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Chapter 6: Water Supply Management for the Future

INITIAL DRAFT 6.6: Environmental and Recreational Projects and Methods
(previously Chapter 5.9)

The policy of the state of Colorado is to identify and implement environmental and recreational projects to achieve the following statewide long-term goals:

- Promote Restoration, Recovery, and Sustainability of Endangered, Threatened, and Imperiled Aquatic and Riparian Dependent Species and Plant Communities
- Protect and Enhance Economic Values to Local and Statewide Economies Derived from Environmental and Recreational Water Uses, Such as Fishing, Boating, Waterfowl Hunting, Wildlife Watching, Camping, and Hiking
- Support the Development of Multi- Purpose Projects and Methods that Benefit Environmental and Recreational Water Needs as well as Water Needs for Communities or Agriculture
- Protect, Maintain, and Improve Conditions of Streams, Lakes, Wetlands, and Riparian Areas to Promote Self- Sustaining Fisheries and Functional Riparian and Wetland Habitat to Promote Long-Term Sustainability
- Maintain Watershed Health – Protect or Restore Watershed that Could Affect Critical Infrastructure and/or Environmental and Recreational Areas

The importance of Colorado's natural environment and recreational opportunities to its quality of life and to its economy cannot be overstated. Outdoor recreation (including hunting, fishing, wildlife watching and many other types of outdoor activities) contributes nearly $34.5 billion to Colorado's economy annually.[i] Outdoor recreation directly supports 201,442 jobs in Colorado each year.[ii] Hunting contributes $919 million to Colorado's economy each year, while fishing contributes $1.92 billion and wildlife watching contributes $2.28 billion.[iii] Healthy watersheds, rivers and streams, and wildlife are vital to maintaining Colorado's quality of life and a robust economy.

This section details the projects and methods by which environmental and recreational water needs have been safeguarded in the past, as well as how these values may be maintained in the future. The benefits of such projects and methods, and existing examples, are described. This section contains several subparts: 1) an overview of existing tools for expanding the understanding of environmental and recreational needs; 2) an account of gaps in knowledge; 3) an overview of environmental and recreational statutes and recent legislation; and, 4) a description of projects and methods contained in the eight Basin Implementation Plans.

6.6.1 Overview

Water is a crucial element in maintaining the environmental and recreational values important to Coloradans. Without adequate streamflow, the outstanding fisheries in the upper Arkansas River will diminish, and rafting through Glenwood Canyon would become less attractive with every portage. Adequate water supply is one crucial element to maintaining habitat for the water dependent natural environment. In addition the environment depends upon water quality, connectivity, in stream, and riparian habitats, and geomorphology. Issues have arisen in the past fifty years regarding endangered species, and careful water management and dedication of significant resources allowed progress towards recovering these threatened and endangered species. The importance of recreation to Colorado's economy is undeniable, and much of it depends upon water supply resources. For instance, ski seasons would be shorter and of less certainty without innovations in snowmaking technology, which are water-dependent.

However, the demands on Colorado's water supply are growing, as detailed in other sections of Colorado's Water Plan. Meeting environmental and recreational needs must be included as an important piece of comprehensive water planning, along with agricultural, municipal, and industrial needs. The IBCC's draft conceptual agreement supports this concept and states,

> Colorado's Water Plan, BIPs, and stakeholder groups across the state should identify, secure funding for, and implement projects that help recover imperiled species and enhance ecological resiliency whether or not a new [transmountain diversion] is built. This could create conditions under which future projects may be possible…. These existing environmental and recreational gaps should be meaningfully addressed in the near term.[iv]

Projects and methods that maintain or improve Colorado's environmental and recreational values are an important part of Colorado's water future.

The challenges faced by environmental and recreational project proponents in the future include making the most of limited funding opportunities. Environmental and recreational needs have a host of non-governmental proponents; however, funding opportunities are minimal when compared with existing programs for municipal, industrial, or agricultural uses. For this reason, strategic partnerships are a necessity when looking to the future of this type of project or method. Project proponents seeking to fund additional storage or a new diversion may find that working with a diverse group of stakeholders from the beginning will make the process more successful. For a new project or method, multipurpose uses have been identified by the draft BIPs as desirable, and working towards an environmental or recreational use to be associated with the project will garner support of a wider range of stakeholders. For example, if a new storage project could identify a potential associated recreational opportunity, such as boating or fishing, a greater range of advocates can be counted on to support the project through permitting and financing.

This sort of strategic cooperation on environmental and recreational projects and methods has proven to be a successful mechanism in the past, as will be examined later in this section. In planning for this sort of project or method, proponents must also take into account the watershed nature of projects and methods, and the manner by which they influence more than just one particular reach. With an eye to serving multiple purposes, proponents may also consider a project or method which meets multiple environmental and recreational purposes, in a reach where it has the most beneficial outcome.

With multipurpose projects in mind, it is important to note that many environmental and recreational needs benefit from existing uses. Although there can be impacts to the environment and recreational interests from municipal or agricultural projects, these uses can also provide benefits. A reservoir provides wildlife and fish habitat and recreational opportunities for visitors, and provides a mechanism for beneficial management of stream flows. Agricultural water uses also provide these types of benefits. The cultivation of crops around the state provides habitat and open space for many species, and the agricultural tourism sector has boomed in Colorado, with wineries and orchards around the state bringing visitors and development to agriculturally-centered communities. These direct benefits are obvious, but agricultural diversions also offer some indirect benefits. Diversions that occur in the irrigation season come back to the stream in the form of return flows. These late-season return flows that occur in early fall provide a boost to stream flows which would otherwise not be present. These retimed flows benefit riparian health and provide instream habitat.

6.6.2. Existing Environmental and Recreational Projects and Methods

Recognizing the value of a robust recreational economy and the obvious benefits of healthy ecosystems, Colorado has implemented programs and invested in projects to protect and improve these attributes. Below are some examples of these programs and projects.

