

The Effect of the Shoshone and Cameo Calls on the Roaring Fork Watershed

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There are two major water rights which affect the stream flow of the Roaring Fork River and its tributaries as they flow through the Roaring Fork Watershed: the Shoshone Hydro Plant in Glenwood Canyon and a group of Grand Junction water rights collectively known as the “Cameo Call.” See Appendix B, Map of the Upper Colorado River Basin Major Water Rights.

I. Shoshone Hydro

The most powerful water right on the Colorado River (the River) is the Shoshone Hydro Plant (Shoshone Hydro), built in 1909 and located eight miles east of Glenwood Springs. Shoshone Hydro’s water right dates back to 1902 and amounts to more than 900,000 acre feet (af) of water per year (approximately 2,500 af per day) or 1,250 cubic feet per second (cfs). Shoshone Hydro has an additional right to 158 cfs dating back to 1940. Today, it generates up to 15 megawatts of electricity to supply power to roughly 16,700 homes in the Roaring Fork Valley, New Castle, and Silt as well as the Front Range.

During low flows (less than 1,408 cfs), as the most senior water right on the River, Shoshone Hydro may divert the entire flow out of the river into its turbines, leaving several miles of the Colorado River in Glenwood Canyon dry for up to 12 weeks a year. However, its effect on downstream flows is actually beneficial. Shoshone Hydro’s use of the water is non-consumptive, meaning almost 100 percent of the water it diverts returns to the River downstream. For example, water flows out of Shoshone Hydro’s turbines, into the Colorado River, out of the state, and into Lake Powell. This water constitutes 20 percent of the water the Colorado River carries out of the state in an average year.

Thus, while Shoshone may dry up a portion of Glenwood Canyon, its call (the common term for an order issued by the Division Engineer to stop diversions when the water is needed by senior water rights holders) actually keeps water instream. According to Eric Kuhn, general manager for the Colorado River Water Conservation District (River District), Shoshone Hydro, owned by Xcel Energy, Inc., “makes the river run.” Above and below the plant, water users ranging from cities to rafting businesses to anglers rely on Shoshone Hydro to keep water in the river.

By “calling” the water downstream, Shoshone Hydro’s water rights prevent upstream, transbasin diversions from taking water out of the River. For example, if Shoshone Hydro were not calling the water downstream, then upstream water users could divert the water in priority long before it

ever reached Glenwood Canyon. Such upstream users include the Moffat Tunnel System (Fraser River), the Colorado-Big Thompson Project (Grand Lake area), Denver’s Roberts Tunnel, and other major transbasin diversions. In addition, water would be diverted for full storage to the Green Mountain Reservoir, Denver Water’s Williams Fork and Dillon reservoirs, and the Wolford Mountain Reservoir. Thus, by calling water downstream, the Shoshone Call plays a critical role in keeping upstream portions of the Colorado River flowing.

Unlike irrigation water rights, the Shoshone Call is generally exercised throughout the year, except in the spring run-off months. However, it has its greatest effect during the winter - when the Cameo Call (discussed below) is off - by limiting diversions in the Upper Colorado River tributaries for junior municipalities, transbasin diversions, and snowmaking.

Table 1. Shoshone Water Rights

Water Right	Uses	Adjudication Date	Appropriation Date
1250 cfs	Industrial, Power Generation	Dec. 9, 1907	Jan. 7, 1902
158 cfs	Commercial, Industrial, Power Generation	Feb. 7, 1956	May 15, 1929

a. Effect on Transbasin Diversions

For nearly 40 years, Denver Water has been negotiating for Shoshone Hydro’s water. In 2003, for the first time, Denver Water, Xcel Energy, and several other Western Slope interests reached a cooperative agreement that provided for a partial shut down of Shoshone Hydro during low flows. Under the agreement, Denver Water compensated Xcel Energy for lost revenue due to inefficient power generation resulting from the partial shut down, took the water the plant would normally use, and diverted it to reservoirs that supply the Front Range. In addition, Denver Water earmarked ten percent of the water gained from the call reduction to be returned to the Western Slope, providing additional storage water for the Fraser, Blue, and Colorado Rivers.

