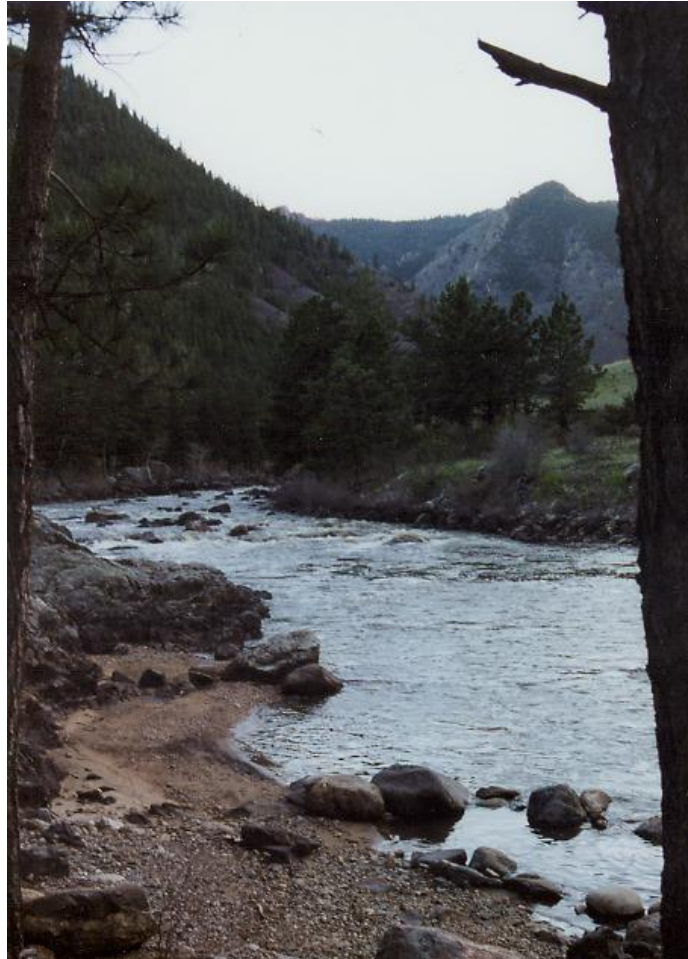




COLORADO CATTLEMEN'S ASSOCIATION

# Water Quality Guide



*Photo by Jared Koch*



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## ***Forward***

Dear fellow beef producer,

Society is continuing to place increased emphasis on water quality protection. My feeling is that most ranchers agree with the importance of protecting water quality because it is part of our livelihood. Producers need to be actively engaged in protecting water quality and guiding the decisions that will affect how we address water quality. It is always better to take a proactive approach to solving our problems, otherwise, the decisions that other people make to address water quality might not fit with our lifestyle. Recognizing water quality issues and how they affect your operation is becoming increasingly important for private landowners and grazing permittees.

The Colorado Cattlemen's Association Water Quality Guide is an excellent first step for producers to become aware of water quality issues and the options that we have to improve the quality of water, as well as the uses that may impact water quality.

Additional assistance and resources are available through agencies listed in the back of the guide. I hope you take the time to look through this guide. It just might help you determine if your water quality is as good as you think.

Sincerely,

A handwritten signature in cursive script that reads "T. Wright Dickinson". The signature is written in black ink and is positioned above the typed name.

T. Wright Dickinson  
Maybell, CO  
Beef Producer and CCA Water Steering Committee member

## ***Introduction***

Water is, and has been, a sensitive issue in Colorado ever since the first pioneers settled here over a century ago. Agriculture is dependent upon the key role that water plays. In Colorado, the cattle industry generates over 2.5 billion dollars per year and 55.9% of all agricultural commodities in the state. Without water, the beef industry as we know it would not exist. Water quality is a determining factor in how productive an operation can become. In order to increase the sustainability of the beef industry, it is of utmost importance to protect our water quality in Colorado.

