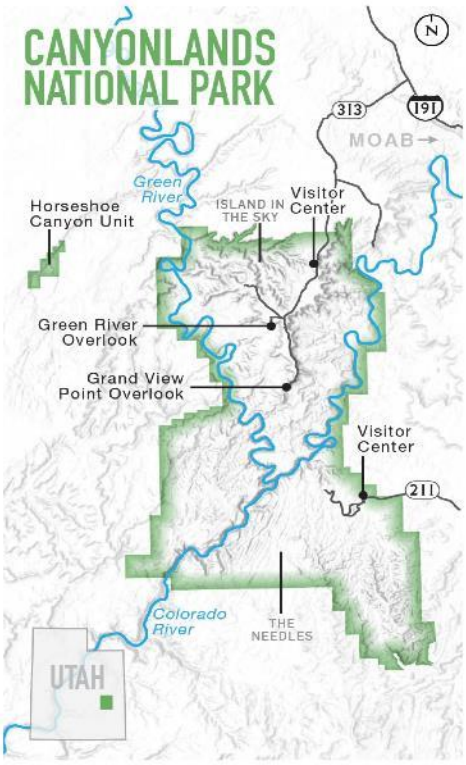
CANYONLANDS NATIONAL PARK:
Managing the Land and Rivers



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NR201 Managing Natural Resources for the Future

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Overview

Canyonlands National Park ("Canyonlands") is one of five national parks located in Southern Utah. Canyonlands was established on September 12, 1964 to preserve a portion of the Colorado Plateau including the Colorado and Green Rivers which converge near the center of the park. The park contains semi-arid benchlands (long, narrow strip of land that is either level or slightly inclined) and arid canyons and is home to many desert-loving animals and plants. Roads were created back in the 1950's as encouragement for miners to search for uranium (very little was found). These roads brought about tourism, as word spread about the geographical wonders at Canyonlands.

Credit: Denise Valentin

Stakeholders and Residents

Canyonlands National Park is public land and is governed by the U.S. National Park Service under the U.S. Department of Interior. There is no one living in the park, but currently the Southern Utes and the Diné (Navajos) live in Southeastern Utah, south of the park. The first humans known to the area, "Paleoindians," lived there over 10,000

years ago. Around 250 A.D., ancestral Puebloans lived on the land and were one of the first farmers in the area. Europeans settled in Southeast Utah back in the 1880's and became ranchers. Canyonlands was used for ranching up until 1975, when ranching was discontinued in the park.

The closest city to the park is Moab, and its population as of 2020 was 5,432. Moab is one of the key stakeholders as they use the land for recreation, culture, and employment. Tourists and scientists would also be considered key stakeholders as they use the park for recreation, education, and scientific research. Tour guides, commercial boat recreation providers (white-water rafting / kayaking), and biking and hiking companies depend on the park for income. Concessioners sell their wares in the park and earn a living from the park. Even the plants and wildlife would be considered main stakeholders!

Animal and Plant Residents that are Threatened or Endangered

Category	Scientific Name	Common Name	Status
Bird	*Empidonax traillii extimus*	Southwestern Willow Flycatcher	Endangered
Fish	*Xyrauchen texanus*	Razorback Sucker	Endangered
Fish	*Gila cypha*	Humpback Chub	Endangered
Fish	*Gila elegans*	Bonytail Chub	Endangered
Fish	*Gila robusta*	Roundtail Chub	Endangered
Fish	*Ptychocheilus lucius*	Colorado Pikeminnow	Endangered
Bird	*Coccyzus americanus*	Yellow-billed Cuckoo	Threatened
There are no endangered or threatened plants found at this time.			

Plants play an important part in the park. According to the NPS, plants provide not only animal habitat, but also filter gaseous pollution and catch particulate dust from the air. Because the park is a desert, most plants must be drought tolerant, such as cacti, columbine, and ferns. Cottonwood trees and willows must live near a river or streams for their water needs.

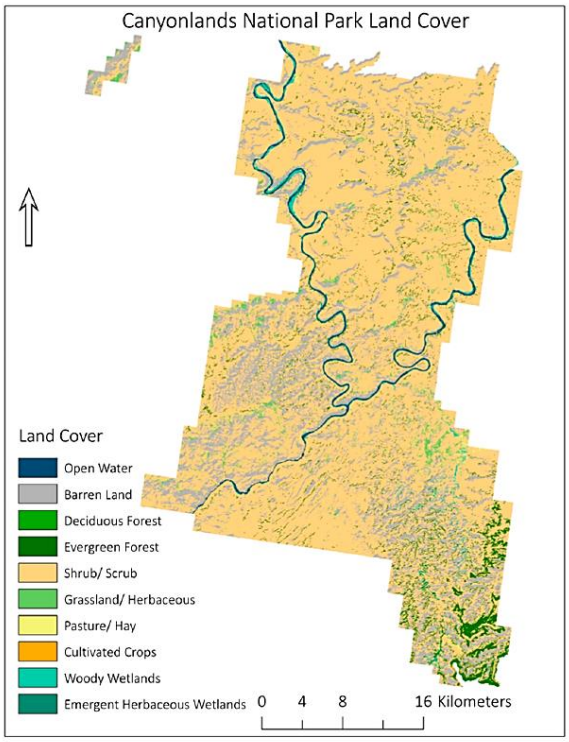
Desert animals that live in the park include snakes and lizards. There have been over 273 bird species seen in the park. You can also find small rodents and jackrabbits. Foxes, skunks, mule deer, black bears, and bobcats also make Canyonlands their home.