By reducing the Shoshone Call, Dillon and Green Mountain reservoirs stored an additional 50 to 200 af of water per day, and additional water was diverted through several tunnels to the Front Range. This agreement was not renewed in 2004, largely because Shoshone Hydro was partially shut down for maintenance and repair. Thus, the Shoshone Call was not on during the crucial spring months, allowing the upstream reservoirs to store additional water. As a result of low flows below Shoshone Hydro that resulted from additional upstream storage, the Colorado River District released an additional 1,000 cfs from Wolford Mountain Reservoir into the River to preserve fisheries and instream flows for recreation.

Many Western Slope water users (including water providers, recreationalists, environmentalists, wastewater plants, and municipalities) view the agreement as a dangerous precedent. The towns of Battlement Mesa and Rifle argue that any reduction in the River’s flows would reduce the quality of water flowing into their treatment plants, adding to the cost of providing water to their

towns. As the River's flow decreases, the concentration of sulfates, magnesium, iron, manganese, and calcium deposits increases. Currently, the towns' water treatment plants are unable to filter this increase in minerals and particles. If the water flow decreases too much, Battlement Mesa and Rifle may not be able to draw their water from the river.

In addition, Western Slope water users have voiced concern about agreements with Denver Water in average years. Western Slope users argue that if Front Range water interests start to rely on the reduced call and increased storage in reservoirs serving Denver, then it will be difficult in the future to terminate the agreement when Western Slope interests and fisheries need the water.

Although Denver Water pushed hard for the 2003 agreement, it argues that it can take Shoshone water whenever necessary. The utility cites Denver's 1986 franchise agreement with Xcel Energy (formerly Public Service Co. of Colorado) that establishes Xcel as the exclusive supplier of natural gas and electricity to the city. According to the agreement, Denver Water can take the Shoshone water and pay the company for any electricity that is lost due to lack of water. However, despite the 1986 agreement, 2003 marked the first year that Denver paid Xcel for a call reduction.

Xcel, on the other hand, views the 2003 agreement as a response to unique circumstances (persistent drought). As a general position, the company refuses to change Shoshone Hydro's right without the support of the Western Slope. Xcel feels, by the nature of the hydro-water right, that the water is ultimately Western Slope water.

The franchise agreement between Denver and Xcel is up for renewal in 2006. As it stands, the agreement provides few limitations on when Denver Water can take water from Shoshone Hydro and reimburse Xcel for lost revenue. Xcel's current proposal for the 2006 renewal includes controlling the Call from March 20 to May 20 of each year at 700 cfs (one-turbine), during certain dry years when threshold conditions are met. Xcel continues to insist on no further "relaxations" unless general agreement with Colorado River stakeholders can be reached. In addition, Xcel insists that it will not relax the Shoshone Call to the point that a call from Grand Valley would come on.

In a letter dated November 1, 2004, Denver Water rejected Xcel's proposal. In the alternative, Denver Water delineated the "relaxation option of most benefit for upstream water suppliers:" elimination of the Shoshone call during the winter months or on the rising and falling limbs of the hydrograph during the runoff season. Denver Water's Manager, Chips Barry, dismissed the impacts to power interference, recreation, fisheries, or water quality as problems that could be mitigated after detailed analyses. In addition, in a meeting on October 26, 2004 in Grand Junction with Grand Valley interests and River District staff, Denver Water officially announced its preference to totally eliminate the Shoshone Call. According to the Middle Park Irrigation District's Attorney, Stanley W. Cazier, Denver Water stated it "didn't want to hear any philosophical concerns" about limiting the Shoshone Call, only "injury suffered by the ditch companies."

The 2006 franchise agreement is a private agreement between Xcel Energy and Denver Water. Meetings related to the agreement are mostly closed to the public, and there is no official process for public participation. After Xcel and Denver Water reach an agreement, Denver's City Council, the approving governmental entity, will provide the only forum for public opposition (e.g., the Colorado Legislature will not review the agreement).