The Colorado Cattlemen's Association (CCA) has recognized the need to address water quality issues, and in an effort to do so, pursued and received a grant under section 319 of the Federal Clean Water Act. CCA's Water Quality Program is set in place to inform and educate Colorado's western-slope beef producers about various water quality issues. Throughout the program, CCA has participated with its western-slope affiliates in increasing awareness of the importance of water quality. In addition to increasing awareness, CCA and its western-slope affiliates have identified best management practices that can improve water quality, as well as the overall sustainability of ranching operations in Colorado. CCA's western-slope affiliates, including Delta County Livestock Association, Eagle County Cattlemen's Association, Gunnison County Stockgrowers' Association, Holy Cross Cattlemen's Association, La Plata/Archuleta Counties Cattlemen's Association, Mancos Cattlemen's Association, Mesa County Cattlemen's Association, Middle Park Stockgrowers' Association, Moffat County Cattlemen's Association, Ouray County Cattlemen's Association, Rio Blanco County Stockgrowers' Association, Routt County Cattlemen's Association, San Luis Valley Cattlemen's Association, Southwestern Colorado Livestock Association, Uncompahgre Cattlemen's Association and West End Livestock Association, have played a vital role in the Water Quality Program.

Several watersheds on the western slope of Colorado could benefit from implementing management practices to improve water quality. Water quality on the western slope of Colorado affects water quality throughout the western United States. How you manage water quality on your land most certainly affects your neighbor's water quality.

Nonpoint Source (NPS) pollution can have serious effects on you and your downstream neighbor. NPS pollution originates from several different sources rather than a single definable source. In addition to agriculture, NPS can originate from urban runoff, mining and forestry to name a few. To reduce agriculture's role in NPS pollution, increase forage and your overall production and sustainability, you can implement best management practices (BMPs). Keep in mind though, that the BMPs are suggestions of how you can improve water quality. They may not be a perfect fit for your operation and may need some adaptation to properly work for you.

A watershed is the area of land where all of the water that is under it or drains off of it goes into the same place. On the western slope of Colorado alone, there are thirteen watersheds in need of restoration. That may not seem like very many at first glance, but when you take into consideration that several main sources of water for the western United States originate in western Colorado, that is thirteen watersheds too many.

Throughout this water quality guide, you will find laws, definitions and BMPs related to water quality so that beef producers can take a proactive approach to improve water quality rather than a reactive approach to potential future regulations. In addition, you will find contact information for cost share and technical assistance.

# Major Colorado Watersheds



## **Statute & Definitions**

### **Statute:**

**P.L. 100-4, Section 319-** Congress amended the Clean Water Act (CWA) in 1987 to establish the section 319 Nonpoint Source Management Program because it recognized the need for greater federal leadership to help focus State and local nonpoint source efforts. Under Section 319, States, Territories and Indian Tribes receive grant money which supports a wide variety of activities including technical assistance, financial assistance, education, training, technology transfer, demonstration projects, and monitoring to assess the success of specific nonpoint source implementation projects. The goal of Section 319 of the Clean Water Act is to restore to full use those waters, both surface and groundwater, impaired by NPS and to prevent future impairments of all waters.

### **Definitions:**

**Riparian Area-** The vegetated green zone adjacent to streams, rivers, lakes and ponds

**Nonpoint Source Pollution (NPS)-** Pollution which originates from several different sources

**Point Source Pollution-** Pollution which originates from a single definable source

**AFO-** Animal Feeding Operation. Your operation is AFO if you confine animals for at least 45 days in a 12-month period **and** there is no grass or other vegetation in the confinement area during the normal growing season.

**CAFO-** Concentrated Animal Feeding Operation

- Large CAFOs – Have at least 1,000 beef cattle animal units (i.e. heifers, feeders, cow/calf pairs).

- Medium CAFOs – Contain a man-made ditch or pipe that carries manure or wastewater from your operation to surface water **or** animals come into contact with surface water running through the area where they are confined. In addition, the operation must have at least 300 beef cattle animal units (i.e. heifers, feeders, cow/calf pairs).
- Designated CAFOs – No matter the size of the operation, if it is an AFO, it may be designated a CAFO. If a permitting authority inspects the operation and finds that it is adding pollutants to surface waters, a CAFO permit might be needed.

