

# Colorado Water Conservation Board

## Department of Natural Resources

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# Gunnison River

## Drought & Water Supply Assessment Basin Summary

### Project Summary

The Colorado Drought & Water Supply Assessment is the first statewide project to determine how prepared Colorado has been for drought and identify measures that will better prepare us for the next drought.

### Overview of Basin Summary

This basin summary presents the results of the Drought & Water Supply Assessment Project for the Gunnison River Basin (also known as Division 4) for purposes of:

- Supporting local and regional planning efforts
- Presenting the water needs and issues on a regional and local basis

The summary presents selected results of the project based on responses provided by water users within Division 4. A listing of the water users that participated in the survey by water use, or segment, is provided in the table to the right. The responses were used to characterize the following key areas of interest with respect to water use and drought impacts, within the Gunnison River basin:

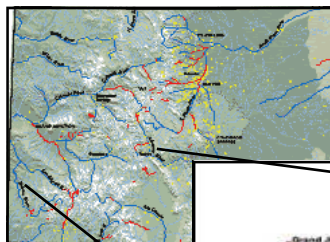
- Current Water Use Limitations
- Current Water Management Planning
- Recent Drought Impacts (1999-2003)
- Future Water Use Planning Issues
- Drought Mitigation Needs

Comparative analysis for many areas of interest are provided in this basin summary to allow for a comparison of the results from Division 4 to the rest of the State.

### Basin Overview

The Gunnison River drains the west central portion of the state, stretching from the continental divide west to Grand Junction. The Gunnison River contains some of the largest water bodies in the state, and local water users include significant agricultural and recreational entities. The Black Canyon National Park also creates a significant demand on the Gunnison.

Growth in the Gunnison River basin is not expected to be large in numbers, but large in percentage. Future pressure may be exerted on this basin for transmountain diversion, and increased recreational and environmental flows to protect the quality of the watershed in response to public expectations.



### Basin Statistics and Information

#### Population

2000	93,908
2030 (projected)	161,000

#### Number of Reservoirs and Dams

240

#### Colorado Legislative Districts

House	54, 55, 58, 61, 62
Senate	5, 6, 7

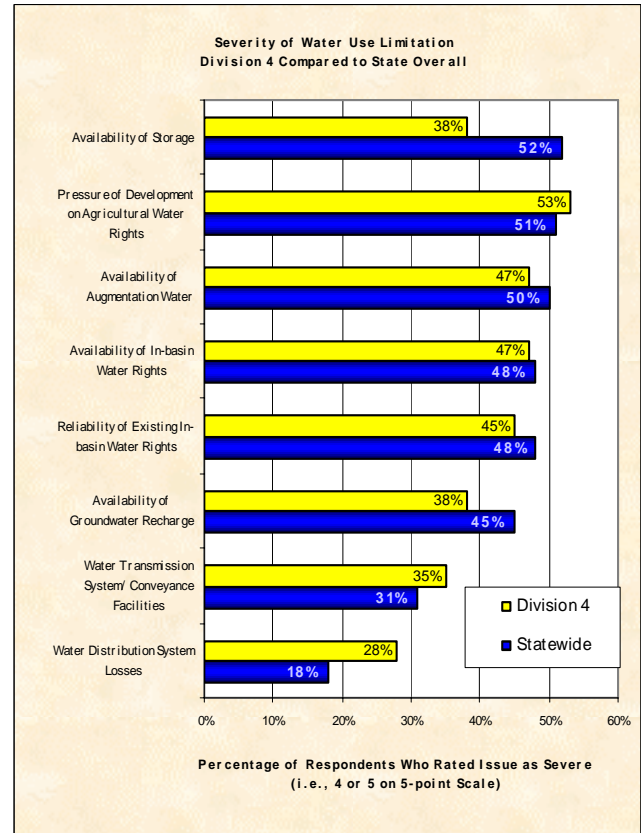
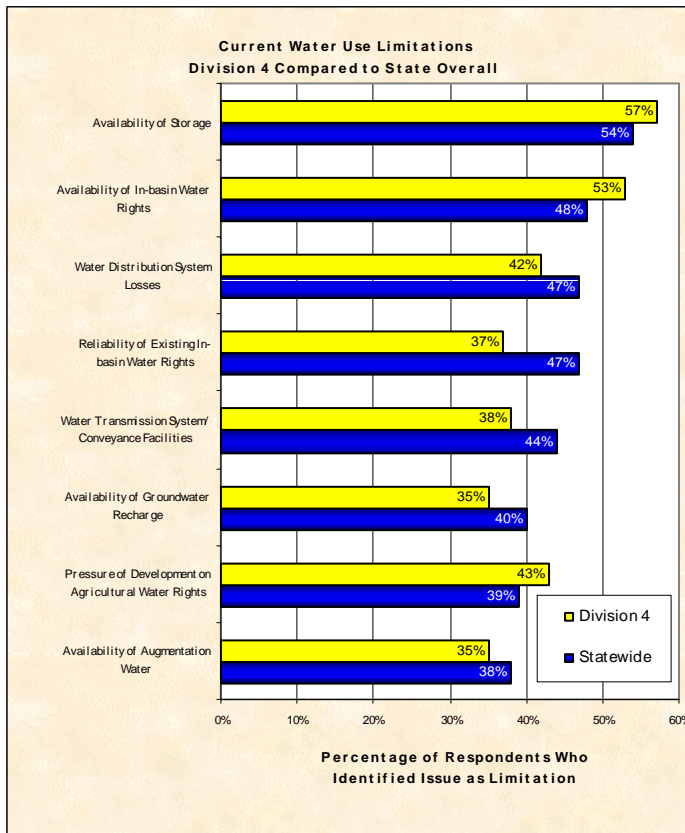
#### Survey Participants (Total = 70)