II. The Cameo Call

The Cameo Call, also called the Cameo Demand, provides water mostly for irrigation and power in the Grand Valley near Grand Junction. The Call is comprised of a series of water rights on the Colorado River owned by five entities: the Grand Valley Irrigation Company (GVIC), the Orchard Mesa Irrigation District (OMID), the Grand Valley Water Users Association (GVWUA), the Palisade Irrigation District (PID), and the Mesa County Irrigation District (MID). These entities operate several diversion dams, pumping plants, a power plant, and a system of canals. Primarily serving agricultural interests, it has furnished a full supply of irrigation water to approximately 33,368 acres and supplemental water to about 8,600 acres of fertile land for nearly a century. The priorities of these entities date back from 1912 though 1934, total 2,260 cfs during the irrigation season and 800 cfs during the non-irrigation season, and trump all upstream junior users.

The Cameo Call usually consists of the GVIC “junior Cameo” right to 119 cfs and the GVWUA “senior Cameo” right to 730 cfs. Presently, the Cameo Call operates only during the irrigation season, which can range from April to October in dry years. The Call’s length depends on how dry the season is and how much water is diverted by junior users upstream. In drier years, the Division of Water Resources administers the Call for a longer period of time as it comes on earlier in the season. Regardless of dryness, though, the Call comes on every year simply because the river is over-appropriated.

Like the Shoshone Call, the Cameo Call effectively keeps water instream until it reaches the Grand Junction area. This means that upstream diversions, including Front Range reservoirs and direct diversions, must shut down to satisfy senior agricultural needs at Cameo, and upstream reservoirs may need to release additional water into the River to meet the Call.

Table 2. Junior and Senior Cameo Call Water Rights

Structure	Decree (cfs)	Uses	Adjudication Date	Appropriation Date	Comments
Grand Valley Canal (GVIC)	119.470	Irrigation	July 25, 1941	April 26, 1914	a.k.a. Junior Cameo
Grand Valley Project (GVWUA)	730	Irrigation	July 22, 1912	Feb. 27, 1908	a.k.a. Senior Cameo, includes the Gov’t Highline Canal and the Roller Dam

a. The Roller Dam and the Government Highline Canal

Near Grand Junction, the Roller Dam, also called the Grand Valley Diversion Dam, is located above Plateau Creek on the Colorado River. It is operated by GVWUA in conjunction with the United States Bureau of Reclamation. The Roller Dam delivers water for 55 miles to the south and west via the Government Highline Canal (the Highline Canal). The Highline Canal has a diversion capacity of 1,675 cfs but diverts approximately 1,560 cfs each irrigation season. More than half of this water is diverted to OMID, MID, and PID through other canal systems. The remaining 720 cfs continues down Highline Canal into the irrigated project area served by the GVWUA.

The OMID has a decreed water right to 450 cfs during the irrigation season dating back to 1912. This water is diverted through the Government Highline Canal to its facility where it uses 170 cfs for irrigation and approximately 280 cfs to run its pumping plant. The Orchard Mesa Pumping Plant lifts water uphill from the Orchard Mesa Power Canal to the distribution system. It serves land on the Orchard Mesa, on the south side of the Colorado River between Palisade and the Gunnison River.

In addition, the Government Highline Canal diverts another 310 cfs during irrigation season and 800 cfs during non-irrigation season to the OMID facility, for use by the United States government in its federal Power Plant for hydroelectric power generation.

b. Orchard Mesa Check Case

OMID consumptively uses only 170 cfs of the water it diverts from the Government Highline Canal. The rest, after supplying OMID's pumps, returns to the River. Therefore, to satisfy GVIC's senior rights and manage the water system most efficiently, OMID also operates a return flow canal, the Orchard Mesa Check (the Check). The Check directs the return flow upstream just above GVIC's diversion dam on the Colorado River so that GVIC can use the water again for irrigation.¹

Operation of the Check reflects conflicting goals in the Grand Valley and the entire Colorado River Basin. Using the Check most efficiently means there is little water in the 15-Mile Reach, the stretch of the Colorado River from the GVIC's dam to the confluence of the Gunnison River. However, the Upper Colorado River Endangered Fish Recovery Program has designated the 15-Mile Reach as critical fish habitat where instream flows are crucial. To keep water instream for the endangered fish means less available water for the Grand Valley irrigation systems, for Shoshone Hydro for power production, for Dillon and Green Mountain Reservoirs for storage, and ultimately, for Front Range cities. For example, up to 200 af of water per day could be stored upstream in reservoirs, much of which could be taken through the Adams Tunnel, or any other tunnel, to the Front Range.