Colorado's Instream Flow and Natural Lake Level Program

In 1973, the Colorado legislature recognized the need to "correlate the activities of mankind with some reasonable preservation of the natural environment" and passed Senate Bill 97, creating the State's Instream Flow and Natural Lake Level Program.[v] This program, one of the first of its kind, vested the Colorado Water Conservation Board (CWCB) with exclusive authority to protect streamflow through a reach of stream rather than just at a point, and to protect levels in natural lakes. Before this law was passed, all appropriations of water in Colorado were required to divert water from its natural course in the stream.[vi] SB 97 removed the diversion requirement for the CWCB and allowed the Board to appropriate water instream between specific points on a stream, and for levels on natural lakes.[vii]

Any person or entity may recommend streams and lakes for appropriation to preserve the natural environment. The CWCB also is required to request recommendations from Colorado Parks and Wildife, the U.S. Dept. of Agriculture and the U.S. Dept. of the Interior.[viii] The CWCB uses a public notice and comment procedure in determining whether to appropriate instream flow water rights.[ix] Before applying to water court for an instream flow water right, the CWCB must determine that: (1) there is a natural environment that can be preserved to a reasonable degree with the instream flow water right; (2) the natural environment will be preserved to a reasonable degree by the water available for the appropriation; and (3) such environment can exist without material injury to water rights.[x] Once decreed by the water court, instream flow water rights are administered within the State's water rights priority system like any other water right in the state. The CWCB has legal standing in water court to protect instream flow water rights from injury at any point within an instream flow reach.

The CWCB also can acquire water, water rights and interests in water to preserve and improve the natural environment on a permanent or temporary basis from willing water rights owners. The acquisition process includes a biological analysis by Colorado Parks and Wildlife, CWCB consideration of several factors related to the transaction, and opportunity for public input.[xi]

Since 1973, Colorado has appropriated instream flow water rights covering over 9,200 miles of stream and natural lake level water rights on 486 natural lakes.[xii] This protection represents approximately 30% of the perennial stream miles in the state. In addition, the CWCB has completed 26 water acquisition transactions, including acquisitions to protect critical habitat for endangered species on the Yampa River, to improve the natural environment of the Blue River downstream from Dillon Reservoir, and to restore native flows to a degraded stream system near Silverton, Colorado.[xiii]

Following are specific examples of instream flow and natural lake level water rights that were appropriated or acquired to preserve, and in some cases to improve,[xiv] the natural environment to a reasonable degree.

Black Hollow Creek

In 2010, based upon a recommendation from Colorado Parks and Wildlife, the CWCB appropriated an instream flow water right on approximately 5.5 miles of Black Hollow Creek in Larimer County from the stream's headwaters down to the confluence with the Cache La Poudre River. This appropriation protects flows in three different seasons: 2.2 cfs from May 1 to September 30; 1.4 cfs from October 1 to November 15; and 0.75 cfs from November 16 to April 30. The natural environment in this segment of stream consists of a healthy population of greenback cutthroat trout.

Deadhorse Creek and Hanging Lake

In 1996, the CWCB appropriated water rights on both Hanging Lake and Dead Horse Creek and determined that all of the unappropriated water in this stream and lake system was required to preserve the natural environment to a reasonable degree. The CWCB took this approach based upon the fact that the natural environments on the lake and creek are unique, consisting of distinct assemblages of riparian vegetation, endemic hanging garden communities and globally imperiled species.

Big Dominguez and Little Dominguez Creeks

In 2011, the CWCB appropriated all of the unappropriated water on both Big Dominguez and Little Dominguez Creeks to preserve both aquatic and riparian aspects of the natural environment. These ISF appropriations not only preserve distinct fish populations, but also protect amphibians, aquatic insects and increasingly rare and distinctive communities of cottonwood trees and other associated riparian vegetation. Another important objective for these appropriations was to maintain the creeks in their natural pristine condition due to their location in a designated Wilderness Area.

Colorado River Instream Flow Reaches from the Blue River to the Confluence with the Eagle River

In 2011, the CWCB appropriated water rights on three segments of the mainstem of the Colorado River: (1) Blue River to the Piney River; 2) Piney River to the confluence with Cabin Creek; and 3) Cabin Creek to a point immediately upstream from the Eagle River. These reaches, which appropriated between 500 and 900 cfs at various times throughout the year, were recommended by the Upper Colorado River Wild and Scenic Stakeholder Group as an acceptable alternative to a finding of suitability for Wild and Scenic designation for the subject reaches.

Acquisition to Implement Portion of the Colorado River Cooperative Agreement on the Fraser River and its Tributaries, Williams Fork River and its Tributaries, and the Colorado River

Under a Water Delivery Agreement and water court decree, Denver Water will provide annually 1,000 acre-feet of water to Grand County for instream flow use by the CWCB. The instream flow use will consist of: (1) preserving the natural environment to a reasonable degree by maintaining flows in stream reaches where the CWCB has decreed instream flow water rights when those rights are not satisfied; (2) improving the natural environment to a reasonable degree by increasing flows in existing instream flow reaches above the CWCB's decreed amounts up to recommended flow rates; and (3) improving the natural environment to a reasonable degree on streams with no existing instream flow water rights.

Acquisition of Breem Ditch Water Right for Instream Flow Use on Washington Gulch and Slate River

Under a Water Conservation Use Right and water court decree, CWCB may use the senior Breem Ditch water right that once swept the stream dry to re-water the stream. This water will be used to preserve and improve the natural environment to a reasonable degree on Washington Gulch and to preserve the natural environment to a reasonable degree on the Slate River. The historical consumptive portion of the water right may be diverted downstream of the instream flow reaches for municipal use by Skyland Metropolitan District, thus making multiple uses of the changed irrigation right for consumptive (municipal) and non-consumptive (environmental) uses.

Three Species Agreement

Colorado Parks and Wildlife (CPW), five other Colorado River Basin state wildlife agencies, the United States Forest Service (USFS), Bureau of Land Management (BLM), Bureau of Reclamation (BOR), and sovereign tribes are parties to a multi-state, multi-agency, range-wide conservation and strategy agreement that provides the framework for conservation actions designed to preserve three declining native fish species: roundtail chub, bluehead sucker, and flannelmouth sucker, across their historic range[xv]. Noting range-wide declines of these species, the Three Species Agreement addresses the species' potential for listing by the U. S. Fish and Wildlife Service (USFWS) as threatened or endangered under the Endangered Species Act of 1973, as amended (ESA). The USFWS relies on implementation of the multi-state Three Species Agreement to protect and conserve these three native warm-water species.

The Three Species Agreement provides that within their jurisdictional authorities, signatories are responsible for taking action to conserve native fish, coordinating status assessments, developing and maintaining data sets on occupancy and genetics, and documenting conservation measures taken on behalf of the three species. It encourages all signatories to cooperate on science, research, education and outreach to send a clear and consistent message about conservation of these species. The agreement is predicated on the concept that collectively, local, state, and 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. Establishment of instream flow protection for streams known to provide habitat for the three species is identified as a priority conservation action under this agreement. CPW and BLM have recommended that the CWCB appropriate instream flow water rights to preserve the habitat of the three species. A recent example of such an appropriation is an instream flow water right

on the San Miguel River from Calamity Draw to the confluence with the Dolores River, decreed in May 2013.