Municipal	18
Agricultural	35
Federal	5
State	3
Water Conservancy District	3
Industry	4
Other	2

#### Additional Projected In Basin Municipal/Industrial Water Supply at 2030 (based on SWSI)

15,800 acre-feet

## Current Water Use Limitations



The two graphs presented above, in combination, indicate what are believed by Division 4 water users to be current water use limitation within the basin, and the relative severity of the limitation. For example, more than half (57%) of Division 4 water users believe that the current availability of storage limits current water use. Of these water users, only 2 out of every 5 view this limitation as severe. The response related to the identification of water storage as a limitation is similar to the rest of the state, however the rest of the state views the limitation as being much more severe than does the Gunnison basin. Gunnison water users did register concerns unique to this basin with respect to federal land management, federal special use permitting and public expectations for instream water use as being substantial limitations to current water supply.

## Current Water Management Planning

### Water Supply Master Plans:

- 42% of Division 4 water users have a water supply master plan vs. 43% of the water users statewide.

### Drought Management Plans:

- 38% of Division 4 water users have drought management plans vs. 40% of the water users statewide, which may be indicative of the significant number of large water utilities and municipalities in this basin.
- Division 4 water users utilize different drought management tools than water users in the rest of the state, which may be attributed to the lack of large municipalities contained in this basin compared to some of the other divisions.

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### Key Water Planning Definitions

**Water Supply Master Plan:** A comprehensive plan in which a water management entity or planner will address technical and political issues related to providing sufficient quantity and quality of water for identified or projected demands.

**Drought Management Plan:** A plan in which a water management entity or entities or planner identified the measures and responses needed to prepare for, monitor, and mitigate the effects of drought

**Water Conservation Plan:** A plan that outlines how a water management entity or planner will improve water use efficiency over the long-term and how the efforts fit within their overall water supply and demand management efforts.

