



Water Quality Trends in Curecanti National Recreation Area and Black Canyon of the Gunnison National Park, 2001–2014



Ice recedes on Blue Mesa Reservoir, Curecanti National Recreation Area.

“Is it safe to go in the water?” It’s a pretty basic question—and a really important one. In Curecanti National Recreation Area and Black Canyon of the Gunnison National Park, the Northern Colorado Plateau Network (NCPN) partners with park managers to find the answer.

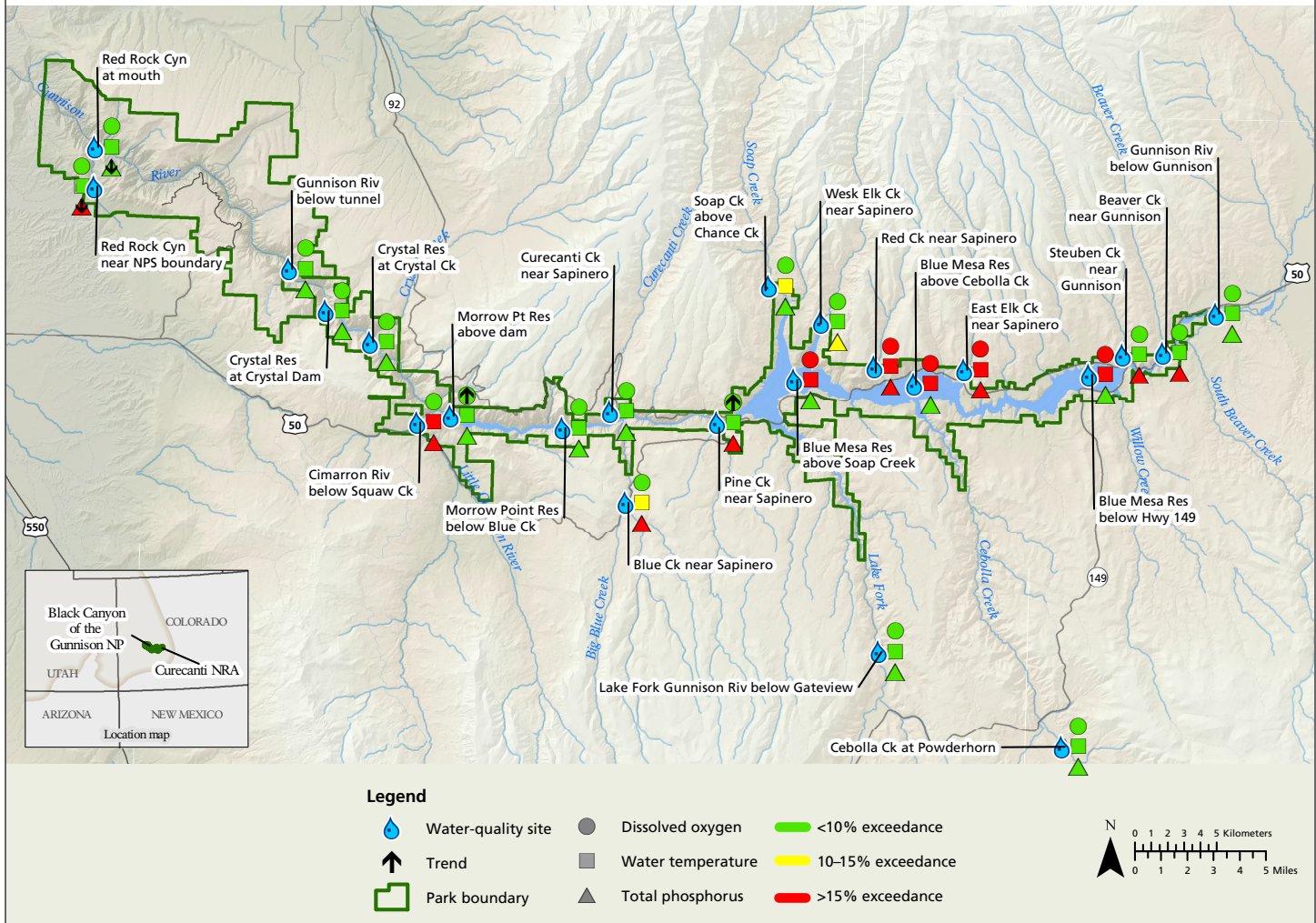
About once a month, staff from the parks and the U.S. Geological Survey collect water-quality samples at 23 sites (see figure, next page). Sampling sites include streams and reservoirs protected within or upstream of the parks. After the samples are analyzed, the NCPN reports the results to park managers. This consistent, long-term monitoring helps alert managers to existing and potential problems. Looking at the results over time can help managers know how they’re doing at addressing those problems—or at maintaining good water quality. A recent report examined water-quality trends for the two parks from 2001 to 2014.

