White Paper on Potential for a Stream Corridor Protection Ordinance

Restore the Gore Programs, Accomplishments and Challenges

Gore Creek has been listed as "impaired" by the State of Colorado since 2012 for failing to meet state standards for aquatic life. The Gore Creek Strategic Plan (GSP), adopted by the Vail Town Council in 2016, identifies three main causes of Gore Creek's impairment:

- Pollutants from land-use activities
- Drainage from impervious surfaces and,
- The loss of riparian and streamside vegetation

The plan recommends 219 individual actions to address and correct the causes of Gore Creek's impairment. These actions fit into five categories. Up to this time, Restore the Gore programs and initiatives have largely focused on the categories of *Education and Outreach, Best Management Practices, Data Collection and Research*, and *Site Specific Projects*. Impressive progress has been made in all four of these focus areas including completion of several enormous stormwater treatment projects, more than 10,000 native plants introduced in riparian areas, and the development of popular education series and programs that have resulted in greater awareness and water quality literacy in the community.

Among the high priority actions that remain largely unaddressed are several that fall into the category of *Rules and Regulations*. These include:

- Update stream setback, riparian zone, vegetative buffer zone and other water quality objective definitions and maps (title 12 review and amendments).
- Consider the legal ramifications of partially or fully restricting commercial application of pesticides near streams and rivers.
- Delineate Stream Protection Overlay/Hazard Zones adjacent to waterbodies. Restrict land uses in near-stream zones to maintain and/or restore water quality buffer characteristics.

Since adoption of the GSP in 2016, the TOV has undertaken a dedicated and targeted effort to reverse the declining macroinvertebrate populations in Gore Creek. The Town has overseen the planting of thousands of native plants along more than 4 miles of town-owned stream tract. (previously stated so just shortening it). Major stormwater filtration projects involving a combination of custom infiltration systems, manufactured water treatment vaults, natural vegetation, and man-made wetlands have been completed at the East Vail highway interchange, TOV Public Works yard and the TOV snow dump. Major stormwater projects are also planned for Westhaven Drive and the West Vail Roundabout.. (these may not happen this year) Steady, incremental progress toward the recovery of aquatic insect populations has been documented as a result of these efforts to restore riparian habitat on town-owned parcels and update stormwater infrastructure for which TOV is responsible.

Educational initiatives have raised awareness of the threats to Gore Creek. Community awareness and concern are high as has been consistently reflected in the town's bi-annual surveys. Thirty-five to forty

private landscapers and property managers participate in an annual workshop showcasing the town's own shift to an Integrated Pest Management (IPM) approach for maintaining town-owned landscapes. This landscaping strategy advocates a holistic approach that prioritizes proper plant care, diverse plant species, thoughtful plant selection, and the use of alternative methods of pest control; reserving chemical treatments as a last resort. The Town has demonstrated that beautiful landscaping can be maintained using the IPM method and without the use of foliar-applied pesticides, but more work is needed to educate private landscapers and property managers to follow through on this approach.

Project Re-Wild, a public-private cost-share program designed to encourage private property owners to restore riparian buffers and stream setbacks along Gore Creek, was unveiled in 2017. Initially, the program provided 75% funding for the design of such projects, but property owners were responsible for the entire cost of construction, implementation and management. Under this model, five projects were designed but only one was constructed. Thanks to grant funding from the Eagle River Watershed council and design funds from Project Re-Wild, this project was completed at no cost to the HOA or homeowners.

In the winter of 2018-19, following a report on the slow progress made toward restoring riparian buffers on private property under the public-private cost-share program called Project-Re-Wild, Town Council directed staff to use remaining funds allocated for the program to complete the five projects that had already been designed. Two major projects including nearly 1,000 native plants and the restoration of a floodplain wetland were completed in East Vail in the summer of 2019. These projects were made possible by an additional $15,000 in funding from the Colorado Water Conservation Board (CWCB) and again were completed with very modest investments from the property owners. A third bank stabilization and riparian restoration project in East Vail is very likely to move forward in the summer of 2020 with approximately 25% funding from Project Re-Wild.

In response to the high average cost the town was incurring for the relatively small number of projects Project Re-Wild was managing to incentivize, the lack of riparian restoration projects occurring on private property and the demonstrated need to restore riparian habitat, Town Council directed staff to research and recommend code changes that would require private property owners to address the root causes of Gore Creek's impairment by:

- Encouraging private property owners and managers to re-establish riparian buffers
- Reducing impervious surfaces on private property
- Discouraging the use of landscaping chemicals, especially pesticides, and encouraging adoption of IPM strategies

Numerous Colorado municipalities have successfully addressed similar challenges impacting their local waterways through code changes restricting land use activities adjacent to streams and wetlands, by establishing stream setback zones, and by limiting the application of pesticides and other activities in the setback through a Source Water Protection Ordinance (SWPO).