## Current Water Management Planning (continued)

- A comparison of the most significant differences between drought management tools used by Division 4 water users vs. statewide follows:
  - Less have drought related communications protocols (external, 42% vs. 55%; internal 52% vs. 63%)
  - Less have defined levels of drought response (32% vs. 48%)
  - More have water quality monitoring programs (62% vs. 54%)
  - More have substitute water supply plans (41% vs. 30%)
  - Less have procedures for declaring drought (42% vs. 52%)

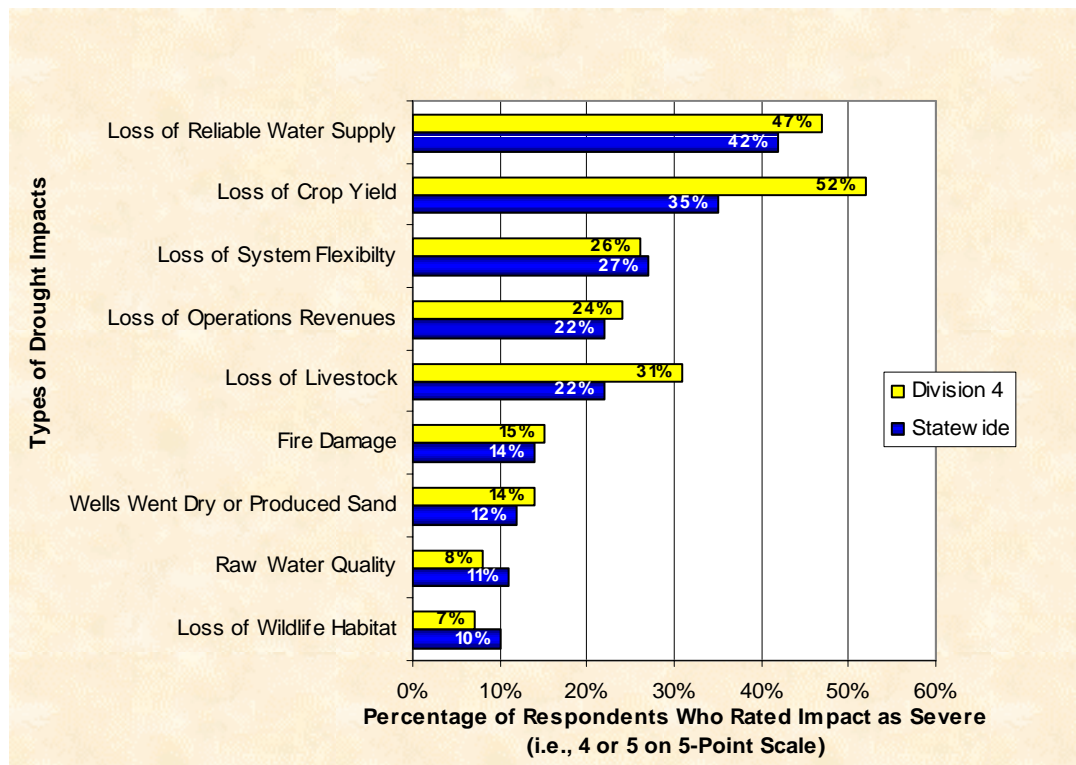
### Tools for Drought

- More cloud seeding, fewer lawn watering fines, fewer lawn water restrictions, not as much ground-water

