SEVEN GREENWAYS VISION PLAN

FINAL

NOVEMBER 2022

Emigration Creek at Westminster College in Salt Lake City.

SEVEN GREENWAYS VISION PLAN

THE SEVEN GREENWAYS VISION PLAN WILL INSPIRE A COMMON VISION, OVER THE NEXT 100 YEARS, TO REVITALIZE OUR WATERWAYS, CONNECTING PEOPLE THROUGH GREENWAYS IN THE SALT LAKE VALLEY.

IT SETS IN MOTION A COMMUNITY-SUPPORTED FRAMEWORK TO HIGHLIGHT OPPORTUNITIES, MANAGEMENT PRACTICES, POLICIES, AND DESIGN GUIDELINES.

CONNECTING PEOPLE THROUGH NATURE & OUR WATERWAYS.

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Thank you to our partners and funders who made the *Seven Greenways Vision Plan* possible.

And, a special thank you to the many community members who participated in the planning process and contributed to the document.

All photographs and graphics are courtesy of the Seven Canyons Trust or Design Workshop, unless otherwise noted.

Land Acknowledgement: The seven creeks flow through the ancestral lands of the Eastern Shoshone Tribe, Goshute Indian Tribe, Northwestern Band of the Shoshone Nation, Ute Indian Tribe, and Shoshone-Bannock Tribes (land colonially known as the Salt Lake Valley).

PARTNERS & FUNDERS

FOREWORD

The Salt Lake Valley is looking forward to an exciting future—a connected system of greenways that celebrate the seven major creeks flowing out of the Wasatch Range, including City, Red Butte, Emigration, Parleys, Mill, Big Cottonwood, and Little Cottonwood Creeks. The *Seven Greenways Vision Plan* will inspire a common vision, over the next 100 years, to revitalize our waterways, connecting people through greenways in the Salt Lake Valley.

This plan represents hope, expressing how a vision over generations is brought to reality. It requires a collective response and articulated messaging of benefits: revitalization of streams, enhanced bicycle and pedestrian infrastructure, increased climate resiliency, improved wildlife habitat, places for people to experience nature, access for all, catalyzed economic activity, and opportunities to learn about and enjoy water in our oasis on desert's edge. Engagement efforts, including a regional community survey, pop-up workshops, and an online mapping platform, revealed this Plan's purpose resonates with virtually every person who lives, works, or visits the Salt Lake Valley.

Governmental leaders, technical experts, and community members have worked together to identify goals and opportunity areas across five core elements that emerged through research and assessment of the existing greenways system—nature, water, community, recreation, and urban. They organize what the greenways aspire to achieve, and serve as a framework for projects, best management practices, policies, and a toolbox of design concepts and guidelines.

Rediscovery and exploration lie before our cities and residents along the Wasatch Front. Each of our eight stream-side municipalities (Cottonwood Heights, Holladay, Midvale, Millcreek, Murray, Sandy, Salt Lake City, and South Salt Lake) and Salt Lake County must collaborate to make this vision a reality. The *Seven Greenways Vision Plan* provides a framework for this collaboration over the next century. Let us work together toward capturing the collective imagination in the creation of seven greenways to restore natural habitats, improve water quality and flows, and create spaces for all people to enjoy.

Mayor Jenny Wilson, Salt Lake County

Mayor Brett Hales, Murray

Mayor Mike Weichers, Cottonwood Heights

Mayor Monica Zoltanski, Sandy

Mayor Robert Dahle, Holladay

Mayor Erin Mendenhall, Salt Lake City

Mayor Marcus Stevenson, Midvale

Mayor Cherie Wood, South Salt Lake

Mayor Jeff Silvestrini, Millcreek

Big Cottonwood Creek at Old Mill Corporate Center in Cottonwood Heights.

In This Section:

- Greenways
- Mission & Vision
- Creeks
- Cities
- Your Voice

INTRO

Some 60 to 90 million years ago, rock layers folded, compressed, and thrusted along the Wasatch Front to form seven major canyons in Salt Lake County.[1] Out of each canyon flows melted snow and runoff to the Jordan River and onto the Great Salt Lake.

OUR URBAN CREEKS HAVE THE POTENTIAL TO BECOME AN EQUITABLE, INNOVATIVE, AND RESILIENT SYSTEM OF GREENWAY CORRIDORS.

The seven creeks—City, Red Butte, Emigration, Parleys, Mill, Big Cottonwood, and Little Cottonwood—extend 129 miles through eight municipalities in the Salt Lake Valley. From *Exploration of the Great Salt Lake of Utah*:[2]

"The site for the city is most beautiful: it lies at the western base of the [Wasatch] mountains... for twenty-five miles extends a broad level plain, watered by several little streams, which, flowing down from the eastern hills, form the great element of fertility and wealth to the community."

Indigenous peoples hunted, fished, and gathered along the creeks. Early colonial settlers used the canyons as pathways to the Salt Lake Valley and beyond, as well as a source of water and industry. This shaped the waterways. Pollution from industry and development degraded water quality. Creeks were channelized to control flooding. Banks became steep and eroded. This led to the burial of creeks, dubbed a nuisance, in the early 20th Century.

An estimated 87 miles have impaired water quality and 21 miles are culverted underground. Even then, residents saw the damaging outcome. An article from the time[3]:

"To hide completely the flowing water within a conduit and to make of the street a stretch of ordinary pavement would be to throw away opportunity for which many cities would gladly pay a million dollars."

Burial of City Creek, circa 1910. Courtesy of Utah State Historical Society.

A NEW PARADIGM

The *Seven Greenways Vision Plan* envisions a century of reversing this impact by revitalizing our creeks in the Salt Lake Valley. It captures the collective imagination in the creation of greenway corridors along the seven largest waterways flowing out of the Wasatch Range, including City, Red Butte, Emigration, Parleys, Mill, Big Cottonwood, and Little Cottonwood Creeks.

