

STATE of the **POUDRE**

A River Health Report Card



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The purpose of the River Health Report Card is to provide a description of the current health of the Poudre River from approximately Gateway Natural Area to I-25. This Report Card provides the City of Fort Collins with a new tool to benchmark progress towards its vision of sustaining a healthy and resilient Cache la Poudre River.

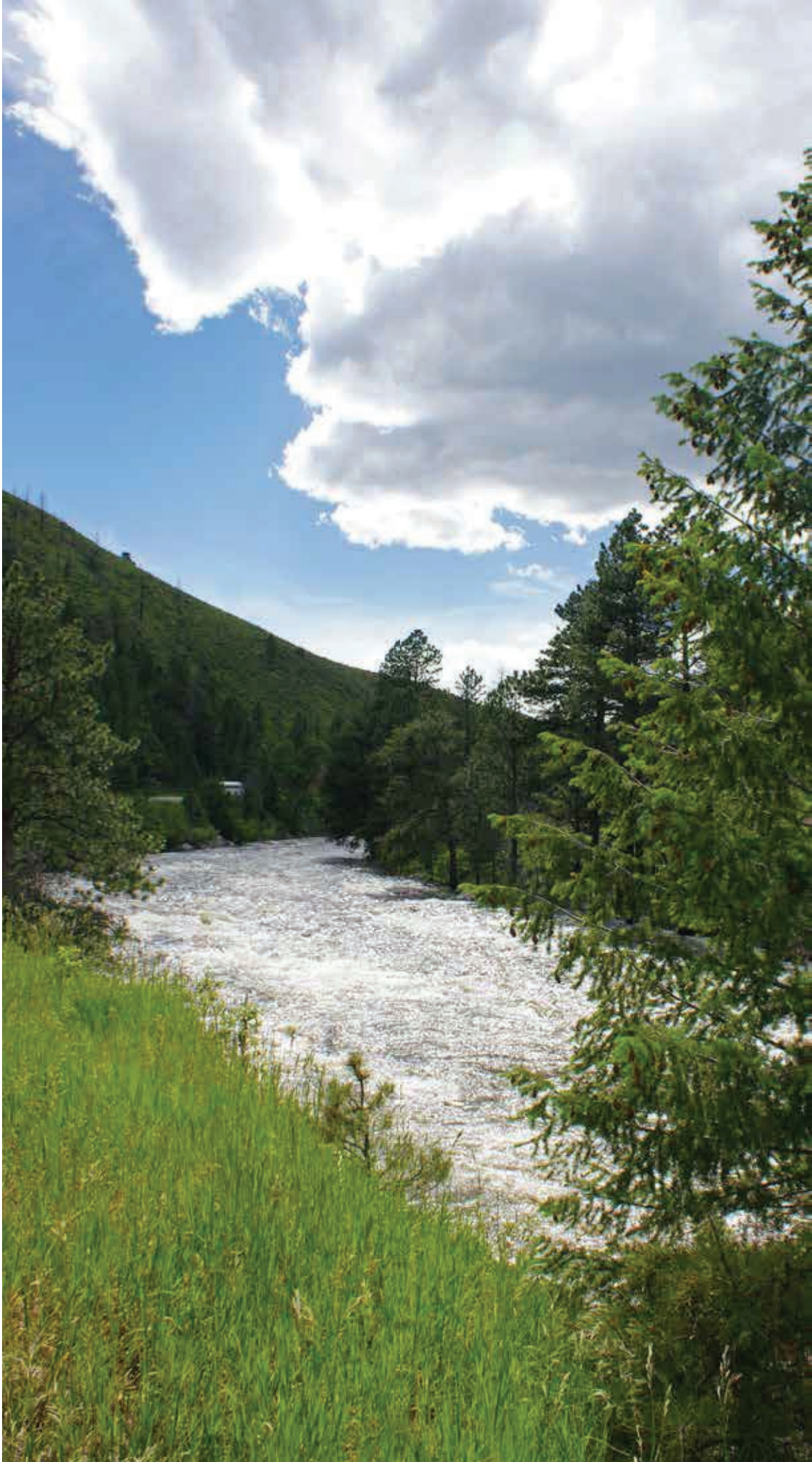
The Cache la Poudre River (Poudre) is a complex natural system that has been altered by nearly two centuries of human use. This has resulted in dramatic changes to water quantity and quality, the physical structure of the river, floodplain, forests, and wildlife communities associated with it. The human footprint continues to expand, placing additional pressure (or stresses) on the river ecosystem and the natural processes that sustain it.

