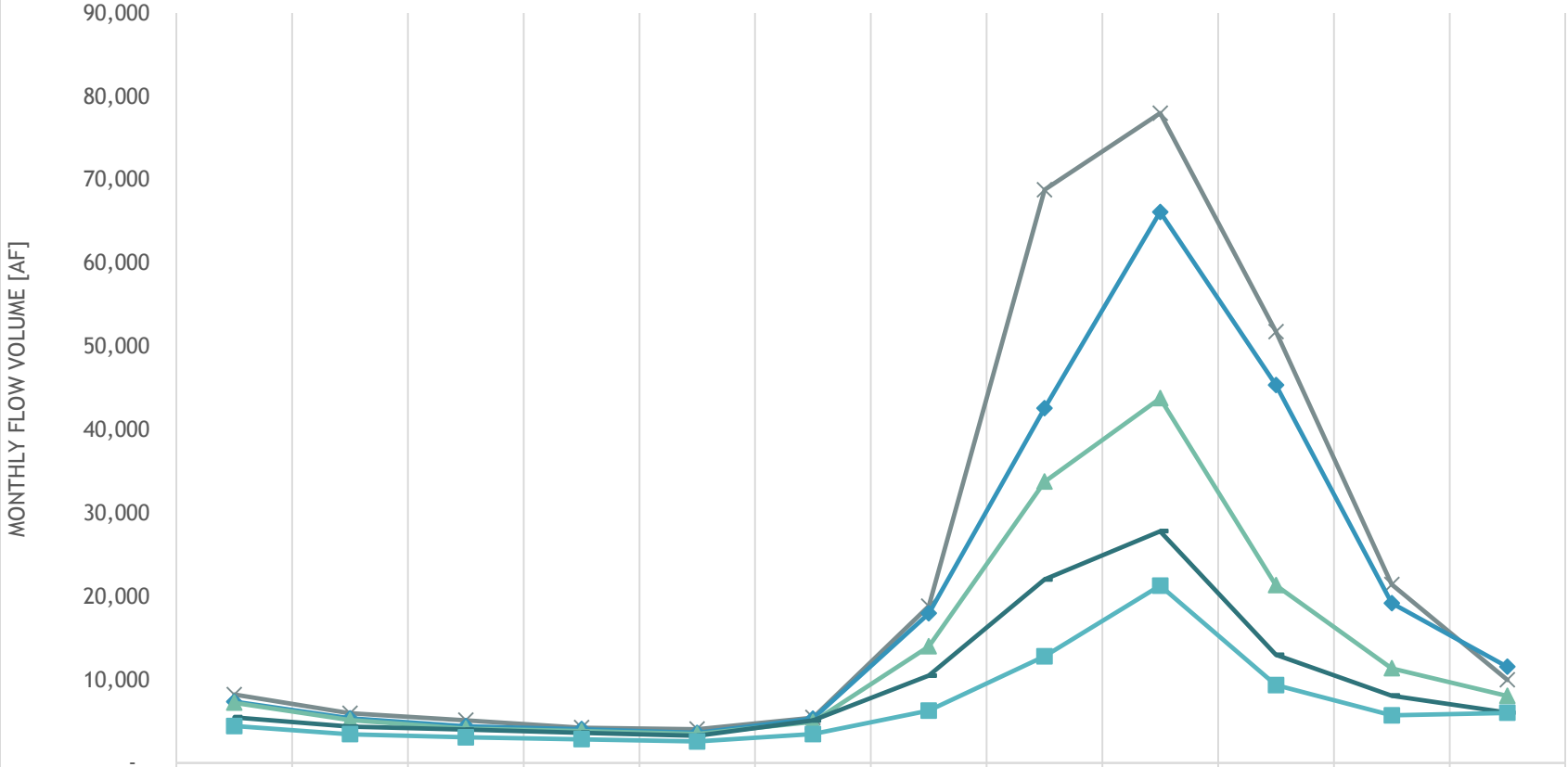
FIGURE 13. DOLORES RIVER NEAR BEDROCK - AVERAGE MONTHLY FLOWS BY HYDROLOGIC YEAR CLASSIFICATION (WY 1972 TO 2012)



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Flood	11,610	6,127	6,054	5,907	6,613	22,496	162,805	265,220	170,654	34,879	9,003	1,704
Wet	6,086	6,039	5,391	6,675	6,238	23,837	122,293	177,912	106,916	17,692	9,285	5,658
Average	4,590	3,411	3,462	3,684	4,259	10,550	43,144	70,010	35,311	7,360	5,216	5,623
Dry	3,498	2,742	2,832	2,982	3,146	4,572	7,260	5,895	4,502	4,330	4,647	3,904
Drought	1,599	1,585	1,556	1,736	1,970	2,110	2,938	1,356	452	6,303	4,200	3,257

Average Annual Flow 247,213 AF

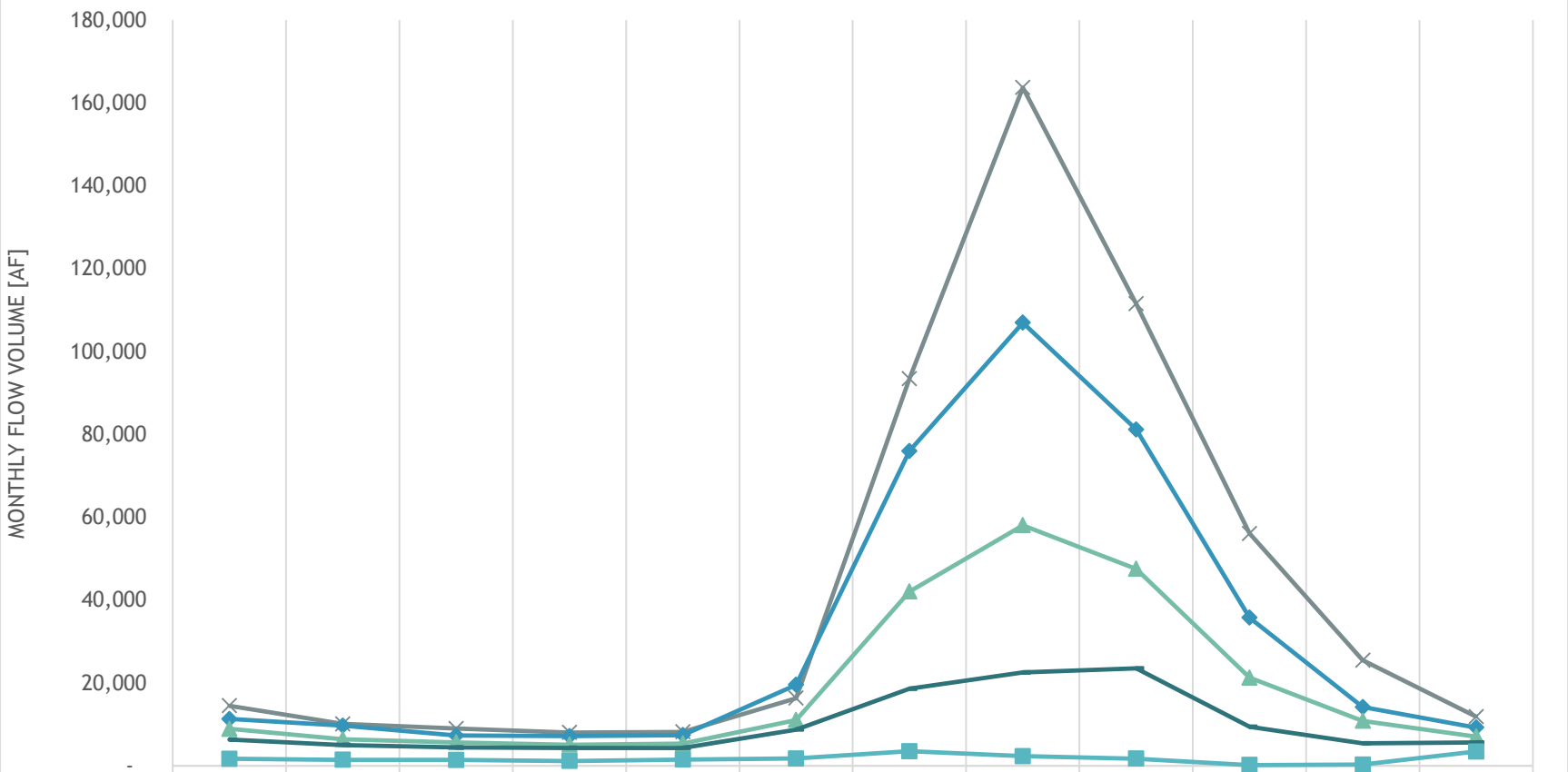
FIGURE 14. SAN MIGUEL RIVER NEAR PLACERVILLE - AVERAGE MONTHLY FLOWS BY HYDROLOGIC YEAR CLASSIFICATION (WY 1950 TO 2012)



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Flood	8,203	5,975	5,133	4,243	4,066	5,452	18,819	68,796	77,993	51,777	21,427	9,965
Wet	7,359	5,360	4,426	4,069	3,613	5,324	17,948	42,584	66,126	45,367	19,175	11,533
Average	7,230	5,146	4,134	3,821	3,479	4,935	14,001	33,769	43,780	21,336	11,358	8,051
Dry	5,486	4,359	4,001	3,625	3,270	5,118	10,485	22,034	27,824	12,992	8,090	6,037
Drought	4,443	3,452	3,081	2,844	2,582	3,482	6,280	12,810	21,278	9,342	5,710	6,017

Average Annual Flow 244,390 AF

FIGURE 15. SAN MIGUEL RIVER NEAR URAVAN - AVERAGE MONTHLY FLOWS BY HYDROLOGIC YEAR CLASSIFICATION (WY 1952 TO 2012)



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Flood	14,494	10,111	8,987	8,033	8,182	16,316	93,432	163,692	111,516	56,071	25,470	11,879
Wet	11,286	9,703	7,303	7,154	7,424	19,554	75,975	106,942	81,171	35,746	14,177	9,241
Average	8,919	6,426	5,646	5,108	5,390	11,069	42,065	58,072	47,541	21,260	10,829	7,069
Dry	6,325	5,015	4,410	4,314	4,333	8,735	18,581	22,543	23,514	9,394	5,397	5,608
Drought	1,682	1,432	1,410	1,175	1,507	1,745	3,517	2,316	1,730	188	281	3,439

Average Annual Flow 168,244 AF

3.5 PREDICTED FUTURE HYDROLOGY

Phase I of the Colorado Water Availability Study (CRWAS) considered five climate change scenarios, all treated as if they were equally probable. Preliminary findings of the CRWAS show that compared to current conditions, projected future climate conditions may lead to a number of changes in the Colorado River basin within western Colorado (the "Study Area"). According to the Colorado Drought Mitigation and Response Plan, Annex C. Climate Change Implications (CWCB 2013), some of the projected conditions directly pertinent to the Southwest Basin include changes in temperature, precipitation, crop irrigation requirement, and hydrology as summarized below.

TEMPERATURE

- Each of the five climate projections shows an increase in average annual and monthly temperature within the Study Area, with average annual increases ranging from 1.8°F to 5.2°F.

PRECIPITATION

- Generally increases in the winter months and decreases in the summer months.
- Average winter increases are smaller in the southwestern portion of the Study Area.
- Increase in temperatures causes a shift from snow to rain in the early and late winter months.
- Study Area winter average changes by 102% to 116% of historical.
- Study Area April through October average changes by 82% to 105% of historical.

CROP IRRIGATION REQUIREMENT (BASED ON ACREAGE AND CROP TYPES IDENTIFIED IN A 1993 ACREAGE INVENTORY)

- Increases throughout the Study Area for all climate projections (average annual increase by 1.9 to 7.4 inches depending on projection).
- Increases are primarily due to higher temperature and lower irrigation-season precipitation, which increase the number of growing season days for perennial crops, and crop demand for irrigation water.
- Peak CIR continues to occur in the same month as it has historically.
- Study Area average annual growing season increases by 8 to 32 days.

CLIMATE-ADJUSTED HYDROLOGY

- At over 80% of the sites, the majority of climate cases suggest a decrease in annual flow.
- Annual flow is more likely to increase in parts of the Yampa basin and at some higher elevations.
- Annual flow is more likely to decrease in southwestern watersheds and at lower elevations.

- At 75% of locations, all climate cases showed a shift toward earlier runoff, and at all locations, some climate cases showed a shift toward earlier runoff. Runoff shifts earlier by an average of 8 days.

MODELED STREAMFLOW

- Flows are generally higher than historical in May and June and lower in July through March.
- The historical annual low flow values generally fall within the range of projected low-flow values.

WATER AVAILABLE TO MEET FUTURE DEMANDS

- Upstream locations on main rivers and smaller tributaries generally have less flow available to meet future demands as a percent of modeled streamflow than gages farther downstream that include more tributary inflow.
- Most locations show less water availability for three of the five climate projections, although one projection shows more water available at the locations selected to display CRWAS results.
- Generally more water availability in April and May, corresponding to the shift in natural flow hydrographs.
- The historical annual minimum water availability values generally fall within the range of projected minimum water availability values for 2040 throughout the Study Area.

MODELED RESERVOIR STORAGE

- Earlier peak runoff, reduced flows during the peak irrigation season, and increased crop demands result in more use of water in reservoirs, resulting in more reservoir fluctuation.
- Reservoirs are generally drawn down to lower levels, and generally fill to historical levels.

MODELED CONSUMPTIVE USE

- Average annual consumptive use in the San Juan basin is less for every climate projection.
- Projected consumptive use in the San Juan generally increases in spring months only.

- Total consumptive use for the Study Area is greater than for historical climate conditions for most climate projections.
- Although modeled consumptive use generally increases, not all crop demands are met in any basin. Similar to historical conditions, there continue to be water shortages on tributaries and in the late irrigation season for the projected conditions.

In order to allow a better understanding of how projected, climate-impacted stream flows differ from historic and prehistoric conditions, the 2013 update to the Colorado Drought Mitigation

and Response Plan (CWCB) developed graphs to compare the prehistoric, historical, and projected flows. These graphs provide the long-term context within which to consider the 56-year period experienced from 1950 through 2005. They also suggest the need for adaptations to meet future needs.

The projections of future streamflow were obtained for a number of locations in the Colorado, South Platte and Arkansas rivers' basins. Reconstructions of prehistoric flows have been made for a large number of stream gauges in Colorado (NOAA, 2013). Sixteen locations were selected where both climate change projections and prehistoric reconstructions exist, including the Dolores and Animas rivers in the Southwest Basin.

Figure 16 shows the comparison for the Animas River at Durango and Figure 17shows the comparison for the Dolores River. The 56 year running average of the prehistoric reconstruction (paleo data) is the solid blue line. The end of the solid blue line represents average conditions over the most recent 56 years. The dashed lines show the averages for each climate-impacted flow scenario. Both graphs show that all projected scenarios fall outside of the highest and lowest 56-year average flows in the prehistoric reconstruction, and seven of the eight projected scenarios are below the historical average flow, indicating that the projections of future flows are drier.

The Colorado Drought Mitigation and Response Plan points out that "because there is greater scientific confidence in the quantification of prehistoric flows than in the quantification of projected flows, there is a better scientific basis to support adaptation measures based on the variability of prehistoric flows. On both the Animas and the Dolores rivers, all of the projections fall outside the range of the prehistoric flows, and suggesting that decisions regarding adaptation should primarily consider the projections of future flow in order to develop management strategies that will meet future needs.