### Water Conservation Plans

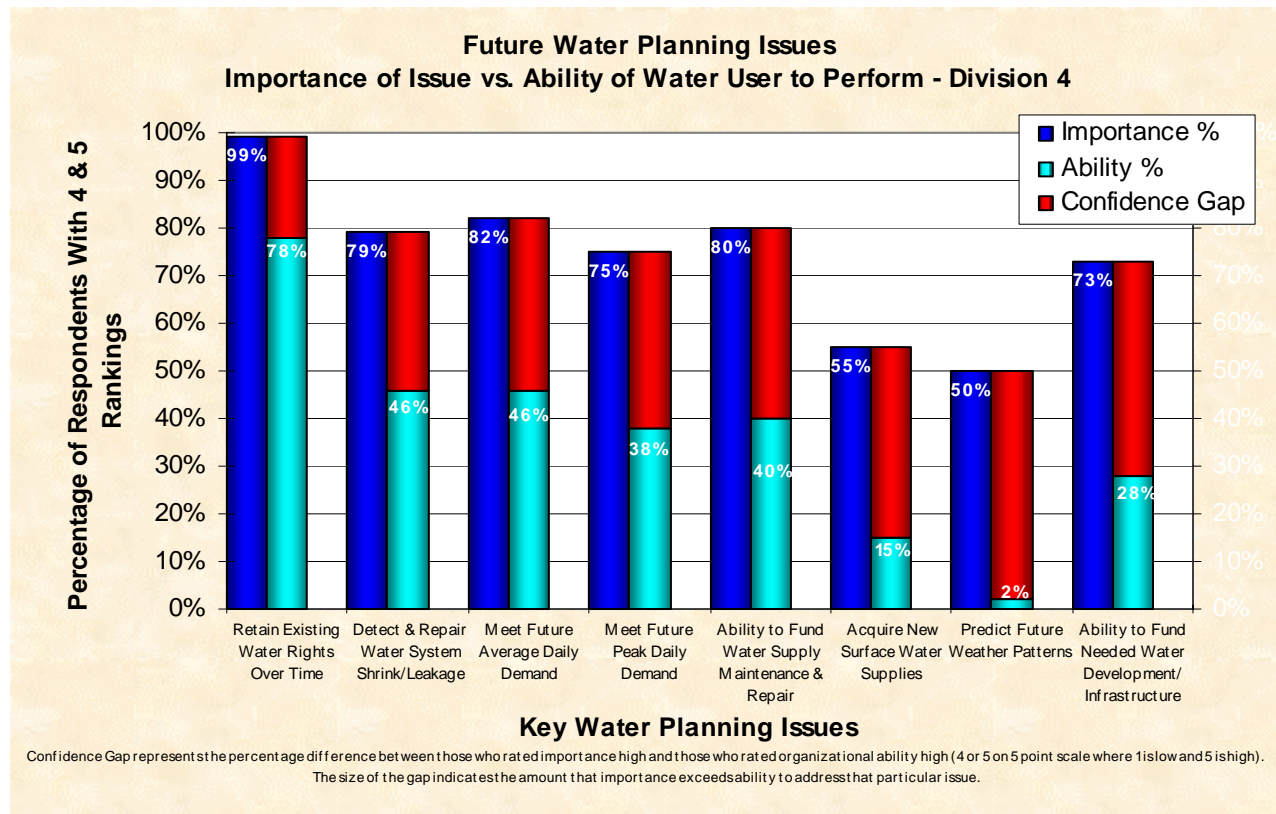
- Division 4 has about the same level of water conservation planning as the rest of the State (43% vs. 40%)
- Tools utilized for water conservation (Division 4 vs. statewide)
  - Lining of ditches and canals
  - Metering and Public Information
- Best tools for water conservation (Division 4 vs. statewide)
  - Public education/involvement (29% vs. 25%)

## Recent Drought Impacts (1999-2003)



Division 4 water users indicated that they were impacted by the recent drought, and that the severity of the impacts were in many cases more than the severity of the impacts noted by other water users statewide. Loss of reliable water supply, loss of crops and loss of livestock were significantly more severe in the Gunnison basins than was reported by the balance of the state. Division 4 water users were impacted by the other types of drought impacts at roughly the same rate as the impacts observed by the rest of the state's water uses.

## Future Water Use Planning Issues



The above figure compares the relative importance of a selected future water planning issue (as identified by water users) (dark blue) with the ability of water users to address the issue on their own (light blue). The difference between the importance of the issue and the ability of the water user to address the issue is identified as a gap (red), with the size of the gap indicative of where water users may require assistance in the future. To illustrate the meaning of the gap analysis, consider “retaining existing water rights”. This issue was rated as the most important issue by Division 4 water users. These same water users indicated that roughly 4 out of every 5 have the ability to address this issue with in-house resources. To this point, there was a gap of 21% between those indicating that this issue was important and those that believed they had the ability (e.g., resources, staff, funds) to address this issue. Conversely, the funding of water supply development was identified as an important issue by about 3 of every 4 water users, with only 28% indicating that they had the ability to address this issue; thus identifying a 45% gap between need and ability. Large gaps (i.e., 40% or greater) were also identified for funding and acquisition of new surface water supplies. These gaps put the Division 4 needs roughly in the middle of those identified by other basins.