¹ The district has operated this Check on an informal basis since 1926. However, in response to a potential threat to the continued informal operation of the exchange, OMID (with co-applicants the United States and GVWUA) filed an application in the State Water Court in 1991. A stipulation and agreement, known as the Orchard Mesa Check Case Settlement, was entered in District Court in 1996.

c. GVIC's Diversion Dam

The GVIC Diversion Dam has a decreed water right of 520 cfs dating back to 1912 and an additional 120 cfs dating back to 1934. The Dam is fourteen feet high with a crest of 546 feet. It is located on the Colorado River at the head of the 15-Mile Reach and just upstream from OMID's return flow. The Dam is among the largest of its type in the world, considered unique, and listed on the National Register of Historic Places.

A fish passage structure was constructed at the Dam on the Colorado River in January 1998. Providing fish passage at this structure, the Price-Stubb Dam (no longer in operation), and the Roller Dam will eventually restore 55 miles of historically occupied habitat for endangered fish, upstream to the Rifle area.

III. The Effect on the Roaring Fork Watershed

a. Diversions

The effect of the Shoshone and Cameo calls on diversions in the Watershed is mixed. Often neither call affects the ability of junior users to take the full or partial amount of their decreed water right. However, in dry years, it is possible that diversions may be curtailed completely or junior users may have to pay for replacement water from Ruedi Reservoir if flows are low.

In terms of administration, the Colorado Division of Water Resources (DWR) cuts off junior diversions in the Watershed based on priority in relation to the "swing right." DWR defines a swing right as the most junior water right, either totally or partially in priority, upstream of the calling structure, which satisfies the calling right. Thus, each junior user is shut down, beginning with the most junior user, until the call is satisfied. The junior user satisfying the call is the swing right. Each user junior to the calling right, but senior to the swing right, may continue to divert.

The swing right varies constantly throughout the year (especially during irrigation season), depending on the amount of water in the Basin (which varies due to precipitation and dryness) as well as the amount of water needed to satisfy the calling right. The five large storage reservoirs in the Basin are often "called out," regardless of whether the calling right is GVIC, GVWUA, or Shoshone (see Table 6).

Table 6. Table of Large Diversions in the Colorado River Basin, in order of priority

Structure	Decree	Adjudication Date	Appropriation Date
Shoshone Power Plant	1250 cfs	Dec. 9, 1907	Jan. 7, 1902
Grand Valley Project (GVWUA)	730 cfs	July 22, 1912	Feb. 27, 1908
Grand Valley Canal (GVIC)	119.470 cfs	July 25, 1941	April 26, 1914
Twin Lakes Canal & Reservoir Company	322 cfs	August 25, 1936	August 23, 1930

Williams Fork Reservoir	93,637 af	November 5, 1937	November 10, 1935
Roberts Tunnel/Dillon Reservoir	252,678 af	March 10, 1952	June 24, 1946
Green Mountain Reservoir/C-BT	160,961 af	October, 12, 1955	August 1, 1935
Shoshone Power Plant	158 cfs	Feb. 7, 1956	May 15, 1929
Ruedi Reservoir	102,369 af	June 20, 1958	July 29, 1957
North/South Collection Systems of Fry-Ark Project (16 structures)		August 3, 1959	July 29, 1957
Wolford Mountain Reservoir	59,993 af	November 20, 1989	December 14, 1987