The Plan also notes that "it is important to keep in mind that these comparisons use 56 year average flows. Annual droughts, and multi-year spells will be superimposed on the average flows, so the curves and projections do not represent the most severe conditions that may face a system."

FIGURE 16. COMPARISON OF HISTORIC AND PREHISTORIC FLOW RECONSTRUCTION TO AVERAGE FUTURE FLOW PROJECTIONS FOR THE ANIMAS RIVER AT DURANGO, FROM THE COLORADO DROUGHT MITIGATION AND RESPONSE PLAN (CWCB 2013)

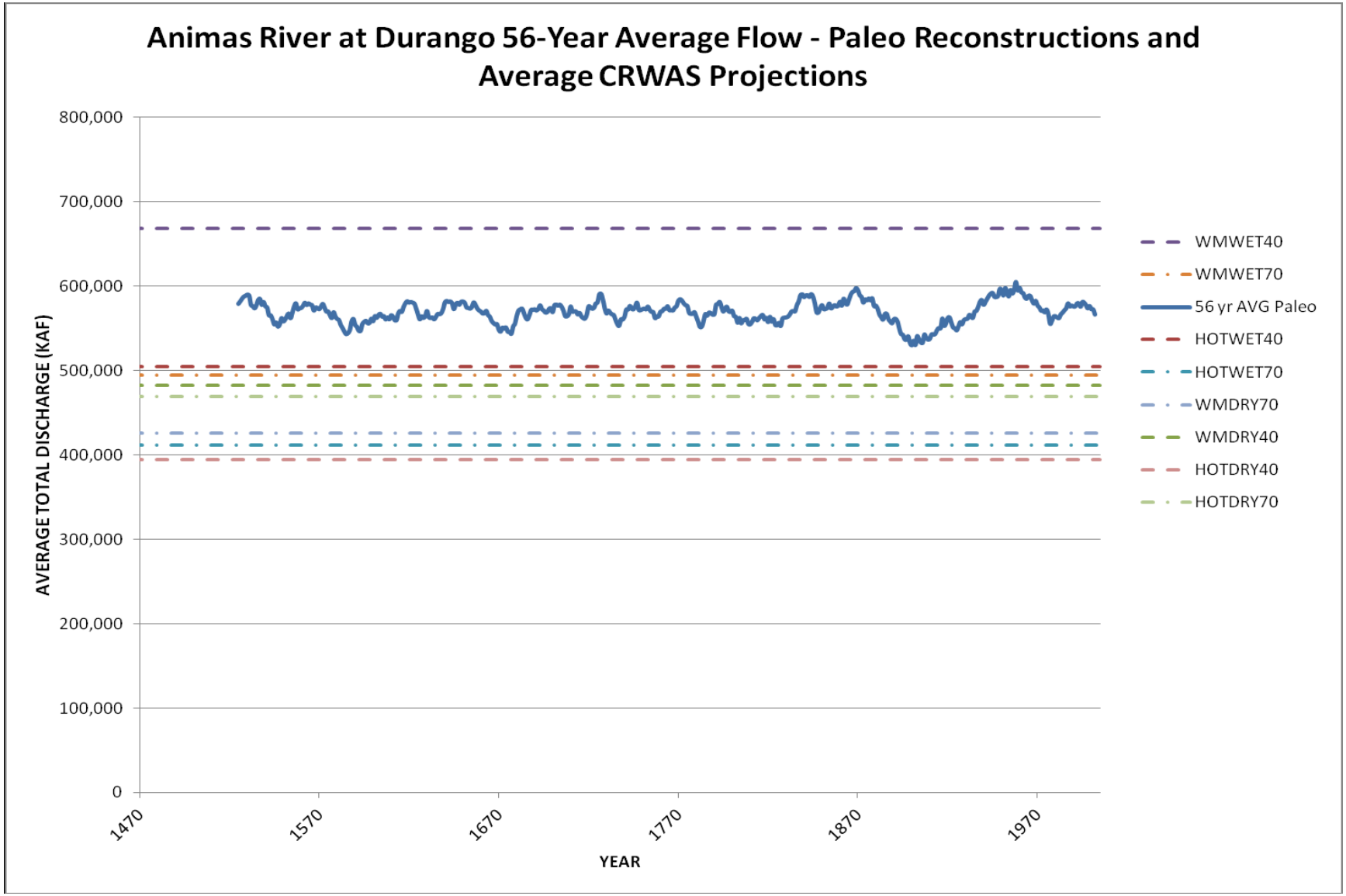
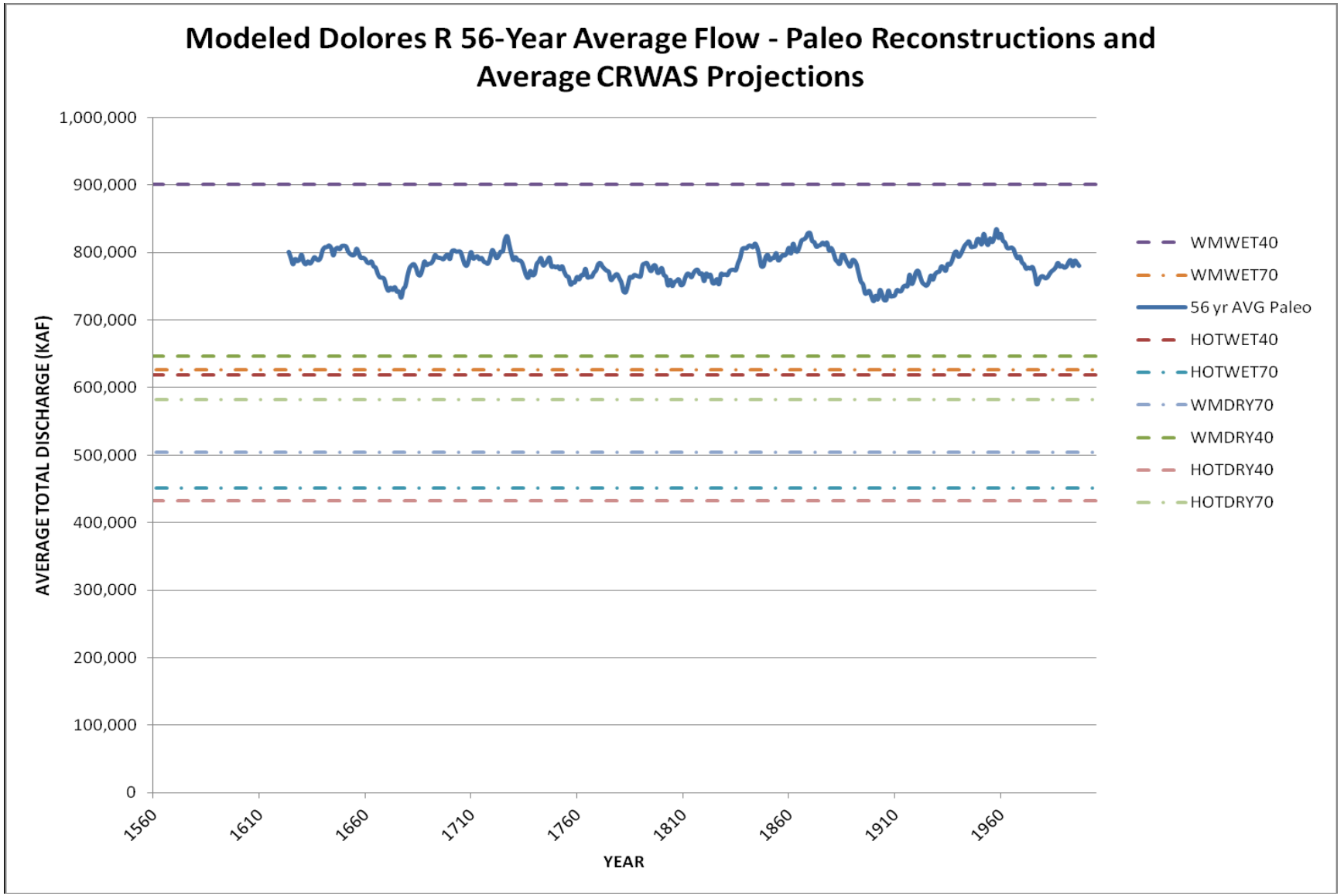


FIGURE 17. COMPARISON OF HISTORIC AND PREHISTORIC FLOW RECONSTRUCTION TO AVERAGE FUTURE FLOW PROJECTIONS FOR THE DOLORES RIVER, FROM THE COLORADO DROUGHT MITIGATION AND RESPONSE PLAN (CWCB 2013)



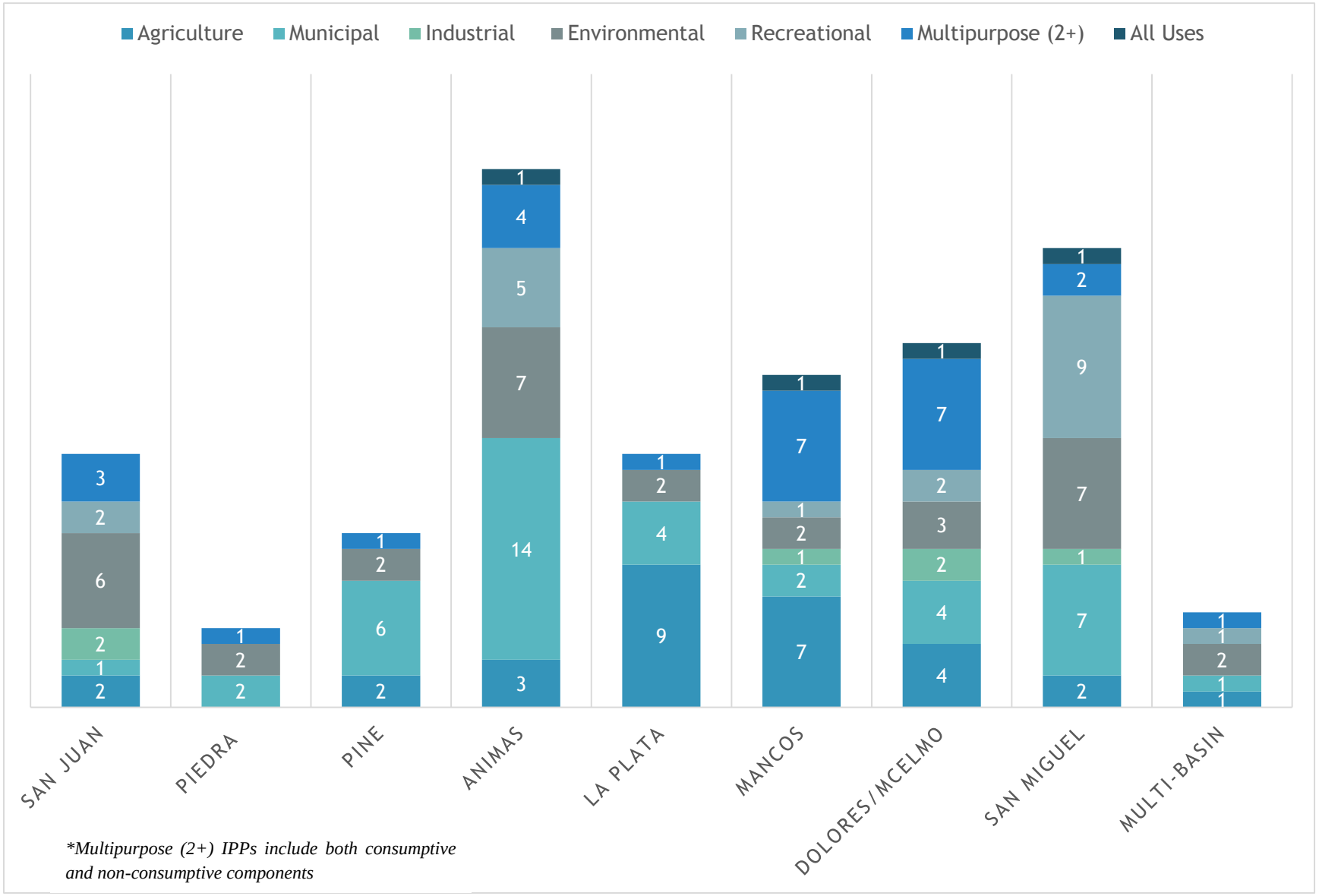
SECTION 4: PROJECTS & METHODS

The SWSI 2010 Identified Projects and Processes (IPP) list went through an in depth updating process for inclusion into the BIP. The BIP consultants outreached to over 200 people across the nine sub-basins requesting updates and identification of new IPPs. The following sections describe outreach efforts, and provide a summary of current IPPs, as well as conceptual IPPs. Conceptual IPPs are ideas for projects or processes that people or entities within the sub-basin have, but which do not yet have a sponsor who is actively pursuing implementation of the concept.

For a complete list of the IPPs for all sub-basins please reference Appendix A. The Roundtable takes a collaborative approach to treat all types of IPP equally and to evaluate them equally for all environmental, agricultural, recreational, municipal, industrial, and multi-purpose needs. Figure 18 presents the IPPs as sorted by sub-basin and type of need. The IPPs are sorted by the following types of need: agricultural, municipal, industrial, environmental, recreational, multipurpose (addressing at least one consumptive and one non-consumptive need), all uses, and multi-basin (e.g. agricultural efficiency projects or hydropower development).

Agricultural IPPs make up about 19% of the total IPPs on the list to date. Municipal and industrial IPPs make up about 29% of the total IPPs on the list to date. Environmental IPPs make up about 21% of the total IPPs while recreational IPPs make up about 12% of the IPPs on the list today. There are about 17% that are considered multipurpose with a consumptive and non-consumptive component. The IPPs are almost equally split between consumptive and non-consumptive projects and/or processes.

FIGURE 18. IPPS SORTED BY SUB-BASINS AND TYPE OF NEEDS



4.1 EDUCATION, PARTICIPATION & OUTREACH

This section provides a summary of the Roundtable Education Action Plan (EAP) activities both completed and planned. Specifically, this section provides information on how the Roundtable informed local decision makers and the public about the CWP. This section includes: number and locations of public meetings (or sessions at regular Roundtable meetings), as well as number of attendees and recorded demographics/professional affiliations; additional engagement mechanisms and related outreach; other notable features of the Roundtable outreach activities; and a 2015 and long-term (2016-2020) EAP, including budget.

NUMBER AND LOCATIONS OF PUBLIC MEETINGS

There is a half hour social networking opportunity before each of the Roundtable meetings that the public is invited to and they are also invited to attend the Roundtable meetings themselves. The demographic/professional affiliations of the general public attendees are recorded in each of the Roundtable meeting minutes. Starting when the BIP planning process began in the fall of 2013. The number of public in attendance at the Roundtable meetings breaks down as follows:

- November 2013: 31 public in attendance; 25 members in attendance
- January 2014: 15 public in attendance; 25 members in attendance
- March 2014: 22 public in attendance; 22 members in attendance
- May 2014: 21 public in attendance; 20 members in attendance
- July 2014: 20 public in attendance; 24 members in attendance
- September 2014: 16 public in attendance; 21 members in attendance
- November 2014: 20 public in attendance; 26 members in attendance
- January 2015: 22 public in attendance; 23 members in attendance

Roundtable members also help conducted four public outreach meetings specific to the BIP and CWP. These meetings were held across the Southwest Basin in the winter of 2014. The meetings provided the public with presentations on the CWP and BIP along with discussion topics to spur public participation and input. The meetings were a great success in understanding the public's concerns and interests as they relate to water development and uses within the Southwest Basin. Appendix B contains meeting presentations, sign in sheets, and meeting notes.