Recreational In-Channel Diversions

Since 2001, Colorado is one of several states that authorize the appropriation of water rights for recreational boating purposes within a natural stream if there are structures in the stream that create recreational experiences. These water rights are known in Colorado as recreational in-channel diversions (RICDs).[xvi] These water rights allow water to be called for recreational boating purposes when in priority. The size and magnitude of river flows called by RICD water rights have the potential to restrict future upstream development potential and may reduce the flexibility that Colorado has to manage its water resources. Thus, under Colorado water law, RICDs are limited to the minimum stream flow necessary for a reasonable recreational experience and must be diverted through a control structure, often a whitewater park itself.[xvii] Only a local governmental entity may apply for a RICD.[xviii] The statutes require that any application to water court for a RICD must be considered by the CWCB after deliberation in a public meeting to determine whether the proposed RICD will:

1. Promote the maximum beneficial use of waters of the state;
2. impair Colorado's ability to fully develop and use its compact entitlements; and
3. cause material injury to CWCB instream flow water rights.[xix]

The CWCB then provides its findings to the water court for consideration. The water courts must also consider whether:

1. The water right sought is the minimum necessary for a reasonable recreational experience;
2. the RICD is accessible to the public; and
3. the RICD includes only that stream reach that is appropriate for the intended use.

Coloradans and visitors currently enjoy twelve existing whitewater parks with RICD water rights and eight existing whitewater parks that operate without a RICD. Additionally, there are eight conditional and one pending RICD water rights, with whitewater parks yet to be constructed.[xx] Colorado's existing and planned whitewater parks are illustrated in the map below (Figure 6.6-1).

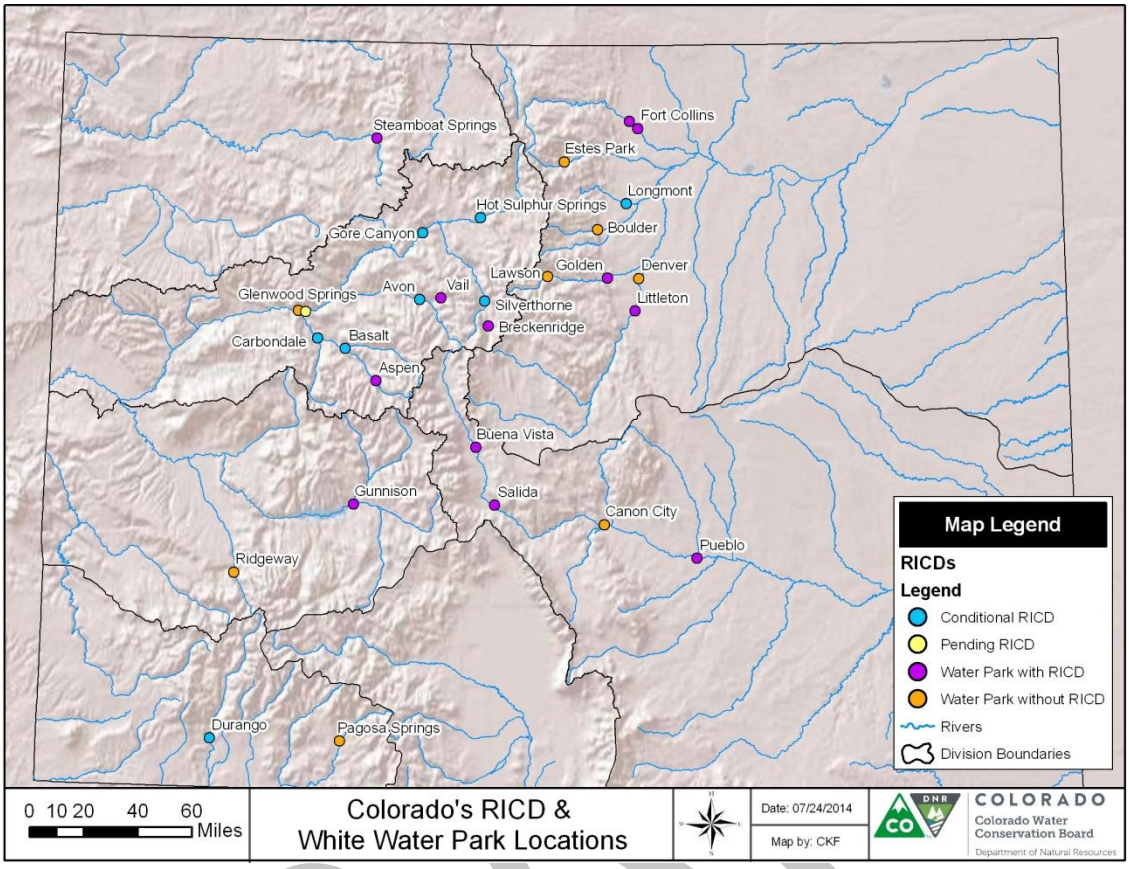

Figure 6.6-1 Existing and Planned Whitewater Parks

Endangered Species Recovery Programs

Many of Colorado's water projects are likely to have what is known as a "federal nexus." A water project is considered to have a federal nexus if it involves federal funding, federal permitting or licensing, use of federal lands, or a federal program. The existence of a federal nexus often triggers the need for consultation under Section 7 of the Endangered Species Act (ESA).[xxi] The result of a Section 7 consultation is a biological opinion (BO) that states whether a project is likely to jeopardize the continued existence of listed threatened or endangered species or result in the destruction or adverse modification of critical habitat.

To mitigate these impacts, Colorado participates in three cooperative programs to protect and recover stream-dependent species in various river basins. The Upper Colorado, San Juan and Platte River Recovery Programs provide organized collaboration between states, Federal agencies, local agencies, water users, water providers, power providers and environmental organizations. The goal of the programs is to recover the endangered species while allowing water use and development to continue, in compliance with all applicable state and federal laws and interstate compacts.

Funding and resources from participants are dedicated to activities to benefit the species.

Collaboration and focus on recovery activities are intended to

- maximize benefit to the species and the environment from the funding and resources expended,

- minimize resources spent on adversarial activities, including litigation,
- provide Endangered Species Act (ESA) compliance for water users,
- streamline Section 7 consultations for water users and Federal agencies
- reduce uncertainty and delays in planning and permitting processes
- reduce likelihood of jeopardy opinions

Upper Colorado River Recovery Implementation Program (UCRRIP)

The UCRIP was established in 1988 as a unique partnership of various interests in Colorado, Wyoming and Utah working towards recovery of four endangered fish species: humpback chub, bonytail, razorback sucker and Colorado pikeminnow. These species are long-lived warm-water fish endemic to the Colorado River Basin. Recovery efforts focus on creating self-sustaining populations of native fish through restoration and management of habitat, propagation and stocking of hatchery-raised fish, and management of certain deleterious non-native fish species throughout the mainstem Colorado, Gunnison, Yampa and White and Green River basins.