### Key Water Projects Definitions

**Structural Projects for Drought Mitigation:** These projects relate to the construction of capital improvements such as dams, pipelines, pump stations, treatment and transmission facilities, and wells. Increasingly, structural projects also include water reuse and conjunctive use projects, rehabilitation or upgrades to existing facilities and management of water consuming vegetation.

**Non-Structural Projects for Drought Mitigation:** These projects do not necessarily include construction, although limited earthwork or stream restoration may be involved. Non-structural project components include the development and implementation of efficient water supply and demand management tools or methods, allowing water owners, planners and managers flexibility in operating or managing their water resources.



## Need for Structural Drought Mitigation Projects

Type of Project	Statewide Need	Division 4
New storage for surface water	40%	38%
Large-scale/multi-basin projects	24%	36%
New aquifer storage recovery	21%	10%
New storage for groundwater	19%	16%
New or Upgraded Pipelines	33%	37%
New or Upgraded Water Distribution Systems	33%	35%
Lining of Ditches	19%	32%

Like every other part of the state, Division 4 water users identified various structural projects as effective means to mitigate the effects of drought in their basin. As in nearly every other basin, creating new surface water storage facilities ranked as the single most important method to mitigate the effects of drought; however, in Division 4, numerous other project types were deemed to be of approximately the same importance. In particular, large scale multi-basin projects and the lining of ditches were identified as being substantially more important to water users in the Gunnison basin than in the rest of the state. New or upgraded pipelines and water distribution systems were also identified as important.

When asked to **prioritize** the structural projects that would best mitigate drought impacts, Division 4 water users listed the following projects (in order of priority):

- New storage for surface water
- Lining of ditches
- Structural improvements to meet dam safety requirements
- Rehabilitation or new diversion structures
- New or upgraded water distribution systems

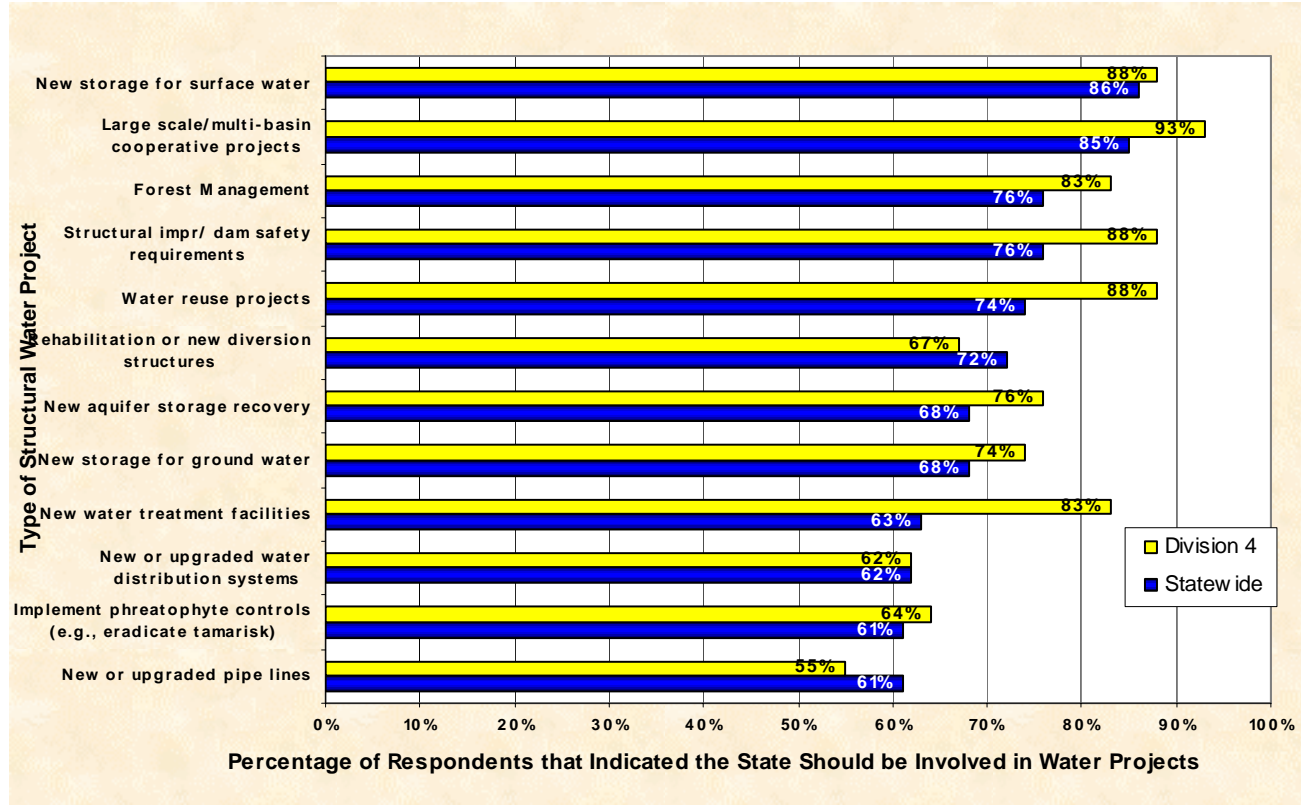
Although water users statewide agreed that new surface water storage was of the highest priority, they did not see as great a need for lining of ditches or dam safety improvements.