- November 17, 2014 meeting was held in Pagosa Springs; 16 plus people in attendance
- November 19, 2014 meeting was held in Bayfield; 14 plus people in attendance
- December 1, 2014 meeting was held in Mancos; 30 plus people in attendance
- December 9, 2014 meeting was held in Placerville; 15 plus people in attendance

In addition, information about the Interbasin Compact Committee (IBCC)/Roundtable process and the CWP, including updates, has been presented at many local events (e.g. Kiwanis, Rotary, etc.), most local water board meetings (e.g. Animas-La Plata Water Conservancy District, Dolores Water Conservancy District, San Juan Water Conservancy District, Southwestern Water Conservation District, etc.), the annual Water 101 Seminar, and the annual *Water in the West Art Show*. Local presentations included:

- Kate McIntire (CWCB), Kristin Maharg (CFWE), and Denise Rue-Pastin (WIP) conducted a one hour public education and outreach workshop session prior to the November 2013 Roundtable meeting. The majority of roundtable members and some public were in attendance and it was well received. In addition, the importance of public education and outreach was discussed as an agenda item during this meeting.
- Denise Rue-Pastin made a presentation to the Durango Kiwanis Club (approximately 30 in attendance) on November 12, 2013 that provided an extensive discussion of the CWP, including a wide variety of handouts.
- Denise Rue-Pastin provided a presentation at the Durango High Noon Rotary meeting on March 27, 2014 (approximately 50 in attendance) that provided an extensive discussion of the CWP, including a wide variety of handouts.
- Mike Preston, General Manager of the Dolores Water Conservancy District, made presentations (including handout materials) to the Montezuma Valley Irrigation Company Board of Directors and staff (approximately 40 in attendance) on April 8, 2014 and the Dolores Water Conservancy District Board of Directors and staff (approximately 35 in attendance) on April 10, 2014.
- Bruce Whitehead, Executive Director of Southwestern Water Conservation District, provided CWP information at a 4CORE meeting on May 1, 2014 (approximately 15 in attendance).
- Rod Profitt, Board President for San Juan Water Conservancy District, made a CWP presentation on May 7, 2014 to the Pagosa Springs Town Council (approximately 25 in attendance).
- Rod Profit and Val Valentine provided a CWP information session at the Archuleta County Board of Commissioners meeting on May 14, 2014 (approximately 15 in attendance).
- Rod Profitt attended the regularly scheduled June 2014 meeting of the Pagosa Area Water and Sanitation District to provide information on the CWP (approximately 30 in attendance).
- Rod Profitt attended the regularly scheduled June 2014 meeting of the Park Ditch Company to provide CWP information (approximately 20 in attendance).
- Mike Preston presented CWP information at the Club 20 Meeting at La Plata Electric Association on July 31, 2014 (approximately 30 in attendance).
- Mike Preston presented Southwest Basin Roundtable perspectives at the SB115 Legislative Hearing in Durango on August 27, 2014 (approximately 100 in attendance).
- CWP and Roundtable information were presented at the Annual Water 101 Seminar on September 22, 2014 in Telluride (approximately 70 in attendance).
- April Montgomery and Mike Preston provided the Dolores Conservation District with a CWP and Roundtable update at their December 5, 2014 meeting (approximately 25 in attendance).
- Mike Preston provided the Mancos Conservation District with a CWP and Roundtable update at their December 6, 2014 meeting (approximately 20 in attendance).

- Various roundtable members participated in and provided CWP input at the December 18, 2014 West Slope Caucus in Grand Junction (approximately 150 in attendance).
- Bruce Whitehead presented CWP information to the Kiwanis on February 12, 2015 in Durango (approximately 50 in attendance).
- Rod Proffitt presentation to the Archuleta Board of County Commissioners, which updated them on Dry Gulch, noting that Dry Gulch is an IPP and part of BIP in the CWP (approximately 25 in attendance).
- Bruce Whitehead presented CWP information to the Pagosa Springs Rotary on February 19, 2015 (approximately 50 in attendance).

ADDITIONAL ENGAGEMENT MECHANISMS AND RELATED OUTREACH

Area newspapers are invited to each of the Roundtable meetings and various local papers periodically ran information pieces related to the CWP and the importance of public input. Examples include the Cortez Journal (Circulation: 7,500; Geographic area: Predominantly the Cortez/Dolores/Mancos areas), the Durango Herald (Circulation: 9,400; Geographic area: Nine-county Dolores/San Juan River Basin), and the Pine River Times (Circulation: 1,600; Geographic area: Predominantly the Bayfield area). The WIP website has over 100 newspaper articles posted that specifically reference the CWP. A sampling of those articles includes:

- February 12, 2015: Colorado water plan can't create more H20 (Aspen Daily News)
- December 14, 2014: Colorado needs this water plan (Times Call)
- December 10, 2014: Colorado water plan draft goes to Hickenlooper to address shortfall (Denver Post)
- December 9, 2014: Southwest Basin Water Roundtable holds meetings to discuss plan (Cortez Journal)
- November 26, 2014: Statewide water plan taking shape (Pine River Times)
- November 6, 2014: State water planning is 'evolutionary' (Grand Junction Sentinel)
- October 14, 2014: 18,000 Coloradans call on water board for strong conservation and efficiency in state water plan (Groundfloor Media)
- October 11, 2014: How will Colorado's water plan address West-East water transfers? (Post Independent)
- September 11, 2014: State water plan must include recreation economy (Post Independent)
- September 4, 2014: State Water Plan draws crowd (Pine River Times)
- August 13, 2014: Colorado's Water Plan (KRCC)
- July 29, 2014: The importance of the Colorado Water Plan (ColoradoPols.com)
- July 17, 2014: Colorado's river basin users discuss statewide water plan (KUNC)
- July 9, 2014: Water plan would weigh new diversion projects (Post Independent)
- June 15, 2014: Take the opportunity to make your voice heard in state's water planning (Grand Junction Sentinel)
- June 1, 2014: Conservation, efficiency key to water plan (Soapbox)

- May 29, 2014: Can the state water plan bridge the gap? (Summit Voice)
- May 24, 2014: Draft plan for state's water future released (Aspen Daily Times)
- May 5, 2014: Water planning: What Colorado could learn from Texas (Durango Herald)
- April 11, 2014: Water supply concerns dominate regional seminar (Pine River Times)
- April 8, 2014: Haven't heard of the Colorado Water Plan? (Durango Herald)
- March 7, 2014: Governor pushes state water plan (Durango Herald)
- January 23, 2014: Colorado continues to wrangle over last drop (Durango Telegraph)
- January 30, 2014: Anxiety builds over state water plan (Durango Herald)
- October 30, 2013: Protecting Colorado's water future by Bruce Whitehead (Durango Herald and Southwestern Water Conservation District)

In addition, a local radio station, K-WUF, provided coverage and information on the CWP in May 2014. K-WUF serves all of Archuleta County and parts of La Plata, Hinsdale, and Mineral Counties in Colorado, as well as portions of northwest New Mexico. Moreover, the WIP website provides information on the IBCC/roundtable process, as well as links to provide public input to the CWP.

OTHER NOTABLE FEATURES OF THE ROUNDTABLE OUTREACH ACTIVITIES

The Roundtable wanted local decision makers and the public to understand the status of the Southwest Basin's consumptive and non-consumptive needs as well as planned projects. Related to this, the Roundtable hired a consulting team to work on their BIP. The consultants met with numerous individuals and organizations to obtain input to update the Southwest Basin's consumptive and non-consumptive needs assessment, as well as planned projects related to the BIP. To-date, the BIP consultants have met with and talked to over 200 individuals and organizations throughout the Southwest Basin. The consultants reviewed and have incorporated all public input comments into this BIP.

It should be noted, too, that the Roundtable wanted to promote partnerships for new projects and methods. Therefore, each funding application to the Roundtable is required to provide information related to collaborative efforts, including cost-sharing. Over the years, too, the Roundtable has made numerous recommendations to applicants about potential future partners. Moreover, the BIP consultants continually worked to obtain input and promote partnerships.

In addition, the Roundtable felt it was important that the public understand how they are represented on the Roundtable. Related to this, the CWCB produced a very informative Frequently Asked Questions (FAQs) and fact sheet related to the IBCC and Roundtable process that explained how they are represented. Both pieces were regularly distributed at each of the Roundtable bi-monthly meetings throughout 2013 and 2014. Also, in early January 2014 the CWCB produced a Roundtable fact sheet and that has been disseminated at each of the Roundtable meetings. It was

also sent to the entire Roundtable email list which is distributed to more than 100 individuals and organizations. Roundtable members and the public were asked to widely share the FAQs and fact sheets with their constituents. This information is also available at the WIP office in Durango and has been used extensively and disseminated at various public events.

Due to the natural variability of river flows and the hydrologic cycle, the Roundtable thought it was important that local decision makers and the public understand the potential for dry as well as wet years. Information pieces related to this were disseminated at each of the Roundtable meetings, as well as various events and presentations. Some of those pieces came from or included:

- Cech, T. V. (2010). *Principles of water resources* (3rd ed.). Hoboken, NJ: John Wiley & Sons. [Note: Chapter 3 surface water hydrology, to include river components and morphology]
- Colorado Foundation for Water Education. (2009). *Headwaters: Administering Colorado's water resources scarcity rules.* Denver, CO: Author.
- Grigg, N. S. (2008). *Total water management: Practices for a sustainable future*. Denver, CO: American Water Works Association. [NOTE: Chapter 9—laws and regulations]
- Maxwell, S. (Ed.). (2008). *The business of water: A concise overview of challenges and opportunities in the water market*. Denver, CO: American Water Works Association.

In addition, the CWCB developed a drought factsheet that was continually disseminated at each of the Roundtable meetings. This factsheet, as well as additional informational pieces related to variations in the hydrologic cycle, is available on the WIP website and at the WIP office. They have been disseminated at various functions throughout the roundtable process.

OUTREACH PLAN

It will be important to continue to provide information to local decision makers and the public about the BIP so that people understand the BIP's context and are better able to connect to their role in implementing the BIP. In addition, the Roundtable believes it is important to plan for educational programs that allow for deeper exploration of the important water issues within the Southwest Basin. To those ends, the following provides an outreach/education action plan and budget for 2015, as well as a broader, long-term (five year) plan for outreach:

- Continue with Roundtable meetings currently scheduled for: January 14, 2015, April 8, 2015, July 8, 2015, and October 14, 2015.
- Continue with the public education and participation outreach activities identified in Section 4.1 of this BIP (e.g. local presentations, Annual Water 101 Seminar, newspapers, radio, website, etc.).
- Continue with all of the other notable features of Roundtable outreach activities to include keeping local decision makers and the public informed about consumptive and non-

consumptive needs and planned projects, promoting partnerships, providing information about how they are represented on the Roundtable, and disseminating information on natural variability of river flows and the hydrologic cycle.

The Roundtable's overall goals and priorities for education, participation, and outreach including target audiences are presented in Section 1 of this Plan, a synopsis of which is provided as follows:

Short-Term Goals

- Encourage education and conservation to reduce demand.
- Implement informational events about [water conservation and land-use planning] and water reuse efforts, tools and strategies.
- Promote wise and efficient water use through implementation of municipal conservation strategies to reduce overall future water needs.

Ongoing Activities

- Implement IPPs to benefit recreational values and the economic value they provide.
- Implement IPPs to directly restore, recover or sustain endangered, threatened, and sensitive aquatic and riparian dependent species and plant communities.
- Implement IPPs to monitor, protect or improve water quality.
- Participate in Compact Water Bank efforts.
- Support agricultural water efficiency projects identified as IPPs.
- Support and participate in IPPs that promote dialogue, foster cooperation and resolve conflict.

Mid-and Long-Term Targets

- Mid-Term: Promote 60% in-house use and 40% outside use (60/40 ratio) for Southwest Colorado and the entire State by 2020.
- Long-Term: Promote 70% in-house use and 30% outside use (70/30 ratio) for Southwest Colorado and the entire State by 2030.

One strategy to achieve the short-term goals of conservation, land-use planning (which will include coverage and discussion of the 60/40 and 70/30 ratios referenced above), and water reuse is to implement a pilot conservation and land-use planning session in 2015. Initially it is anticipated that this would be a two to four hour workshop for local decision makers and water utility personnel. Between local water professionals, including a land-use planner and the WIP Coordinator, it is believed the session can be effectively conducted and facilitated at a reasonable cost. Depending upon input from the Roundtable, PEPO funds (estimated to be about $1,200) could be used for this effort. If the first year pilot is successful, the session could be annually

rotated throughout the basin (e.g. Cortez, Telluride, Pagosa Springs, etc.) similar to the Water 101 Seminar. The Roundtable would also like to pursue a similar water conservation workshop approach, to include water-wise landscaping for the general public, however these details have yet to be determined. Strategies to achieve ongoing activities are discussed in the following partnerships section. Mid-and long-term goals will be incorporated in with the short-term water conservation, land-use planning, and reuse workshop already discussed. A breakdown of the budget and schedule to achieve the Roundtable educational goals is provided in Attachment C.

Moreover, the Roundtable will continue with key components identified in their original EAP to include:

- Consumptive Projects: Relay gap information, to include an action plan and public participation process, communicate statewide implications of IPPs, engage diverse stakeholders, and provide assistance and information to the Roundtable members and public related to prioritizing projects.
- Non-Consumptive Projects: Keep the public and Roundtable members informed about non-consumptive projects and help to bridge the consumptive and non-consumptive communities while highlighting progressive, multi-purpose solutions.
- Roundtable Member Education: Provide Roundtable members information and education related to a wide variety of water-related issues and interests (e.g. climate change, drought planning, groundwater hydrology, interstate compacts, water quality regulation, etc.).
- Support and utilize existing water education efforts.

It should be noted, that in addition to all of the Roundtable members and their associated organizations, future partners that could be involved in assisting with educational programming may include the Colorado DWR, CWCB, Animas Watershed Partnership, Mountain Studies Institute, San Juan Citizen's Alliance, Trout Unlimited, and Southwestern Water Conservation District.

This section provided a summary of the Roundtable EAP activities that were conducted in the 2013 to 2014 timeframe. The goal of Roundtable EAP outreach activities to date has been to inform decision makers and the public about the Roundtable process and how they can effectively participate in the CWP. Thus far, it is conservatively estimated that nearly 3,000 members of the public, plus Roundtable members in the Southwest Basin have been informed and/or involved in the CWP and public input process. Constituent support for the BIP will be important to meet future water supply needs. The Roundtable believes that well informed members and the public will help to execute this BIP. The Roundtable plans to continue their public education, participation, and outreach activities well into the future.