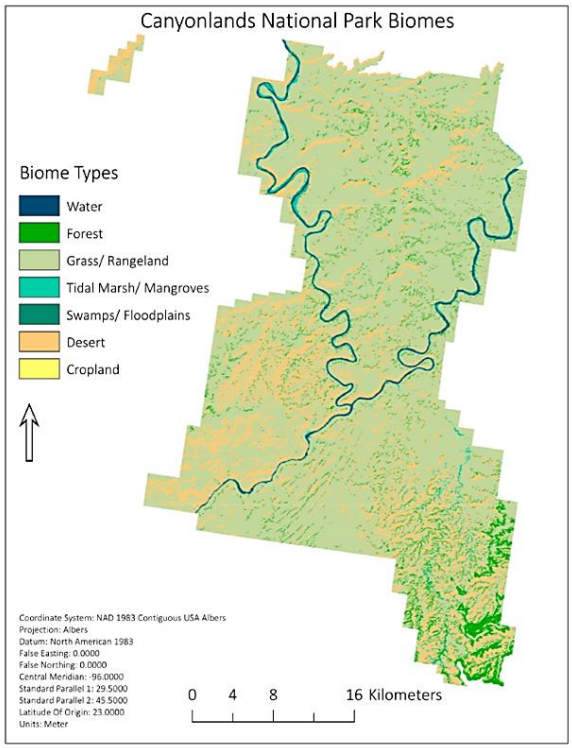
There are other stakeholders that are also involved with the park. They are responsible for stewardship and maintenance. They include non-profit organizations, science and research, and government (local, state & federal). The park fees and tourist dollars bring money to local, state, and federal governments so they have an economic interest in the park.

Park Stakeholders

Stakeholder Name	Stakeholder Type
The Nature Conservancy The Sierra Club Foundation Southern Wilderness Alliance (SUWA) National Park Conservation Association (NPCA)	Non-Profit organizations & Stewards of the Park
Northern Colorado Plateau Network (NCPN)	Monitoring & Science
University of Utah	Education & Science
U.S. Geological Survey (USGS)	Research & Science
State of Utah	Has partnerships with the park
U.S. National Park Service (NPS)	Oversees Canyonlands
Bureau of Land Management (BLM)	Government responsible for lands around Moab
Bureau of Reclamation	Builds and controls dams, powerplants, and canals on the Colorado River

According to Sutton et al (2019), human wellbeing, economic value, and even long-reaching support (air filtering, water quality) are services provided by the park. They also revealed that Canyonlands has an ecosystem service value of $1,017,166,042 annually.





Sutton et al. (2019).

The ecosystem services that the key stakeholders receive from Canyonlands including the Colorado and Green Rivers are shown on the diagram. Examples include food, clean air and water, recreation, education, stewardship, biodiversity, habitat and so much more!

Credit: IUCN, International Union for Conservation of Nature

Spectrum of Management Issues

There are numerous management issues at Canyonlands. Population increase is not one of them. Moab is not very large and has 0.89% population growth yearly.

Increased tourism and recreation are serious management issues. Off-road vehicle recreational use has degraded wildlife habitats by causing erosion and increasing particulate matter into the air. The rising number of visitors to the park leads to more traffic on hiking trails, which also increases particulate matter pollution. Those people who chose to hike off the trail damage biological soil crusts (living soils that include lichen, mosses, green algae, micro fungi, bacteria, and cyanobacteria). These biological soil crusts are very important to the ecosystem. Some visitors damage rock formations and pollute the land and streams on purpose.

Air quality is another management issue. There are two coal-fired plants located in Utah – PacifiCorp Hunter Plant in Castle Dale and Huntington Power Plant in Huntington. These facilities pollute the air in both Utah and Colorado. The U.S. Environmental Protection Agency (EPA just approved last October the updated Utah regional haze plan. This plan still allows for operation without catalytic reduction retrofits at these two power plants, which allows for nitrogen oxide pollution into the air, causing a dangerous haze.

