



Barton Creek Trail Work

Status Report: September 2022 - January 2023

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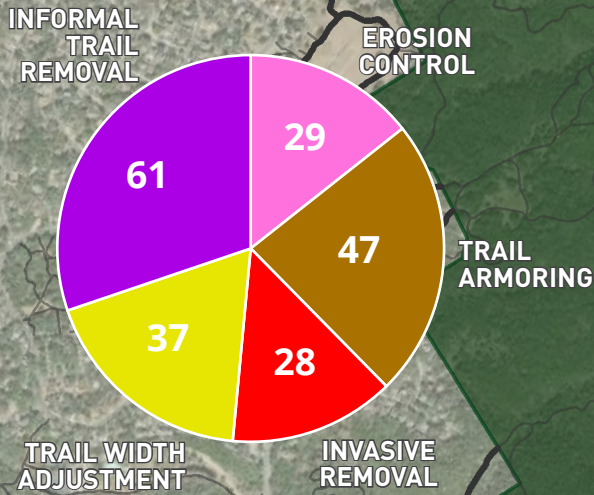
Collecting Seed

Future Projects

INITIAL SURVEY RESULTS

202 observations logged from SEPTEMBER 2022 TO JANUARY 2023

5 PROJECT TYPES

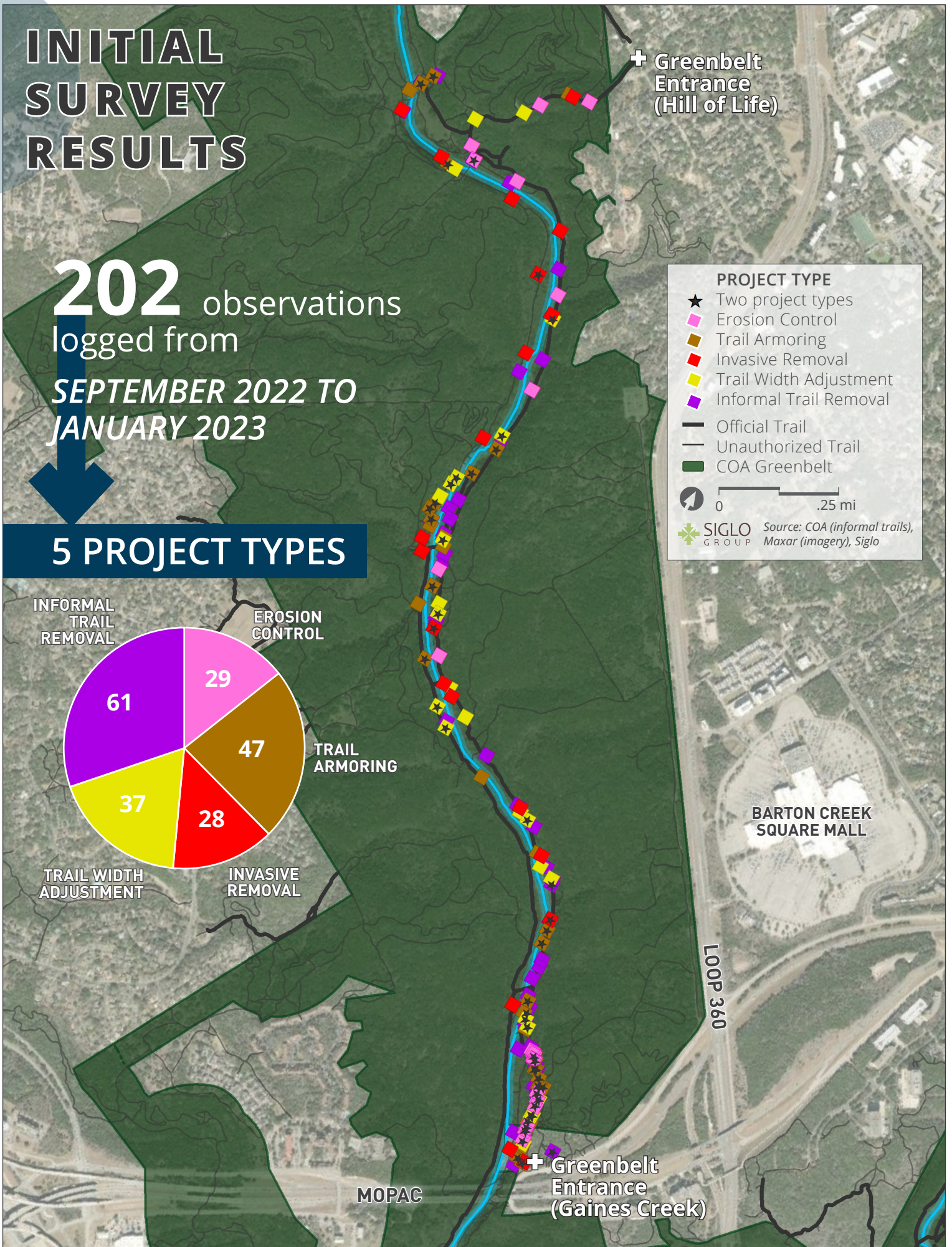


PROJECT TYPE

- ★ Two project types
- Erosion Control
- Trail Armoring
- Invasive Removal
- Trail Width Adjustment
- Informal Trail Removal
- Official Trail
- Unauthorized Trail
- COA Greenbelt

0 0.25 mi

SIGLO GROUP Source: COA (informal trails), Maxar (imagery), Siglo

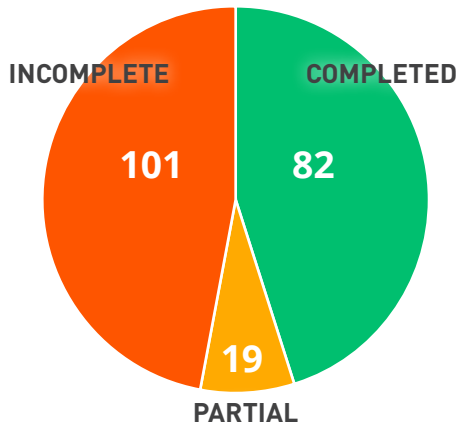


COMPLETED PROJECTS OVERVIEW

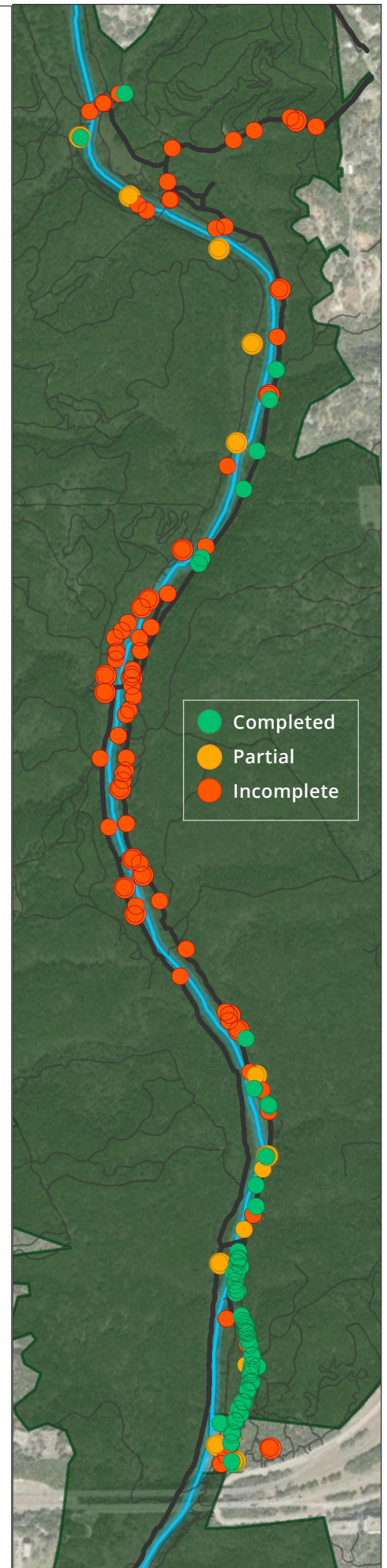
As of September 2022, Siglo Group has tackled a wide range of trail-related issues within the Barton Creek Greenbelt. The restoration work performed has most frequently taken the forms of erosion control, limiting user impacts, and mechanical removal of invasive species. Thirty informal trails have been decommissioned using brush to block the access points. Some of these decommissioned trails were contributing to erosion issues so large stones and logs were used to build check dams to slow water and build soil. Since beginning the project in September, Siglo Group has observed 202 ecological issues on trail, completed 82 projects, and has partially addressed 19 of the remaining issues. Additionally, many potential hazards to trail users have been addressed. These hazards include dead trees or tree branches over the trail as well as washout areas and informal water access trails that have become increasingly steep and slick due to erosion. The following pages will go into detail summarizing issues and completed projects for the 5 project types - erosion control, trail armoring, invasive removal, trail width adjustment, and informal trail removal.