TABLE 11. SOUTHWEST BASIN ROUNDTABLE 2015 EAP AND BUDGET

GOAL	OBJECTIVE/TASK	LEAD	TIMELINE	EXPENSE	ONGOING?	COMMENTS
Educate decision makers in the SBR area about how they are represented	a) Regularly distribute FAQs and fact sheet related to the IBCC and roundtable process. b) Purchase and distribute Headwaters Colorado Water Plan issue. c) Purchase and distribute information about the IBCC/roundtable process and the State Water Plan at local events, local water board meetings, and the annual Water 101 Seminar.	Denise Rue-Pastin	Throughout 2015	$800	Yes	
Educational priority	Pilot conservation and land-use planning session	Denise Rue-Pastin	Late Fall 2015	$1,200	Pilot	
Roundtable members and general public information and education related to consumptive and non-consumptive projects and CWP	a) Notify all area papers of Roundtable meeting dates, time, and location; including 'open to the public' invitation	Denise Rue-Pastin	Quarterly meetings 2015	$108	Yes	WIP Coordinator time est.
	b) Post all consumptive and non-consumptive related activities and meetings on WIP website	Denise Rue-Pastin	Throughout 2015	$108	Yes	
	c) Presentations to various local organizations	Varies	Throughout 2015	$125	Yes	Copies and materials
	d) Roundtable information is provided at each Annual Water 101 Workshop	Denise Rue-Pastin	Throughout 2015	$225	Yes	Copies & 75 issues of the CFWE Water Law
	e) Other/Misc			$100		
Roundtable Members Education	a) Drought planning information at Roundtable meeting	Handouts; Speaker TBD	TBD	$125	No, but info needs will be continually assessed	Copies and materials
	b) Climate change information at Roundtable meeting	Handouts; Speaker TBD	TBD	$125	No, but info needs will be continually assessed	Copies and materials
	c) Water quality regulation or groundwater hydrology information at Roundtable meeting	Handouts; Speaker TBD	TBD	$125	No, but info needs will be continually assessed	Copies and materials
	d) Interstate compacts information at Roundtable meeting	Handouts; Speaker TBD	TBD	$125	No, but info needs will be continually assessed	Copies and materials
	e) Other/Misc: Current river operations and opportunities, constraints associated with different hydrologic cycles			$100		
TOTAL				$3,266		

TABLE 12. SOUTHWEST BASIN ROUNDTABLE 2016 TO 2020 EAP AND BUDGET

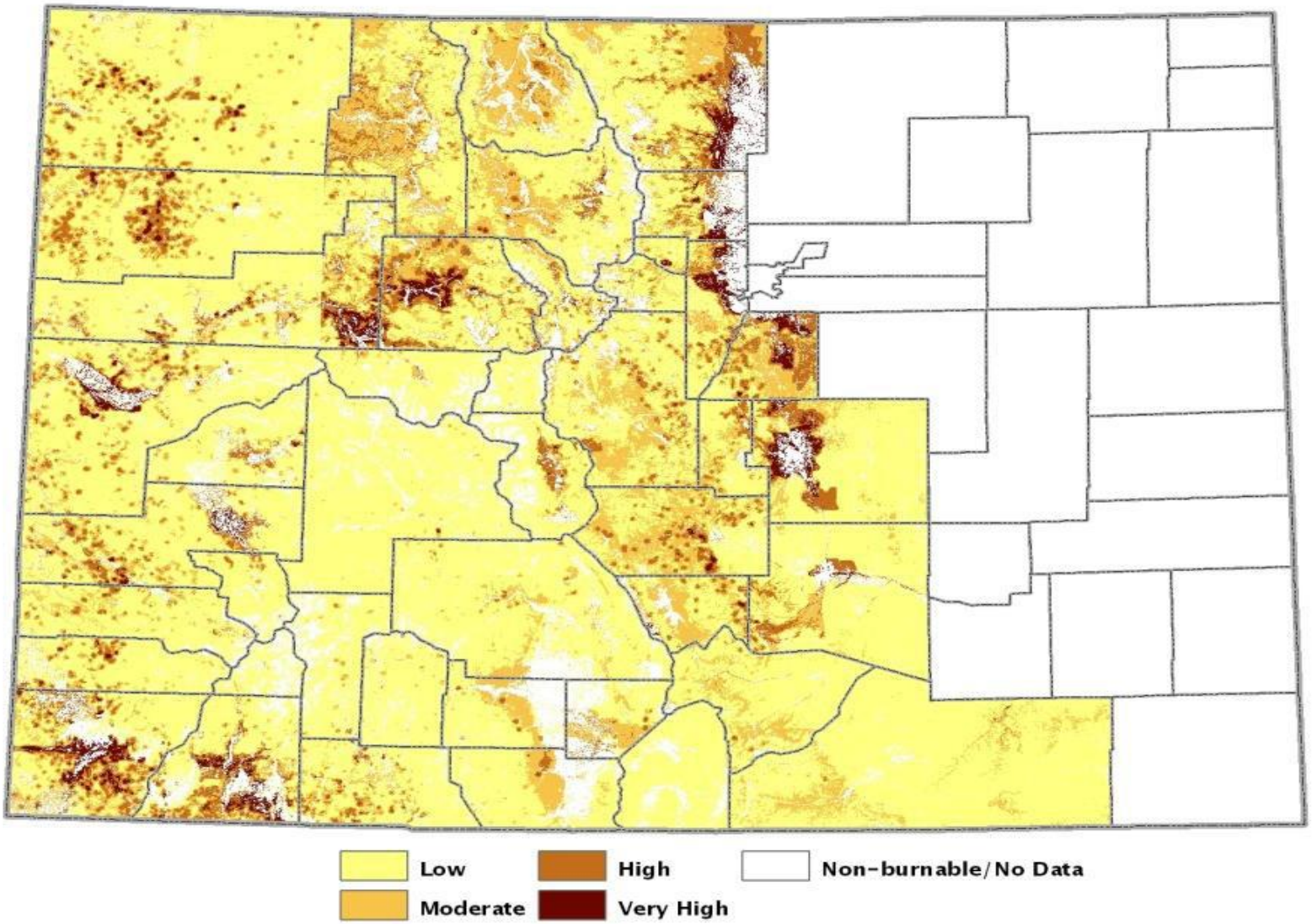
GOAL	OBJECTIVE/TASK	LEAD	TIMELINE	EXPENSE	ONGOING?	COMMENTS
Educate decision makers in the SBR area about how they are represented	a) Regularly distribute FAQs and fact sheet related to the IBCC and roundtable process. b) Purchase and distribute Headwaters Colorado Water Plan issue. c) Purchase and distribute information about the IBCC/roundtable process and the State Water Plan at local events, local water board meetings, and the annual Water 101 Seminar.	Denise Rue-Pastin	2016-2020	$2,400	Yes	
Educational priority	Water conservation workshop, to include water-wise landscaping for the general public	Denise Rue-Pastin	Starting in 2016	$1,200	Pilot	
Roundtable members and general public information and education related to consumptive and non-consumptive projects AND CWP	a) Notify all area papers of Roundtable meeting dates, time, and location; including 'open to the public' invitation	Denise Rue-Pastin	Quarterly meetings 2016-2020	$541	Yes	WIP Coordinator time est.
	b) Post all consumptive and non-consumptive related activities and meetings on WIP website	Denise Rue-Pastin	2016-2020	$541	Yes	
	c) Presentations to various local organizations	Varies	2016-2020	$625	Yes	Copies and materials
	d) Roundtable information is provided at each Annual Water 101 Workshop	Denise Rue-Pastin	2016-2020	$1,125	Yes	Copies, plus 75 issues of the CFWE Water Law
	e) Other/Misc			$500		
Roundtable members education	a) Information on a variety of topics at Roundtable meetings	Handouts; Speaker TBD	TBD	$625	No, but info needs will be continually assessed	Copies and materials
	b) Other/Misc:			$500		
Support and utilize existing water education partners and efforts	a) All Roundtable meetings are posted on WIP website and in quarterly newsletters	Denise Rue-Pastin	2016-2020	$541	Yes	WIP Coordinator time est.
	b) There is a Roundtable update section in each of the WIP quarterly newsletters	Denise Rue-Pastin	2016-2020	$947	Yes	WIP Coordinator time est.
	c) There is a Roundtable tab/section on the WIP website	Denise Rue-Pastin	2016-2020	$947	Yes	WIP Coordinator time est.
	d) Water information provided at each of the Roundtable meetings on an information table	Denise Rue-Pastin	2016-2020	$625	Yes	Copies
	e) Other organizations that could help with efforts (e.g. CDWR, CWCB, SJCA, SWCD, etc.)	Varies	2016-2020	N/A	Yes	
	f) Other/Misc.			$500		
TOTAL				$11,617		

4.2 WATERSHED HEALTH & WATER QUALITY

CHECK IT OUT!
http://www.coloradowildfirerisk.com/

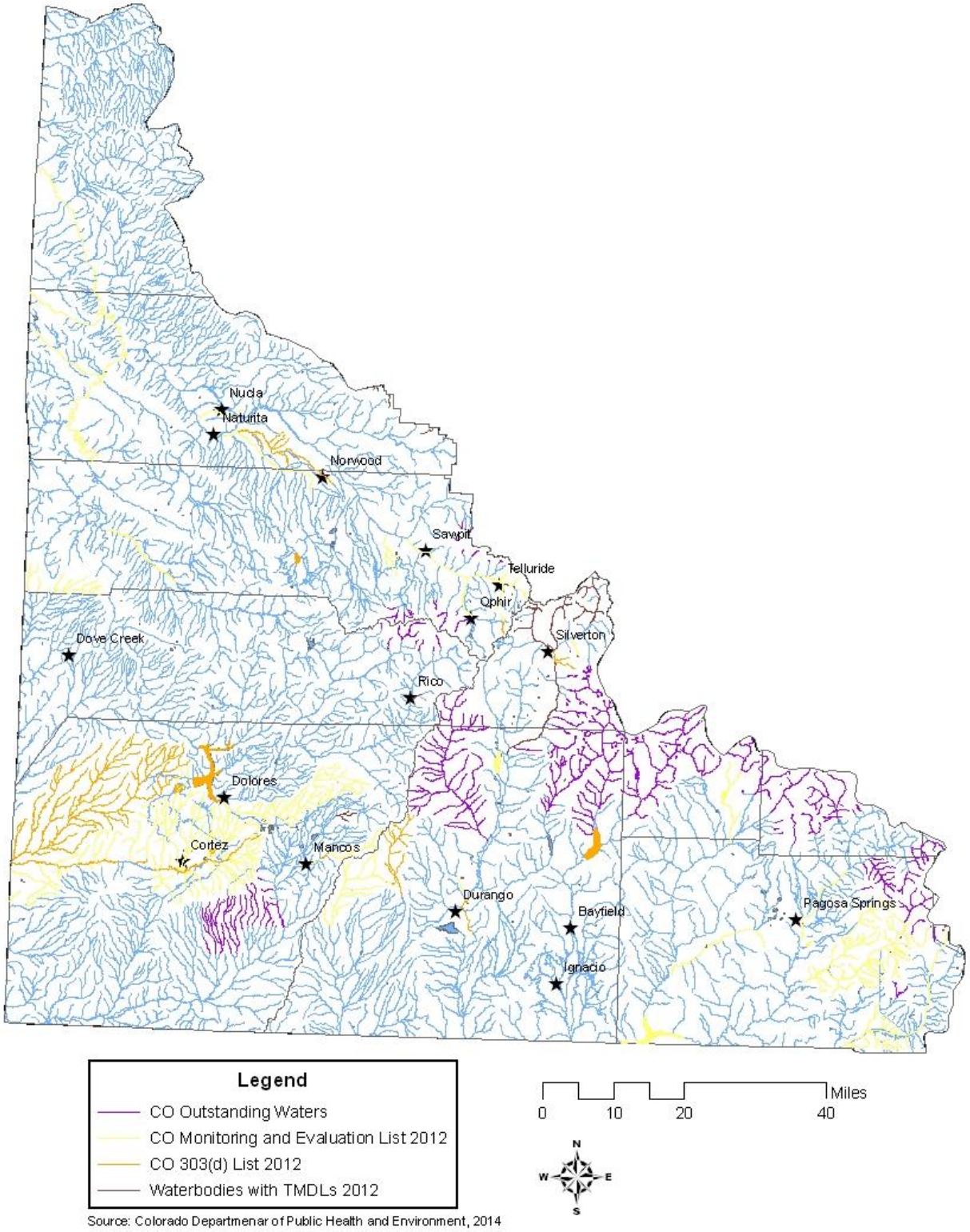
Wildfire, water quality degradation and other issues related to watershed health can impact and endanger critical water supplies through impacts to water supply infrastructure, environmental or recreational values, and/or water quality. The Colorado Wildland Fire Susceptibility Index (Figure 18), developed by the Colorado State Forest Service, provides one tool for gaging levels of fire risk within the Southwest Basin. Go to the website to obtain fire risk information for specific locations.

FIGURE 19. COLORADO WILDLAND FIRE SUSCEPTIBILITY INDEX (COLORADO STATE FOREST SERVICE 2008)



The protection, maintenance, and restoration of Colorado's water resources are managed by the Clean Water Program within the Colorado Water Quality Control Division (WQCD). Colorado's water quality is assessed periodically in conjunction with the WQCD's triennial review of water quality standards, the development of discharge permits, the 303(d) List and Total Maximum Daily Loads, and the completion of special studies. Water bodies are listed as "impaired" under Section 303(d) of the Clean Water Act when monitoring data demonstrates that the water quality standard for a pollutant or pollutants is being exceeded. Figure 20 shows the waterbodies listed as impaired in the Southwest Basin, as well as those with Outstanding Waters designation and those on the Monitoring and Evaluation List for impairment.

FIGURE 20. COLORADO WATER QUALITY CONTROL DIVISION WATER QUALITY LISTINGS AND DESIGNATIONS FOR WATERBODIES IN THE SOUTHWEST BASIN



Source: Colorado Departmenar of Public Health and Environment, 2014

CURRENT IPPS

Watershed health protection projects and methods are occurring or have been completed within each of the Southwest Basin's nine sub-basins. These efforts range from broad collaborative watershed groups, to collaborative groups focused on forest health or water quality, to more focused community wildfire mitigation plans aimed at protecting property and source water protection plans to protect drinking water supplies. The dialogue and action fostered by these efforts can help protect critical water supplies from harm by fire, contaminants or other hazards.

In the San Juan River basin, there are two groups working on forest and watershed health focused on public and private lands. The San Juan Headwaters Forest Health Partnership includes people and organizations representing multiple interests working to strengthen understanding of methods for improving forest health and long-term resilience of the watersheds of the Upper San Juan River Basin, to broaden knowledge of current conditions and opportunities, to develop and implement a set of management approaches and projects, as well as monitoring and adaptive management.

CHECK IT OUT!
http://www.sanjuanchama.org/

The Chama Peak Land Alliance formed the San Juan–Chama Watershed Partnership to engage public and private stakeholders in collaborative planning and decision making in the Navajo River and Rio Blanco River watersheds of Colorado (as well as the Chama River watershed in New Mexico). These watersheds are at very high risk for wildfire and insect and disease mortality; yet they sustain agricultural operations, tourism based economies, wildlife populations and public recreation, as well as supply over 50% of the water supply for Santa Fe and Bernalillo counties in New Mexico, via the San Juan Chama Diversion.

In the Animas River basin two collaborative groups are working on water quality issues. In the upper watershed, the Animas River Stakeholders Group (ARSG) is focused on water quality challenges related to historic mining and natural mineralization in the upper Animas River watershed. The ARSG's mission is to improve water quality and aquatic habitats in the Animas River watershed through a collaborative process designed to encourage participation from all interested parties. Focusing lower in the basin, the Animas Watershed Partnership (AWP) works to protect and improve the quality of water resources in the Animas River. AWP's efforts to date have focused on nutrient, sediment, and bacterial levels based on recent and current sampling efforts, including the Animas Watershed Based Plan (2011). The Microbial Source Tracking and Nutrient Sampling Project aims to identify the animal sources of bacterial contamination in the Animas River close to the Southern Ute/New Mexico Boundary, as well as to measure and compare the concentrations of E. coli, total nitrogen, and total phosphorus in the Animas River and the Florida River close to their confluence.