OVERALL GRADE

For the study area the Poudre River received an overall grade of C. This grade indicates that even though the Poudre has been altered and degraded by a suite of local and system wide stresses that impair its health, it continues to support basic elements of a functioning river ecosystem.

APPROACH

While the Poudre flows 126 miles from its headwaters to its confluence with the South Platte near Greeley this study focuses on a 24-mile reach from the lower canyon through Fort Collins. Six key indicator groups are informed by metrics, the measurable elements of the system. Metrics grades are developed by collecting and incorporating many types of data and then translated into an A-F grading system.



SIX KEY INDICATORS GROUPS

were used to evaluate river health.



FLOWS

River flows are the primary driver of river health. Runoff from snowmelt brings high flows in spring and early summer. These high flows refresh the riverbed for fish, scour away algae, and provide water to riverside vegetation. Base flows are low flows that occur throughout the rest of the year and sustain basic needs for life in the river. Understanding fluctuation of flows (how quickly flow volumes change over short time periods) is important as this can create unnatural and challenging conditions for fish and insects.



SEDIMENT

Sediment includes soil, sand, and rock that are washed from watershed slopes and the riverbanks into and down the river. A natural component of all rivers, too much or too little can cause imbalances in the river's physical processes. An imbalance of sediment can affect fish and insect populations as well as the capacity of the river channel to convey large floods.



RIVER CHANNEL

The shape of the river's winding path, its width and depth, and the presence of finer in-stream habitats across faster and slower moving waters influence this indicator group. The river's response, or resilience, to natural disturbances (such as floods or drought) is closely linked to the condition of its physical setting.



WATER QUALITY

This is the chemical ability of water to support life, including the plants and animals that live in and depend on it including humans. Dissolved oxygen and temperature are critical factors controlling which types of organisms can live there. While nutrients are necessary to support aquatic life, excessive levels can degrade water quality and cause algal blooms, decreased clarity, and bad odor.



AQUATIC LIFE

Introduced, non-native trout are prized for their recreational values while small bodied native fish are valued as a central element of a healthy Poudre River. Aquatic insects (insects that live part of their life on the river bottom) are an essential part of the river system and form the base of the food chain. The upstream-downstream connectivity of river habitats is a critically important component of this indicator.