The UCRIP provides ESA compliance for over 2,050 water projects with more than 2.5 million acre-feet of existing water use and over 300,000 acre-feet of new development. No lawsuits have been filed on the ESA compliance of any of these water projects. Procedures, projects and agreements have been established to provide streamflow protection, voluntary flow augmentation during critical spring peak and late summer time periods, habitat management and improved habitat access, genetic propagation, hatchery and stocking operations, non-native fish control efforts, and research and monitoring. The cooperative nature of the program has led to multiple successes and cost-efficiency, and the program has become a model for other endangered species recovery programs.[xxii]

San Juan River Recovery Implementation Program (SJRRIP)

The SJRIP was established in 1992 for this major tributary to the Colorado River. The Navajo Nation, Jicarilla Apache Nation, Southern Ute Indian Tribe, and Ute Mountain Ute Indian Tribe are active partners in this collaborative effort to recover the razorback sucker and Colorado pikeminnow within the San Juan River basin in Colorado and New Mexico.

The SJRIP provides ESA compliance for over 340 water projects using over 880,000 acre-feet of water in the San Juan River basin. Major accomplishments include extensive research in biology and geomorphology, and the establishment of procedures and agreements to provide streamflow augmentation and protection, habitat management and improvement, genetic propagation, hatchery and stocking operations, non-native fish control, and continued research and monitoring.[xxiii]

Platte River Recovery Implementation Program (PRRIP)

During the early 1990s, all Endangered Species Act Section 7 consultations conducted on Platte River projects received jeopardy biological opinions, which meant that these water projects could not proceed. The solution to this predicament was the creation of a collaborative conservation partnership now known as the Platte River Recovery Implementation Program (PRRIP).[xxiv]

PRRIP is now working to recover four threatened and endangered species (the whooping crane, interior least tern, piping plover and pallid sturgeon) in Nebraska, which in turn, allows water use and development to continue on the Platte River. This program involves the states of Wyoming, Nebraska, and Colorado, federal agencies, and many water, power and environmental interests. This Program provides ESA compliance for water projects and fully complies with the participating states' water law

as well as interstate river compacts and decrees. The program is being implemented in an incremental manner, with the first increment programmatic biological opinion (PBO) covering the 13-year period from 2007 through 2019.

PRRIP has been officially in place since 2007 and has resulted in 117 successful streamlined Section 7 consultations using the PBO for any entity that joins the South Platte Water Related Activities Program (SPWRAP). The preceding Cooperative Agreement, signed in 1997, resulted in bridge measures to allow for ESA compliance for approximately 120 Platte River basin consultations while negotiations for PRRIP were underway.

Through 2019, South Platte water users will pay more than $13 Million and the State of Colorado will pay $24 Million (in 2005 dollars) for PRRIP. However, the PRRIP is thought to be well worth the cost when compared to the untold cost that water users would likely face without the program, including:

- Undergoing uncertain, individual Section 7 consultations including bearing the risk of receiving jeopardy biological opinions,
- potentially being required to replace past and future depletions on a one-to-one basis, which will likely add additional pressure to dry up agriculture,
- delays in the planning and permitting process, and
- the risk of having existing programmatic biological opinions challenged in court.

Wild and Scenic Rivers

The National Wild and Scenic Rivers Act requires federal land agencies (including the Bureau of Land Management [BLM], National Park Service [NPS], and U.S. Forest Service [USFS], U.S. Fish and Wildlife Service[USFWS]) to identify and evaluate rivers that may be "eligible" and "suitable" for designation as a wild and scenic river, through their land and resource management planning processes.[xxv]

To be eligible, a river, stream, or segment must be free-flowing and must possess at least one Outstanding Remarkable Value (ORV) including scenic, recreational, geologic, fish and wildlife, historic, cultural, or similar values. Once eligibility is established, those rivers or river segments are then evaluated for their suitability for designation as a wild and scenic river.[xxvi] Many factors are considered in the suitability evaluation, including whether there is a demonstrated commitment to protect the river and its ORVs by nonfederal entities who may implement protective management.

River segments found suitable may be recommended for designation as a wild and scenic river. However, designation may only be done by an act of the Secretary of the Interior (upon request by a Governor) or by an act of Congress.

If a river is designated as a wild and scenic river, a federal reserved water right is created for a quantity of water necessary to achieve the Act's purposes, including protecting the values for which a river is designated. Furthermore, any water projects with a federal nexus that exist in, above or below a designated reach could be prohibited through the ESA Section 7 consultation process if they would "invade the area or unreasonably diminish the ORV."[xxvii] Also, the Federal Energy Regulatory Commission (FERC) may be prohibited from issuing a new license if a project is "on or directly affecting" a designated river. Additionally, the federal land agencies, to the extent of their authority, may also protect the free flow, water quality, the classification and ORVs for candidate (eligible and

suitable) Wild and Scenic Rivers. These protections implemented by the federal land agencies may also impact potential water projects.

In 2009, Colorado's General Assembly established the Colorado Water Conservation Board Wild and Scenic Rivers Act Alternatives Fund (W&S Fund) to support cooperative and collaborative processes that are committed to exploring alternative avenues for resource protection.[xxviii] These processes typically consist of stakeholder groups aimed at protecting the ORVs associated with rivers within Colorado, while protecting Colorado's ability to fully use its compact and decree entitlements through finding alternatives to wild and scenic designation that satisfy the federal agencies' requirements to protect the ORVs.

The Cache La Poudre River is the only river in Colorado currently designated as a wild and scenic river.[xxix] However, several river segments in Colorado are currently being evaluated for wild and scenic eligibility and suitability by the BLM and USFS as part of their current land and resource management planning processes. Currently, there are three active stakeholder groups utilizing the W&S Fund to develop alternative ways of protecting the ORVs identified by these federal agencies: the Upper Colorado River Wild and Scenic Stakeholder Group (UCRW&S SG), the River Protection Workgroup (RPW) and the Dolores River Dialogue's Lower Dolores Plan Working Group (LDPWG). Additionally, the South Platte Enhancement Board (SPEB) has been active since 1997 to implement its alternative plan to a possible designation under the Wild & Scenic Rivers Act.[xxx]

6.6.3. State of Knowledge

As part of the process established in 2005 by the Colorado Water for the 21st Century Act, the nine Basin Roundtables and the CWCB have worked to identify Colorado's environmental and recreational water needs, also referred to as nonconsumptive needs. Below is a brief description of some of the resources that have been developed so far. However, it is apparent that there is additional work that can be done to develop common metrics for environmental and recreational attributes.