THE ASSESSMENT IS AVAILABLE AT:

http://www.utemountainuteenvironmental.org/index.cfm/water-quality/surface-water/monitoring-assessment/

In the Mancos River basin, four efforts focus on water quality and watershed health. The Ute Mountain Ute Tribe and the Mancos Valley Watershed Group have completed watershed and water quality assessments and implement projects aimed at improving watershed health. The Ute Mountain Ute Tribe Environmental Programs Department recently completed its Mancos River Water Quality Assessment: 2011-2012 (Ute Mountain Ute Tribe 2013).

The Mancos Valley Watershed Group completed the Mancos Watershed Plan in 2011. The group was formed in 2006 and brings together private landowners, environmentalists, recreationalists, government agencies, and concerned community members to address goals including improvement of fishing, reduction of copper loading in the East Mancos, working with irrigators to improve diversions, improvement of the ecological function of the river, and improvement of summer flows through the town of Mancos and downstream. In addition as part of the BOR's Colorado River Salinity Control Program, the U.S. Department of Agriculture Natural Resource Conservation Service's Environmental Quality Incentives Program (EQIP) provides cost share assistance to landowners in the Colorado River basin, including all sub-basins of the Southwest Basin, who install salinity control measures. Finally, the Mancos Water Conservation District plans to conduct Natural Disaster Planning.

In the Dolores River watershed several groups are focusing on different aspects of watershed health. The Dolores River Dialogue is a coalition of diverse interests, whose purpose is to explore management opportunities, build support for and take action to improve the ecological conditions downstream of McPhee Reservoir while honoring water rights, protecting agricultural and municipal water supplies, and the continued enjoyment of rafting and fishing. The Dialogue has completed several assessments, including A Way Forward and the Dolores River 319 Plan. A Legislative Subcommittee has also been formed from this effort, which lead to an Implementation Team developing an Implementation, Monitoring, and Evaluation Plan (IM&E Plan). This IM&E Plan is part of the foundation for draft National Conservation Area legislation to protect native fish, downstream values, water rights, and Dolores Project allocations.

The Dolores River Restoration Partnership is a public-private collaboration "working to remove invasive plants whose extensive growth has displaced native plant communities, impaired wildlife habitat and forage, hindered recreational opportunities, and increased risks associated with wildfire." Their goals include to "increase the number of acres of sustainable, healthy riparian and floodplain plant communities in the watershed while reducing those dominated by tamarisk and other invasive, non-native plant species," and to "increase opportunities for the next generation of stewards; increase public safety both by reducing wildfire-related risks and improving highway safety; and improve aesthetics." They have completed the Dolores River Restoration Action Plan

(Dolores River Restoration Partnership 2010) which identified the riparian and floodplain locations where restoration activities should focus.

Trout Unlimited is currently developing the Upper Dolores River Assessment. This is an assessment of fisheries and riparian conditions of the Upper Dolores Watershed aimed at applying the best science to support restoration activities, including identification of possible restoration and irrigation infrastructure improvement partnerships in the Dolores River watershed, reaches of the Dolores River main stem for possible restoration work, monitoring, reconnection, and/or reintroduction projects on important tributary streams for native and wild trout.

In the San Miguel River basin, the San Miguel Watershed Coalition works to "advance the ecological health and promote the economic vitality of the watershed through the collaborative efforts of the entire community. Our ultimate goal is to realize a watershed that is healthy in every respect while offering a sustainable and quality lifestyle for all who live in it." The coalition periodically compiles and issues a watershed health assessment entitled the San Miguel Watershed Report Card.

Also pertinent to water quality in a tributary of the San Miguel River are the Carbenaro Mine Adit Reclamation and the Carribou Mine Tailings and Adit Reclamation Projects, both aimed at mitigating heavy metal loading to Howard's Fork.

CHECK IT OUT!
http://uplandscape.org/

The Uncompahgre Plateau Collaborative Restoration Project (UP CFLRP) is a collaborative effort engaging public and private partners in efforts "to enhance the resiliency, diversity and productivity of the native ecosystem of priority National Forest System lands on the Uncompahgre Plateau, Colorado using best science available and collaboration." The group is active in forest health issues across the Uncompahgre Plateau, including portions of the San Miguel and Dolores river watersheds. The UP CFLRP is completing projects including "active restoration on 160,000 acres that involves prescribed burns, mechanical treatments, timber harvests, invasive species treatments, native plant establishment, trail and road relocations (sediment control), riparian restoration and improvements for Colorado cut throat trout."

In La Plata, Archuleta, and Montezuma counties, FireWise of Southwest Colorado has Chapter Coordinators working with home and property owners to help them understand their fire risk and recommend actions they can take to mitigate that risk. The organization does education/outreach, planning, and some implementation activities (such as creation of demonstration sites, grant writing, incentives for homeowners, etc.).

The main "planning" effort that FireWise of Southwest Colorado is currently supporting is the development of Community Wildfire Protection Plans (CWPPs). There is a CWPP in place for each of the five counties in Southwest Colorado, as well as 17 subdivision-level plans in place and another 12 such plans underway.

While the CWPP plans focus primarily on what the subdivision can do, many of them also make recommendations for actions to be taken on public lands that adjoin the subdivision. Although the primary emphasis of these CWPPs is on creating defensible space for homes, the wildfire mitigation they promote also helps support healthy forests and healthy watersheds.

FireWise of Southwest Colorado works closely with the Colorado State Forest Service, BLM/USFS, fire departments, Offices of Emergency Management, NRCS, Conservation Districts, and other non-profits like the Southwest Conservation Corps and San Juan Headwaters Partnership (P. Wilson, Pers. Comm.).

Finally, Source Water Protection Plans promote protection of public water systems from fire and other potential hazards/sources of contamination. These are voluntary planning efforts that public water suppliers can pursue with funding support available through CDPHE and technical/planning support provided by the Colorado Rural Water Association. In developing these plans, participating public water suppliers identify their water sources and planning areas, inventory and prioritize potential hazards /sources of contamination, and identify Best Management Practices that they or partners can implement to protect their sources of drinking water.

In the Southwest Basin, 23 public water suppliers have completed or are in the process of developing Source Water Protection Plans for their surface and/or groundwater intakes. These plans cover the following planning areas:

- In the Animas River basin, the Florida River watershed upstream of the Durango-La Plata Airport's water intake, the Animas River watershed upstream of the City of Durango's water intake, and the Falls Creek and Dyke Creek drainages.
- In the Mancos River basin, the source areas for the Mancos Rural Water Company, Mesa Verde National Park, and the Town of Mancos.
- In the Dolores River basin the source areas for The town of Rico, Town of Dolores, City of Cortez, Montezuma Water Company, and the Town of Dove Creek.

Missionary Ridge Fire North of Durango 2002 (Animas River basin)

4.3 CONSERVATION PROJECTS & PROCESSES

CURRENT IPPS

Currently the Southwest Basin does not identify any municipal water conservation projects on the IPP list. This lack of identified IPPs should not be interpreted to mean that there are no efforts in place or planned to enhance levels of conservation in the Southwest Basin, as not every municipality or public water supplier responded to requests for updates and additions to the IPP list.

IPP CONCEPTS

In the course of the interviews gathered around the Southwest Basin to identify existing IPPs, project concepts also were discussed and compiled. These are ideas for projects or processes that people or entities within the Southwest Basin have, but which do not yet have a sponsor who is actively pursuing implementing the idea. One IPP concept identified during the planning process is to work with public water suppliers, including municipalities, to assess their current indoor to outdoor water use ratio and to incentivize attainment of the 60/40 ratio included in the Southwest Basin Measureable Outcome B3. Another IPP concept is the development of irrigation efficiency programs.

4.4 NEW MULTI-PURPOSE, COOPERATIVE, & REGIONAL PROJECTS & PROCESSES

The BIP will be used to foster multi-purpose, cooperative, and regional IPPs. Throughout the efforts of updating the IPP list, new partnerships have formed and new IPPs were identified. While all sub-basins strive towards multi-purpose, cooperative, and regional IPPs not all sub-basins identified new projects during these outreach efforts. Some sub-basins may have existing IPPs, developed during the SWSI 2010 efforts, which already encompass the essence of Section 4.4. Below are specific IPPs that are highlighted for IPPs that demonstrate new multi-purpose and cooperative efforts towards implementation of projects and processes.

SAN JUAN RIVER BASIN

A Geothermal Greenhouse Partnership (GGP) has formed within the San Juan River basin. The GGP mission is as stated: *"Harnessing intrinsic renewable solar and geothermal energy to grow safe, sustainable, reliable and affordable food for local people, and provide an attraction for visitors, year around. In doing so, create educational opportunities, nurture local businesses, create jobs and cultivate pride and economic vitality*."

The project consists of three phases: 1) Development of partnership and building capacity within the organization; 2) Construction of the project will commence and utilization of the facilities; and 3) Expanding the influence of the GGP and further education and outreach efforts. The GGP has relationships with local, state, national, public, and private entities such as: Pagosa

Springs Town Council, Archuleta County Board of County Commissioners, Archuleta School District 50-Jt, U.S. Senator Mark Udall, Southwest Organization for sustainability, Growing Spaces, Pagosa Verde, 4Core – Four Corners Office for Resource Efficiency, Davis Engineering Service, and Reynolds & Associates Architecture Engineering.

Also with in the San Juan River basin multiple processes have formed. Each having a diverse group of stakeholders working together to address multiple known needs. The Chama Peak Land Alliance seeks conservation minded landowners to work collaboratively together to practice and promote ecological and economical sound land management. The San Juan Headwaters Forest Health Partnership is committed to collaborative approaches to improve the health and long-term resilience of mixed-conifer forests and the communities associated with these forests.

MANCOS RIVER BASIN

The Ute Mountain Ute Tribe has received a grant to develop a Water Conservation and Management Plan. The plan is a process to discuss development of the Ute Mountain Ute Tribe allocations in the La Plata, Mancos, San Juan, and McElmo river basins. This includes development with non-tribal partners within the Mancos River valley, development into western La Plata County and eastern Montezuma County, as well as additional needs from the Dolores Project in the amount of 4,000 AF.

Mancos Water Conservancy District has an IPP describing the need to conduct planning for natural disasters such as fire, floods, etc. This project is in the initial planning stages and will try to address protection of water supply and water quality for all values if a natural disaster were to occur.

DOLORES AND MCELMO RIVER BASINS

The Dolores Water Conservancy District and the Ute Mountain Ute Tribe are jointly pursuing the development of an energy dissipating structure (EDS) hydropower project. This is a collaborative process between users of the Dolores Project. The EDS site is located on the Towaoc Highline Canal at the transition between Reaches 2 and 3. The EDS would be a source of renewable energy and annual revenue for the two parties. This IPP combines renewable energy with existing agricultural delivery practices.

Another IPP the Dolores Water Conservancy District is a proponent of is an optimization study for the Dolores and McElmo river basins. The study plans to review the available water supplies to evaluate whether the water is being used as effectively as possible while using existing facilities. The study will recommend additional management methods and/or facilities that may improve effectiveness. This study will collaborate with users of the Dolores Project, upper and lower Dolores River, and McElmo Creek users.

SAN MIGUEL RIVER BASIN

Montrose County provided a new multi-purpose IPP for the portion of the county within the Southwest Basin. The Montrose County Firming Project will consist of two phases. The purpose of the project is to provide a reliable source of water for municipal and industrial demands over the next 50 years. The first phase is to be completed by 2018, which is a feasibility level engineering study of proposed storage sites and diversion points pursuant to recent water right filings. The second phase of the project will be to construct one or two reservoirs, in addition to the Nucla Town Reservoir Enlargement, and the direct flow points of diversion as determined by Phase 1. The project will address the 3,200 AF gap between existing water supplies and demands projected to occur by 2060 in the western portion of Montrose County. The reservoirs release will also provide non-consumptive piscatorial use and water quality improvements.

4.5 M&I PROJECTS & PROCESSES

Throughout the efforts of updating the IPP list, existing M&I IPP's were updated when applicable and new M&I IPPs were identified. While all sub-basins have M&I needs, not all sub-basins identified new IPPs during these outreach efforts. Below are specific IPPs that demonstrate the types of M&I IPPs existing or planned within the Southwest Basin.

The IPP list consists of about 25% municipal projects and/or processes. Every sub-basin has a need for safe, reliable water supplies and adequate infrastructure. Types of M&I IPPs are water diversion structures construction, improvements to infrastructure, construction of new infrastructure, and storage facilities (new and existing), to name a few.

The Dry Gulch Water Storage Facility Project is a noteworthy project for providing municipal water supply. It will incorporate both consumptive and non-consumptive uses for state and local purpose. The primary proponent of the project is presently San Juan Water Conservancy District. The off stream facility will have storage capacity of up to 11,000 AF. The project will utilize gravity flow and syphoning to fill and maintain water levels; this is a cost effective and environmental friendly approach. The project is the preliminary stages and is currently resolving land ownership issues and securing funding.

Across all sub-basins, the potential for micro-hydropower is being explored. As the technologies for hydropower progress so does the potential for production. These potential hydropower projects could be associated with irrigation infrastructure and/or other multi-purpose projects. Multiple sub-basins have specific IPPs addressing the development of hydropower. Within the San Juan River basin, a small hydropower project associated with the Dry Gulch Water Storage Facility Project (utilizing Park Ditch delivery infrastructure) would be developed in conjunction with

Dolores Project (Dolores River basin)

the dam project. The Florida Water Conservancy District within the Animas River basin listed hydropower as need to be meet during utilization of a new water right (other needs addressed as well). Within the Mancos River basin, there is potential for hydropower facilities within the canals and ditches within the Mancos River valley.

The Dolores and McElmo river basins already have existing hydropower facilities with two new additions to the IPP list. As described previously in Section 4.4, the EDS Hydropower Development is jointly pursued by the Dolores Water Conservancy District and Ute Mountain Ute Tribe. The Dolores Water Conservancy District is also pursuing a development of a Plateau Pumpback Project. This project would utilize water released from an upper reservoir through a penstock to generate hydropower and be pumped back to the upper reservoir during off-peak demand.

4.6 AGRICULTURAL PROJECTS & PROCESSES

Throughout the efforts of updating the IPP list, existing agricultural IPP's were updated when applicable and new agricultural IPPs were identified. While all sub-basins have some agricultural IPPs, not all sub-basins identified new IPPs during these outreach efforts. Below are specific IPPs that are highlighted to demonstrate the types of agricultural IPPs existing or planned within the Southwest Basin.

One overarching concept for all sub-basins is the need for ditch company improvements and efficiency projects. A plethora of irrigation systems exist in the Southwest Basin; this leads to not all systems being represented on the IPP list. To account for these systems, a multi-basin IPP exists as a place holder for irrigation systems utilizing open ditches to deliver water. There is potential to upgrade these ditches (by lining or piping) to conserve water. Other efficiency projects may exist and should be developed as needed. Along with this overarching concept, specific IPPs exist for ditch companies that have identified planned improvements and efficiencies. These projects include ditch linings and headgate improvements.

Multiple reservoirs exist within the Southwest Basin. The majority of these reservoirs provide some quantity of agricultural water supply. Agricultural water delivered from a reservoir may require pumping stations, canals, ditches, piping, and delivery boxes for connection with irrigators. All these components require routine maintenance and upgrades. Efficiency improvements are made to conserve water and potentially provide additional water supplies.

Vallecito Reservoir provides agricultural, municipal, tribal, and environmental flows year around. Two IPPs are listed regarding the reservoir and infrastructure repairs. Along with these repairs, continued improvements are being made to the delivery systems and on-farm irrigation practices that utilize Pine River Irrigation District shares.