Invasive plant and animal species are a world-wide problem. In Canyonlands, the Southwest Invasive Plant Management Team restores ecosystems and habitats by removal of invasive plants. They work with universities, non-profit organizations, governmental agencies, and conservation groups to help bring back plant biodiversity. The Bureau of Land Management also provides services to reduce invasive plants and

fishes. They are currently working on the reduction of invasive fish in the Colorado River Basin, part of which includes Canyonlands.

Mining is a dirty industry, literally. Intrepid Potash owns a mine outside of Moab. They have been mining since the 1960's for potassium chloride (muriate of potash) for use in fertilizers. There are number of potash waste evaporation ponds which contain sodium chloride (salt) that are located extremely close to the Colorado River. If these ponds were to leak and flow into the Colorado River, a large amount of salt in the water would alter it to a "salt water" system thereby harming all aquatic organisms and plants along the riverside. Cañedo-Argüelles et al. (2017).

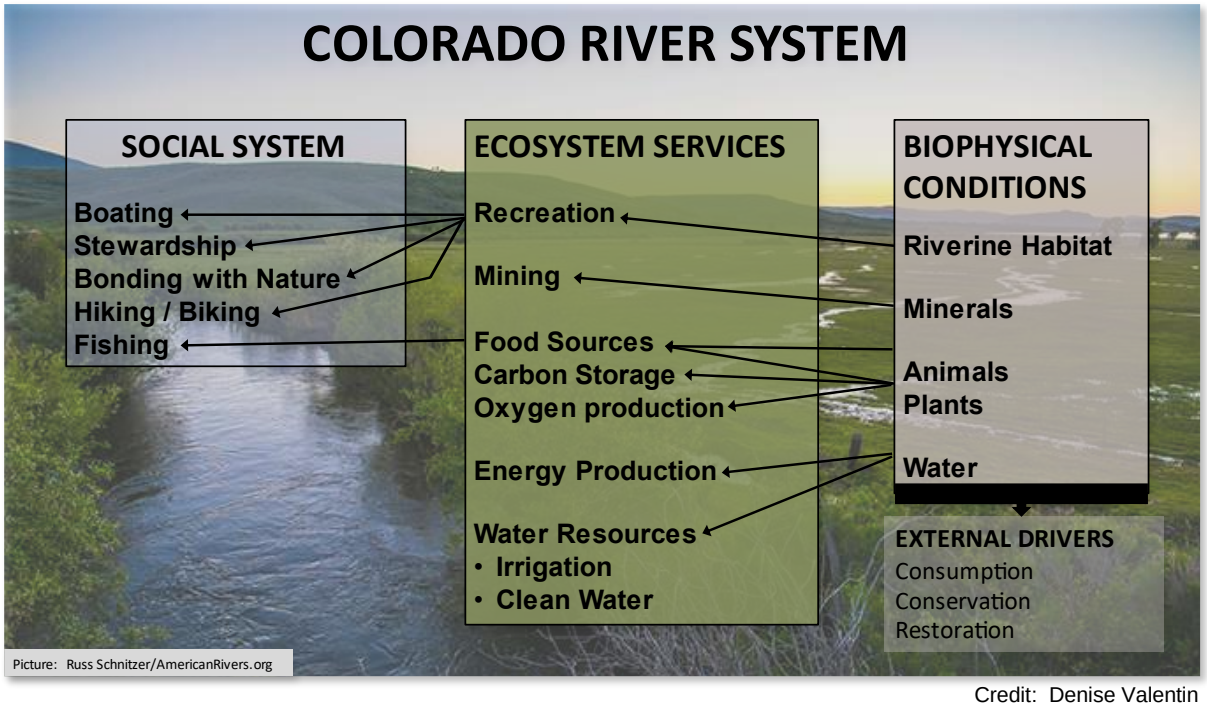
The BLM has tried numerous times to get permits approved for oil and gas exploration on lands near Canyonlands and Arches National Park. The construction vehicles themselves would cause damage to plants and soils. The surface and ground water would be affected by brine water (salt water) here also. If oil or gas were to leak, it would reach the land and water in the park. Drilling sites can also ruin the view for tourists, which impacts the park financially.

Canyonlands management is also responsible for the preservation of cultural resources in the park. Due to funding issues, there are not enough staff to oversee the historical and cultural collections, including an assessment of those structures and cultural art remains. Budget cuts have led to less rangers throughout the park and law enforcement officers from patrolling less-visited backcountry areas. Choices had to be made on whether a ranger will be working in maintenance, in educational interpretation, or in the nature center.

Climate change is also an issue for the park. The area is already arid and higher temperatures will dry up the smaller streams leaving less water for animals and plants. Less water means more red rock dust in the air, causing air pollution and health problems. Wildfires will continue to become more intense, causing landscapes to be altered. If the park loses its beauty, there will be no visitors and no economy for the park, Moab, and other small towns nearby.

