Gunnison River Action Plan (GAP)

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Written by:

Ally Brundage
Jorge Hernandez
Logan Maurer
Kaitlin Murphy
AJ Nolan

Dr. Gerald Kauffman
UAPP411: Regional Watershed Management
Department of Public Policy and Administration
University of Delaware

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Mission Statement

GAP's objective is to create and maintain a sustainable water resource plan with fishable and swimmable water quality standard in the Upper Gunnison River Valley by the year 2050.

History/Background

The North Fork Valley, a region of the Gunnison River Basin, has transformed from an area dependent on mining to having an immensely high concentration of organic farms. The farming in the region gives the opportunity to protect the river and land from the degradation that drilling has caused. The region was historically dependent on coal mining, but shifts in industry have changed the market. The North Fork and the rest of the River Basin are now more commonly known for its orchards, livestock farms, and recreational activities as a means for economic prosperity. While leaving coal mining behind has left the region in a more environmentally friendly situation, it is still in danger of degradation from oil drilling. The valley is home to one of the largest potential natural gas formations in the country. Residents of the area have consistently reached out to government organizations such as the Bureau of Land Management to ensure the valley does not become victim to irresponsible gas development that will degrade the landscape and the river.

The river itself is one of the largest tributaries to the Colorado River, making up about one third of the Colorado River's flow at the Utah state border. The Upper Gunnison River Basin is bound by the continental divide on its east side and and the Blue Mesa Dam into the Black Canyon on its lower end. The development of dams in the river's tributaries are also negatively impacting the environment in the area. The dams mainly serve to route water for irrigation to the vast amount of agriculture that surrounds the river. The agriculture that is mainly found in the basin include cattle ranches, sheep ranches, orchards, cornfields, and hay production. The large amount of agricultural activity in the region is yet another source of harm to the basin's environment. A large portion of the river being routed for irrigation is yet another issue due to the fact that most of the basin receives an average of less than 15 inches annually.

The Bureau of Reclamation has been working in the Upper Gunnison River Basin to help preserve the land and manage the water. The Bureau's oldest project in the area is the Uncompahgre Project, which called for the construction of the Gunnison Tunnel and the Taylor Park Dam and Reservoir. The Reservoir was built to store water for the farmers and to prevent unwanted water users from gaining access to the water of the Taylor River. The largest project of the Bureau in the basin is the Aspinall Unit, which birthed the Blue Mesa Dam, Morrow Point Dam, and Crystal Dam. The three reservoirs combined can store over one million acre-feet of water. The dams were also built to help generate electricity and to meet the obligations of other states that have water rights to the Colorado River.

Two major water management documents were written since 2000 to address the damage that the dams and agriculture have caused to the river basin. In 2008, the Black Canyon Decree was published. The decree was developed to set flow targets that aimed to restore and maintain the environmental health in the Black Canyon, part of the Gunnison National Park. A few years

later, the Bureau of Reclamation released the 2012 Final Environmental Impact Statement (EIS). The EIS was designed to guide the management the Aspinall Unit reservoirs to benefit marine life downstream while still serving its intended purpose. The EIS incorporated the Black Canyon decree into it, and both documents set targets for short term peak flows and minimum flow levels. There are also efforts to clean up a Superfund site along the river that occured due to decreased water quality. The river has seen increased levels of salt and selenium as well as acidic and metal-rich waters from old pipes.

Policies and Mandates in Place

The Gunnison River has been used primarily for agricultural purposes, via the use of dams and reservoirs. Now while these have served the human agriculture purpose well the, there has been a toll to pay from the environmental impacts as a result. In response there has been two documents that address these environmental impacts:

- Black Canyon Decree [4] (2008): Sets standards for flow rate (annual, seasonal… etc)
    - Controversial bill resulted after 30 years of arguing about property rights [5]
    - Agreement is between "United States, conservationists, water users, the State of Colorado, and others" [5]
- Final Environmental Decree [4] (2012): Statement how Aspinall Unit reservoirs are to be managed
    - Guides aimed at benefiting endangered species downstream of the reservoir

Both of these documents were written and implemented with the intention of improving stream conditions overall quality. The first one was a very a result of a 30 year long battle over water rights. In the end the "Black Canyon Decree" resulted in 2008. This set target flows, minimum flow rates, for the rivers in order to ensure all can benefit from the river while ensuring the longevity and health of the river and its inhabitants.

Additionally, there are more example of policy from government earlier on in history acting on the Colorado river as a whole, such as:

- Colorado River Basin Salinity Control Act (1974) [6]
    - Law enacted by congress directing the secretary of interior to proceed on a program to better the quality in all of the Colorado River
- Public Law 104-20 (1995) [6]
    - Authorizes secretary of interior to direct a baseline salinity control program

Problem 1: Inadequate Water Resources

It is estimated that by 2050, there will be 3-5 million new people in Colorado. With the issues of climate change, drought, and current agriculture practices, the Gunnison River will not be a sustainable water resource. The stress on this river basin for recreational, drinking water, and agricultural use will soon create a big problem for natural ecosystems and the economy.

Climate change is a big concern for the Gunnison River and the rest of the Colorado River Basin. Climate change causes a decrease in flow, increased evaporation from higher temperatures, and a decrease in snowpack. All of this will only widen the gap between supply and demand for the Gunnison River Basin.