Statewide Water Supply Initiative (SWSI) Phase 1. Nonconsumptive Mapping (2010): As part of the nonconsumptive needs assessments, each basin roundtable mapped where important nonconsumptive attributes exist. These reaches or watersheds are known as "focus areas." Each focus area is associated with one or more attributes such as imperiled fish species, important boating and fishing areas, important water fowl hunting areas, etc.[xxxi] Environmental attributes identified by the roundtables include federal and state threatened, endangered and imperiled species (e.g., piping plover, greenback cutthroat trout, boreal toad, bluehead sucker); significant riparian wetland plant communities; and special value waters (e.g. CWCB instream flow water rights, eligible Wild and Scenic rivers).[xxxii] Recreational attributes identified by the roundtables include whitewater and flatwater boating; cold and warm water fishing; Audubon important bird areas; waterfowl hunting and wildlife viewing.

SWSI Phase 2. Nonconsumptive Projects and Methods (2010): Phase 2 determined where planned and existing nonconsumptive projects and methods, also known as identified projects and processes (IPPs), are located in relation to the focus areas developed in Phase 1. This information can be used to determine where known nonconsumptive IPPs offer direct or indirect protection for a specific attribute, and equally as important, where there are no known protections for a given focus area. For example, based upon this information, important riparian and wetland areas cover 18,767 stream miles statewide.[xxxiii] Of those miles, IPPs provide direct protection to 2%, a combination of

direct and indirect protection to 2%, and indirect protection to 23%. 73% of those stream miles currently have no known protection in place. The survey information was organized in a database along with Phase 1 information and was summarized in maps created using geographic information system (GIS).[xxxiv] The maps include a list of planned nonconsumptive projects and methods, and show: (1) where planned and existing projects and methods overlap with the nonconsumptive focus areas and (2) where there are no known projects that support those reaches.

Watershed Flow Evaluation Tool: CWCB partnered with The Nature Conservancy (TNC) and CDM Smith to pilot a tool known as the Watershed Flow Evaluation Tool (WFET). The WFET provides a regional framework for examining the risk of ecological change related to stream flow alteration. The WFET can help identify reaches where the historical alteration of stream flow has either increased risk or decreased risk for a given attribute, such as cold water fishery, warm water fishery, and sustaining or recovering cottonwoods. The WFET can also be used to examine ecological responses to future streamflow scenarios resulting from new water development projects, a compact call, or climate change. The Colorado and Yampa-White Basin Roundtables further improved the WFET and applied it to their basins.

While this body of work represents an increase in the understanding of Colorado's nonconsumptive needs, there is more work that needs to be done towards understanding and quantifying recreational and environmental needs. Additionally, information is needed on whether existing nonconsumptive IPPs are sufficient to protect the targeted environmental and recreational attributes of the IPP. Based upon the above-described information, Colorado can work on developing a strategic approach to meeting its nonconsumptive needs to provide meaningful protection to environmental and recreational attributes.

6.6.4. Existing Law and Recent Legislative Activity

Existing Environmental and Recreational Legislation

Instream Flow Legislation

Colorado's General Assembly established the Instream Flow and Natural Lake Level Program in 1973, recognizing "the need to correlate the activities of mankind with some reasonable preservation of the natural environment."[xxxv] This legislation vested the CWCB with exclusive authority "on behalf of the people of the state of Colorado, to appropriate or acquire...such waters of natural streams and lakes as may be required to preserve the natural environment to a reasonable degree."[xxxvi] Over the years, the General Assembly has amended and clarified aspects of this legislation. Highlights of recent legislation are set forth below.

In 2002, Senate Bill 156 authorized CWCB to use acquired water rights to improve the natural environment to a reasonable degree.[xxxvii] In 2003 and 2005, the General Assembly responded to the 2002 drought conditions by allowing temporary changes of water rights to instream flow purposes with State Engineer approval.[xxxviii] In 2007 and 2008, the General Assembly established protection for water rights owners who lease water to CWCB for instream flow use by providing that a lease to CWCB will not reduce the historical consumptive use of a water right, and eliminates the presumption of abandonment for water rights that have been used nonconsumptively by the CWCB.[xxxix]

In 2008, the General Assembly authorized an annual appropriation of $1,000,000 from the CWCB Construction Fund for costs of acquiring water for instream flow use.[xl] That same year, the General Assembly authorized an annual appropriation of $500,000 from the Species Conservation Trust Fund for the costs of acquiring water for instream flow use to preserve or improve the natural environment of species that have been listed as threatened or endangered under state or federal law, , or are candidate species or are likely to become candidate species.[xli] In 2009, the General Assembly established a tax credit that created a market-based incentive for voluntary donation of water rights to the CWCB for instream flow use.[xlii]

Recreational In-Channel Diversion Legislation

In 2001, the General Assembly established authority and procedures for local government entities to apply for and hold in-channel water rights for recreational uses, referred to as recreational in-channel diversions (RICDs).[xliii] The legislation charged the CWCB with making findings of fact and submitting recommendations to the water court on RICD water court applications, and authorized the CWCB to hold hearings on such applications if requested by any party. In 2006, the General Assembly updated the procedures for RICD water rights applications and clarified the role of the CWCB's administrative process and determination of findings of fact to submit to the water court.[xliv]

6.6.2. BIP Identified Environmental and Recreational Projects and Methods

As part of the Basin Implementation Plan (BIP) process, Basin Roundtables identified projects and methods that could assist in meeting environmental and recreational needs within their basins. The process for identifying these projects and methods was unique to each basin, with roundtables collecting and organizing information through public outreach, input solicitation, and review by committees or the full roundtable. As a result, because these processes were different in each basin, the manner in which these projects and methods are presented in the draft BIPs varies, with some basins identifying reaches of concern, and others consolidating existing compilations of project information.

This section examines and summarizes the work of the Basin Roundtables, focusing on a brief description of the process utilized by each basin, a general overview of projects and methods identified, and the path forward as basins move to meet their goals and measurable outcomes. For more information on the BIP process and how each basin collected and organized their environmental and recreational projects, refer to the individual BIPs, available on the Colorado's Water Plan website.[xlv]

Arkansas River Basin

The Arkansas Basin Roundtable undertook an ambitious public outreach process, hosting meetings around the basin to gather input and suggestions from residents. One of the hallmarks of this process was the input form designed by the roundtable, encouraging basin residents to submit ideas and projects for consideration by the roundtable. The roundtable also considered the list of identified projects and processes (IPPs) from SWSI 2010, as well as focus areas or areas of concern identified by the Nonconsumptive Needs Committee[xlvi].