PROJECT STATUS AS OF JANUARY 2023

Total = 202 identified projects



Formalized informal water access point near Gaines Creek Trailhead ▼



EROSION CONTROL

TYPES OF EROSION

	CAUSE	SOLUTION
SHEET EROSION	Infiltration is insufficient compared to intensity of rainfall	Decrease trail width, provide opportunities for water to be directed off trail
RILL EROSION	Runoff forms channels down a slope	Provide opportunities for water to be directed off trail. Seed natives
GULLY EROSION	Unresolved rill erosion leads to the formation of gully erosion	Provide opportunities for water to be directed off trail
BANK EROSION	Flooding and/or visitors utilizing informal water access points	Retire informal trails, build up support walls of rock and gravel, brush the area, and seed natives



SHEET EROSION near Hill of Life Trailhead.



GULLY EROSION near Hill of Life Dam.



RILL EROSION near Gaines Creek Trailhead.



BANK EROSION near Gaines Creek Trailhead.

EROSION CONTROL COMPLETED PROJECTS

16
of
29

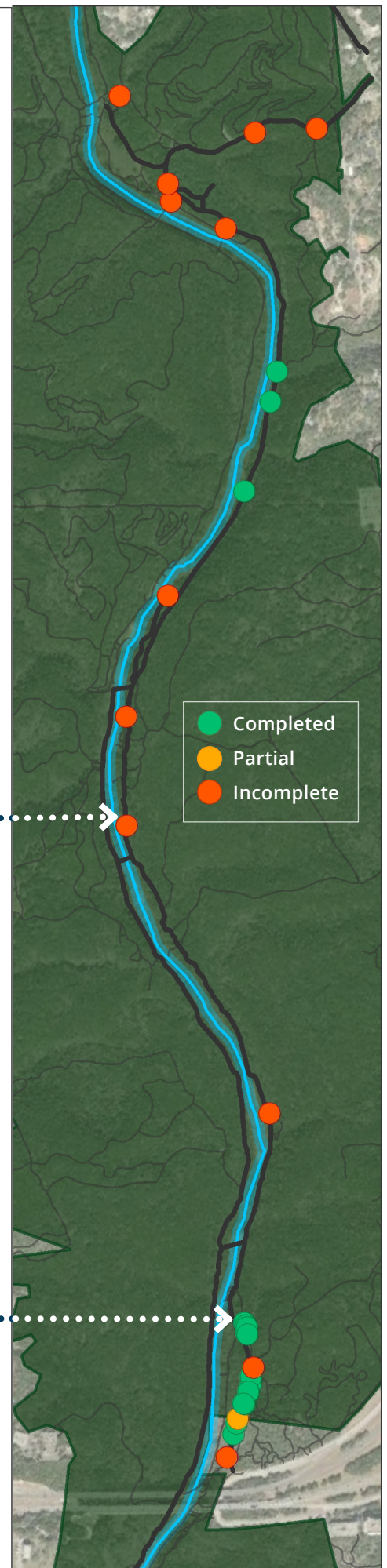
Some of the major issues Siglo Group is addressing on the Barton Creek Trail are trail erosion and washouts, especially near the Gaines Creek Trailhead. Sheet, gully, rill, and bank erosion are the most frequently encountered types of erosion on the trail. Low spots are also being addressed as these lead to issues with trail widening or informal trails as people avoid the ponding water in the trail. The most frequent causes of this erosion are related to trail design (long stretches of trail going down or up), soil compaction, insufficient infiltration that leads to rill and sheet erosion, as well as informal water access and other user impacts. Informal water access has been harmful to the Barton Creek Trail's structural integrity, as the foot traffic inhibits the establishment of vegetation in the area and prevents any regrowth. When there is no vegetation to aid in maintaining bank structure, rain events cause the areas to wash out significantly, eroding the bank and consequently narrowing the trail.

In these situations, the trails are restored by installing gravel backfilled grade dips to help direct the water off the trail and down the slope.