## Need for Non-Structural Drought Mitigation Projects

Division 4 water users identified the need and/or benefit of non-structural projects for drought mitigation, mirroring in many ways the response of water users statewide. However, the Division 4 responses indicate a greater need for improved water conservation methods and various types of technical support than did the rest of the state. It is significant to note that the request for technical support may be correlated to the lower degree of planning in the basin.

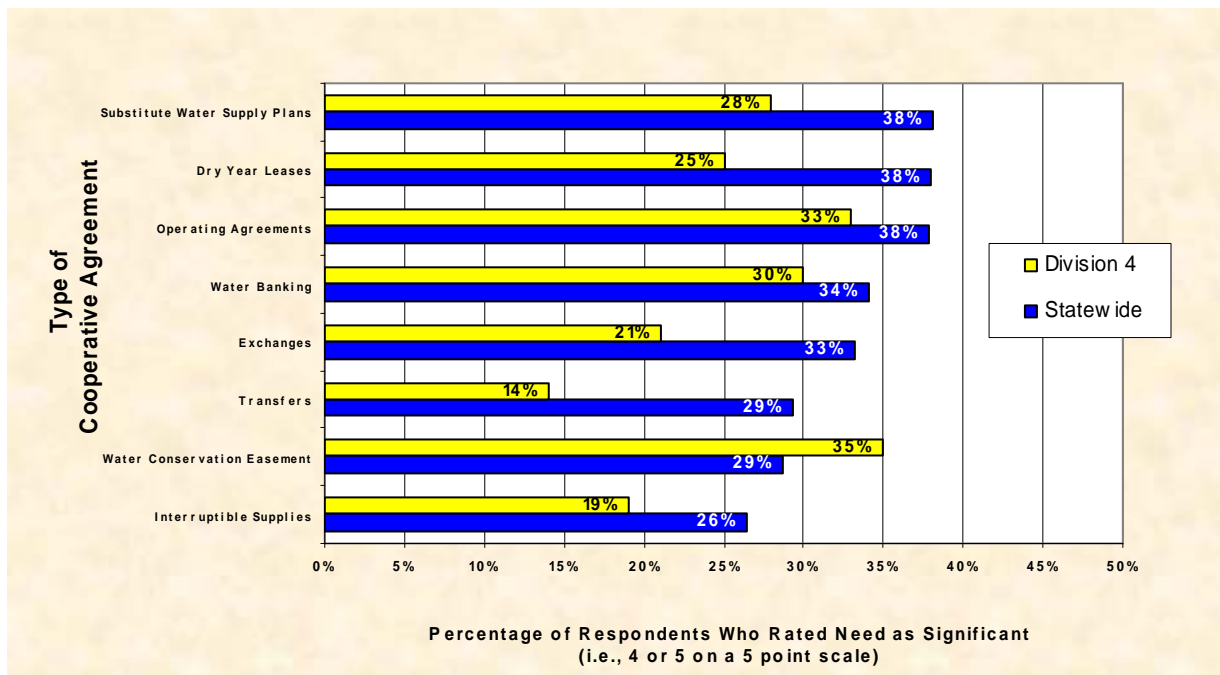
Non-Structural Project	Statewide	Division 4
Public education & awareness	46%	46%
Improved water conservation methods	46%	55%
Technical support in water supply planning	43%	55%
Technical support in drought & conservation planning	42%	48%
Improved water conservation measurement methods	29%	33%