The roundtable has gathered project lists from several sources, including SWSI 2010, The Nature Conservancy, Colorado Parks and Wildlife, and others. Projects funded by the roundtable through the WSRA program are also identified. Through this inventory of potential projects, the roundtable seeks to prioritize available WSRA funding, and demonstrate the type of projects which the roundtable believes conform to the basin goals and measurable outcomes.

Arkansas Basin at a Glance

16 projects identified

3 stream miles identified for protection through **1** project

10,000 acres of avian area identified for protection

$445,000 in total identified costs for **2** projects

7 instream habitat projects

6 water quality projects

10 watershed health projects

Sixteen projects are identified by the Nonconsumptive Needs Committee of the roundtable. These projects line up with the basin's environmental and recreational goals, to maintain and improve key attributes. Several of the projects identified concentrate on the protection and restoration of key habitat, through diversion replacement, wetland improvement, and reoperation of currently existing storage rights. Seven of the projects identified were associated with some aspect of instream habitat restoration. Three projects identified by the Committee focus on recreational needs, through activities such as boat chute improvement, restoration of campsites, and reservoir renovation with recreational needs in mind.

Moving forward, the Arkansas Basin Roundtable plans to delve deeper into the public input received through their outreach program. The roundtable will establish tiering criteria, by which projects and methods can be measured against basin goals, and ranked accordingly. Projects which meet basin goals may lead to a proponent being invited to a roundtable meeting to present on their project, and potentially work with the roundtable to meet funding needs. The roundtable plans to take a holistic view of projects and methods, including concepts such as watershed health, as they move forward to maintain an updated inventory of activities within the basin. GIS mapping of needs is a priority of the basin, supporting the BIP efforts and identifying areas of concern. This look forward is planned to complement the pending update to SWSI, with projects and methods that meet the definition of an IPP specifically identified.

Colorado River Basin

The Colorado River Basin Roundtable also began with an extensive public outreach campaign, as consultants interviewed water providers throughout the basin, and hosted a number of town halls and opportunities for BIP input. This outreach process yielded a comprehensive list of projects, organized by basin themes and geographical location. Similar to the Arkansas Basin approach, the roundtable believed that a comprehensive inventory of projects and methods would serve the basin well, as a suite of options for moving forward and meeting their future water supply needs. Projects and methods from existing sources such as SWSI 2010 were also compiled into this inventory.

The Colorado Roundtable established several themes to sum up and organize the input received from basin stakeholders. Theme #1 is as follows: "Protect and Restore Healthy Streams, Rivers, Lakes, and Riparian Areas."[xlvii] In their inventory of projects, the roundtable identified a number of projects that complemented this basinwide theme. Central to this theme is the roundtable's goal of establishing a basinwide stream management plan. Key issues of concern for this basin are data gaps for

environmental and recreational needs: the roundtable would like to see more progress statewide in scientifically quantifying the amounts of water necessary to maintain or improve these attributes.

Colorado Basin at a Glance

102 projects identified

32 stream miles identified for protection through **3** projects

$15,332 in total identified costs for **7** projects

59 projects to protect and restore healthy streams, rivers, lakes, and riparian areas

20 water quality projects

78 watershed health projects

In assembling this inventory of projects and methods, many with an environmental or recreational focus were identified. Keeping with the basinwide theme, the majority of the projects and methods identified were related to watershed health. Fifty-nine projects and methods were identified with an environmental purpose, and thirteen were specifically recreational. An additional seventeen projects are related to river and water management, with environmental and recreational benefits. The needs of endangered species in the Colorado basin are called out in the goals and measurable outcomes of the draft BIP , with species recovery as a measurable outcome, through habitat improvement and addressing invasive species. Recreational projects and methods include protection of flows in twenty-eight identified popular reaches, the development of RICDs, and the aforementioned stream management plan.

Moving forward, the roundtable plans to begin organizing the inventory of projects for potential implementation. To prioritize the projects and methods, the roundtable will examine each through the lens of their basinwide themes, and identifying the projects which may serve multiple purposes, or meet basin goals. Many of the projects and methods which are water management related may already be in the planning stages, such as some associated with the Colorado River Cooperative Agreement (CRCA), or projects funded by the roundtable which contemplate multiple phases.

Gunnison River Basin

The Gunnison Basin Roundtable identified two basin goals which addressed environmental and recreational water uses, then identified projects and methods within the basin which could assist in meeting those needs. This inventory of projects and methods was compiled through outreach within the basin and participation by stakeholders in the BIP process. The roundtable also convened a group of environmental and recreational advocates, including staff from state and federal agencies, to provide input and assist in identification of focus reaches. As part of the BIP process, the roundtable approved the use of "project summary sheets," used to break down elements of projects and methods such as project proponent, project cost, and effectiveness at meeting basin goals.

In organizing their projects and methods inventory, the roundtable established three tiers of projects, with timeline and effectiveness of meeting basin goals as the two criteria for tiering. The basin roundtable also identified twenty-nine target stream reaches within the basin, as areas where environmental and recreational projects and methods could be beneficial. While identifying potential projects and methods, the roundtable called out a series of ongoing efforts involving environmental protections and monitoring, which help to maintain these attributes within the basin.

Tier 1 of the Gunnison projects and methods inventory are those defined as "implementation likely feasible by 2020; project does excellent job of meeting Basin Goals."[xlviii] Twelve projects classified as Tier 1 are identified with the goal to "quantify and protect environmental and recreational water

uses."[xlix] These projects are mostly focused on improving or restoring stream channels within the aforementioned target stream reaches, or improving native trout populations. Many projects identified as Tier 1 projects are multipurpose projects, with an environmental or recreational benefit included. Thirteen projects were also identified by the roundtable as meeting another basin goal: "Describe and encourage the beneficial relationship between agricultural and environmental and recreational water uses."[l] These projects are chiefly multipurpose projects for agricultural uses, which have environmental and recreational benefits identified, in line with this basin goal.

Gunnison Basin at a Glance

61 projects identified

$93,602,600 in total identified costs for **14** projects

29 projects to protect and restore healthy streams, rivers, lakes, and riparian areas

4 water quality projects

31 watershed health projects

The Gunnison roundtable also established some measurable outcomes for their environmental and recreational goal which are based in project implementation. Moving forward, the roundtable aspires to develop ten projects from the list of recommended solutions by 2030. Additionally, a more comprehensive inventory of environmental and recreational projects is included as a method in the list of recommended solutions, and the roundtable hopes to see this "Identification and Inventory" completed by 2020.