For example, the Twin Lakes Reservoir & Canal Company (Twin Lakes), which serves Front Range water users, is possibly affected more by the Cameo Call than any other diverter in the Watershed. Yet, it is rarely shut down. Diversions through the Twin Lakes Tunnel began on May 24, 1935. In 1936, Twin Lakes won a decree for 60,000 af of water, or more than half of the roughly 110,000 af produced annually by the headwaters of the Roaring Fork River above Aspen. But, Twin Lakes has never had enough storage to take advantage of all its rights. It takes about 38 percent of the headwaters - 35,000 to 40,000 af - that would normally drain off the peaks around Independence Pass and flow through the Roaring Fork River to the Colorado River below. Being junior to GVIC's 119 cfs water right by five years, it is the last right to be called out to satisfy the Cameo Call. In 2004, for example, the Cameo Call did not affect Twin Lakes' diversions.

Similarly, the Fryingpan-Arkansas Project (Fry-Ark Project) is one of the largest diversions in the Watershed, but the calls have only shut it down twice in the project's history. The U.S. Bureau of Reclamation developed the Fryingpan-Arkansas Project (Fry-Ark Project) to bring more water to Front Range users. The West Slope Collection System, located upstream of Ruedi Reservoir (Ruedi) in the Upper Fryingpan River and Hunter Creek watersheds, is a series of collection structures that captures snowmelt runoff for diversion to the Charles H. Boustead Tunnel (Boustead Tunnel). Sixteen structures that comprise the North and South Collection Systems divert an annual average of approximately 65,000 af of water during the irrigation season and deliver it through the Boustead Tunnel and under the Continental Divide to Turquoise Lake near Leadville.

Storage in Ruedi Reservoir is integral to the Fry-Ark Project. Ruedi was constructed by the United States Bureau of Reclamation and made operational in May 1968. Ruedi's 102,373 af of storage provides replacement water for out-of-priority depletions to the Colorado River as well as replacement water for junior users in the Roaring Fork Watershed for West Slope agricultural, municipal, and industrial uses on a contractual basis.

According to Kara Lamb, the Bureau of Reclamation's Public Information Director for Colorado, the Cameo Call has only shut down the Fry-Ark diversions twice (once in summer 2002, during the height of the drought) for three reasons. First, Shoshone Hydro is located

upstream of the confluence of the Roaring Fork and Colorado rivers and doesn't affect Ruedi operations. Second, while the Cameo Call is downstream, it typically comes on later in the summer than the Fry-Ark Project diversions and rarely impacts it. Third, conflict is rare because minimum instream flows upstream of Ruedi usually preclude diversion by the collection system before the Cameo Call comes on. This means that, because there are established minimum flows, when snow melt is poor and drought conditions severe, the Fry-Ark Project cannot divert water out of the system.

Normally, the collection and diversion system for the Fry-Ark Project, upstream of Ruedi, runs in the spring. Ruedi provides replacement water to the lower Fryingpan River to supplement water taken by the West Slope Collection System. By agreement meant to appease Western Slope water users, Boustead Tunnel diversions cannot exceed the storage capacity of Ruedi, or 120,000 af in any one year. However, low flows still plague the Upper Fryingpan River during irrigation season. For example, according to data recorded at gage stations, 2004 summer flows in the Upper Roaring Fork River ran less than 50 percent of historical average.

Similarly, the City of Glenwood Springs has a large diversion on No Name Creek to serve municipal water demands. However, Glenwood Springs' water right is sufficiently senior, so not often affected by the calls. Similarly, the Clifton Water District and the City of Grand Junction each hold water rights for municipal purposes. However, these rights are senior to most transbasin diversions on the River, so not often affected by either call.

If junior users are shut down in this Valley, Green Mountain and Ruedi reservoirs provide them with replacement water under existing water contracts. This means that instead of shutting down their diversions after being called out, junior users may contract with these reservoirs to release replacement water into the Fryingpan River.