**Watershed-** the area of land where all of the water that is under it or drains off of it goes into the same place



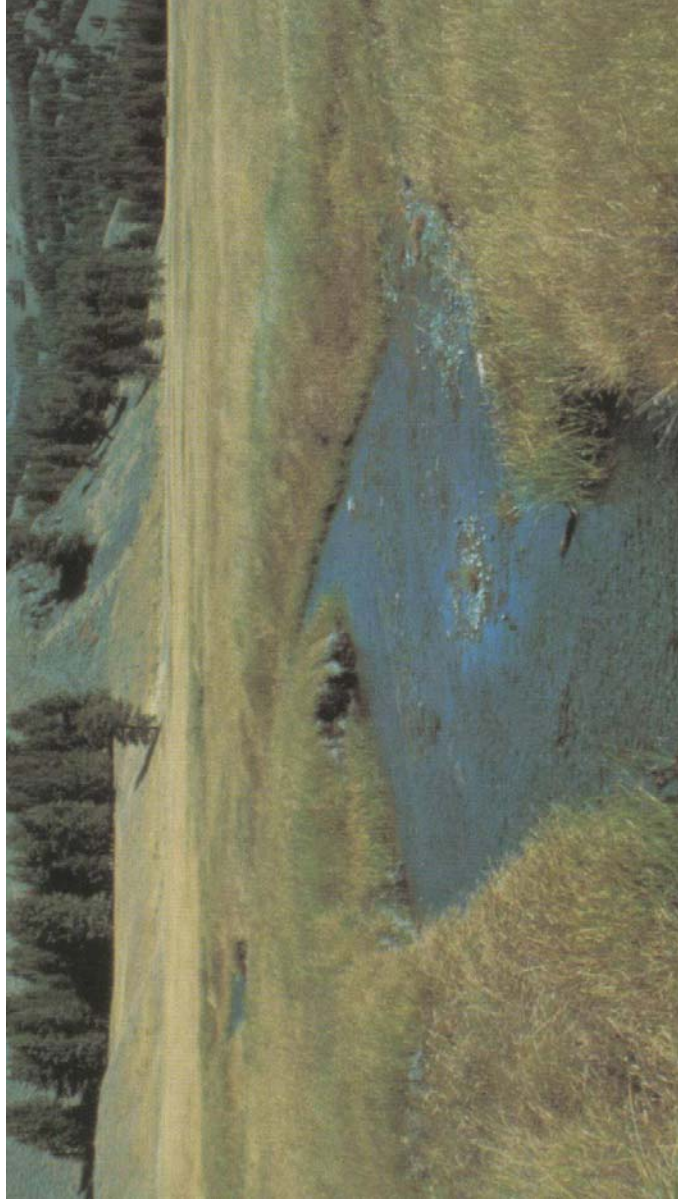
*Photo by Jared Koch*

***Damage Indicators:  
recognizing damaged or degraded  
riparian areas***

- Shallow water
- Wider than natural width
- Warmer in summer
- Freezes easily in winter
- Sediment in water
- Little or no vegetation on streambanks
- Streambank erosion
- Increase in noxious weeds
- Increase or decrease in woody vegetation (could be a positive or negative indicator)
- Presence of “silt fans”
- Lowered water table
- Decrease in production of vegetation



*Photo by Richard Prange*



*Photo by William Platts*

Although the stream in the above picture may look healthy, it does show red flags. It is shallower and wider than natural.



*Photo by William Platts*

The above picture is of the same stream immediately downstream of the picture on the previous page. In this picture, the stream is narrower and deeper with abundant grasses to provide a filtering and insulating effect. As a result, the stream is cooler in the summer and warmer in the winter.

## Recognizing and Solving the Problem

Here are some examples of how beef producers have recognized damaged riparian areas and utilized best management practices to benefit their overall productivity and increase their profit.

### **Recognizing the problem: *Rangeland Condition***

Deteriorating rangeland condition can have a negative affect on water quality. As upland pastures dry out, cattle seek the more palatable forage located in riparian areas. Cattle tend to crowd riparian areas for more palatable forage as well as an easily accessible watering source. As cattle graze in the riparian areas, they remove forage that acts to cool and disperse the flow of water. Removal of vegetation can increase velocity and runoff as well as the temperature of the water, which may lead to decreased water quality. Increased water flow in riparian areas can cause excessive erosion and downcutting of streams and increased water temperature. If the stream channel continues to downcut, the water table can be lowered causing the riparian area to go dry.