Eroded banks
near Gaines Creek Trailhead has been armored using limestone boulders sourced nearby. ▶



Grade dips back filled with gravel installed to mitigate sheet and rill erosion frequently occurring in low areas on trail. ▶



TRAIL ARMORING COMPLETED PROJECTS

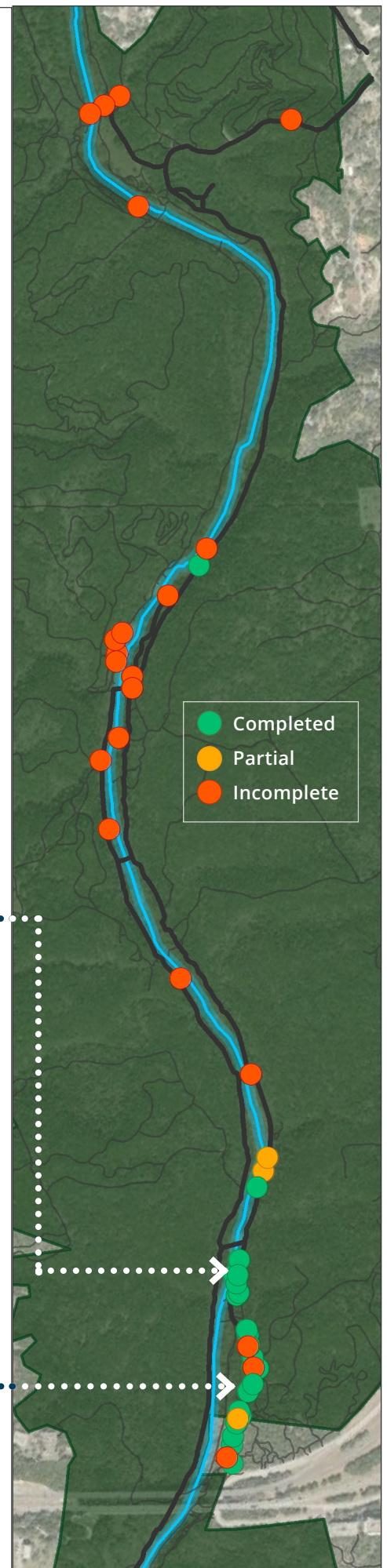
23
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47

Throughout the Barton Creek Greenbelt, trail erosion has led to many exposed roots. These are a tripping hazard, and both foot and bicycle traffic cause further damage to these roots and the associated trees. To protect exposed roots and provide stability in these washout areas, boulders sourced from the Greenbelt and the soil that was removed when installing grade dips were used to build up the trail where erosion was evident. Drainage trenches to direct water off of the trail have been installed above the areas where the trail was built back up to prevent washouts from occurring in these areas in the future. Another example of trail armoring includes the formalization of water access points that were contributing to erosion along Barton Creek. In these situations, large, flat rocks were used to create a safe, accessible walkway for trail users to utilize that would limit further erosion.

A section of trail that was eroded near the Gaines Creek Trail Head was built back up using local rocks and soil from excavated erosion control trenches. ▶



Rocks and brush used to delineate a more narrow path in a wide segment of trail. Edges were seeded with inland sea oats ▼



INVASIVE REMOVAL

TYPES OF INVASIVES

The Barton Creek Greenbelt is inhabited by several species invasive to the region. Invasive species are a cause of ecological concern due to their potential to negatively impact an environment. They can reduce biodiversity, decrease native species populations through competition, alter habitats and soil chemistry, and provide little to no resources for native wildlife. The invasives of highest concern include invasive privets (*Ligustrum lucidum*, *L. sinense*, and *L. quihoui*), Nandina (*Nandina domestica*), Bermudagrass (*Cynodon dactylon*) and King Ranch (KR) bluestem (*Bothriochloa ischaemum* var. *songarica*). In order to promote native plant growth and nurture a healthier ecosystem, a major component of the Barton Creek trail work has been invasive plant removal.