Similarly, Green Mountain Reservoir may augment the instream flows in the Colorado River by releasing water from its historic user pool (HUP). Only irrigation and domestic decrees perfected on or prior to October 15, 1977 and junior to the Shoshone Call qualify to have their consumptive use replaced by the Green Mountain HUP. If they qualify, users continue diverting even though they are out of priority. Decrees for purposes other than domestic or irrigation and junior to the Shoshone Call, including transbasin decrees, may not be replaced by the HUP and must be curtailed based on the priority of the decrees in times of shortage. However, the remaining 34,000 af in the Green Mountain Reservoir not in the HUP may be contracted out by the Bureau of Reclamation to satisfy these decrees. In addition, the operating policy of the Green Mountain Reservoir allocates 52,000 af of the total 152,000 af of storage for the purposes of replacing Colorado-Big Thompson (CBT) diversions, which would otherwise be curtailed by a call on the River.

The Green Mountain Reservoir's operating policy does not allow for the use of its water to replace out-of-priority transbasin diversions (except for CBT diversions, mentioned above). It may also not be used to replace diversions on tributaries to the Colorado River, which have been called out by a decree on that tributary. Transbasin decrees may continue to divert when they are out of priority only if they provide replacement water to the River.

b. Streamflows

Generally, either the Shoshone or the Cameo Call is beneficial to instream flows in the Roaring Fork Basin. Upstream reservoir releases keep water instream in the River from the headwaters to the state line, and Ruedi Reservoir releases keep water instream for fisheries and recreation in the Fryingpan and Roaring Fork rivers. By calling water downstream, the calls protect segments of river that would otherwise be drawn to critically low levels by upstream water users. In addition, without the calls, increased water temperatures and early algae blooms can threaten local fisheries. By contrast, when the calls are off, local and trans-basin diversions may fulfill the full extent of their decreed rights at the expense of instream flows.

However, despite the positive effect of the current system, the Colorado Water Conservation Board (CWCBC) has considered proposals to reduce the Shoshone Call to allow for more water storage in upstream reservoirs to be released on the peak hydrograph for the benefit of endangered fish.

Appendix A Glossary

Acre-feet (af): the volume of water required to cover one acre of land (43,560 square feet) to a depth of one foot. Equal to 325,851 gallons or 1,233 cubic meters.

Augmentation: increasing the water supply in the stream through a court-approved plan. Augmentation typically will involve storing junior water when in priority and releasing that water when a call comes on, purchasing stored waters from federal entities or others to release when a river call comes on, or purchasing senior irrigation water rights and changing the use of those rights to off-set the new users injury to the stream.

Call: Usually a written document filed with the Division Engineer stating that as of a certain date and time a water right holder is not receiving all of the water they are entitled to by decree and requesting that the Division Engineer shut down (curtail) all upstream water rights junior to them until their senior right is satisfied.

Consumptive use: that part of water withdrawn that is evaporated, transpired by plants, incorporated into products or crops, consumed by humans or livestock, or otherwise removed from the immediate water environment. Also referred to as water consumed.

Cubic feet per second (cfs): a rate of the flow, in streams and rivers, for example. It is equal to a volume of water one foot high and one foot wide flowing a distance of one foot in one second. One "cfs" is equal to 7.48 gallons of water flowing each second. As an example, if your car's gas tank is two feet by one foot by one foot (two cubic feet), then gas flowing at a rate of one cubic foot/second would fill the tank in two seconds.

Diversion: physical removal of surface water from a channel.

Reservoir: a pond, lake, or basin, either natural or artificial, for the storage, regulation, and control of water.

Return flows: that water which, after application to a beneficial use, returns to the stream system either on the surface or as groundwater.

Runoff: that part of the precipitation, snowmelt, or irrigation water that appears in uncontrolled surface streams, rivers, drains or sewers. Runoff may be classified according to speed of appearance after rainfall or melting snow as direct runoff or base runoff, and according to source as surface runoff, storm interflow, or ground-water runoff.

Transbasin or transmountain water: water which is imported by man from its natural drainage basin into another drainage basin, typically from the West Slope to the East Slope of Colorado by means of tunnels under the Continental Divide.

Appendix B

Upper Colorado River Basin Major Water Rights