Current Status of Town Code Concerning Stream Setbacks and Vegetated Buffers

The Town of Vail currently has two regulations that address the construction of improvements in proximity to watercourses. The first is a setback requirement that is measured from the centerline of the watercourse:

12-14-17: SETBACK FROM WATERCOURSE:

Minimum setback from a creek or stream shall be not less than thirty feet (30') from the center of the established creek or stream channel as defined by the town comprehensive plan base maps; provided, however, that the setback from Gore Creek shall be fifty feet (50'). Natural creek or stream channels may not be rechanneled or changed.

Additionally, Town of Vail prohibits improvements within any flood hazard zones:

12-21-10: DEVELOPMENT RESTRICTED:

A. No structure shall be built in any flood hazard zone or red avalanche hazard area. No structure shall be built on a slope of forty percent (40%) or greater except in single-family residential, two-family residential, or two-family primary/secondary residential zone districts. The term "structure" as used in this section does not include recreational structures that are intended for seasonal use, not including residential use.

At this time, the Town of Vail code of ordinances prohibits removal of vegetation without obtaining a permit but does not restrict mowing or pesticide use within a riparian, or creekside, zone.

12-11-3: DESIGN APPROVAL:

A. Scope: No person shall commence removal of vegetation, site preparation, building construction or demolition, dumping of material upon a site, sign erection, exterior alteration or enlargement of an existing structure, paving, fencing or other improvements of open space within the corporate limits of the town unless design approval has been granted as prescribed in this chapter. The addition of plant materials to existing landscaping, gardening and landscape maintenance shall be exempt from this provision.

Why undertake code changes?

The GSP, adopted by Council in 2016, recommends that the town develop rules and regulations to govern activities in delineated "Stream Protection Overlay/Hazard Zones adjacent to water bodies," and "Restrict land uses in near-stream zones to maintain and/or restore water quality buffer characteristics."

<u>Chemical Use</u>

Currently, pesticide use is regulated by the State of Colorado and the label on the pesticide container is the law. Municipalities have not had the authority to regulate pesticides within their jurisdictions since 2005. While Town of Vail does not currently regulate chemical use on private property, town staff has altered pesticide application methods on town-owned trees. The adjustment eliminated all foliar applications in 2015 and reduced the total number of trees being treated by systemic insecticides from a peak of 2,400 to less than 100 in 2019. This was accomplished by evaluating trees prior to applying

insecticides. Private property owner and pesticide applicators have been encouraged to adopt this method however only a few have changed their operations. The largest improvements in Gore Creek macroinvertebrate scores achieved so far have occurred following the town's policy change.

While the town has educated and encouraged professional landscape contractors, arborists and residents to follow the town's example, foliar applied pesticides are still in wide use in Vail and examples of irresponsible and excessive application of pesticides has been observed. In a survey of actions taken in response to mountain pine beetle, the number of Vail residents who reported "spraying trees with chemicals" jumped from 35% in 2007 to nearly 50% in 2018 (Hua, Sanders Prentice & Vickery, *Mountain Pine Beetles and Colorado Forests: Vail community re-survey report*, University of Missouri-Columbia and University of Colorado Boulder). The survey did not ask a follow up question about what motivated this rise in prevalence of tree spraying in the decade from 2007 but it was likely related to ongoing concern about pine beetle infestations, in spite of education and outreach efforts informing both residents and landscape professionals that new infestations of mountain pine beetle have become exceedingly rare in Vail since about 2015. There appears to be a lag between the end of the pine beetle epidemic and public recognition that the beetle is not much of a threat to their trees at this time.

As of the end of March 2020, a bill lifting the preemption on local control of pesticide regulations was stalled in the state senate. A hearing before the Senate Agriculture Committee had been scheduled in early March, but the legislative session was suspended due to concerns about Covid-19. Barring the passage of this or a similar bill in the future, Source Water Protection is the only justification municipalities can use to exercise the power to regulate pesticide use at the local level. Town of Vail staff were working closely with Eagle River Water & Sanitation District to develop a Source Water Protection Plan (SWPP), but this effort has also been temporarily suspended due to the impacts of Covid-19.