Florida Water Conservancy District has multiple needs within the Florida River drainage (a tributary of the Animas River). One of the many components of their IPP is irrigation system improvements by the Florida Mesa Ditch Companies that would firm up agricultural delivery and

provide additional water supply for those other uses in Lemon Reservoir through the reduction of losses in the delivery system. Currently, nearly all of the irrigation system delivering water from Lemon Reservoir consists of old, open ditches. To date 3 miles of ditches have been lined, with future plans to continue these upgrades.

Long Hollow Reservoir is a 5,400 AF storage project in Long Hollow (a sub-basin of the La Plata River) with construction scheduled to be completed in the fall of 2014. This reservoir will be used for La Plata River Compact compliance and as a source of exchange water for irrigation water supply. Potential uses for augmentation and exchange for domestic wells exist too. Along with the reservoir construction, a water delivery study will be conducted to better meet La Plata River Compact requirements to the State of New Mexico.

Southwester Water Conservation District holds water rights in the Animas River that are decreed and available to meet irrigation demands within the La Plata River basin. This water supply could potentially provide supplemental water for existing irrigated lands and water supply for full service lands that are currently not in production and/or dry-land farmed.

The Mancos Water Conservancy District provided multiple new IPPs. These range from reservoir enlargements, inlet rehabilitation for reservoirs, river measuring stations to improve water management, and ditch piping to improve conservations.

Irrigators in McElmo Canyon have expressed the need for agricultural water in the early part of the irrigation season. A pilot project was conducted for a single year utilizing Totten Reservoir to provided releases for agricultural uses during the early months of the irrigation season. For this to become permanent release, improvements to Totten Reservoir must be made.

San Miguel River

Multiple reservoirs exist within the San Miguel River basin that have IPPs ranging from reservoir improvements to enlargements. These reservoirs provide agricultural water to their surrounding areas as well as water for other uses. It is important to maintain these reservoirs so supplemental irrigators needs are meet.

4.7 ENVIRONMENTAL PROJECTS & PROCESSES

This section provides an overview of the environmental IPPs currently identified in the Southwest Basin. In the San Juan and Piedra river basins, IPPs aim to restore and improve stream, wetland and CRCT habitat. Six IPPs focus on restoration of aquatic and riparian habitat, and

channel stability. These include the Cat Creek Watershed Project, San Juan River Bank Stability Project, the Navajo River Restoration, Spring Creek Restoration, San Juan River Village MD River Restoration, and the Lower Piedra from Hwy 160 to Navajo Lake Projects. Two projects aim to enhance or create wetlands: Crowley Ranch Reserve Wetland Enhancement and the Sambrito Project. Two projects focus on working with private landowners to improve habitat for CRCT Conservation Populations. These are on Himes Creek and Headache Creek.

In the Pine River basin, the River Ranch Pine River Habitat Improvement Project plans to restore aquatic and riparian habitat and channel stability. The Vallecito Reservoir Instream Flow Project aims to allow donation of an instream flow to the CWCB to enhance fish habitat.

In the Animas River basin IPPs aim to improve stream habitat, CRCT habitat and water quality. Four projects focus on improving riparian habitat, aquatic habitat, and/or water quality, including the Salmonid Habitat Improvement Animas above Howardsville, Animas River Vegetation Management, Florida River Water Quality Initiative, El Rancho Florida Florida River Riparian and Aquatic Habitat Improvement, and the Florida River Habitat and Water Quality Improvement Projects. Two projects focus on native fish. The Hermosa Creek CRCT Metapopulation Project works to create and sustain habitat for CRCT, while the Florida River Habitat Assessment hopes to work with private landowners to assess habitat for native warm water fish.

In the La Plata River basin two projects aim to control invasive species: the Southern Ute Indian Tribe Management of Invasive Riparian Species and Long Hollow Reservoir Non-Native Fish Control.

In the Mancos River basin, three projects aim to improve aquatic habitat for native warm water and non-native trout, and/or riparian habitat. These include the Mancos Fishing Habitat Improvements, Mancos River Habitat and Diversion Project - Phase II, the Ute Mountain Ute Tribe's Mancos River Restoration (riparian and aquatic natives). The Habitat Assessment of the Mancos River is focused on assessing the quality of the lower Mancos for native warm water fish.

In the Dolores and McElmo river basins three IPPs have the potential to help address flow needs for native warm water fish while meeting other needs. These include the Dolores Water Conservancy District Optimization Study, the Upper Plateau Storage Reservoir, and the Proposed ISF on the Dolores River. The Dolores River Restoration Partnership and the Dolores Project McPhee Reservoir Aquatic Nuisance Species Protection aim to maintain and improve riparian and aquatic habitat respectively by controlling non-native species. The Upper Dolores River Assessment will evaluate riparian and aquatic habitat quality. The Redburn Ranch will improve aquatic habitat connectivity for the non-native trout fishery. The Future River Stewards project will engage in water quality sampling and river stewardship education to benefit all uses.

In the San Miguel river basin four IPPs address maintenance of flows for environmental values. These include the Naturita Creek Proposed ISF, Flow Protection for Area of Critical Environmental Concern, San Miguel ISF, and Suitability - Wild and Scenic Rivers Act. Three

projects focus on improving habitat for native fish species: one for CRCT (Woods Lake CRCT Refuge), and two for native warm water fish (Tabeguache Creek Native Fish Barrier Removal Project, CCC-Ditch Fish Ladder Repair). The Valley Floor River Channel Restoration project will improve both aquatic and riparian habitat. Three IPPs focus on developing new reservoirs which in addition to meeting municipal and agricultural needs, could include benefits to environmental values. These are the Montrose County Firming Project Phase 1 and 2, and the San Miguel Project.

In addition several projects are multi-purpose processes focused on watershed and forest health, and/or water quality. These have the potential to benefit multiple values, including environmental values. These IPPs are covered in depth in Section 4.2.

4.8 RECREATIONAL PROJECTS & PROCESSES

Rafting on the Dolores River

IPPs that have recreational benefits have been identified throughout the Southwest Basin. Three IPPs help maintain or improve whitewater boating recreation. These include the Four Corners Paddle Trail (Animas River basin) Upper Dolores River Recreation Access, San Miguel Potential Recreational In-Channel Diversion, San Miguel Suitability - Wild and Scenic Rivers Act, and the CCC-Ditch Fish Ladder Repair. An IPP concept is to update the identification of boatable reaches and boatable days and flows for the rivers in each sub-basin.

The following three IPPs will benefit flat-water boating recreation as well as fishing and waterfowl viewing opportunities: the Dry Gulch Storage Facility Project, Lake Nighthorse Recreation, and Dolores Project McPhee Reservoir Aquatic Nuisance Species Protection. In addition, eight IPPs plan specifically to improve fishing, waterfowl viewing, and/or hunting opportunities around the Southwest Basin. These include the San Juan River Village MD River Restoration, the Spring Creek Restoration, the Crowley Ranch Reserve Wetland Enhancement, River Ranch Pine River Habitat Improvement, Salmonid Habitat Improvement Animas above Howardsville, Mancos Fishing Habitat Improvements, Upper Dolores River Assessment, and Rehabilitation of Priest Lake.

Finally, several water quality IPPs described in Section 4.2 have the potential to benefit all uses, including Recreation.

SECTION 5. STRATEGIES & TOOLS

In order to implement this BIP, address the identified challenges and opportunities within the Southwest Basin and ensure reliable water supplies into the future the Roundtable has identified a suite of strategies and tools. Included are the overarching strategies considered by the Roundtable in development of the IPPs discussed in the following sections. Also included are big picture tools for implementation of the IPPs. The Roundtable recommends and supports these strategies and tools for implementation of IPPs and cross-basin cooperation.

5.1 STRATEGIES

The water supply in the Southwest Basin, as in the entire Colorado River Basin, is highly variable from year to year. Tree ring data for nearly 1,200 years indicates that the water supply has historically had decades long wet and dry cycles. These overarching strategies attempt to set a framework for how the Southwest Basin will "live" through these fluctuating water supplies while implementing our IPPs.

- The Roundtable treats and evaluates all IPPs equally, whether they are consumptive, non-consumptive, projects, or processes. This approach strengthens the foundation of collaboration and dialogue that already exists within the Southwest Basin, as well as the opportunities for partnerships to address existing and future water supply challenges. The potential to build partnerships across a range of interests and needs is identified as a key opportunity and strategy for achieving all of the goals and many of the measureable outcomes identified in this BIP.
- The Roundtable encourages sponsors to pursue a broad set of potentially complementary funding sources and to consider funding their projects from more than one source.
- The Roundtable intends to continue to cooperate with other Basin Roundtables to implement components of this BIP, as well as to address new challenges and pursue new opportunities that may arise in the future.
- Education and outreach about water values, water supplies, available funding options, and new information and tools will be a critical component for the implementation of this BIP. Education and outreach are specifically identified as strategies in measureable outcomes, IPPs or opportunities relating to M&I water conservation and reuse, agricultural water projects, recreational uses, water quality and watershed health.
- Continually improving water management and conservation by all water users is critical to meeting water demands of any type. At times there is simply not enough water to meet even one demand without considering all of the possible demands. Specific IPPs have not been developed for all possible management and conservation opportunities but overall strategies include:
    - Maintain and improve irrigation delivery facilities in order to reduce shortages, keep in production irrigated lands especially lands using pre-Compact water rights, and where possible leave additional flows in streams.

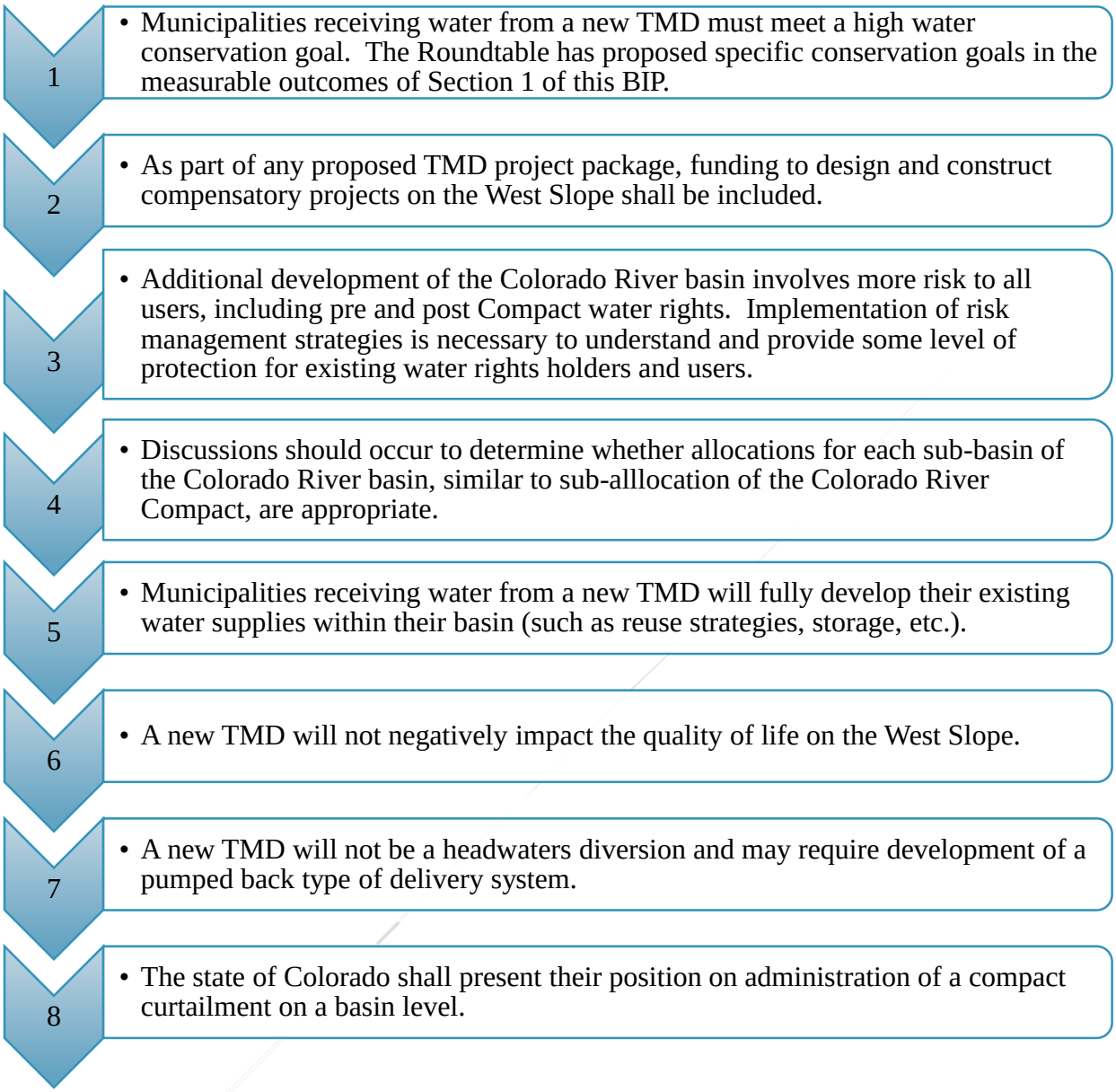
- Continue to reduce the amount of water needed for municipal, domestic, and industrial purposes through conservation efforts to meet the Roundtable's goal and measureable outcome herein.
- Investigate ways to maintain the desired values with available water supplies.

5.2 STRATEGIES RELATED TO NEW TRANSMOUNTAIN DIVERSIONS

The Roundtable is concerned about any new TMD. A new TMD would increase the risk of a Colorado River Compact curtailment, as well as the risk of contingency measures to address serious conditions such as the inability to generate power from Lake Powell or levels of Lake Mead dropping below Las Vegas's municipal water supply intake. An increase in such risks jeopardizes the Southwest Basin's ability to develop water supplies to meet needs in the Southwest Basin and puts additional pressure on the Southwest Basin's agriculture to meet downstream water needs for compact compliance and/or obligations.

The Roundtable recognizes that these increased risks are not limited to conveyance of west slope water through construction of new infrastructure. These risks can also be increased right now by new purchases of existing west slope water rights, including buy and dry of pre-1922 west slope agricultural water rights. Such purchases could conceivably occur in any basin along the west slope and be delivered across the divide by means of exchange, through existing infrastructure. This risk of buy and dry of west slope water to meet east slope demands is one of the concerns behind the Southwestern Water Conservation District's participation as a member of the Water Bank Working Group to develop a Compact Water Bank.

As a result of the concerns and risks described above, the Roundtable agrees on eight factors that must be addressed prior to considering a new TMD.



In addition to the factors the Roundtable has developed the following statement:

> *A new TMD must be considered in conjunction with alternative water sources that do not rely on the Colorado River basin water supplies.*

The Roundtable expresses serious concerns over a new TMD because of the potential impacts of the over-development of Colorado River Basin supplies could have on the economy, agriculture, and quality of life of west slope communities. Due to the lingering drought, the Colorado River Basin is looking less and less like a reliable source of water to support Colorado's urban development. Recently there has been significant concern about the water levels in Lakes Powell and Mead and there are on-going efforts through "system conservation" and "demand

management" to attempt to put more water into Lake Powell through curtailment of existing users. This drought is not an unusual situation based on the tree ring study from 760 to 2010 that shows droughts commonly occur for decades.