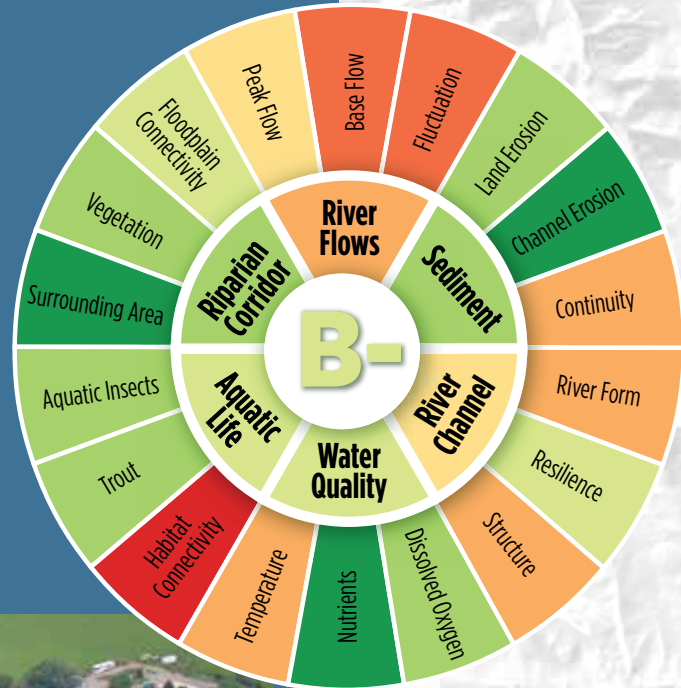
RIPARIAN CORRIDOR

The interaction of land and water results in beautiful riverside forests, wetlands, and grasslands. Also, a healthy river-floodplain connection protects us in larger flood events because the river can access its floodplain. Valued as critical habitat for the majority of terrestrial wildlife, the riparian corridor supports river health by slowing floodwaters, filtering pollutants, and forming habitats for many animals closely tied to or dependent on the river itself.



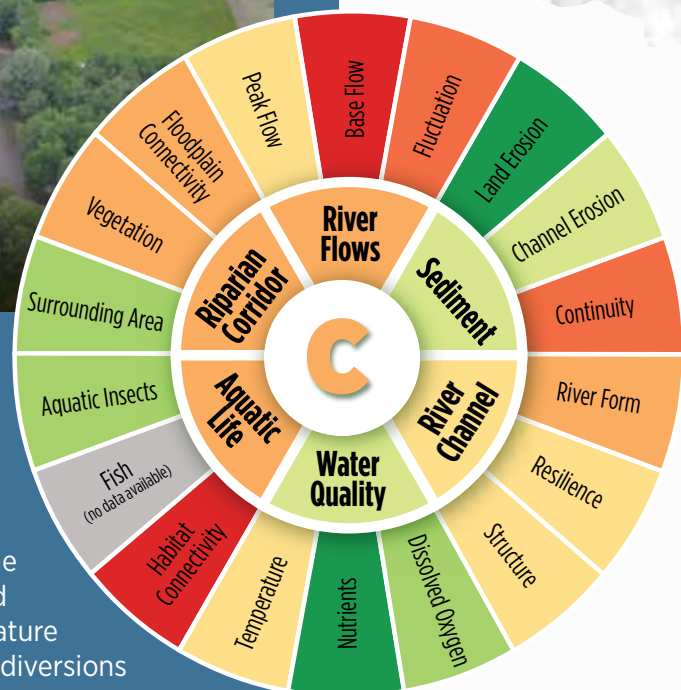
CANYON ZONE

Through the Canyon zone the river and riparian corridor are confined by canyon walls. Highway 14 further limits the river's space and ability to mitigate large floods. Here the river supports aquatic life, a narrow riparian forest, and floodplain, but this zone marks the beginning of an approximately 20-mile reach of river that is heavily impacted by multiple diversions which begin to reduce flows and fragment aquatic habitat. The upstream forested watershed provides Fort Collins and surrounding communities with a reliable and high quality drinking water source, but in the lower Canyon zone warming water temperatures emerge as a potential concern for aquatic life.



