East Vail Riparian Habitat and Floodplain Restoration

Final Report

Prepared for:
Colorado Watershed Restoration Grants
Attn: Chris Sturm
PO# POGG1, PDAA, 201900002727
September 12, 2019

Eagle River Watershed Council
Grant Amount: $53,400
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Introduction

Why was the plan/ project created? What is the need? Is it part of a larger project? Provide any information about your organization you feel is relevant to better understand the project.

In 2012, Gore Creek was listed on the State of Colorado's 303d impaired waterways list due to low macroinvertebrate scores. The years of 2014/2015 showed the worst scores to date with 6 out of 9 testing sites reporting failing numbers. The Town of Vail took this news very seriously and in 2015 the Gore Creek Strategic Action plan was created to identify several priority areas and address the falling water quality standards stemming from increased urbanization issues such as abundant pesticide use, increasing permeable surfaces, and storm drain dumping incidents. From that, the *Restore the Gore* initiative was born to repair Gore Creek.

The East Vail Riparian Habitat and Floodplain Restoration (located at Sundial Townhomes in Vail) was one of several projects in the larger scope of the *Restore the Gore* restoration efforts. This project marks the second successful restoration effort between the Town of Vail and Eagle River Watershed Council in the same number of years.

The main concerns with the Sundial lawn were a large area of turf grass, little native riparian vegetation and a manmade berm blocking the natural freedom space of the creek. These issues led to water quality degradation from untreated stormwater and adjacent bank erosion. The homeowners worried about the substantial bank loss they were experiencing every year.

Background

Provide a summary of the background information used when creating the plan/ project. Please include the information used to develop the plan/ project, including existing plans, assessments, monitoring efforts, studies, reports, etc., as well as additional information gathered and used after the application was submitted.

After being identified as a priority restoration site by Town of Vail environmental staff and engineers the Sundial lawn area was listed in the action plan. This listing and the large area of turf grass, as well as willingness to participate from the residents, is why it was chosen as our project of focus this year.

Jeff Crane of Crane Associates (vetted through the town's vendor procurement policies) then created a design plan for the restoration project, funded by the Town of Vail's Project Re-Wild program. The Town of Vail, Crane Associates and Eagle River Watershed Council then discussed the plan with the HOA and, after some educational outreach, the residents of the HOA agreed with the need and were willing to put funds toward the project and take corrective actions. Upon receiving the CWCB Watershed Restoration Grant award, the plan to implement the project was put into action. Appropriate floodplain permits were pulled, the restoration ecologists (AloTerra Restoration) created a plant palette and a volunteer planting day was planned by the Watershed Council.

Describe the objectives and long-term goals of the project in detail. A Site Summary should be included within this section, entailing the general location of the plan/ project, as well as locations of the specific sites involved within the plan/ project. If using maps and pictures in this section, a caption should be included at the top of the image.

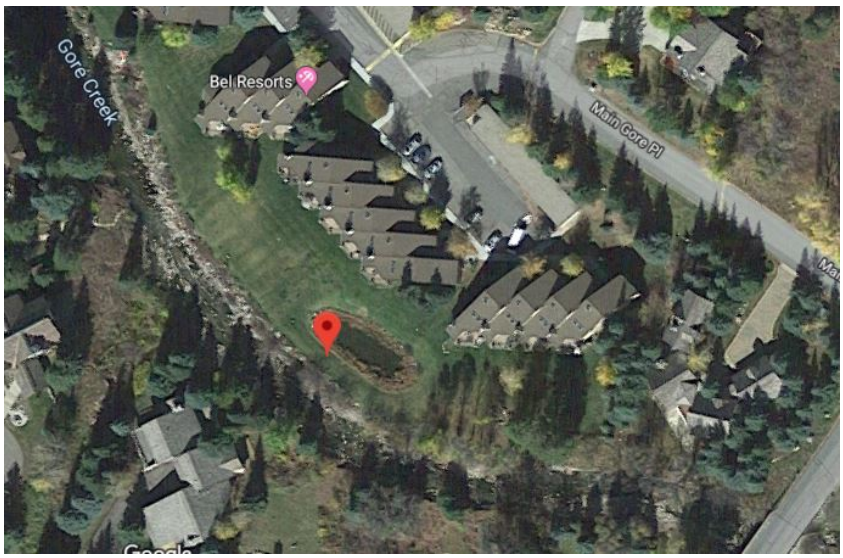
A primary objective of this restoration was to repair the riparian habitat in Gore Creek. The Town of Vail and private property owners have been diligently working up and down stream over the past few years to re-establish a contiguous buffer of riparian habitat along Gore Creek that connects to town-owned property at Bighorn Park allowing wildlife precious space to migrate, reproduce and thrive.