The IBCC has developed 7 points as a framework (IBCC Draft Conceptual Agreement; July 2014) for further discussion of a new TMD, one of them is "The East Slope is not looking for a firm yield from a new TMD project and would accept hydrologic risk for that project." The conceptual thinking has been that the East Slope would only divert when conditions at Lake Powell or the Colorado River Basin were above a yet to be determined trigger amount. Based on the current conditions, Lake Powell hasn't been much above 50% since 2002. Even without knowing what the trigger content might be, it is unlikely that water would have been available for most of the last 15 years under any trigger amount or scenario. In other words, billions of dollars could be spent on a new TMD without achieving the goal of supplying water to the Front Range while minimizing agricultural dry-up and removing the threat to west slope communities.

The Roundtable continues to firmly believe that conservation and reuse must be a major means to reduce demand and address future gaps and that no TMD should proceed unless high level conservation goals are achieved. However, assuming a new east slope municipal water source is required to minimize agricultural dry-up, there needs to be a thorough analysis of alternative water sources with criteria that include: annual cost per acre-foot of firm yield; benefits to entire state or just a portion of the state (since broader benefits allow costs be spread to more sectors); net environmental benefits; etc. For this to be a meaningful comparative analysis it needs to be led by the state and "Alternative Water Sources" must be more broadly defined to include not just the Colorado River basin and alternatives involving storage on the Front Range, but other reliable alternative water sources with strong emphasis on in-state alternatives. BOR's "Colorado River Basin Water Supply and Demand Study" provides a list of potential water sources north and east of the Colorado River basin such as the Missouri River and Mississippi River for comparison to the Colorado River basin.

Assuming an alternative water source can be developed and is needed, it will be sometime in the 2040's before any project can be constructed and operational. The other three "legs of the stool", especially conservation (e.g. municipal and agricultural) will be essential to meeting the interim water demand. The Roundtable maintains that meeting high level conservation goals and reuse is essential and no alternative water sources project should proceed without high levels of municipal conservation. Repayment of construction costs needs to be commensurate with benefits received.

Roundtable asserts that these evaluations are a statewide issue and need to be conducted by the state (probably CWCB) because some of the alternative water sources will involve state to state discussions and in some cases compact obligations. For this reason, the Colorado Water Plan should include the evaluation of alternative water sources. Individual or collective water providers are not appropriate entities to represent Colorado in these types of discussions. By having multiple alternatives to consider, the state can play a neutral role in critical comparative evaluation, without

being "pre-decisional" concerning potential outcomes. Leadership on the part of the state in a rigorous comparative evaluation process will provide a foundation for the Basin Roundtables, IBCC, CWCB, along with water providers, recreational and environmental advocates to work toward a statewide consensus.

In summary, the Roundtable does not make this proposal to delay a new TMD but to make sure the billions of dollars that will be spent on a new municipal water source actually provides a firm water supply that will minimize agricultural dry-up. The current drought in the Colorado River Basin indicates that a new TMD may also require significant agricultural dry-up to provide a firm supply. Therefore, a new TMD must be considered in comparison with alternative water sources that do not rely on Colorado River Basin water supplies. Any such new supply must be designed to minimize impacts on users throughout Colorado. The Colorado Water Plan needs to include planning for evaluation of such alternatives.

5.3 TOOLS FOR IMPLEMENTATION OF IPPS

EDUCATION

Key audiences for outreach about resources and tools to meet water needs include municipalities, drinking water suppliers, mutual ditch companies and irrigation districts, water conservation districts, water conservancy districts, recreational companies, resource agencies, non-governmental organizations, and the people of the Southwest Basin and the State of Colorado. Such education efforts can occur on many levels throughout the Southwest Basin, from individual water users and suppliers around the basin, to collaborative watershed groups, to the basin-wide level of the Southwestern Water Conservation District and the Water Information Program. Continued funding for the Water Information Program will help ensure that consistent information is shared and disseminated around the basin to all users and interests.

FUNDING MECHANISMS

It is clear that additional funding strategies and mechanisms will be needed to fully implement this BIP. One novel strategy with potential to develop and fund more multipurpose projects and potentially support multiple IPPs in one funding effort is the idea of "bundling" a package of proposals (e.g. bundling IPPs). Such a bundle might seek funding for a number of different projects within the Southwest Basin, within a sub-basin, or at a specific site. As an example, a municipal supply project could be "bundled" with an effort to benefit flows or aquatic habitat for a sensitive species elsewhere in the same sub-basin. Such a strategy might take a watershed health approach to meeting a broader set of watershed needs. The advantage of such a strategy is that it might be more easily funded due to the multipurpose nature of the packaged projects.

Using two or more complimentary funds from different levels of private, local, state and/or federal funding will often be helpful in obtaining the funding match required by any one source. Examples of some sources that may be complementary and could work well together depending on the IPP include:

Local	State	Federal
•Private Funds •Southwestern Water Conservation District •Southwest Basin Roundtable WSRA •Local governments	•Water Supply Reserve Account Grants from CWCB through the Roundtable •Loans from CWCB •Colorado Non-Point Source Program Grants •Southwest Wetland Focus Area Funding from CPW •Source Water Protection Planning Grants from CDPHE •Colorado Parks and Wildlife Grants (HPP, Fishing is Fun, etc) •Loans from the Colorado Water Resources and Power Development Authority for municipal water systems	•Working Lands for Wildlife Funds from the NRCS and USFWS •RCPP, EQIP, WIP, or CREP cost-share funds from NRCS •Water SMART grants (BOR). •Partners for Fish and Wildlife

This is NOT an exhaustive list. Grant funding programs come and go over time. Their availability changes with budgetary constraints and other factors. It is important to check early and often with individual agencies to see what funding options they may have available and when the deadlines are for application.

RECOMMENDATIONS

In addition to these strategies, the Roundtable submits three recommendations to the State of Colorado:

WSRA funds are a secure and important source of funds for implementation of the Southwest BIP. CWCB should not manage these funds on a "use it or lose it" basis. The Roundtable is concerned that doing so would discourage the development of more thoughtful and high quality IPPs by forcing the Roundtable to disperse these funds in a more quick and potentially indiscriminant fashion. The Roundtable recognizes that there are gaps in the data and understanding regarding the flows and other conditions necessary to sustain the environmental and recreational values identified in the Southwest Basin. The Roundtable also recognizes that the tools currently available to help maintain those conditions are limited. The Roundtable has identified

two IPPs, described below under "Partnerships", to help address and bridge this need for additional information and tools. These IPPs should be considered on even priority with other IPPs when considered for basin and state WSRA funding. Though the WSRA Supplemental Scoring Matrix describes a scoring matrix for ranking funding, this should only be used as one of many criteria and should NEVER be used as the sole criteria for funding.

PARTNERSHIPS

Developing partnerships and collaborative efforts can be an effective tool for accomplishing multi-purpose IPPs. Partnerships are particularly well suited to combine with two or more funding sources mentioned above. Partnering with different interests has the potential to expand the funding opportunities such as partnering with the Southern Ute Tribe and/or Ute Mountain Ute Tribe to support implementation of the Tribal Settlement and other mutually beneficial IPPs.

Hermosa Creek (Animas River basin)

The Roundtable specifically plans to use partnerships and collaboration to implement the following two IPPs developed by the Roundtable to help evaluate environmental and recreational gaps:

1. Evaluation of environmental and or recreation gaps is planned to be conducted for improvement of non-consumptive resources and/or in collaborative efforts with development of consumptive IPPs. The evaluations may be conducted by a subgroup of the Roundtable or by individuals, groups, or organizations with input from the Roundtable. The evaluation may utilize methodologies such as the southwest attribute map, flow evaluation tool, R2 Cross, and any other tools that may be available.
2. Where environmental and/or recreational gaps are identified, a collaborative effort will be initiated to develop innovative tools to protect water identified as necessary to address these gaps.

ADDITIONAL INFORMATION AND ANALYSIS

In developing this BIP, the Roundtable identified three key data gaps that need to be addressed in order to significantly improve the Southwest Basin's ability to plan for and ensure reliable water supplies for all uses into the future. The questions behind these data gaps are:

1. What are the current demands and future needs for water to serve all major industrial uses in the Southwest Basin (e.g. snowmaking, mining, oil and gas development, etc.)?
2. What are the water supply related needs of the non-community nonpublic water systems in the Southwest Basin? How can the Roundtable identify and improve communication and outreach to these systems?

3. What are the flows and other conditions necessary to sustain environmental or recreational values associated with specific reaches around the Southwest Basin? What are boatable flows for segments that support recreational whitewater boating values?
4. What new or existing tools can be developed and employed at the reach, local, basin and/or state level to maintain the conditions that sustain environmental or recreational values on segments around the Southwest Basin?
5. What specific stream and lake segments currently support environmental and recreational values within the Southwest Basin? What are those values? The segments and values mapped for SWSI 2010 need to be brought up to date.

By addressing these questions, the Roundtable plans to develop tools to fill data or analysis gaps that challenge the Southwest Basin's ability to adequately plan for and maintain water supplies for all values and uses within the Southwest Basin.

CROSS-BASIN COOPERATION

The Southwest Basin intends to continue its involvement in two current cross-basin cooperative efforts. One is the IBCC's effort to develop a conceptual agreement between roundtables regarding how to approach a potential future TMD from the west slope to the east, including the discussion of a possible future use allocation. The Southwest Basin is actively engaged in the West Slope Caucus discussions and supports further refinement of the seven points of framework (IBCC Draft Conceptual Agreement; July 2014). The Roundtable would like the opportunity to review and comment on any future refinements to said Framework.

The Southwest Basin's cooperative effort is through the Southwestern Water Conservation District's participation as a member of the Water Bank Working Group to develop a Compact Water Bank.

SECTION 6. HOW THE BIP MEETS THE ROUNDTABLE'S GOALS & MEASUREABLE OUTCOMES

The Roundtable has crafted the BIP to represent the values and goals of the Southwest Basin. The BIP's implementation will meet identified gaps and water supply needs as related to these goals and measurable outcomes. Where water supply needs and gaps are not known, the BIP provides for a process to develop the information and a loop back to revise the BIP as needed, consistent with the Roundtable's principle that the BIP is a "living document."

Since SWSI 2010, the Roundtable success rate for completing IPPs is 44%. A total of 55 projects were completed since the drafting of the SWSI 2010 list. While many projects are now complete, through the BIP outreach process over 80 projects were added to the list. Table 13 shows the breakdown of completed IPPs to date by sub-basin. At the end of 2014, the Roundtable had granted $1,906,626 from the Southwest Basin account and $5,162,859 from the statewide account.

TABLE 13. IPPS COMPLETED TO DATE

SUB-BASIN	IPPS OUTSTANDING FROM SWSI 2010	NEW IPPS	COMPLETED SINCE 2010	SUCCESS RATE FOR 2015 LIST
San Juan	4	12	3	43%
Piedra	3	2	7	70%
Pine	4	7	16	80%
Animas	16	18	13	45%
La Plata	6	10	0	0%
Mancos	6	15	4	40%
Dolores/McElmo	11	12	4	27%
San Miguel	21	8	8	28%
Total	**71**	**84**	**55**	**44%**

To date the list totals about 160 IPPs for all sub-basins. Of these 160, about 50% of the IPPs are for needs such as agricultural, municipal, and industrial while the remaining 50% of the IPPs are for environmental and recreational needs.

MEETING THEME A, B, C, AND F GOALS AND MEASUREABLE OUTCOMES

Table 14 shows how IPPs listed in Appendix A will address the following goals identified by the Roundtable in Section 1, assuming they are completed by 2050.

A. Balance All Needs and Reduce Conflict
B. Maintain Agriculture Water Needs
C. Meet Municipal and Industrial Water Needs

TABLE 14. HOW THE SOUTHWEST BASIN IMPLEMENTATION PLAN IPPS ADDRESS THEME A, B, C, F, AND G GOALS AND MEASUREABLE OUTCOMES

THEME	MEASUREABLE OUTCOME	SOUTHWEST BASIN IMPLEMENTATION PLAN
A	1. 100% of new IPPs shall consider from the initial planning stage maintaining and enhancing environmental and recreational needs.	Not known.
A	2. Complete 19 multipurpose IPPs to meet identified gaps.	19 IPPs on list to date.
A	3. Initiate and participate in 10 processes that promote dialogue, foster cooperation and resolve conflict.	10 IPPs on list to date.
A	4. At least 50% of sub-basins have existing or planned IPPs that are protective of critical infrastructure and/or environmental and recreational areas and watershed health.	100% of sub-basins have existing or planned IPPs.
A	5. All towns and major water supply systems with water supply infrastructure have watershed/ wildfire assessments that identify strategies/ treatments necessary to mitigate the impacts that occur to hydrology in a post-fire environment.	100%
A	6. All major reservoirs have watershed/ wildfire assessments that identify strategies/treatments necessary to mitigate the impacts that occur to hydrology in a post-fire environment.	100%
B	1. Implement agricultural sharing projects in order to help preserve agriculture and open space values, and to seek other means to address municipal, environmental, recreational, and industrial needs; while respecting private property rights.	No IPP.
B	2. Implement strategies that avoid permanent agriculture transfers.	No IPP.

TABLE 14. CONTINUED…

THEME	MEASUREABLE OUTCOME	SOUTHWEST BASIN IMPLEMENTATION PLAN
B	3. The water providers in the state that are using dry-up of agricultural land (defined as requiring a water court change case) and/or pursuing a new TMD (as defined by IBCC to be a new west slope to east slope diversion project) shall have a higher standard of conservation. The goal for these water providers is a ratio of 70/30.	For 2013: Pagosa (75/25) Durango (57/43) Cortez (60/40).
B	4. Implement at least 10 agricultural water efficiency projects identified as IPPs (by sub-basin).	10 IPPs.
C	1. Complete 41 IPPs identified in 2015 IPP list (includes all basins) aimed at meeting municipal water needs.	41 IPPs (about 30% of total IPP list).
C	2. Consistently meet 100% of residential, commercial and industrial water system demands in each sub-basin.	Unknown.
C	3. Implement projects that protect or enhance the ability of public water supply systems to access and deliver safe drinking water that meets all health-based standards.	1 SWPP IPP.
C	4. Change the ratio of in-house to outside treated water use for municipal and domestic water systems (referred to as water providers herein) from the current ratio of 50/50 to 60/40 for southwest Colorado and the entire State by 2030.	
C	5. Implement 3 informational events about water reuse efforts and strategies.	No IPP.

TABLE 14. CONTINUED…

THEME	MEASUREABLE OUTCOME	SOUTHWEST BASIN IMPLEMENTATION PLAN
C	6. The water providers in the state that are using dry-up of agricultural land (defined as requiring a water court change case) and/or pursuing a new TMD (as defined by IBCC to be a new west slope to east slope diversion project) shall have a higher standard of conservation. The goal for these water providers is a ratio of 70/30. Water providers proposing a new TMD shall achieve a 60/40 ratio by 2020 and 70/30 by 2030 (high conservation) as a prerequisite for the Roundtable to consider support of a new TMD.	Included in TMD criteria.
F	1. By 2016, replace the following statewide outcomes with outcomes based on the current status of these measures in the Roundtable area.	.
F	2. 60% of stream miles and 40% of reservoir acres attain water quality standards and support all designated uses.	TBD.
F	3. 15% of impaired stream miles and reservoir acres are restored to meet all applicable water quality standards.	TBD.
F	4. 50% of stream miles and 30% of reservoir acres are attaining water quality standards.	TBD.
F	5. 100% of existing direct use and conveyance use reservoirs attain the applicable standards that protect the water supply use classification.	TBD.
F	6. Implement 6 IPPs to monitor, protect or improve water quality.	6 IPPs.