GLOSSY PRIVET
Ligustrum lucidum



CHINESE PRIVET
Ligustrum sinense



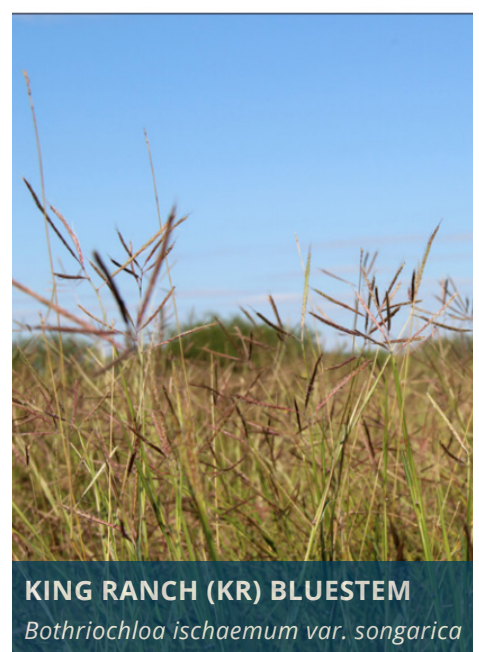
WAXYLEAF PRIVET
Ligustrum quihoui



NANDINA
Nandina domestica



BERMUDAGRASS
Cynodon dactylon



KING RANCH (KR) BLUESTEM
Bothriochloa ischaemum var. *songarica*

INVASIVE REMOVAL COMPLETED PROJECTS

1
of
28

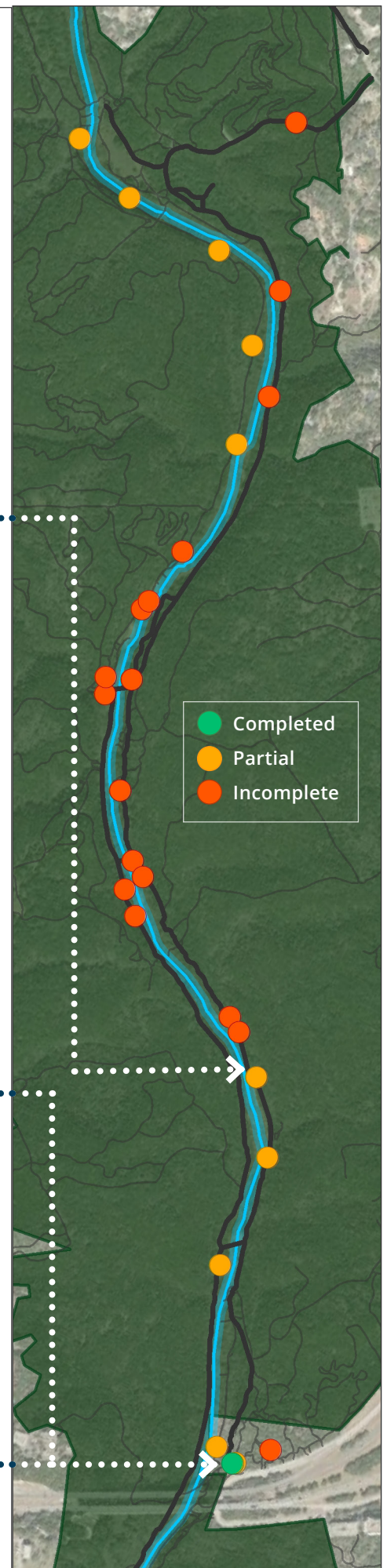
A patch of ligustrum near the Gaines Creek Access Trailhead. ▶



A patch of Bermudagrass at the Gaines Creek trailhead before removal. ▶



The same area as the photo above following invasive removal. The area has also been seeded and brushed to prevent trampling. ▶



TRAIL WIDTH ADJUSTMENT COMPLETED PROJECTS

12
of
37

Over time and with use, trail width has fluctuated in areas of the Barton Creek Greenbelt and become an issue of concern. When trail users attempt to avoid standing water, muddy spots, or other obstacles, trails can become wider than intended. In other cases, there are narrow trails where vegetation (usually invasive) encroaches into the pathway. Trail width issues can lead to bank erosion and soil compaction, loss of native vegetation, and habitat fragmentation. As of now, 37 trail width adjustments have been surveyed, and 12 have been addressed.