Water diverted from the basin for agricultural use contributes to depletion of the river because the water evapotranspiration from crops are not returning to the river via return flows.

Problem 1 Goals

To solve the problems stated above, GAP proposes the idea of increased municipal conservation. This would include installing low-flow faucets and toilets, less water intensive landscaping practices, and governmental/monetary incentives to use water saving devices. Reusing wastewater for agriculture and potable uses will also conserve water resources in the Gunnison Basin. Rainwater harvesting would also allow for reducing use of water. With agriculture being the largest use of the Gunnison River Basin, it is important that there be sustainable ways to use this part of the Colorado River Basin for that purpose. Drip-irrigation, crop shifting, and water banking are all ways that this can be achieved.

Problem 2

Declining water quality has plagued the Gunnison River Basin over the past few years. Several factors contribute to the pollution of the river, primarily from human activities. These factors include agricultural runoff from embanked farms, salinity and metal leaching from mines/drilling, selenium runoff, and pollution from human recreational activities (Holm).

Agricultural runoff is a multi-faceted problem; livestock and crops inject a cocktail of detrimental pollutants due to the close proximity of farms to the embankment of the Gunnison River (Kugel 2015). Historically, the Gunnison River Basin area receives minute amounts of rainfall, thereby forcing local farmers to use fertile agricultural land near the river as far back as early as the 1870s (Holm). The predominant irrigation method of this era was flooding, which served to nurture crops and wash pollutants into the river.

While much of the area nearby the Gunnison river is used for agriculture, the primary geologic formation of the basin is constituted by Mancos shale. This formation contains heavy metals, which are mined/drilled for. A natural by-product of these processes is soluble metal leachate, as well as an increase in salinity (Bureau of Land Reclamation 2018).

Just as humans have nurtured and explored the soil of the Gunnison River Basin, they have also sought after natural recreational opportunities. Despite the best intentions, human interaction with nature commonly results in discarded trash, the disturbance of local ecosystems, and the extortion of natural resources. These adverse effects impact water quality inherently; disturbing local ecosystems of fauna and wildlife with alien activities such as kayaking or fishing without a proper education and practices in mind.

Problem 2 Goals

The majority of the problems associated with declining water quality in the Gunnison River Basin stem from lack of public/stakeholder education. To manage several of the pollutants entering the waterway, public outreach programs should be designed to educate waterway users of pollution control.

Agricultural farmers would receive education on efficient water irrigation methods. While these methods help to preserve water (a major facet of our first problem), they also serve to prevent water contamination by limiting exposure through efficiency. These modern techniques would limit the exposure of nitrogen, phosphorus, and fecal contaminants, as well limiting the possibility of algal bloom outbreaks associated with fertilizer pollution.

Miners who understand Mancos shale and its geologic makeup would understand the threat of heavy metals, salinity, and selenium as they pertain to mining/drilling near the Gunnison River Basin. Educating miners/drillers on not only the Mancos shale composition but less invasive techniques would reduce incoming mineralogical pollutants to the river.

Recreational users educated on the impact they have on the local ecosystem of the Gunnison River Basin would take care to manage their influence by respecting taught environmental practices. For example, managing what items they bring into the Basin area and recognizing their pollution potential would help prevent unnecessary outside pollution.

Problem 3: In- Stream Habitat Degradation

The two most prominent causes for in- stream habitat degradation in the Gunnison River Basin are dams and droughts. In particular, the Blue Mesa Dam and the Morrow Point Dam both adversely impact in- stream habitats. These dams change the flow regime of the river but the effect of these dams on endangered species was not considered prior to construction. The movement of fine sediment through the Gunnison River is critical for creation and maintenance of endangered species habitats to help maintain backwaters.

The West is well known for having severe droughts, which over time have seriously hurt in-stream habitats. These droughts have limited the amount of growth possible for many species because their habitats cannot thrive in drought conditions.

Along with drought, water depletions also degrade habitats by taking away more water that is needed for their habitats to flourish. Agriculture is the source for approximately ¾ of all depletions, but this industry has a worse impact on the habitats than other sectors, such as municipal and industrial depletions, because the water is consumed by crops and not returned to the river system.

Problem 3 Goals

GAP is implementing water banking, also known as water sharing, in order to protect water supplies in case of a long-term drought. This process gives water more value and gives people the opportunity to lease their water to others during a particularly dry year(s) to those who can't afford to be without water. Fish ladders will also improve in- stream habitats in the region because they provide a detour route for fish when passing through an obstacle in the waterway. The survival of many fish species is dependent upon their migrations, therefore, fish ladders are a useful tool to assist the species' to easily travel.

GAP Summary of Goals

The Gunnison River Action Plan strives to plan and prepare for future environmental impacts on the state. They tried to heavily address the inevitable climate change to occur and the major population increase they will face. The goal is to provide a safe and feasible plan to make prominent strides towards a better environment.

A summary of the GAP goals include the following:

- Install water efficiency programs to ensure sustainable and equitable use of the water resource
- Prevent mine deposit leaching/ chemical spills to obtain fishable and swimmable water quality state standards
- Restore degraded stream habitats
- Maintain currently healthy stream habitats
- Promote better water conservation practices from agriculture

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