Key findings showed:

- **Overall, water quality at both parks was good and showed few significant trends.** At most sampled sites, there were no statistically significant trends in concentrations over time and state water-quality standards were met on at least 85% of visits.
- **Where trends were found, they mostly indicated improving water quality.** Nutrients, chloride, and metals decreased at several sites. Copper and selenium concentrations decreased in the *Cimarron River*. Exceedances of fecal indicator bacteria, phosphorus, and water temperature were common at that site, however. Chloride concentrations decreased on *Pine Creek*, *Steuben Creek*, and *Red Creek*. This may indicate improved targeting of magnesium-chloride dust suppressants on adjacent dirt roads, with less spillover into the creeks. Increases in nitrite plus nitrate and selenium at *Pine Creek* were recorded at low concentrations. Residential septic systems or park pit toilets could contribute to increases in nitrite plus nitrate concentrations. These could be checked for leaks. Further monitoring and assessment of these sites and parameters is necessary to determine if changes are influenced by sampling frequency and timing or other factors upstream.
- **Improvements in water quality in Red Rock Canyon included decreases in total phosphorus, nitrite plus nitrate, and copper concentrations.** These changes may be linked to a change in irrigation practices from 2006 to 2008, from flood irrigation to a sprinkler system that reduced overland flow. However, the interim value for total phosphorus and the standard for fecal indicator bacteria (*Escherichia coli*) were still regularly exceeded at the upstream site. Selenium concentrations exceeded the standard at both the upstream and downstream sites on almost all visits. Continued management action is needed to bring irrigation return flows in Red Rock Canyon into compliance with state standards.
- **Total phosphorus regularly exceeded the state’s interim standard at many tributary sites.** Human activities that increase erosion, such as livestock grazing, roads, and agricultural activity, can contribute phosphorus to water bodies. However, volcanic rock common in the region can also be high in phospho-



Exceedance Rates at Water-Quality Monitoring Sites, 2001–2014



Trends in dissolved oxygen, water temperature, total phosphorus, and the percentage of times samples exceeded state criteria at water-quality sites in Curecanti National Recreation Area and Black Canyon of the Gunnison National Park. Upwards arrow indicates an increasing trend, downwards arrow a decreasing trend, and no arrow indicates no trend.

rus. High phosphorus concentrations in tributaries have not caused algal blooms or other indicators of eutrophication at either park.

- **Evidence of eutrophication has been noted in Blue Mesa Reservoir in low water years**, even when phosphorus concentrations have remained acceptable. Several localized fish kills were observed in the middle of the reservoir in 2013. The most upstream site in the reservoir occasionally exceeded the interim chlorophyll-*a* standard for cold-water reservoirs. Dissolved oxygen and water temperature are now sampled at multiple depths for better comparison with state standards. National Park Service personnel are also coordinating with the state to increase nu-

trient sampling in the reservoir. Identifying nutrient sources in local watersheds may help land managers develop a plan for improving water quality in the reservoir.

- **Continued exceedances of fecal coliforms in Blue Creek and the Cimarron River support the need for management action to improve public health and safety in these streams.**

The Northern Colorado Plateau Network will continue to partner with others to monitor water quality at these parks and nine others across the northern Colorado Plateau. This information helps park managers comply with the Clean Water Act and mitigate impacts to park waters.

For more information, see R. Weissinger and N. Gibney,

Status and Trends in Water Quality at Curecanti National Recreation Area and Black Canyon of the Gunnison National Park, 2001–2014.