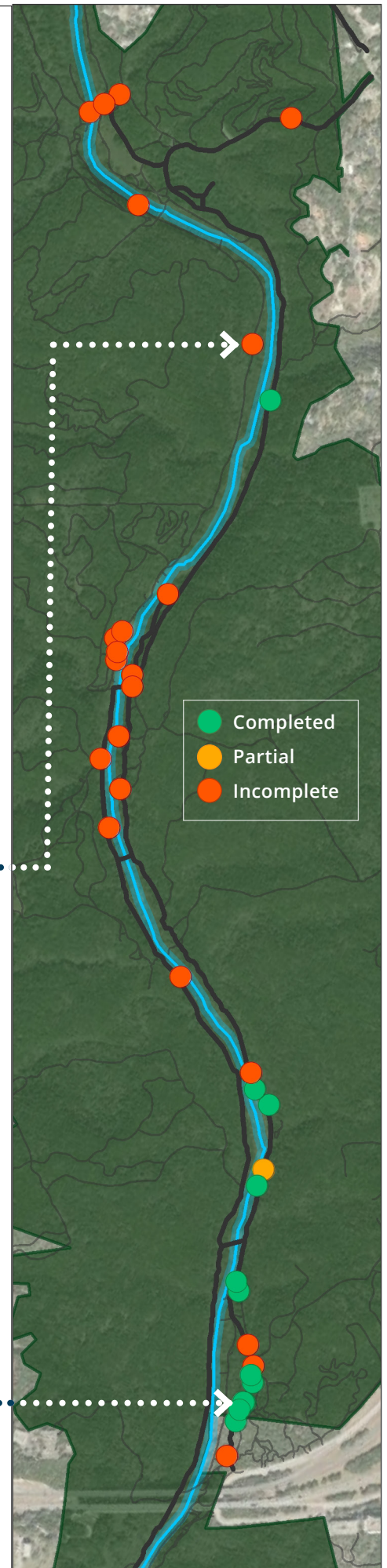
To address wide trails, providing drainage is generally required to resolve the main issues of mud or ponding water. Rocks or logs are placed to obtain a desired trail width. Compacted soil in the retired areas is tilled and native seeds are planted to encourage regrowth. Seeded areas are then brushed to avoid further foot traffic, protect the establishment of new growth, and contribute organic matter to the soil.

Creekside trails southwest of Barton Creek between Sculpture Falls and the Hill of Life dam have been significantly narrowed by invasive privets. Efforts have been made for the mechanical removal of seedlings and saplings. Further treatments with herbicide application are needed for larger shrubs and trees at these locations to clear up the trail for users and reduce invasive populations.

Overgrowth of privet on the southwest creekside trail between Sculpture Falls and Hill of Life trail. ▶



Rocks used to delineate a more narrow path in a wide segment of the trail. ▼



INFORMAL TRAIL REMOVAL COMPLETED PROJECTS

30
of
61

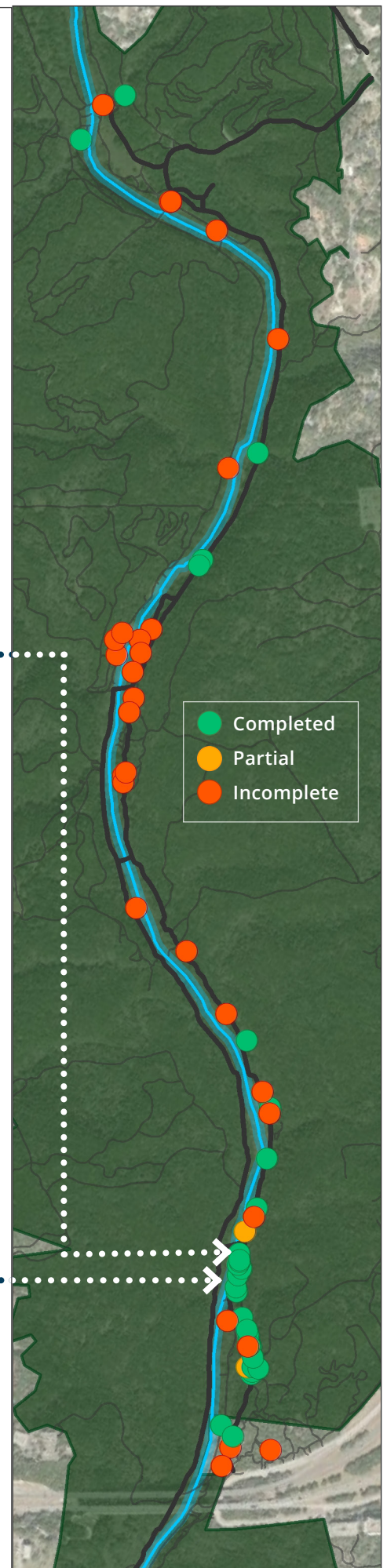
Informal trails are created when people repeatedly traverse through an area until the soil becomes compacted and can no longer support vegetation. Informal trails contribute to erosion, displace native vegetation and wildlife, fragment habitats, and make the greenbelt more confusing and difficult to navigate. The Barton Creek Greenbelt is a popular hiking and biking location that attracts many visitors each day, making it especially vulnerable to informal trail formation. As of now, 61 non-designated trails have been identified in the initial survey and 30 have been addressed since starting the project in September.