RURAL ZONE

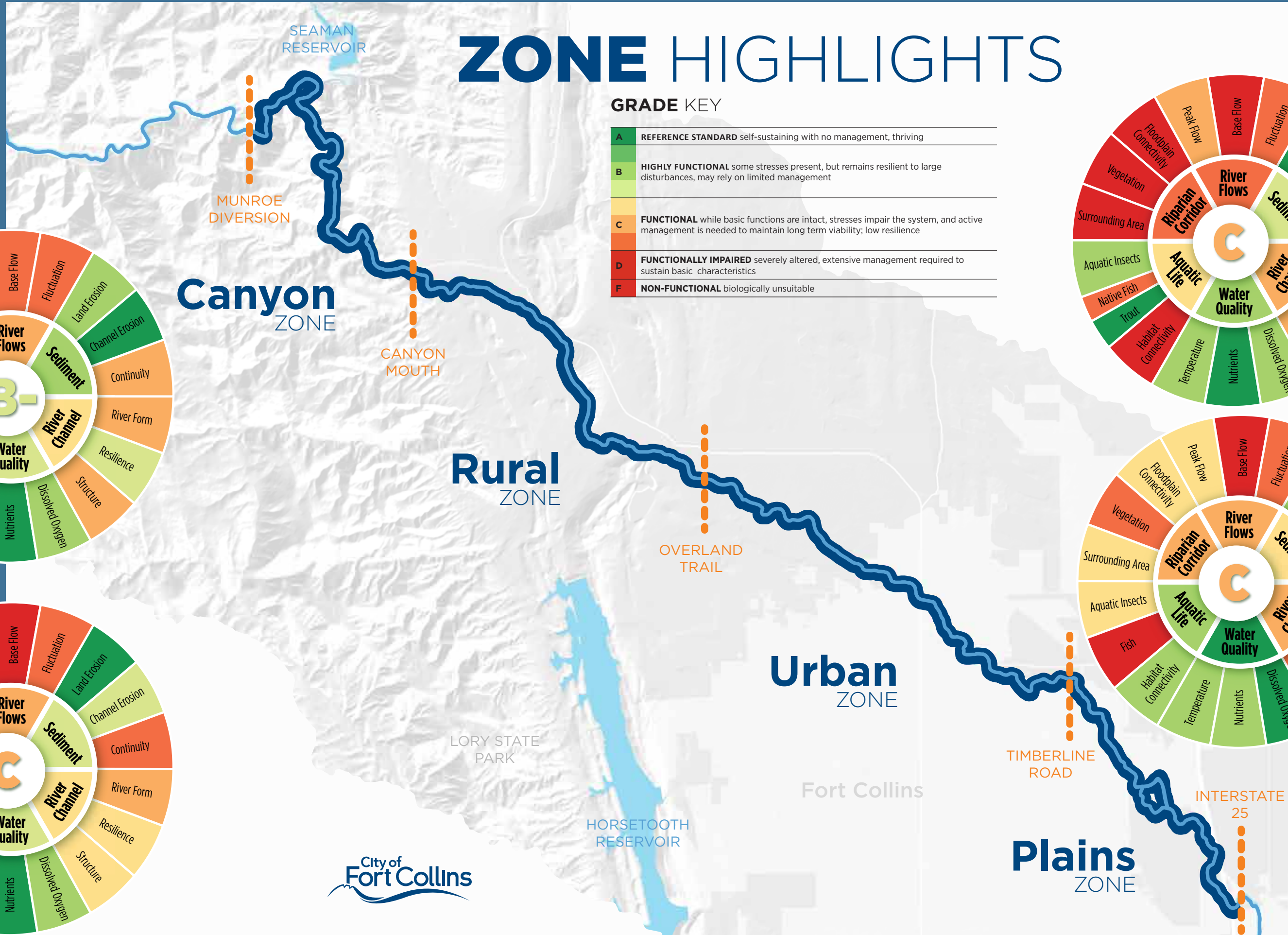
As the Poudre leaves the canyon the river has its first opportunity to connect to a wider floodplain, but impacts from levees, armored banks, and channelization disconnect the river from its floodplain. Native cottonwoods dominate many riverside forests, however, encroachment from agricultural lands affects the health of the vegetation. Cooler waters released from Horsetooth Reservoir lower water temperature in this zone. The impact of multiple large water diversions severely alters peak and base (low) flows.



ZONE HIGHLIGHTS

GRADE KEY

A	REFERENCE STANDARD	self-sustaining with no management, thriving
B	HIGHLY FUNCTIONAL	some stresses present, but remains resilient to large disturbances, may rely on limited management
C	FUNCTIONAL	while basic functions are intact, stresses impair the system, and active management is needed to maintain long term viability; low resilience
D	FUNCTIONALLY IMPAIRED	severely altered, extensive management required to sustain basic characteristics
F	NON-FUNCTIONAL	biologically unsuitable



URBAN ZONE

Gravel pits and levees affect the river's ability to access the floodplain on the upstream end of the Urban zone, while encroachment from roads and development through the City have impacted the diversity and extent of the riverside forests and habitats. Nevertheless, pockets of excellent riverside forests exist (near Shields Street) where high spring flows have access to the floodplain. The river once formed multiple braided channels increasing the system's capacity to mitigate large floods, but now as a single, confined channel it has reduced resilience to flooding. Diversion dams and the lack of large wood in the channel negatively impact habitat for aquatic insects and fish. While introduced non-native trout appear to be doing well, a major concern is the local loss of native fish.