Most Important Management Issue

I believe the biggest issue for Canyonlands is to preserve its water quality and quantity. The Colorado River and Green River converge in Canyonlands and are the essence of the park. These two rivers provide so many ecosystem services to Canyonlands. This water is needed by Moab municipalities, local farmers and ranchers, Indian Tribes, plants and animals and Canyonlands visitors. Even migratory birds use Canyonlands as a rest stop!



Credit: Denise Valentin

The Colorado River starts its journey in Colorado while the Green River starts its journey in Wyoming. They converge in Canyonlands, and continue through Utah, Arizona, Nevada, Arizona and down into Mexico. The Colorado River Aqueduct was created to move water to Southern California. There are 7 states in total that rely on both the Colorado River and Green River for their water supply, and the ecosystem services that these rivers provide.

The increase in population and the anthropocentrism worldview (nature is something to be exploited for human benefit) will cause more negative affects to our climate and the park. It might also cause approval for oil and gas development nearby the park (which was almost approved in 2020), and changes to both the watershed and delivery systems (dams and canals) in or near Canyonlands.

The issues that can affect quality and quantity of water in Canyonlands are climate change, human activities that harm ecosystems and pollute water, river water flow, and water temperature. Low levels of oxygen and dangerous levels of bacteria, nutrients, metals, minerals, and pH can negatively affect the water system. Water quality standards are set by the U.S. Environmental Protection Agency in coordination with the National Park Service.

Until the worldview of those who exploit natural resources changes, people will continue to destroy nature. The Resource Protection Division at Canyonlands is responsible for law enforcement. At Canyonlands, there are not enough rangers and law enforcement officers to watch over all parts of the park (and it is quite large with 3 different regions) due to government funding.

The Northern Colorado Plateau Network (NCPN), part of the National Park Service's Inventory and Monitoring Program, play a very big part in the collection of data and monitoring throughout the park. The NCPN reports on the following issues:

- quality and quantity of water
- water flows
- springs and seeps
- soils and its matrix
- plant communities
- landscape dynamics
- upland vegetation and soils
- climate and weather

The results from the different reports are forwarded to the superintendent of the park, who is responsible for managing operations and park staff.

Management Recommendation (Strategies)

According to Mumich et al. (2020), it is the job of the National Park Service to manage the lands to leave them unimpaired for use by future generations. It is important that the NPS cooperates with other governmental entities, non-governmental organizations (non-profits), and residents to come up with actionable plans to resolve issues.

The National Park Service needs more scientists, staff, and law enforcement officials to manage the rivers and keep them healthy. Continued short-term and long-term monitoring of the park by the Northern Colorado Plateau Network is a must.

Continued work with the U.S. Bureau of Reclamation is needed as they are involved in current projects at Canyonlands.

We need to educate our government officials on the economic value and ecosystem values of our National Parks and recreation areas. Continued relationships with non-profits like Colorado River Connected, American Rivers, The Nature Conservancy, The Sierra Club Foundation, Southern Wilderness Alliance, and the National Park Conservation Association are vital. These non-profits can get the public involved in stewardship of nature in our parks and recreation areas.

A committee should be created within the Department of Education that reviews and updates current environmental programs and creates committees that work on new "environmental" programs throughout the numerous university and colleges in the U.S.

We need to continue research and science programs with the University of Utah and the U.S. Geological Survey. We also need to increase public outreach programs to build support for the parks and recreation areas. Increased funding and more scientists and educators will be needed for these programs.

We also need to increase more Citizen Science awareness in all communities, both urban and rural. Citizen Scientists are free and are very useful in documenting issues in parks and recreation areas. A coordinator will, however, be needed and that will need funding.

More education about the value of parks and recreation areas needs to be taught in schools … start them off young in elementary school. Pique their interest in nature in junior high school. Offer internships to high school students. Get more people involved in stewardship of nature!

Per Monty Christiansen (1983), put “Vandalism Control Management” in place. In his book, he teaches about managing vandalism and provides processes for behavior interpretation, data collection, damage classification, safety, and disturbance priority rating, and much more. Park staff who are involved in these cases should be trained on vandalism causes and strategies and be told to report areas where vandalism has occurred. I believe that only human presence from the park staff will prevent this from happening.

In closing, all parks and recreation areas world-wide need love and support. There seems to a split between nature-lovers and nature-exploiters. While there has been much change in laws and regulations to protect our natural resources, including our National Parks, many of these have been ignored throughout many years of government. Departments created for the protection of our environment (especially the U.S. EPA) have been gutted and new management with no science education have been put in charge. I only hope that we realize just how important our natural resources are before it is too late.

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