A secondary goal of the project was to reconnect the historic floodplain area to Gore Creek allowing it the room to roam and therefore maintain natural aggrading and degrading cycles along its ever-changing channel. This freedom space will also help to naturally recharge the wetland area in the center of the grass lawn. The removal of the hard berm will decrease the bank loss and erosion issues adjacent to the property. The resulting improved in-stream habitat and water quality conditions will result in better fish habitat and increased angling opportunities.

In the future we expect to see more of the Gore Creek sites passing the water quality standards and ultimately, in time, being removed from the 303d list.

The project site consisted of 800 feet of riparian zone situated on the south/ southwest side of the Sundial property. We originally planned to focus efforts on just the Sundial lawn area, but as we came in under budget (as is explained below) we were able to expand the scope to include the opposing private property. Sundial Townhomes are located at 5040 Main Gore Place (East Vail, Colorado) and the Vucich property is at 4957 Juniper Lane (East Vail, Colorado).

Project Location: East Vail, Colorado



Methods

How was the plan/ project implemented? Describe what was done through the project to achieve the stated objectives. How was CWCB funding used specifically to implement your project? If part of a larger project, what costs did CWCB cover? Be as precise as possible (equipment used, materials used [including quantities], etc.) Please use enough detail when describing actions taken, so that the plan/ project can be implemented again in the same way based on explanations found in this section. Describe the methods for each task individually. Include diagrams, figures, and tables where appropriate.

Implementation of the project plan was completed by skilled contractors in conjunction with a volunteer labor workforce.

2017 LiDAR aerial imagery and topography, FEMA floodplain mapping and HEC-RAS streambed cross sections were used by Crane Associates in the development of project plans. After changes to the irrigation system were completed by the property management company, the excavation work of removing the berm, regarding the slope of the bank and relocation of large boulders was completed using heavy equipment by Environmental Excavation, LLC of Carbondale, CO.

The riparian and upland plant palette was created by AloTerra Restoration Services and planting was done under their crew leader's supervision using shovels and hand tools by 15 volunteers who Eagle River Watershed Council coordinated. On the planting day, grass seed was placed and raked first, followed by erosion control fabric secured by stakes, then flowers, shrubs, and small trees were planted. Areas that were not covered by erosion control fabric were covered in wood straw. Lastly the irrigation was reconnected and watering of the newly planted vegetation sealed the project's completion.

The objective of repairing the 800 feet of riparian habitat was achieved through the removal of a large area of turf grass and installation of hundreds of specific riparian plants. The irrigation system for the lawn was modified to work around the planting area and will continue to irrigate the newly planted vegetation ensuring less plant mortality at the project site. Removal of the berm also accomplished the goal of reconnecting the historic floodplain of Gore Creek. This will stop the hydrologic forces scouring the opposing banks and causing sediment loading in the creek, thus reducing interstitial spaces consequently negatively affecting trout populations.

The CWCB funding was utilized to hire and pay excavation contractors, and pay the restoration ecologist crew leads as well as pay Eagle River Watershed Council staff for their time on the project.