## Support for State Involvement in Structural Water Projects



Support for state involvement in structural water projects is significant, both statewide and within Division 4 as indicated in the figure above. State involvement appears to be most welcome related to large projects, such as new surface water storage, water treatment facilities, water reuse, dam safety requirements, forest management, and large scale/multi-basin projects. The Gunnison basin demonstrates significantly more desire for state involvement than identified for most other basins.

## Need for Cooperative Agreements



## Need for Cooperative Agreements (continued)

Cooperative agreements are becoming increasingly important within Colorado, creating flexibility within the otherwise rigid prior appropriation system. Cooperative agreements provide the means to allow for temporary transfers of water between uses, and allow for the more efficient use of water in periods of water scarcity. For example, agricultural users can utilize cooperative agreements to allow for the temporary lease, exchange and/or transfer of water to a needy municipal entity, when the limited availability of water may have impacted crop yield or production. In this way, the agricultural community can find sources of revenue while municipalities find emergency and/or short term water supplies in dry and drought years.

When compared to the statewide response, Division 4 water users indicated less need for or use of cooperative agreements than elsewhere in the state, with the exception of water conservation easements. Division 4 mirrored the statewide response in its support for state involvement in the use of cooperative agreements for all categories.

### Summary of Results for the Gunnison River

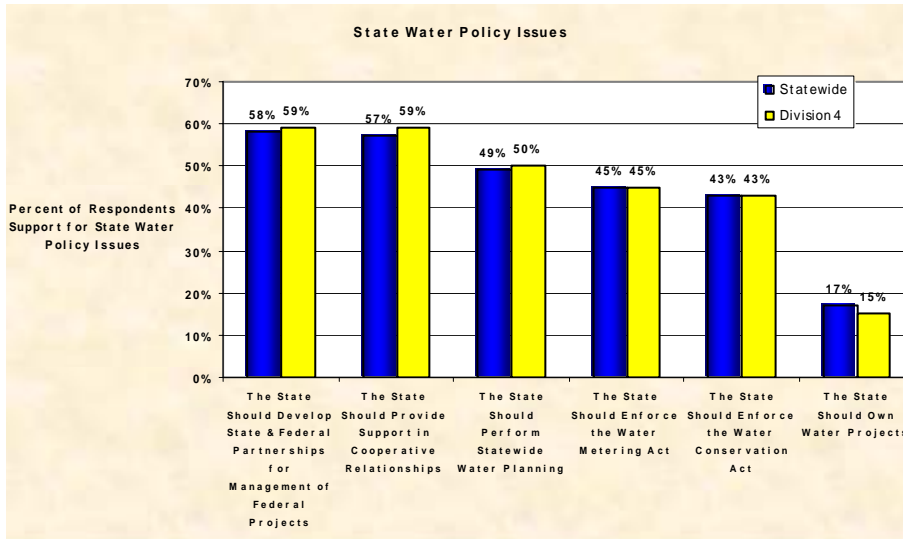
The Gunnison River basin perhaps represents some of the most pristine areas of Colorado's high country. The population of this basin is about 1/3 of the Colorado River main stem, and development pressures are not expected to be as intense here as in many other parts of the state. Nonetheless, there are many significant water issues in this basin that will require management in the future.