### **Implementing BMPs: *Rangeland Condition***

In this case, it is extremely important to employ a grazing strategy along with other BMPs to minimize the impact on riparian areas.

Placing water tanks outside of riparian areas can reduce the need for cattle to utilize riparian areas for their watering source. In some cases it may be necessary to fence off riparian areas to employ a rotational grazing strategy or to allow the riparian area rest from grazing.

Where cattle have normally grazed in riparian areas and used streams as a watering source, beef producers can provide other sources of water and rotate cattle between riparian pastures. These other sources of water can include water troughs and water tanks supplied by wells or developed springs. Applying a rotational grazing BMP or even deferring grazing to allow riparian areas to rest and recover will ultimately improve the quality of the riparian

area and prevent streambank erosion. As beef producers implement these improvements, it is a perfect opportunity to make such improvements to benefit several resources rather than a single resource.

**Recognizing the problem: *Working Facilities***

Corrals that have been placed in riparian areas for a convenient source of water can be a major contributor to both nonpoint source pollution and may fall under CAFO/AFO regulations. Corrals placed in riparian areas not only can damage water quality, they can also have negative affects on herd health. Stagnate areas aid in the incubation of bacteria that can potentially cause illness in cattle.

**Implementing BMPs: *Working Facilities***

Beef producers in this situation should provide alternate sources of water. Again, beef producers can provide water tanks and troughs for the alternate source of stock water. While designing the water source improvements, the beef producer should relocate the corral away from the riparian area. Through applying these BMPs, the beef producer will improve water quality as well as the health of the cattle.

It is important to note that healthy grazing practices such as rotational grazing or deferred grazing in riparian areas promote riparian area health in most cases.

By applying best management practices such as rotational grazing, providing rest periods in riparian areas through fencing or relocating corrals and providing alternate livestock water sources, beef producers can improve rangeland quality, water quality and herd health. These practices improve the water quality by reducing runoff of pollutants such as livestock waste associated with non-point source pollution. Beef producers can implement these BMPs to benefit their land, water and themselves.

## **Riparian Condition Check List**

The following is a checklist of various signs that indicate that a best management practice should be implemented to improve water quality and riparian area health:

### **Section A: Eroding Streambanks**

- Exposed streambanks
- Excessive sediment loading in the stream during periods of high flow
- Sparse grass cover in riparian area including streambanks and surrounding area
- Sparse shrub cover in riparian area including streambanks and surrounding area
- Animals tend to cross in same area
- Animals tend to congregate in riparian areas
- Streambanks are eroding very badly (noticeably from month to month)
- Animals use riparian areas as their main source of drinking water

### **Section B: Rangeland Management**

- Sparse vegetation on upland areas
- Running water through corrals
- Animals tend to congregate in one area
- Animals tend to utilize riparian areas more than upland areas
- Animals tend to utilize one area more than another in the riparian area

If you selected any of the signs in Section A, you should consider implementing a best management practice in the eroding streambank section. For example, if you chose “Animals tend to congregate in riparian areas,” you could place salt and supplemental feed in upland areas to move the animals away from the riparian area.

If you selected any of the signs in Section B, you should consider implementing a best management practice in the rangeland management section. For example, if you chose “Sparse vegetation on upland areas,” you could renovate and seed uplands with preferred forage species along with other BMPs to improve water quality and overall riparian area health.

Whatever BMP or combination of BMP(s) you choose should fit your operation and your goals. If a BMP does not fit, adaptation of the BMP or a completely different BMP may be required. Consulting with your local conservation districts, NRCS, extension agent or a qualified technical service provider is a good idea before implementing any BMP.



*Photo by Lucy Meyring*

# **Best Management Practices**

## **Eroding Streambanks:**

### **Water and mineral sources:**

- Place salt and supplemental feed in upland areas.
  - Controls the distribution of livestock.
  - In conjunction with other practices such as providing off-stream water sources, this can be a very effective tool to manage the distribution of livestock.
- Provide off-stream, high-quality water sources.
  - Controls the distribution of livestock.
  - Encourages livestock to voluntarily move out of riparian areas for high-quality water sources.