<u>Riparian Buffer Restoration</u>

Riparian habitat is crucial to a healthy waterway. Riparian plants prevent erosion and sedimentation, filter runoff, and provide shade, food and shelter for aquatic animals. While riparian areas makeup only 2% of wild land in Colorado, 95% of Colorado animal species depend on riparian areas at some point in their lifecycle.

Vail is fortunate to own nearly 40% of the stream front along Gore Creek. The restoration of riparian habitat on this town-owned stream tract has resulted in a measurable improvement in Gore Creek macroinvertebrate populations. However, restoration of riparian habitat on private property has been very limited despite financial incentives, education and training offered by the town. The restoration and sustainability of healthy water quality for aquatic life such as fish and macroinvertebrates in Gore Creek will depend on the establishment of a continuous, interconnected corridor of riparian habitat along most of the length the stream. If Gore Creek is to make a full recovery, private property owners need to follow the town's lead in restoring native vegetation in the riparian corridor.

<u>Effectiveness of Existing Regulations in Achieving Water Quality Goals</u>

Under current code language the setback from a watercourse in Vail is determined based on the centerline of the creek. This method for determining a setback is problematic for several reasons and can be cause for confusion and discrepancy. Most communities have moved away from using centerline to determine setback for these reasons.

First, there are places on Gore Creek where 50 feet from the centerline is still inside the stream channel, or even still in the water. This means that there is effectively no setback on properties adjacent to those wide portions of stream. On braided reaches of creek, where the stream splits into multiple channels, it can be difficult or even subjective to ascertain which is the primary channel and where the centerline should be established.

Additionally, centerline is difficult to measure and fluctuates more radically and frequently than the top of bank or ordinary highwater mark (OHM). A measurement from top of bank or OHM can be taken on the property where the setback is being determined with a single measurement and without the need to wade in the creek or enter an adjacent property. Determining centerline requires measurements be taken across the stream channel with a surveyor entering the water and entering at least one property on the other side of the creek. Centerline is also not an effective way to establish setbacks from ponds or wetlands. Establishing setbacks from top of bank or OHM creates continuity among setback regulations around all water bodies and wetlands.

Finally, using centerline to determine the setback requirements often does not achieve the objectives of establishing riparian buffers on private property or even ensuring development does not creep too close to waterways. This method creates inequitable setbacks on properties adjacent to wide portions of creek as compared to those adjacent to narrower reaches.

Stream Corridor Protection Codes from around the State

The GSP, adopted by the Town Council in 2016, recommends a bold series of legislative options designed to protect riparian habitat and restore water quality in Gore Creek. While Vail has taken an innovative and active approach to restoring its main water body, Vail is not the first to consider an ordinance to achieve its goals of stream restoration. Many Colorado communities, faced with declining water quality and dwindling populations of fish and aquatic invertebrates, have seen the need to establish regulations to halt and reverse those downward trends. These communities are our peers in many ways, whether they are mountain resort communities, rural communities or strive to be leaders in environmental stewardship. Their water protection regulations fall into two categories: those designed for the protection of in-stream water quality and aquatic ecosystems, and those designed for the protection of drinking water sources. However, all are effective in establishing protections for in stream water quality and aquatic life.

Collbran

Collbran is a small, rural community on the Grand Mesa in western Colorado. The Source Water Protection Ordinance adopted by Collbran is primarily focused on protecting the community's drinking water sources from contamination. Its stated purpose is to "protect the Town's watershed and

waterworks from damage, harm or injury and preventing pollution of the town's water supply." While primarily focused on the protection of the watershed and water supply for human health, the ordinance also has the effect of providing protection for aquatic ecosystems and wetlands. Collbran is a rural community where agricultural, mining and forestry all take place. As such, their ordinance bans surface and subsurface mining within the watershed, the use of restricted-use pesticides (pesticides not available to the general public that can only be applied by state-certified applicators) within 100 feet of a waterway and removal of trees or vegetation in excess of 0.5 acres. As is the case with most SWPOs, the jurisdiction of the ordinance applies to a blanket district extending 5 miles upstream of all the town's drinking water source points (including wells and intakes). The area of jurisdiction is defined in a publicly available map that was established as part of the ordinance.

Larimer County

The regulations Larimer County has adopted are for the purpose of wetland more than stream protection but can be informative in their methods of protecting those aquatic and semi-aquatic habitats with a tiered series of buffer zones, similar to those established in Boulder's stream protection regulations. The Larimer County regulations express their goals as protecting water quality, wildlife habitat, flood protection and other critical environmental functions. The regulations establish a list of activities that are prohibited in wetlands and establish minimum buffer zones based on the size of the wetlands (50 feet for wetlands smaller than one acre, 100 feet for wetlands larger than an acre). The ordinance establishes a comprehensive map of wetlands as well as a process for challenging the boundaries of a wetland. While the Army Corps of Engineers establishes national regulations governing the modification, development and destruction of wetlands, Larimer County has established a broader definition of what qualifies as a wetland and created a comprehensive map of qualifying wetlands within the county.