TABLE 14. CONTINUED…

THEME	MEASUREABLE OUTCOME	SOUTHWEST BASIN IMPLEMENTATION PLAN
G	1. Water providers proposing a new TMD shall achieve a 60/40 ratio by 2020 and 70/30 by 2030 (high conservation) as a prerequisite for the Roundtable to consider support of a new TMD.	See above.
G	2. A conceptual agreement is developed between roundtables regarding how approach a potential future TMD from the West Slope to the East.	In progress.
G	3. Protect 100% of pre-compact water rights in the Southwest Basin.	Protected by current DWR policy on pre-22 rights.
G	4. Implement 2 IPPs aimed at utilizing Tribal Water Rights Settlement water.	2 IPPs.
G	5. Implement 2 IPPs aimed at meeting La Plata River compact.	2 IPPs.
G	6. Participate in Compact water bank efforts.	SWCD is participant in Water Bank Working Group.

MEETING THEME D AND E GOALS AND MEASUREABLE OUTCOMES

In order to begin to gage how well this BIP may address the goals and measureable outcomes identified to meet environmental and recreational water needs, the map of 2015 environmental and recreational IPPs (including multipurpose IPPs) (Figure 20 & 21) was overlaid onto Figures 2 and 3, the maps of Southwest Basin environmental and recreational attributes with no identified flow protections. This mapping allows an assessment of the stream reaches where environmental and recreational values exist with some level of protection, project, or process that could benefit the values to some extent, and of the stream reaches where no such protections, projects, or processes appear to exist.

FIGURE 21. MAP OF ALL 2015 ENVIRONMENTAL, RECREATIONAL OR MULTIPURPOSE IPPS; IDENTIFIED FLOW PROTECTIONS; AND RECREATIONAL ATTRIBUTES WITHOUT IDENTIFIED FLOW PROTECTIONS

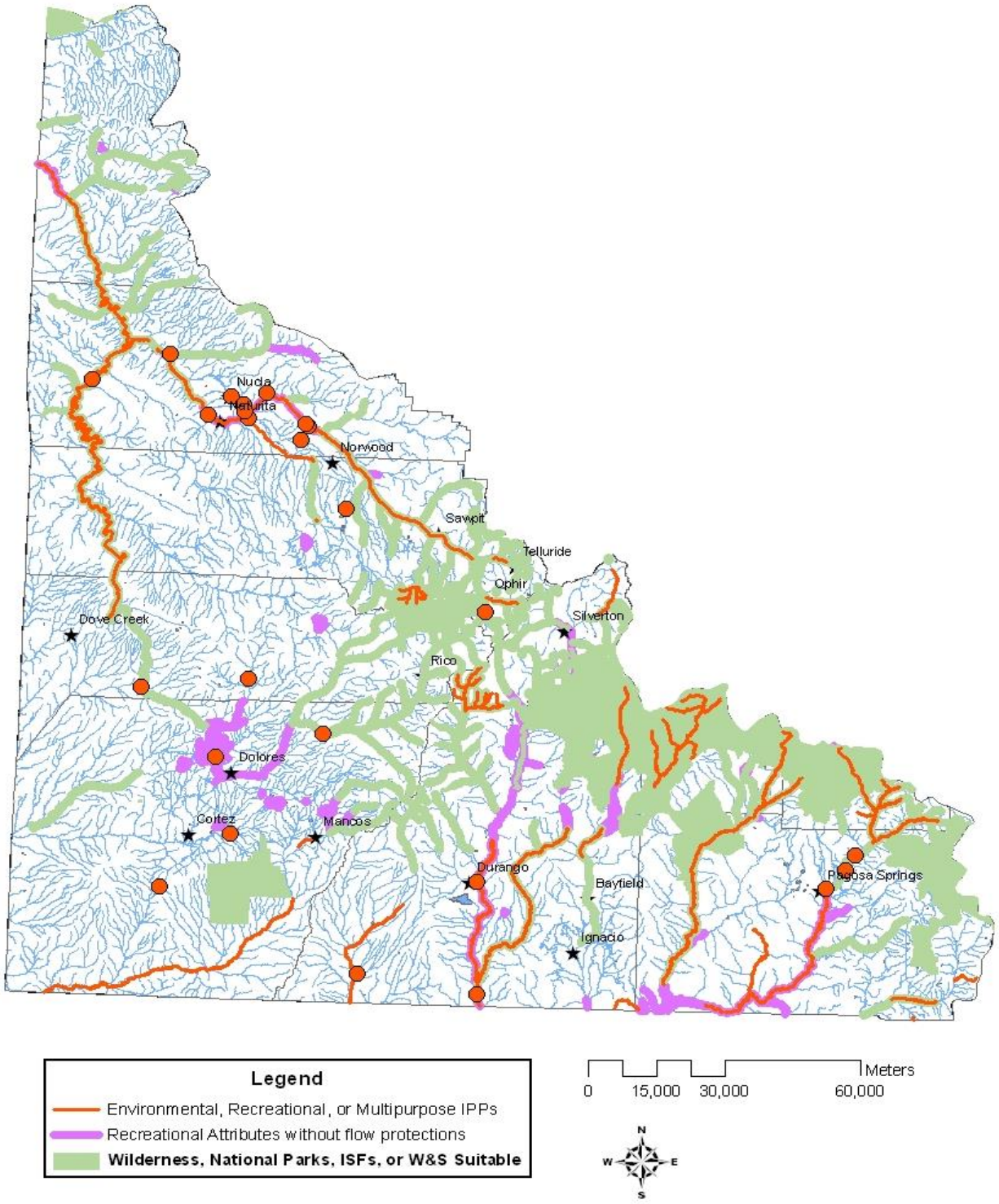
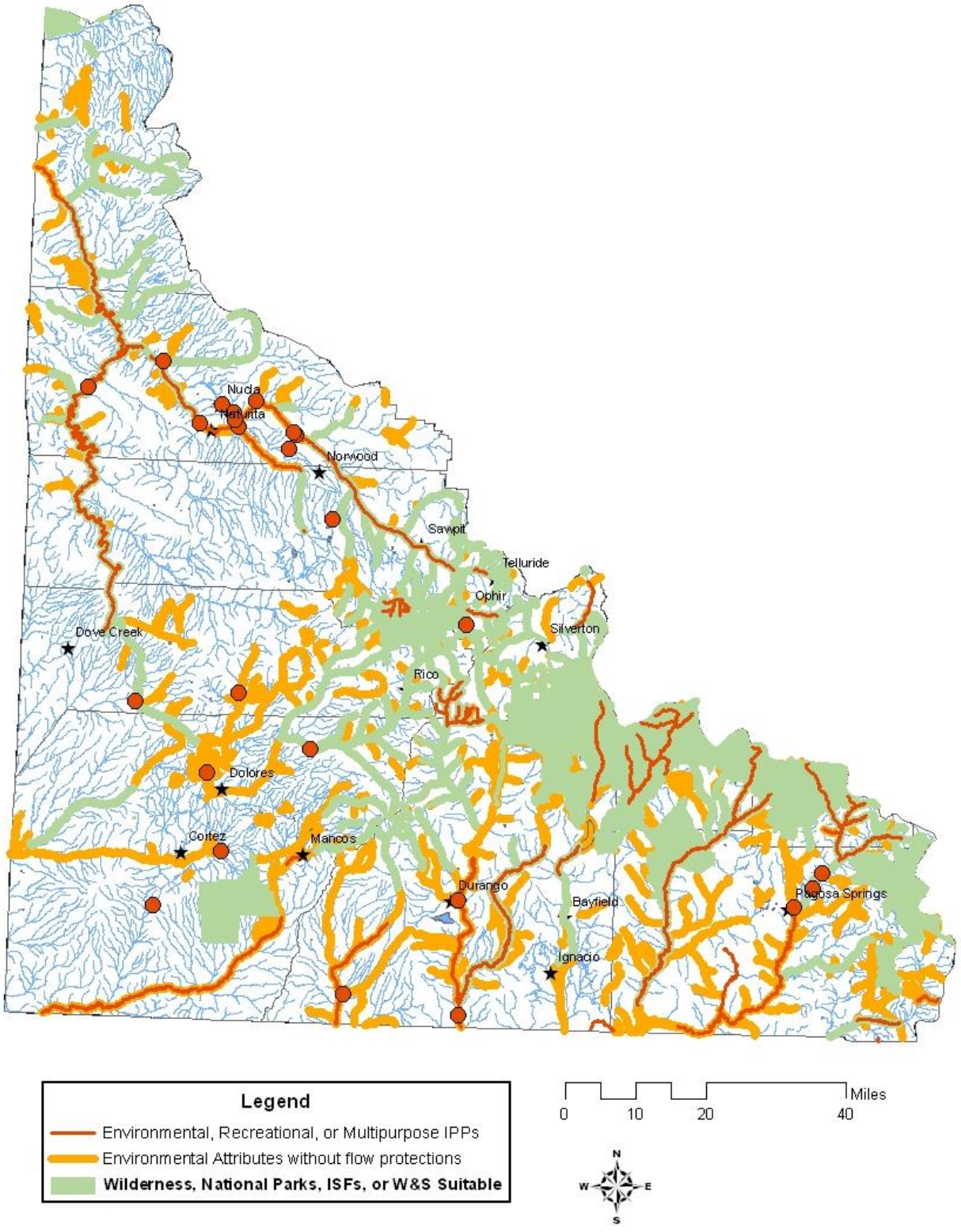


FIGURE 22. MAP OF ALL 2015 ENVIRONMENTAL, RECREATIONAL OR MULTIPURPOSE IPPS; IDENTIFIED FLOW PROTECTIONS; AND ENVIRONMENTAL ATTRIBUTES WITHOUT IDENTIFIED FLOW PROTECTIONS



The Roundtable recognizes that there are significant gaps in the data and understanding regarding the flow regimes (stream flow frequency, magnitude, duration, and timing) and other conditions necessary to sustain many of the environmental and recreational values identified in the Southwest Basin. The Roundtable also recognizes that the tools currently available to help maintain those conditions are limited. Therefore the Roundtable cautions against any assumption that the presence of an existing protection (e.g. ISF) or of an IPP is sufficient to maintain or sustain the attribute(s) identified in that reach. Assessment of the sufficiency of such measures depends on the particular attributes, the condition of the stream reach and the measures in place, and is better conducted on a reach by reach basis. The Roundtable has identified two IPPs that it hopes can help address and bridge these needs for more information and additional tools (Sections 4 and 5).

Table 15 summarizes available information about how well this BIP may address the suite of Theme D and Theme E goals and measureable outcomes identified in Section 1 upon completion of the environmental and recreational IPPs in Appendix A. The analyses of stream miles in this table makes use of the information on values developed in SWSI 2010, maps of the existing flow protections in the Southwest Basin (e.g. ISFs, Minimum Lake Levels, RICDs, Wilderness and National Park Service lands, and Wild and Scenic Suitability), and the Southwest Basin 2015 updated IPP list.

It is important to note that the stream mile percentages in Table 15 do not necessarily measure anticipated progress toward the corresponding measureable outcome upon implementation of the 2015 IPPs. Rather, these percentages represent only the miles out of all the stream miles occupied by a specific value, where some level of protection, benefit or attention from existing protections, or from current IPPs may exist upon completion of those IPPs. The Roundtable cannot measure the sufficiency of these protections or the anticipated projects and processes at this time.

TABLE 15. HOW THE SOUTHWEST BASIN IMPLEMENTATION PLAN IPPS MAY ADDRESS RECREATIONAL (THEME D) AND ENVIRONMENTAL (THEME E) MEASUREABLE OUTCOMES

THEME	MEASUREABLE OUTCOME	BASIN IMPLEMENTATION PLAN
D	1. Implement 10 IPPs to benefit recreational values and the economic value they provide.	There are 10 IPPs currently listed that involve education about, enhancement of, protection of, or access to recreational uses.
D	2. At least 80% of the areas with recreational opportunities have existing or planned IPPs that secure these opportunities and supporting flows/lake levels within the contemporary legal and water management context.	While the level to which they may be secure is unknown, the percent of total stream miles for each recreational attribute that have some level of protection, benefit or attention from existing protections or from existing or planned IPPs is: Whitewater Boating: 83% Flatwater Boating: 4% Gold Medal Trout Streams: 1% Other fishing Streams and Lakes: 60% Audubon Important Bird Areas: 8% Waterfowl Hunting /Viewing Parcels: 52% Ducks Unlimited Projects: 22% (Note: these cannot be added together for a total percentage because some attributes are found within the same reach.)
E	1. Implement 15 IPPs to directly restore, recover or sustain endangered, threatened, and imperiled aquatic and riparian dependent species and plant communities.	There are 10 IPPs listed that aim to restore, recover or sustain endangered, threatened, or imperiled aquatic or riparian dependent species or plant communities.
E	2. At least 95% of the areas with federally listed water-dependent species have existing or planned IPPs that secure the species in these reaches as much as they can be secured within the existing legal and water management context.	TBD. Not currently known because we do not currently possess maps of the habitat for these species.

TABLE 15. CONTINUED….

THEME	MEASUREABLE OUTCOME	BASIN IMPLEMENTATION PLAN
E	3. At least 90% of areas with identified sensitive species (other than ESA species) have existing or planned projects and methods that provide direct protection to these values.	While the level to which they may be protected is unknown, the percent of total stream miles for each sensitive species that have some level of protection, benefit or attention from existing protections or from existing or planned IPPs is: Colorado River Cutthroat Trout: 72% Roundtail Chub: 43% Bluehead Sucker: 49% Flannelmouth Sucker: 54% River Otter: 66% Northern Leopard Frog: 32% Active Bald Eagle Nests: 40% Rare Plants: 42% (Note: these cannot be added together for a total percentage because some attributes are found within the same reach.)
E	4. Implement 26 IPPs to benefit the condition of fisheries and riparian/wetland habitat.	There are 26 IPPs that aim to benefit the condition of fisheries, riparian or wetland habitat.
E	5. At least 80% of areas with environmental values have existing or planned projects and methods that provide direct protection to these values.	Not known.

REFERENCES

Bureau of Reclamation. 1979. Animas-La Plata Project Definite Plan Report Appendix B: Water Supply.

Colorado State Forest Service. 2008. Colorado Statewide Forest Resource Assessment: A Foundation for strategic discussion and implementation of forest management in Colorado. *Available online at http://csfs.colostate.edu/pages/statewide-forest-assessment.html*.

CRCT Coordination Team, 2006. Conservation strategy for Colorado River cutthroat trout (*oncorhynchus clarkii pleuriticus*) in the States of Colorado, Utah, and Wyoming. Colorado Division of Wildlife, Fort Collins, CO, 24p. http://cpw.state.co.us/Documents/Research/Aquatic/pdf/CRCT_Conservation_Strategy_Jun06.pdf.

Dolores River Restoration Partnership. 2010. Dolores River Riparian Action Plan (DR-RAP): Recommendations for Implementing Tamarisk Control & Restoration Efforts. Available online: http://www.tamariskcoalition.org/programs/dolores-river-restoration-partnership.

Utah Department of Natural Resources. 2006. Range-Wide Conservation Agreement and Strategy for Roundtail Chub *Gila Robusta*, Bluehead Sucker *Catostomus Discobolus*, and Flannelmouth Sucker *Catostomus Latipinnis*", Utah Department of Natural Resources, Division of Wildlife Resources, Publication Number 06-18, 2006. see: http://cpw.state.co.us/Documents/WildlifeSpecies/SpeciesOfConcern/RecoveryPlans/ChubSuckerRangewideConservationAgreementandStrategy01-04-07.pdf

Water Information Program. (2012). *Southwest Basin Roundtable outreach action plan*. Durango, CO.