### **Vegetation:**

- Improve forage in upland areas.
  - Controls the distribution of livestock.
  - Encourages livestock to voluntarily move out of riparian areas to upland areas.
- Create riparian pastures.
  - By creating riparian pastures, vegetative cover can be re-established while still allowing livestock to utilize the riparian areas through more intensive management practices.
- Leave enough plant growth to protect streambanks and filter sediments.
  - Buffers the streambanks to prevent erosion.
  - Creates a buffer zone to filter runoff from uplands.
- Set grazing periods and specific rest periods to protect streambank stability.
  - Prevents streambank erosion by managing the riparian area and adjusting grazing intervals.

- Create riparian buffers to protect streambanks and filter sediments.
  - Establishes forage along streambanks, filters runoff from uplands and prevents streambank erosion.

**Water crossings:**

- Place rocks or other obstacles on streambanks to limit animal access and the number of crossings.
  - Encourages livestock to utilize specific areas for stream crossings.
- Create hardened stream crossings.
  - Reduces erosion at stream crossings.



*Photo by Richard Prange*

## **Rangeland Management:**

**Incorporate management of riparian areas into the overall management plan for the whole operation.**

### **Working Facilities:**

- Relocate corrals away from riparian areas.
  - Combined with other BMPs, prevents excessive runoff from corrals from entering riparian areas. Drinking water wells can also be affected by the location of corrals.

### **Vegetation:**

- Renovate and seed uplands with preferred forage species.
  - Encourages livestock to voluntarily move out of riparian areas to upland areas.
- Conduct prescribed burning of uplands to regenerate desirable species.
  - Helps to reestablish desirable forage species.
  - Encourages livestock to voluntarily move to upland areas for desirable forage.
- Provide adequate re-growth time and rest for plants.
  - Maintains healthy rangeland.
  - Prevents excessive erosion of rangeland.
- Ensure adequate residual vegetative cover.
  - Maintains rangeland health.
  - Allows desired forage species adequate recovery time.
  - Prevents excessive runoff.

### **Grazing:**

- Select a season or seasons of use so grazing occurs, as often as possible, during periods compatible with animal behavior and conditions in the riparian area.
  - Allows livestock to graze preferred forage species.
  - Maintains grazing management flexibility.

- Control the distribution of livestock within the targeted pasture.
  - Maintains sufficient ground cover to prevent excessive runoff.
- Tailor the grazing approach to the specific riparian area under consideration.
  - Maintains grazing management flexibility in riparian areas.
- Alternate livestock turn-in locations from year to year.
  - Allows for more efficient use and recovery of pastures.
  - Turning in livestock in upland pastures can delay the use of riparian areas.
- Alternate the season of use from year to year.
  - Variations in temperature, precipitation and vegetation growth can affect the most efficient season of use of pastures.
- Set target grazing use levels to maintain both herbaceous and woody plants (according to the site's potential) and the desired plant community, and monitor use each year to be sure you are meeting your objectives.
  - Maintains rangeland health by allowing a specific amount of forage to be grazed.
  - Allow adequate recovery time for desired species.



*Photo by William Platts*



*Photo by Richard Prange*

The above photo shows a damaged stream with eroded streambanks due to reduced vegetative cover including willows and aspens that armor the streambank. The stream is many times its natural width and is very shallow. As a result, increased sediment deposition and streambank cutting takes place during high flows.

The photos on pages 21-23 are of riparian areas located in the Purgatoire River Watershed Project. This watershed project was funded under the Natural Resources Conservation Service (NRCS) Small Watershed Program (PL-566). It was approved for funding in 1992. The project covers about 111,000 acres of the northwest portion of the watershed that is located in western Las Animas County in extreme south-central Colorado. One of the primary objectives of the project was to restore the structure and function of the major riparian areas within the watershed. To accomplish this, riparian areas were targeted where landowners agreed to implement prescribed grazing management that would replace the continuous season-long grazing that had previously taken place. These areas were then fenced, if needed, and off-stream livestock water was developed to enable several pastures (including the riparian pastures) to be properly stocked and rotationally grazed. This controlled the frequency and intensity of the grazing periods while allowing adequate opportunity for the grazed plants to recover.

The project was successful in restoring health to the riparian areas in the watershed. The following photos illustrate this success story. All photos are credited to Mr. Tony Arnhold, Soil Conservationist, NRCS, 422 East First Street, Trinidad, CO 81082; 719-846-3681.