To stop future foot traffic on informal trails, these trails are blocked with large rocks or brushed with logs and fallen branches. Retiring these trails will reduce the erosion associated with these trails and will allow native plant species to repopulate.

A brushed informal water access point. ▶



An informal trail with signs of erosion. ▶



COLLECTING SEED

Native seeds are collected to promote native plant growth after mechanical invasive plant removal, efforts to revegetate areas where the trail should be narrower, or on informal trails that have been retired. An upland seed mix was collected within the Barton Creek Greenbelt in areas with an abundance of plant diversity, with a particular abundance of little bluestem (*Schizachyrium scoparium*), prairie coneflower (*Ratibida columnifera*) and white tridens (*Tridens albescens*) seed. Seeds were picked manually and mixed together.

A bottomland shade mix has also been collected for areas where invasive privets were removed or other areas that are being restored. Inland sea oats (*Chasmanthium latifolium*) seeds make up the majority of these seeds but frostweed, Drummond's aster and Virginia wildrye were also collected and used. Inland sea oats are low maintenance, shade tolerant, and grow quickly relative to other native plants, making them a good grass to seed in these locations.

Common name	Scientific name
Virginia wildrye	<i>Elymus virginicus</i>
Purple three-awn	<i>Aristida purpurea</i>
Little bluestem	<i>Schizachyrium scoparium</i>
Dotted blazing star	<i>Liatris punctata</i>
White tridens	<i>Tridens albescens</i>
Antelope horns	<i>Asclepias asperula</i>
Sideoats grama	<i>Bouteloua curtipendula</i>
Wedelia	<i>Wedelia hispida</i>
Plains lovegrass	<i>Eragrostis intermedia</i>
Prairie coneflower	<i>Ratibida columnifera</i>
Inland sea oats	<i>Chasmanthium latifolium</i>
Frostweed	<i>Verbesina virginica</i>
Drummond's aster	<i>Symphyotrichum drummondii</i>

This Table highlights plant species from which seeds were collected. Species in purple are used in bottomland areas when invasive ligustrum removal disturbs the soil. The other upland seeds are used after removal of upland plants like KR bluestem (*Bothriochloa ischaemum*) and Bermudagrass (*Cynodon dactylon*).