Buena Vista

Like Collbran, Buena Vista adopted a source water protection ordinance with the primary stated intention of protecting the community's drinking water supply. The adopted regulations apply to a blanket area extending 5 miles upstream of all drinking water intakes. This zone is outlined in a map that was established at the time the ordinance was passed and is publicly available upon request to the town clerk's office. Activities requiring a permit from the town include commercial application of landscaping chemicals, mining, drilling, timber harvesting and use or storage of toxic waste materials, among others.

Steamboat

The ordinance Steamboat has in place is primarily a drinking water protection ordinance, similar to those established by Buena Vista and Collbran. Like those other source water protection ordinances, it establishes a jurisdiction extending 5 miles upstream from all drinking water intakes. The ordinance dictates that a permit is required for a suite of activities including use of any restricted use pesticide, removal of vegetation in excess of 0.5 acres, removal of vegetation within 100 feet of a waterway and mining.

Glenwood Springs

Glenwood Springs is in the process of adopting code changes designed to protect waterways, stream channels and riparian habitat for the benefit of water quality and aquatic species. The proposed code language would establish a 50-foot setback from the Ordinary Highwater Mark (OHM). This is a designation recognized and defined by the Army Corps of Engineers. The proposed changes would prohibit building, grading, excavation, backfill, dumping, vegetation removal (in excess of 10% on a property), and chemical treatments (with exceptions made for noxious weed control).

Boulder

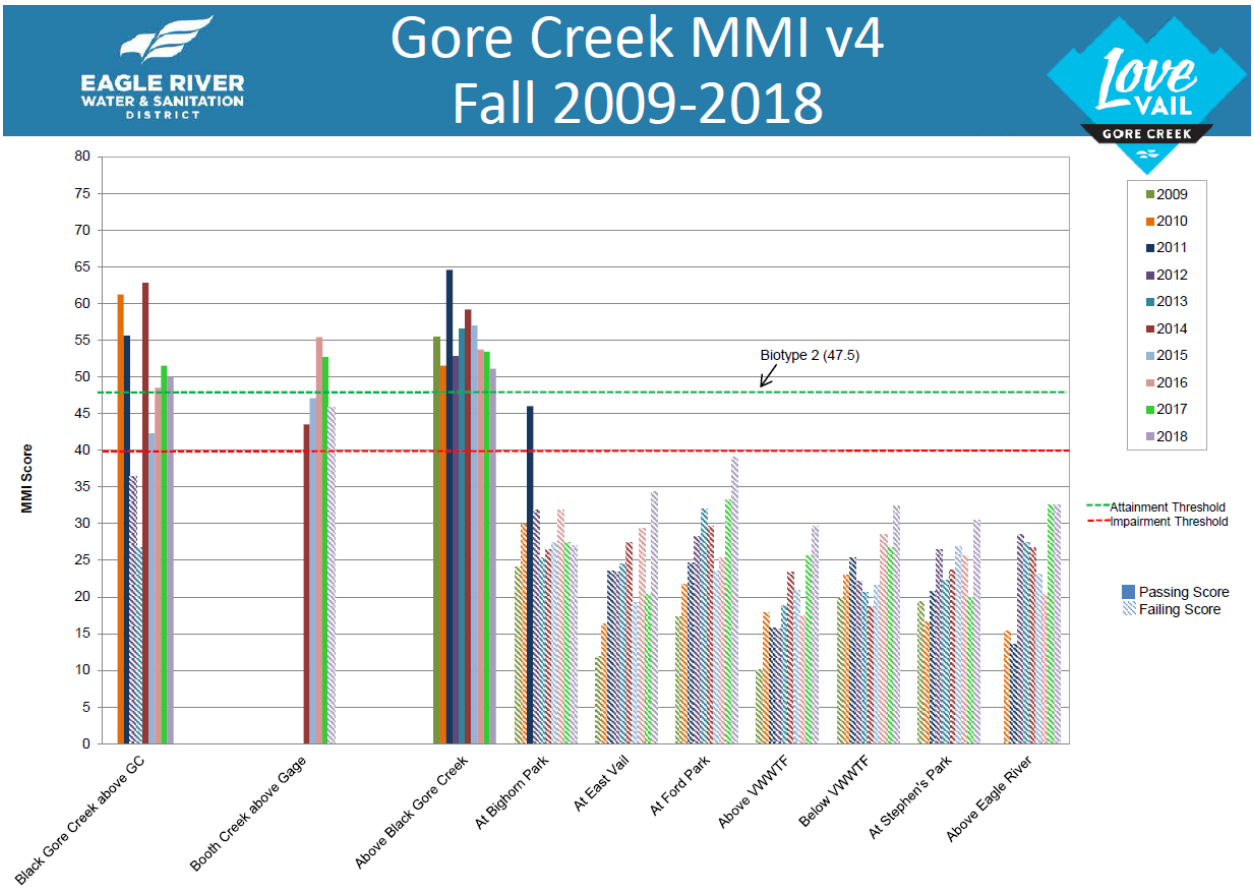
The ordinance that the City of Boulder adopted to protect waterways and wetlands makes specific reference to the fact that non-point source impacts to waterways were historically of little concern throughout most of the City's development. This is true of many Colorado communities, Vail included. The Boulder ordinance offers a detailed explanation of its legislative intent, indicating that waterways are "indispensable and fragile natural resources" and that "it is necessary for the city to ensure protection by discouraging development activities in streams, wetlands and water bodies and those activities at adjacent sites that may adversely affect the visibility and functional values of these resources."