Results

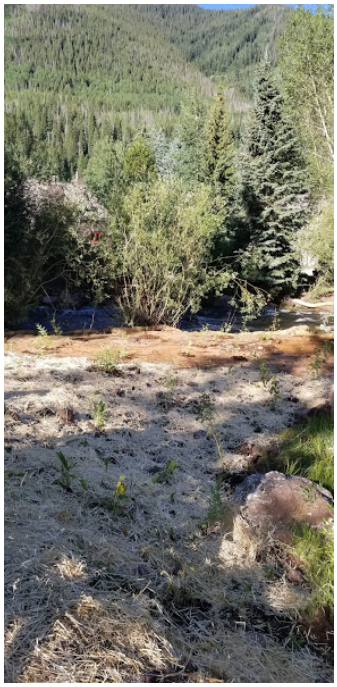
Please describe any findings through the duration of your plan or project including, but not limited to, any measurements taken, materials generated, communities affected, etc. Utilizing figures, pictures, and tables to represent findings is highly recommended. All figures, pictures and tables should have captions.

Photos have been the most impactful measurement tool we were able to use. As you will see in our coversheet photos and the images below the before and after images reflect a vast difference in grade of the slope and numerous new riparian plants to aid with filtration and stabilization of the creek. True metrics will come over several years as we see macroinvertebrate scores improving and trout pools repopulating.

The Sundial HOA community has been directly affected by increased views of the creek, a more natural riparian corridor protecting their property, and increased education on the importance of improving our watershed. Several of the homeowners even joined in the volunteer planting day. These newly created stewards of their waterways will speak to friends, family, and neighbors about their contribution for years to come passing on a vital sustainability message.

Volunteers working at the project site

Straw covering project site



Sundial from Vucich property

Vucich property & Sundial

Conclusions and Discussion

Discuss whether or not your objectives were met. If they were, to what degree were the objectives met? What monitoring efforts are currently in place? Include how the project will be sustained in the long-term, and how this can be measured.

The partners for this project are in agreement that the project was successful undertaken and all goals were 100% completed. The newly created riparian habitat with help shade the creek to ensure healthy stream temperatures for aquatic wildlife as well as prevent bank erosion and associated sedimentation, while reconnected floodplains will improve wildlife habitat and increase flood capacity in Gore Creek.

We have visited the project site a couple of times since implementation and are pleased to see that grass is growing through the erosion control fabric and the plants are thriving. The Sundial project site will be monitored by the homeowners as well as Town of Vail Environmental staff who plan to repair plant mortality to ensure the continued vitality of

the project area. Measurement of macroinvertebrate scores and trout population numbers will be the most vital metrics to show true improvement to the stream health.

Discuss difficulties or "lessons learned" with the plan/ project. How were these difficulties addressed? Did they influence your end results, if so, how? Is there anything you would do differently? Is there anything you plan to do differently if the project continues?

As this was the second project partnership between the Town of Vail and Eagle River Watershed Council on the Gore Creek corridor we have a close relationship which made planning of logistics streamlined and gratefully there were not too many challenges with project planning and implementation.

One obstacle for this project, however, was the education of the local community on the importance of the project in order to create buy in from the owners. They were a bit weary of allowing implementation to proceed out of fear of damage to personal property, which we were informed was due to a difficult incident with a contractor in the past. After meetings, phone calls and eventually a drafted contractual agreement we were able to assuage the homeowners concerns and proceed with a project that ultimately we received wonderful feedback on from those same homeowners. We feel the outcomes were very positive and therefore would not change our approach. Providing facts, real funding numbers, and helping homeowners understand the local ecology was pivotal to the success of the project.

Another challenge for the partners on this project was the budget. Our design plan was created as a very conservation (over) estimate which we were able to value engineer some of the project scope, allowing us to come in under the proposed budget. We thankfully were able to get matching funds from the HOA and Town of Vail, but feel it would have been slightly easier to 'sell' the project to both homeowners and town council if a lesser amount was required from the start. We plan to take this into account and will strive to create more precise estimates for future projects. This difficulty nevertheless did result in a positive outcome for the project as it allowed us more funds to include the adjacent property that was experiencing severe bank erosion due to the topography of the Sundial lawn and the interconnectedness of the creek system.