Bowman Ranch located on the lower Burro Canyon tributary to the Purgatoire River.  
“Before” picture taken on 4/95 showing effects of historical season-long grazing.



Bowman Ranch two months after implementation of prescribed grazing management. Note the installation of the riparian pasture division fence to facilitate the rotational grazing management program.



This photo was taken after five years of prescribed grazing on the Bowman Ranch. The riparian vegetation has responded through the establishment of a diverse plant community consisting of grasses, sedges, rushes, forbs and woody plants. Many of the cottonwood and willow shrubs were planted using cuttings of switches and poles obtained from the NRCS plant materials center in Los Lunas, NM as well as from local native cuttings in the area. As a result, this riparian area has moved toward proper functioning conditions.

## ***Monitoring***

Whether your riparian area and water quality are in good condition or not, continual monitoring of the riparian area is necessary to maintain or improve the health of the riparian area and water quality. When monitoring the health of your riparian area, remember that the management of your riparian area should be incorporated into the overall management plan for your operation. Riparian area health affects upland health and vice versa, and both affect water quality. If one is healthier than the other, animals will tend to over-use the healthier of the two areas. Over several years of monitoring, you will be able to determine if the best management practices in use are accomplishing your goals and objectives.

Useful monitoring practices include keeping written documents as well as photos of the use and progress of specific areas including pastures and riparian areas. The USDA NRCS or Colorado State University Cooperative Extension can help establish photo points for a visual record of the condition of the riparian area. The USDA has a variety of programs to assist producers with implementing many of the practices outlined in this guide.

With the proper use of best management practices and monitoring, a balance of health can be maintained among all areas of your operation, as well as improved water quality.

## Cost Share & Technical Assistance

If you have any questions about your specific riparian area and would like technical or cost share assistance, contact:



**Water Quality Control Division**  
[www.cdphe.state.co.us/wq/wqhom.asp](http://www.cdphe.state.co.us/wq/wqhom.asp)  
**303-692-3500**

Colorado Department  
of Public Health  
and Environment



[www.epa.gov](http://www.epa.gov)  
**1-800-227-8917**



[www.ext.colostate.edu](http://www.ext.colostate.edu)  
**970-491-6281**

*Putting Knowledge to Work*

- **Local CSU Extension**



### **Farm Service Agency**

Colorado State Office  
[www.fsa.usda.gov/co/co.htm](http://www.fsa.usda.gov/co/co.htm)  
720-544-2876

- Local FSA field office



Colorado State Office  
[www.co.nrcs.usda.gov](http://www.co.nrcs.usda.gov)  
720-544-2810

- Local NRCS field office



### **Colorado Association of Conservation Districts**

[www.cascd.com](http://www.cascd.com)  
303-232-6242

- Local Conservation Districts

### **Water Conservation Districts:**

Colorado River Water Conservation District  
970-945-8522

Rio Grande Water Conservation District  
719-589-6301

Southwestern Water Conservation District  
970-247-1302

### **Local CCA Affiliate**

**Notes on my Operation**

**Notes on my Operation**

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**Special Thanks to:**

Colorado Department of Public Health and Environment, Water Quality Control Division.

U.S. Department of Agriculture Natural Resources Conservation Service

U.S. Environmental Protection Agency

Colorado State University Cooperative Extension

Colorado Nonpoint Source Council

Colorado Cattlemen's Association Water Steering Committee

**The Colorado Cattlemen's  
Association mission is to  
promote the interests of  
Colorado's beef industry and  
protect Colorado's land, water  
and forage resources.**



The Colorado Cattlemen's Association has united beef producers since 1867 to provide a unified voice for Colorado's beef industry. In fact, CCA is the nation's oldest cattlemen's association. CCA serves members by speaking out on behalf of Colorado's beef producers and landowners to state and national legislators, agencies, media and consumers. Beef producers join CCA voluntarily and manage it cooperatively, working together to accomplish goals that no single beef producer could reach alone. CCA is governed by its members, who elect a Board of Directors. Policy is developed directly by membership through CCA's 19 steering committees. CCA is committed to enhancing the investment of the grassroots beef producer through legislative representation, research and education, information distribution, public relations, issues management and allied group cooperation.

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