North Platte River Basin

The North Platte Basin also had two primary goals related to environmental and recreational uses and needs. The BIP process was informed by the public outreach and education process that the roundtable had been performing up to that point, engaging stakeholders within the basin as well as a more technically-based outreach to identify specific projects and methods. Similar to the Draft Gunnison BIP, the North Platte Roundtable had one goal associated with the maintenance of healthy rivers and wetlands, and one geared toward the nexus with agricultural water use. For both of these goals, measurable outcomes within the BIP are project implementation based, with an inventory of potential projects and methods which serve as "recommended solutions."[li]

North Platte Basin at a Glance

44 projects identified

29 projects to protect and restore healthy streams, rivers, lakes, and riparian areas

4 water quality projects

31 watershed health projects

The projects and methods identified in the draft BIP complement the roundtable's previous work, in which they prioritized environmental and recreational attributes within the basin. The previous prioritizing of attributes was applied to the inventory of recommended solutions, and the roundtable set out a process for identifying locations where these needs are not being met, and finding solutions. Measurably, the roundtable plans to develop three projects from the inventory of solutions by 2020. Regarding the goal of supporting environmental and recreational benefits through agricultural projects, the roundtable plans to complete at least two multi-purpose projects by 2025.

In the inventory of recommended solutions, the roundtable identifies forty-nine environmental and recreational projects. Twenty-nine of these projects are classified as restoration of wetlands, riparian or stream projects. These projects call out specific species for protection and habitat restoration. The North Platte Roundtable has a particular emphasis on wetlands protection and restoration, so amphibians and waterfowl are called out as direct beneficiaries of implementation projects. Ten of

the basin projects are focused on habitat restoration through projects that will improve livestock grazing management through fencing. The focus in this basin, as is evident through their goals and implementation based outcomes, is multipurpose projects and methods.

Through implementation of these projects and methods, the roundtable hopes to accomplish incremental increases in recreational activities within the basin. Specifically, the basin calls out a 5% increase in waterfowl hunting and viewing days by 2020, as well as a 5% increase in fishing user days in the same time period. Moving forward, the basin will utilize their existing prioritizing system to evaluate funding for projects and methods in this inventory of recommended solutions.

Rio Grande River Basin

The Rio Grande River Basin Roundtable, like others around the state, established a set of basin goals, and then examined potential projects with these goals in mind. The roundtable compared their basin goals with basin needs and came up with a multipurpose focus, as thirteen out of fourteen goals had a nexus with environmental and recreational needs.[lii] Projects and methods were gathered and consolidated through the roundtable's public outreach process, and through the work of subcommittees led by the BIP Steering Committee. The roundtable identified eighteen projects and methods, called out in detail in "Project Fact Sheets," which were preliminarily evaluated by basin goals.

Rio Grande Basin at a Glance

29 projects identified

5 stream miles identified for protection through **1** project

$54,409,400 in total identified costs for **16** projects

10 water quality projects

29 watershed health projects

9 natural disaster management projects

The projects and methods identified in the draft BIP were assessed as multipurpose projects, with all eighteen identifying some nexus with environmental and recreational needs. Additionally, the basin compiled a list of additional projects and methods which may merit future consideration, but were not considered in this iteration of the water plan because of time constraints. This additional section identified twenty-seven additional projects and methods which would meet an environmental or recreational need, often as part of a multipurpose project.

In keeping with the goals and measurable outcomes of this roundtable, many of the projects and methods identified have a focus on riparian restoration and watershed health. Projects which fall into these categories include projects intended to improve fish habitat, headwaters restoration, and comprehensive watershed planning. Storage projects included are viewed as potential sites for habitat and recreational opportunities such as angling and boating. Other projects fall into the category of water management, with studies planned on hydrology within the basin, examinations of post-fire conditions, and potential streamflow optimization.

Moving forward, the roundtable has estimated costs for sixteen of the eighteen identified projects which were examined in Project Fact Sheets. These sixteen projects total an estimated financial need of $54 million through the year 2020. As the roundtable moves forward with the basin planning effort, funding avenues will be explored, and the list of identified projects and methods may be refined. More analysis will be performed on the supplementary list of projects and methods, and as these potential recommendations are measured against the basin goals, some may be prioritized. Similar to the Colorado Basin Roundtable, the Rio Grande Roundtable has identified the need to fill information

gaps regarding environmental and recreational needs: finding ways to better understand how water may be managed to maintain and protect these attributes. The Water Plan provides a list of projects and methods which would address these information gaps, and provide guidance to the roundtable as it moves forward in project funding and implementation.

South Platte River Basin / Metro Roundtable

The joint BIP prepared by the South Platte and Metro Roundtables required a large amount of outreach throughout the basin, as the most populous area in Colorado. The roundtables chose to outline a series of goals and measurable outcomes, specifically for environmental and recreational needs. These "nonconsumptive measurable outcomes" outlined the roundtables' priorities for environmental and recreational uses for the future.[liii]

South Platte/Metro Basin at a Glance

71 projects identified

2.5 stream miles identified for protection through **2** projects

23 projects to protect and restore healthy streams, rivers, lakes, and riparian areas

15 water quality projects

66 watershed health projects

1 natural disaster management project

The South Platte/Metro team, similar to other basins, chose to create an inventory of projects and methods, to serve as a suite of options for fulfilling these nonconsumptive measurable outcomes. A great deal of the projects listed for environmental and recreational projects came from the SWSI 2010 Nonconsumptive Needs Assessment. Beyond these identified projects, the roundtables also created an inventory of "Additional Identified Environmental and Recreational Projects." These projects were identified through the public outreach process, through proponent submission, or were active projects in progress that the roundtables chose to identify as they were steps toward meeting the nonconsumptive measurable outcomes.

Beyond the inventory of SWSI and additional environmental and recreational projects, the roundtables also identified specific examples of projects which they believe meet their measurable outcomes, and would be good models to follow in the future. Existing multipurpose projects throughout the basin were specifically called out as in line with goals and measurable outcomes. These goals have a focus on endangered and threatened species, the economic value of environmental and recreational uses, and the sustainability of water-dependent areas. Following these goals, a great number of projects identified beyond the SWSI Needs Assessment were categorized as wetlands restoration, riparian restoration, and stream habitat projects. Measurably, the recovery of key species of trout and native plains fish are identified as important. Serving as a snapshot of the current state of affairs in the basin, this list identifies projects which are proposed, planned, completed, and ongoing.