◀ Little bluestem seed heads

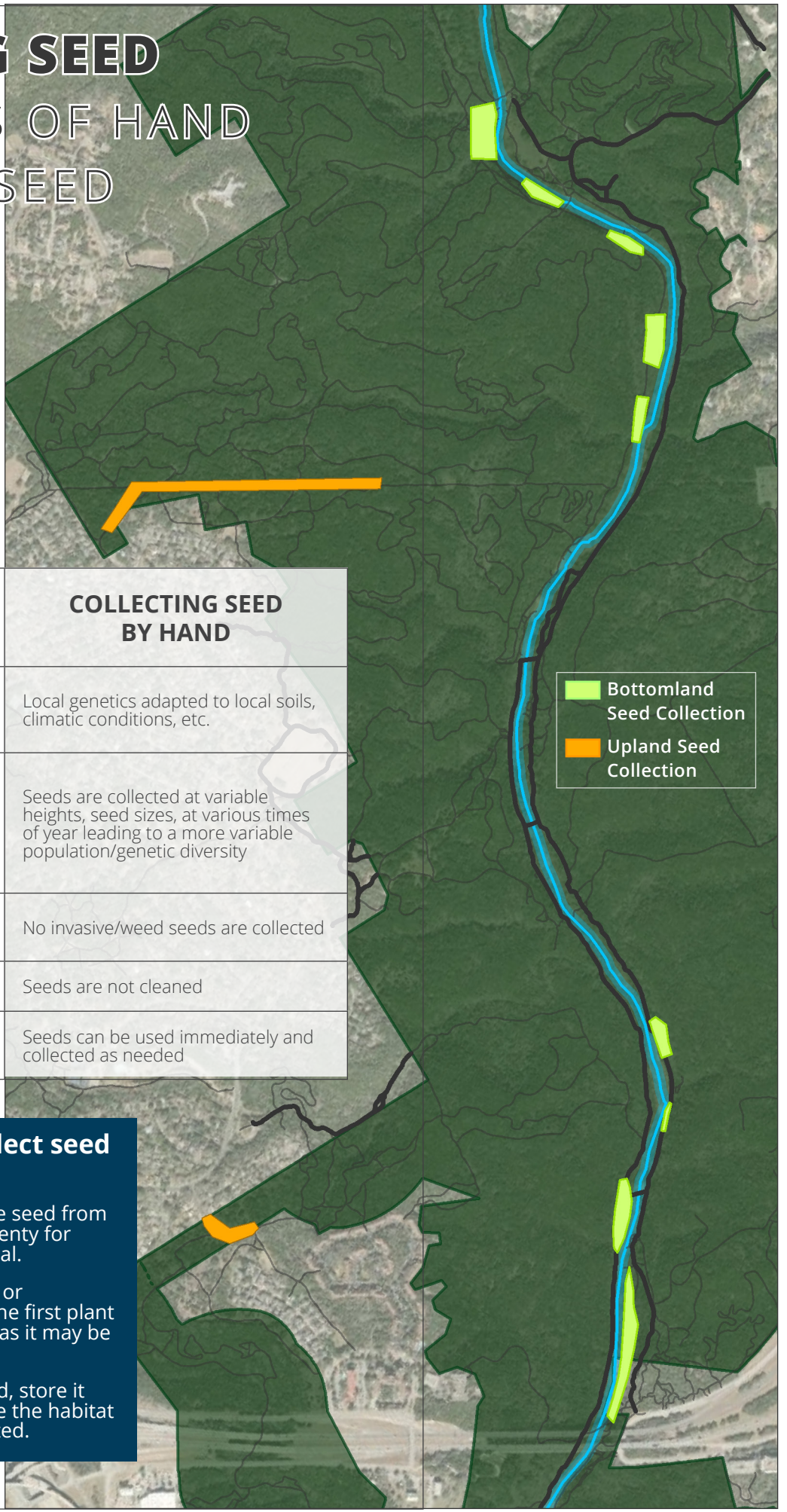
Seed heads of inland sea oats ▶



COLLECTING SEED

THE BENEFITS OF HAND COLLECTING SEED

While buying commercial seed can be more convenient, hand collecting seed offers various ecological benefits not present in commercial seed collections.



COMMERCIAL SEED COLLECTION	COLLECTING SEED BY HAND
Seeds are harvested from outside of the county and potentially a different ecoregion	Local genetics adapted to local soils, climatic conditions, etc.
Seed harvesting equipment selects for certain size seeds on certain plant heights, and are harvested at a certain time of the year which leads to less variation in the population.	Seeds are collected at variable heights, seed sizes, at various times of year leading to a more variable population/genetic diversity
Chances of invasive or weed seeds collected	No invasive/weed seeds are collected
Seeds are cleaned	Seeds are not cleaned
Seed orders can slow down work/ change work priorities	Seeds can be used immediately and collected as needed

Bottomland Seed Collection

Upland Seed Collection

Precautions taken to collect seed sustainably:

- Collect no more than 1/2 of the seed from any one species. This leaves plenty for wildlife and for natural dispersal.
- Do not collect seeds from rare or endangered species, or from the first plant encountered of a new species as it may be the only one in the area.
- Only take as much as is needed, store it appropriately, and use it where the habitat is suitable so that it is not wasted.

FUTURE PROJECTS:

FORMALIZING WATER ACCESS BELOW HILL OF LIFE DAM

The Hill of Life dam is a popular area on the Barton Creek Greenbelt where visitors enjoy various water-based recreational activities. While this is a frequently visited location, there are currently no formalized water access trails or steps. Instead, access points south of the dam are steep informal trails that are slick when wet, and have in several areas developed sheet, rill, and gully erosion.

A potential future project for Siglo Group involves installing steps down to the Hill of Life dam to formalize access to the water and to address large sections of sheet erosion along the trail. Steps will be created using cedar logs set in place with rebar. To address current erosion issues and prevent future erosion, water will be redirected off of the steps into drainage areas. These steps will provide visitors with a safe path to and from the dam and discourage utilization and creation of informal trails. Following the construction of the stairs, non-designated trails in the area can be retired to promote regrowth of native vegetation and reduce soil erosion and compaction.



▲ *Currently, the trails south of Hill of Life dam are steep and eroding. Installing steps on these trails can help prevent additional erosion and provide visitors with better access to this high use area of the Barton Creek Greenbelt.*

Hill of Life Dam. ▼