PLAINS ZONE

As the river flows through large areas of land managed as conserved open lands river health improves slightly in the Plains zone. Yet the legacy of land use and water diversions continues to have a significant influence on river health. Diminished peak flows and significantly impacted base flows have created a smaller-than-natural river channel that is frequently disconnected from its floodplain. Low numbers and diversity of native fish are a major concern but fish passage structures allow for better aquatic habitat connectivity.

A Suite of Diverse Issues DRIVE Poudre River Health



SEDIMENT AND RIVER CHANNEL

The river channel has seen drastic changes over the past two centuries causing widespread fundamental alterations to the ecosystem. The river used to meander across the floodplain. Forcing it into a single, permanent path has disrupted various processes dependent on natural river movement including the regeneration of riparian forests, the movement and balance of sediment, the river's resilience to large floods, and other events like wildfires in the upper watershed. However, with today's land uses, there is a need to protect infrastructure in the floodplain. Understanding this new physical dynamic and its relationship with extreme flow events is central to our success in managing for river health.



FLOWS

The Poudre is characterized by major changes in flow volumes and timing. Reductions have significantly altered peak and base flows, the effects which are exacerbated the further one travels downstream. Diversions also cause unnatural fluctuations in flow volume, which likely affects critical habitat and reproductive needs of fish and insects in the river.



WATER QUALITY

Water quality in the Poudre is quite good, despite the presence of some stresses, and is supported by the City's commitment to manage stormwater runoff and meet regulatory requirements for treated wastewater effluent. The City and others closely track water quality, implementing quick action if undesirable changes are detected.



AQUATIC LIFE

While non-native trout are thriving in Poudre's cooler waters (generally upstream from College Avenue) the populations of native fish are in sharp decline. These declines are most likely due to fragmented habitat and extended periods of extremely low base flows. Other stresses likely influencing fishery health include rapid fluctuation of flows, non-native predatory fish and altered water temperatures.



Flooded forest



Johnny Darter

WHAT'S NEXT?

A “B” grade for river health is desired to fulfill the City’s vision for a healthy and resilient river. This holistic and science-based river assessment can help the City evaluate operational, management, and policy options for preserving or enhancing the river’s health.

This assessment can also serve as a benchmark for monitoring river health and changes in the future. Broader communication and engagement of diverse Poudre River stakeholders can strengthen our impact to manage for a healthy river now and in the future.



YOU CAN HELP

Direct your downspout to water some of your landscape with rain instead of treated water. Use water-efficient fixtures and eliminate water waste like leaky toilets or damaged irrigation equipment.	Conserves water, reduces overall water demand from streams and rivers.
Clean up wastes around your home and pollutants like lawn chemicals, pet waste, trash and automotive fluids so they don't wash into the storm drain when it rains.	Helps protect river water quality by preventing pollutants in urban stormwater runoff.
Abide by regulations, wildlife and restoration closures, and stay on trails to reduce erosion along banks.	Supports health of wildlife and vegetation.
Buy fishing license or Habitat Stamp from Colorado Parks and Wildlife.	Supports Colorado Parks and Wildlife management of fisheries.
Volunteer! Opportunities include river cleanups, water-related boards and commissions, education and outreach.	Contact engage@fcgov.com .
Get out, recreate, participate in educational programs and enjoy the beautiful wildlife, forests and sounds of flowing water.	Personal renewal, appreciation, reminds you why river health is important to you and your community.



This report card represents a summary of findings. For the full report and online mapping tool, visit fcgov.com/poudrereportcard.

Auxiliary aids and services are available for persons with disabilities.

ACKNOWLEDGMENTS

This project was developed by a collaboration of ecologists and resource managers from; City of Fort Collins Natural Areas Department, City of Fort Collins Utilities Watershed Program, Otak Inc., Ecometrics, Johnson Environmental Consulting Inc., Timberline Aquatics, Colorado Parks and Wildlife and AlpineEco.