The draft BIP also includes an analysis of the benefits to environmental and recreational needs which multipurpose projects can provide. Examples include the potential for installation of environmentally-friendly passages after flood events, coordinated reservoir operations, and recharge projects. Moving forward, the roundtables will continue to identify projects and methods which match up with their identified measurable outcomes, and seek to identify projects which may meet multiple needs.

Southwest River Basin

The Southwest Basin Roundtable began an extensive public outreach process, hoping to provide a comprehensive update to the SWSI 2010 IPP list. Through a series of public meetings, newspaper articles, and conversations with water management entities within the basin, the roundtable sought to create a complete inventory of new IPPs within the basin. Additionally, the roundtable identified "Conceptual IPPs,"[liv] which have no active sponsor, but are ideas for projects and methods within the basin which may conform to basin goals and measurable outcomes. The Southwest Roundtable, similar to the Rio Grande, evaluates any project or method for potential multiple uses and benefits, so many projects identified have a potential environmental and recreational nexus.

Southwest Basin at a Glance

71 projects identified

183 stream miles identified for protection through **6** projects

$60,000,000 in total identified costs for **1** project

15 projects to protect and restore healthy streams, rivers, lakes, and riparian areas

16 water quality projects

58 watershed health projects

2 natural disaster management projects

The goals identified by the Southwest Roundtable specifically identify the benefit to statewide and local economies which environmental and recreational values provide. The maintenance, protection, and enhancement of these uses are called out as measurable outcomes, as well as species recovery and watershed health. In their inventory of projects and methods, seventy-one environmental and recreational projects were listed, with thirty of those categorized as multipurpose. Fifteen of these projects and methods were related to wetland, stream, or riparian restoration. Additionally, projects were identified pertaining to invasive species removal, native revegetation, hydroelectric projects, and natural disaster mitigation.

The roundtable identifies some storage projects which would have an environmental or recreational nexus, providing a cost estimate for one off-stream water storage facility, and identifying another reservoir which could potentially provide water supply to valuable fisheries. In line with the basin's measurable outcomes relating to the "condition and natural function of streams, lakes, wetlands, and riparian areas," riparian restoration projects are planned for a key reaches of the La Plata, the Dolores, the Navajo, and the San Juan. On the Florida River, livestock fencing is identified as a means to protect a riparian buffer zone.

The projects identified which specifically call out stream miles would total around 180 miles of project and method implementation. Moving forward, the basin will continue to consider all proposed IPPs equally, and evaluate each one for potential multiple uses and benefits. In the text of the draft BIP, the roundtable considers the opportunities for funding available, and explores the concept of "bundling" a package of proposals, and how such an approach may be a way to make the most of limited funding. The Southwest Basin Roundtable, similar to the Rio Grande and Colorado, identifies the data gaps in environmental and recreational knowledge as a priority moving forward. Identification and evaluation of gaps in this body of knowledge are discussed, and by addressing these gaps, the roundtable believes that planning for the water supply future of the basin will be more reliable and project implementation can be made more efficient.

Yampa/White/Green River Basin

The Yampa/White/Green Basin Roundtable drew from two different sources to compile an inventory of projects and methods within the basin. First, the roundtable conducted an extensive outreach process, with several public meetings, information in local publications, and surveys. Also, the roundtable had previously begun the Projects and Methods Study (P&M Study), which identifies projects and methods within the basin, as well as comparing certain IPPs against potential future hydrological scenarios.

Yampa/White/Green Basin at a Glance

18 projects identified

$5,350,000 in total identified costs for **4** projects

4 projects to protect and restore healthy streams, rivers, lakes, and riparian areas

1 water quality project

15 watershed health projects

5 recreational projects

The roundtable identified two main inventories of projects with an environmental and recreational nexus. Many of the projects and methods listed in the inventory of "Current M&I, SSI, Agriculture, and Multi-Purpose IPPs" have an identified or potential benefit for environmental and recreational needs, some of which were modeled. Additionally, some of the projects identified have ongoing feasibility studies, which could potentially identify environmental and recreational benefits to be realized through project implementation. A collection of projects with primarily environmental and recreational benefits was identified, drawn from interviews and information provided by basin stakeholders. Most of these projects and methods are located within focus areas identified by the roundtable. Seventeen projects and methods were identified in this collection. Several of these projects have a completion date before 2020, with others classified as ongoing through 2020.

The list of Environmental and Recreational IPPs focuses heavily on the improvement of existing river conditions to restore and improve environmental and recreational attributes. Several projects identify specific reaches to modify for the benefit of endangered fish or for recreational access. Other projects seek to restore and preserve the natural state of the river for recreational access, watershed health, and erosion control. Other proposed methods would study potential solutions to identified challenges such as flow regimes for endangered fish or potential augmentation of instream flow shortages. However, the roundtable emphasizes that the current inventory is not exhaustive, and that other projects and methods will be necessary to fully address the environmental and recreational needs located within focus segments or otherwise. As planning efforts continue within the basin, projects and methods will be identified to meet these needs.

Like other Basin Roundtables, the draft Yampa/White/Green BIP stresses the need for accurate information and analysis of data gaps for environmental and recreational needs. To that end, the roundtable plans to utilize studies and modeling efforts already completed or underway to fully assess the impacts of projects and methods. These analyses would be used to determine which type of project or location would be the most beneficial, regarding stream conditions and hydrologic impact.

6.6.3. Next Steps

In order to support a strong environment includes healthy watersheds, rivers and streams, and wildlife as well as a robust recreation and tourism industry, several next steps are necessary.

1. Conduct additional technical work to better determine the levels of existing protections, and where additional projects and methods should be focused. This work needs to be done in partnership with the Basin Roundtables and the CWCB technical team.
2. To support the technical work, Watershed Master Plans may be necessary; work toward a long term goal of developing watershed master plans for every large watershed area.
3. Encourage and support capacity in many areas that currently do not have watershed groups or other groups that work with a broad set of local stakeholders.
4. Continue to support and assist the Basin Roundtables in moving forward the environmental and recreational projects and methods identified in their draft BIPs.
5. Incorporate the potential effect of climate change on environmental and recreational attributes.
6. Support an integrated approach to understanding how environmental and recreational projects and methods may interact with municipal, agricultural, and industrial projects and methods.
7. Continue to track nonconsumptive projects and methods.
8. Continue to support and implement state programs that benefit environmental and recreational attributes, such as the Colorado Watershed Restoration Program, Instream Flow and Natural Lake Level Program, and CPW's Wetlands for Wildlife Program.
9. As discussed in Section 7.1, strengthen funding opportunities for environmental and recreational projects by:
    a. Coordinating current funding
    b. Assessing funding needs
    c. Exploring additional funding opportunities

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