Discuss any future work related to the plan/ project. Was there room for continuance once the plan/ project was completed? What new questions arose throughout the process? How is the plan/ project continually beneficial?

The next meaningful steps will be to address other Town of Vail private property owners along the creek corridor to continue the larger *Restore the Gore* effort. The Town of Vail does water quality monitoring of 9 sites along the Gore Creek, not only for macroinvertebrate scores, but also for other signs of stream health such as levels of pH, metals, alkalinity, and hardness. They assess bug scores annually with expert in the field,

Dave Reese, of Timberline Aquatics. These monitoring plans will continue in perpetuity not only until Gore Creek is removed from the impaired waterways list, but as the community continues to grow and change.

The project partners have gained great knowledge about working with private property owners throughout the successful implementation of these restorations. Questions of how best to approach and inform them did surface and creative approaches were discussed. The lessons learned here will be utilized in future year's restoration outreach efforts.

Actual Expense Budget

Include the actual budget including all cash match and in-kind match funding. It is helpful to use the same format as that of the Budget template provided for the scope of work.

Expense Budget is attached.

Appendix

This Section focuses on any additional information that would benefit the understanding of the plan/ project. This can include photos (before and after), site maps, design drawings, metadata, measurement data used in calculations, survey data, model data, etc. used or generated throughout plan/ project implementation.

Attached:

- Vail Daily Front Page Project Photo
- Plant Palette
- Design plans were included in the original grant request, but please do not hesitate to reach out if you would like us to provide them again.

References

List all references used throughout the project. Formatting is irrelevant as long as it is consistent.

- Pete Wadden – Town of Vail Watershed Education Coordinator [Partner]
    - PWadden@vailgov.com | 970-479-2144
- Jeff Crane – Crane Associates [Design & Project GM]
    - jeff@craneassociates.net | 970- 261-5043
- John Giordano – AloTerra Restoration [Restoration Ecologists]
    - john@aloterraservices.com | 970-420-7346
- Jim Crane – Sundial HOA Board President [Main HOA Contact]
    - cranej@wustl.edu | (314) 401-3770

Final Expense Budget

Task	Description	CWCB Funds	Other Funding Cash*	Other Funding In-Kind*	
1	Project Design (TOV and Sundial HOA)		$11,000.00		
2	Project Construction	$28,000.00	$8,600.00		
3	Volunteer Planting			$3,300.00	
4	TOV Staff Time			$3,500.00	
5	ERWC Staff Time	$2,500.00			
6	Purchase of plant materials and seed (TOV		$2,500.00		
7	Maintenance and watering (Sundial HOA)		$2,500.00		**TOTAL PROJECT COST**
	TOTALS	$30,500.00	$24,600.00	$6,800.00	$61,900.00

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An epic $264M deal

Vail Resorts to acquire Peak Resorts, which operates 17 ski resorts in the Northeast and Midwest. **A3**

TAKE IT TO **THE BANK**

Parker Rodeen places rocks while Peter Wadden, the town of Vail's water quality education coordinator, hammers in stakes during Monday's Restore the Gore workday on the banks of Gore Creek. About 15 volunteers helped with streamside improvements near the Sundial properties in East Vail.

KELLY GETCHONIS
SPECIAL TO THE DAILY

HighLife

Retreat offers twice-daily yoga, 14er climb and connection with others. **FOR THE FULL STORY, SEE PAGE B1.**

COMMENTARY

Don't love Happy Valley? Leave! **FOR THE FULL COLUMN, SEE PAGE A6.**

WEATHER

JACKI CASTILLO
Edwards Elementary School

Chance of showers
High 78; **low** 50 — Weather, B8

YOUR NEWS

SUMMER SHOTS

Use #VailLive on Instagram to see your photos on Page A10 of the Vail Daily each day.