To that end, Boulder adopted a suite of regulations that establish a tiered series of zones including the water bodies themselves, an inner buffer and an outer buffer. Within those zones, activities are characterized as *Exempted, Conditional Use, Standard Permit Review, Prohibited Activities* or *Allowed with Notice*. This strategy allowed the city to create a single set of standards, made available and easily understood through a chart that appropriately limits, discourages or bans various activities that have an adverse impact on the water resources within the city based on the proximity of those activities to valuable water resources. For example, construction of new or expansion of existing impervious surfaces (such as pathways and driveways) are prohibited within the wetland or waterbody itself, and subject to standard permit review in both the inner and outer buffer zones.

Legislation can help us achieve our goal of permanently removing Gore Creek from the 303d list

In 2018, the Colorado Department of Health and Environment (CDPHE) amended the formula it used to calculate macroinvertebrate scores in Gore Creek (MMI v4). When applied to all macroinvertebrate samples taken from Gore Creek since 2009, all but one site in one year (2011) failed to meet the standards set with this new formula. This policy change essentially revised Gore Creek scores down. While still showing that steady, if modest, improvements have been made in recent years due to Restore the Gore initiatives, Gore Creek is farther from reaching its goal of removal from the state's 153d list than it was under the previous formulation (MMI v3).

Fig. 1 *Gore Creek MMI Scores, September 2018*



Setback overlay zone

The most effective buffer zone ordinances delineate at least two separate areas of influence along creeks, streams, wetlands and ponds. Setbacks are measured from top of bank or OHM, which can be established objectively and easily measured. Within a narrow, inner buffer land use activities are tightly restricted. Mowing, vegetation removal, chemical use and establishment of impervious surfaces are prohibited with only few exceptions for control of invasive weeds. Beyond that an outer zone establishes less stringent restrictions on land use and landscaping activities but still provides a level of protection for water quality by limiting or prohibiting high impact activities such as construction of hardscapes, development and storage of materials, even if vegetation removal and landscape maintenance are permitted within this outer zone. The existence of multiple zones also allows for exceptions to be made for properties where existing buildings are very close to the top of bank. In such places, municipalities sometimes choose to only apply a strict inner buffer, allowing property owners to manage areas outside that buffer as they always have.

Exemptions should be made for certain permitted activities within even the inner buffer. For example, if the use of pesticides becomes prohibited within an inner buffer, opportunities need to exist for property owners to obtain a permit to manage an infestation of noxious weeds like Canada thistle, which are nearly impossible to maintain without the use of herbicide. There also needs to be a mechanism through which removal of dead vegetation, such as hazard trees and potential fuel sources, can be permitted.

Conclusion

A stream corridor protection ordinance, while recommended by the GSP, has not yet been adopted in the town of Vail. While steady, modest progress has been made in recovering aquatic macroinvertebrate numbers in Gore Creek, full recovery is unlikely to occur without the widespread restoration of riparian buffers on both public and private property. Adoption of a well-thought-out ordinance that regulates vegetation removal, construction, pesticide use and other activities within a near stream zone has enormous potential to help Town of Vail achieve its goal of permanently removing Gore Creek from the state's 303d list of impaired waterways.