Gunnison basin water users indicated that as a group they perform slightly less planning than most of the state. More importantly however is that their planning efforts may not leverage appropriate types of measures and programs that have proven to be effective in other parts of the west. This may be due to the lack of large municipalities and special districts, which tend to have the resources needed to plan. In addition, the Gunnison River water users indicated a more substantial need for state involvement and support in providing funding and technical assistance in planning than did the balance of the state, which may be directly linked to a lack of planning resources available locally. This result probably also indicates that the water users know that they could do a better job of planning based on the tools that are available.

Another driver influencing the Division 4 water users is the nature and severity of drought impacts realized during the most recent drought. Those entities in the Gunnison River basin appear to have been more severely impacted by the recent drought than most of the other basins, with the agricultural community particularly hard hit. Loss of crop yield and livestock was particularly acute, based on the water user responses. These impacts obviously relate chiefly to agricultural entities.

One of the challenges that exists for the Gunnison basin is that agricultural entities do not have the range of measures and programs available to them for managing and responding to drought—in part because watering restrictions and conservation efforts directly impact crop yield and business livelihood. In addition, agricultural entities in other basins have been able to utilize cooperative agreements to allow for the short term exchange or transfer of water to thirsty municipalities, however there are fewer opportunities for these types of agreements in the Gunnison. Basin water users have indicated that state involvement to help agricultural water users reduce canal and ditch leakage, improve water storage infrastructure and improve or construct new diversion structures would be welcome.

Overall, the Gunnison River basin is faced with many challenges related to current and future water use. Although there are other major river basins with more pressing issues, the Gunnison represents one of the state's most pristine watersheds, and therefore carries with it additional issues that must be considered in striking the balance between traditional water and future water use.



### Major Objectives of State Water Policy

- Improve water availability and reliability statewide

### Areas of Practice to Achieve the Major Objective

- Improve public understanding and knowledge of state water and water resources issues
- Support infrastructure needs of water users and suppliers
- Support technical assistance needs of water users

### Initial Implementation Steps Proposed by the CWCB

- Examine need for new policies related to how CWCB provides public information and education, technical assistance and infrastructure support
- Improve the role and relationship of public information and education efforts by the CWCB with the DNR and the Governors Office.
- Evaluate, improve, and coordinate the role and relationship of public information and education efforts with those being conducted by local water authorities, utilities, users, and suppliers.
- Evaluate, and where appropriate, engage alternative funding sources and mechanisms to provide resources for programs water users identified as being needed.
- Evaluate and support enhancements to and funding for improving the SEO water administration tools related to tracking annual water use, stored water, well and water administration, and diverted water by water users.
- Revise and update CWCB Strategic Plans to ensure performance of the identified implementation tasks and activities occurs.
- Examine internal budgets and organizational structure to determine how to best achieve desired objectives.
- Evaluate means to fund public information and education, infrastructure construction and maintenance, and technical assistance programs in conjunction with sustaining and expanding the construction fund.
- Coordinate use of other state resources (e.g., DoLA, SEO, etc.) and affiliates (e.g., Colorado Foundation for Water Education) in supporting needs identified by Colorado's water users.
- Continue to support the development and use of the CDSS tools, especially with respect to understanding and characterizing basin hydrology, firm yield, groundwater-surface water interactions (including augmentation water and groundwater recharge programs), and water supply development needs.
- Continue to support development and implementation of the Statewide Water Supply Initiative (SWSI) as it relates to the identification of areas with critical water management issues, water development projects, water supply and demand imbalances, and infrastructure needs; and the development of a sustainable process for maintaining inter and intra-basin communications.
- Continue development and the appropriate allocation of resources to the Office of Water Conservation and Drought Planning in providing technical assistance to covered entities, evaluating submitted water conservation and drought plans, administering fund programs, and disseminating information to the public.
- Integrate the results of this project, and other relevant projects, into the SWSI, Bureau of Reclamation Water 2025 Project, and other state and regional water planning efforts.
- Provide appropriate resources to continue to develop and administer opinion surveys of Colorado water users relative to important water issues, and to create a temporal database related to drought and water supply impacts, limitations, planning needs and projects.