LOCAL & REGION

From fire fears to flooding — what a difference a year makes in Gypsum. **FOR THE FULL STORY, SEE PAGE A2.**

Sundial: Plant Palette. Elevation: 8,570

DRAFT: 5/22/19

Zone 1 Area (SF): 2000

ZONE 1: Shrubs				Zone/ Hydrosere	Spacing (ft on center)	% in Palette	Quantity
Container Type*	**Life History**	**Species Name**	**Common Name**				
D-60 or 1 gallon	NS	*Lonicera involucrata*	twinberry honeysuckle	mesoriparian	6	25	16
D-60 or 1 gallon	NS	*Betula glandulosa*	bog birch	hydroriparian	6	25	16
D-60 or 1 gallon	NS	*Cornus sericea*	red osier dogwood	mesoriparian	6	25	16
D-60 or 1 gallon	NS	*Ribes lacustre* or *Ribes inerme*	gooseberry/currant	mesoriparian	6	25	16
					Totals:	100	64

ZONE 1: Wildflowers, Sedges/Rushes, and Grasses				Zone/ Hydrosere	Spacing (ft on center)	% in Palette	Quantity
Container Type*	**Life History**	**Species Name**	**Common Name**				
10ci or 4"	NPF	*Solidago canadensis*	Canada goldenrod	mesoriparian	2	5	29
10ci or 4"	NPF	*Geranium richardsonii*	Richardson's geranium	mesoriparian	2	5	29
10ci or 4"	NPF	*Thermopsis montana*	goldenbanner	mesoriparian	2	5	29
10ci or 4"	NPG-L	*Carex microptera*	smallwing sedge	mesic meadow	2	7	40
10ci or 4"	NPG-L	*Carex praegracilis*	clustered field sedge	mesic meadow	2	7	40
10ci or 4"	NPG-L	*Deschampsia cespitosa*	tufted hairgrass	mesic meadow	2	5	29
10ci or 4"	NPF	*Geum macrophyllum*	largeleaf avens	mesic meadow	2	6	35
10ci or 4"	NPG-L	*Juncus arcticus ssp. littoralis*	mountain rush	mesic meadow	2	7	40
10ci or 4"	NPF	*Solidago canadensis*	Canada goldenrod	mesic meadow	2	7	40
10ci or 4"	NPG-L	*Beckmannia syzigachne*	American sloughgrass	mesic meadow	2	7	40
10ci or 4"	NPG-L	*Carex interior*	inland sedge	mesic meadow	2	7	40
10ci or 4"	NPF	*Heracleum maximum*	common cowparsnip	mesic meadow	2	6	35
10ci or 4"	NPF	*Iris missouriensis*	Rocky Mountain iris	mesoriparian	2	6	35
10ci or 4"	NPG-L	*Juncus confusus*	Colorado rush	mesic meadow	2	7	40
10ci or 4"	NPG-L	*Juncus longistylis*	longstyle rush	mesic meadow	2	7	40
10ci or 4"	NPF	*Mentha arvensis*	wild mint	mesic meadow	2	3	17
10ci or 4"	NPF	*Sidalcea neomexicana*	salt spring checkerbloom	mesic meadow	2	3	17
					Totals:	100	577

* Alternate containers may be necessary, including 1 gallon, 5 gallon, or 4" (for 10ci)

Zone 2 Area (sf): 3005

Zone 2: Shrubs				Zone/ Hydrosere	Spacing (ft on center)	% in Palette	Quantity
Container Type	**Life History**	**Species Name**	**Common Name**				
D-60 or 1 gallon	NS	*Lonicera involucrata*	twinberry honeysuckle	mesoriparian	7	15	11
D-60 or 1 gallon	NS	*Cornus sericea*	red osier dogwood	mesoriparian	7	15	11
D-60 or 1 gallon	NS	*Ribes lacustre* or *Ribes inerme*	gooseberry/currant	mesoriparian	7	15	11
D-60 or 1 gallon	NS	*Ribes cereum*	wax currant	xeroriparian	7	10	7
D-60 or 1 gallon	NS	*Rosa woodsii*	Wood's rose	xeroriparian	7	10	7
D-60 or 1 gallon	NS	*Rubus parviflorus*	thimbleberry	xeroriparian	7	15	11
D-60 or 1 gallon	NS	*Rubus idaeus var. strigosus*	red raspberry	xeroriparian	7	15	11
D-60 or 1 gallon	NS	*Symphoricarpos rotundifolius*	mountain snowberry	xeroriparian	7	5	4
					Totals:	100	71

ZONE 2: Wildflowers, Sedges/Rushes, and Grasses				Zone/ Hydrosere	Spacing (ft on center)	% in Palette	Quantity
Container Type	**Life History**	**Species Name**	**Common Name**				
10ci or 4"	NPG-L	*Carex microptera*	smallwing sedge	hydroriparian	5	6	8
10ci or 4"	NPG-L	*Beckmannia syzigachne*	American sloughgrass	hydroriparian	5	6	8
10ci or 4"	NPG-L	*Carex interior*	inland sedge	hydroriparian	5	6	8
10ci or 4"	NPF	*Heracleum maximum*	common cowparsnip	hydroriparian	5	6	8
10ci or 4"	NPF	*Solidago canadensis*	Canada goldenrod	mesoriparian	5	5	7
10ci or 4"	NPF	*Geranium richardsonii*	Richardson's geranium	mesoriparian	5	3	4
10ci or 4"	NPF	*Thermopsis montana*	goldenbanner	mesoriparian	5	3	4
10ci or 4"	NPG-L	*Carex praegracilis*	clustered field sedge	mesoriparian	5	3	4
10ci or 4"	NPG-L	*Deschampsia cespitosa*	tufted hairgrass	mesoriparian	5	3	4
10ci or 4"	NPF	*Geum macrophyllum*	largeleaf avens	mesoriparian	5	3	4
10ci or 4"	NPG-L	*Juncus arcticus ssp. littoralis*	mountain rush	mesoriparian	5	3	4
10ci or 4"	NPF	*Solidago canadensis*	Canada goldenrod	mesoriparian	5	3	4
10ci or 4"	NPF	*Iris missouriensis*	Rocky Mountain iris	mesoriparian	5	5	7
10ci or 4"	NPG-L	*Juncus confusus*	Colorado rush	mesoriparian	5	3	4
10ci or 4"	NPG-L	*Juncus longistylis*	longstyle rush	mesoriparian	5	3	4
10ci or 4"	NPF	*Sidalcea neomexicana*	salt spring checkerbloom	mesoriparian	5	5	7
10ci or 4"	NPF	*Eriogonum unbellatum*	sulfur-flowered buckwheat	xeroriparian	5	5	7
10ci or 4"	NPF	*Lupinus argenteus*	silvery lupine	xeroriparian	5	3	4
10ci or 4"	NPF	*Mertensia lanceolata*	bluebells	xeroriparian	5	5	7
10ci or 4"	NPF	*Penstemon virgatus*	waving wand penstemon	xeroriparian	5	3	4
10ci or 4"	NPG-L	*Schizachyrium scoparium var. scoparium*	little bluestem	xeroriparian	5	5	7
10ci or 4"	NPF	*Aquilegia coerulia*	Colorado blue columbine	xeroriparian	5	4	6
10ci or 4"	NPF	*Campanula rotundifiolia*	harebells	xeroriparian	5	4	6
10ci or 4"	NAF	*Chamerion angustifolium*	Fireweed	xeroriparian	5	5	7
* Alternate container sizes may be necessary depending on availability (including 1 gallon and 5 gallon for D-60s, or 4" for 10ci)					**Totals:**	100	139

LIFE HISTORY DESCRIPTIONS
NPF = Native Perennial Forb
NPG-L = Native Perennial Grass-like
NS = Native Shrub