PROJECT BEGINNINGS

In 2019, the Seven Canyons Trust presented this regional visioning effort to the Salt Lake County Council of Governments. They recommended Wasatch Front Regional Council study the proposition. Upon application by Salt Lake County, the Transportation & Land Use Connection Program (a partnership between Wasatch Front Regional Council, Salt Lake County, Utah Department of Transportation, and Utah Transit Authority) funded the visioning plan. Salt Lake County and all eight municipalities (Cottonwood Heights, Holladay, Midvale, Millcreek, Murray, Sandy, Salt Lake City, and South Salt Lake) supported the project and, collectively, provided matching funds. In addition, the National Park Service Rivers, Trails, and Conservation Assistance Program provided technical support for the process.

The Plan will highlight areas of opportunity in each of the seven greenways, recommend best management practices, policies for implementation, and include a toolbox of design concepts and guidelines. This process will offer each municipality concepts and resources for implementation of the plan and may become part of future general plans, park and trails plans, economic and capital improvement plans, and ordinances.

GREENWAY: DEFINED

A linear corridor located around a stream and adjacent land. They may be used to enhance bicycle and pedestrian access, generate economic activity, increase resilience to flooding, treat stormwater through restoration and daylighting, and provide valuable wildlife habitat.

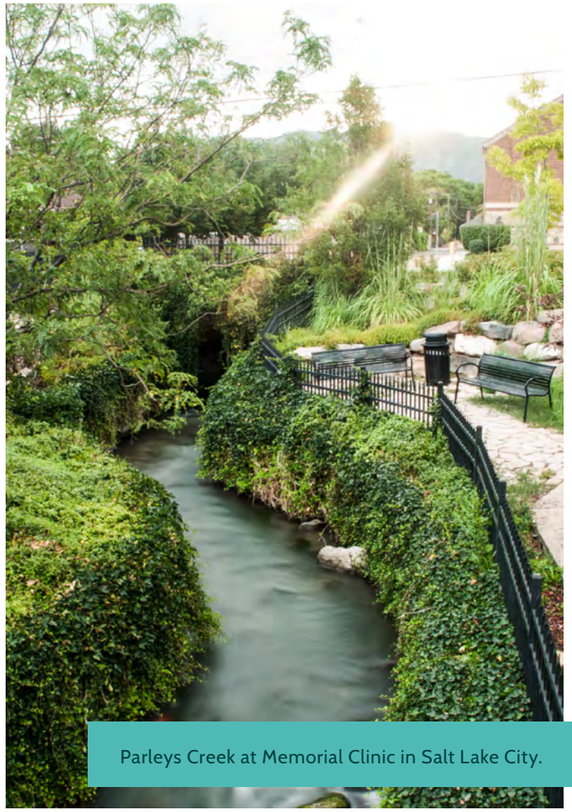
MISSION

Inspiring a common vision, over the next 100 years, to revitalize our waterways, connecting people through greenways in the Salt Lake Valley.

VISION

Rediscovery and exploration lie before our residents, visitors, and partners along the Wasatch Front. The *Seven Greenways Vision Plan* will set in motion a community-supported framework. The Salt Lake Valley is facing an exciting future—a connected system of greenways that celebrate our waterways. We believe this resonates with virtually every person who lives, works, or visits our beautiful Valley. As Salt Lake County's population grows an additional 600,000 people by 2065, this vision is increasingly critical to the protection and enhancement of our creeks.[4] Revitalizing the greenways protects critical riparian habitat, preserves green and open spaces, and provides recreational and community benefits to this growing population.

The *Seven Greenways Vision Plan* represents hope, expressing how a vision over generations is brought to reality. This century-long vision will only be achieved through collaboration and collective will from elected officials, stakeholders, and community members, alike. The plan focuses on the sections of creek flowing from each canyon's mouth to their confluence with the Jordan River. It addresses our desire to mitigate climate change and environmental injustices (poor water and air quality, drought, and the urban heat island effect) and requires a collective response and articulated message of benefits. This includes the revitalization of streams, enhanced bicycle and pedestrian infrastructure, catalyzed economic activity, increased climate resiliency, improved wildlife habitat, providing places for people to experience nature, and opportunities to learn about and enjoy water in our oasis on desert's edge.



Parleys Creek at Memorial Clinic in Salt Lake City.

PLAN ORGANIZATION

The first chapter summarizes the plan document. It explores the seven creeks and cities in which they flow through. Chapter 2 introduces our five core elements: water, nature, community, recreation, and urban. It summarizes the existing conditions of the seven greenways and serves as a guide for the vision. The third chapter outlines goals, opportunity areas, and big ideas for each core element. It illustrates possibilities when applying goals in a significant, transformational way. Chapter 4 provides a toolbox to guide implementation of the seven greenways with design guidelines, best management practices, policies, funding, and partnerships.

PROPERTY OWNERSHIP

WHO OWNS THE LAND?

It is a patchwork of private and public land. Our streams flow through or underneath residential areas, commercial and industrial areas, and public lands, like parks and open space. Large stretches of the underground portions flow underneath roads and parking lots.

ARE YOU A PRIVATE PROPERTY OWNER?

If you own property along one of the creeks, we'd love to hear from you. Scan the QR code or go to sevengreenwaysvisionplan.org/faq. Fill out the form to share your name, email, address, and questions, concerns, and/or visions.

WILL MY PRIVATE PROPERTY BE INVOLVED?

The *Seven Greenways Vision Plan* is a regional visioning effort. While Salt Lake County and the eight municipalities are supportive, recommendations will not replace local land-use planning and zoning. The Plan does not have the authority, or intention, to exercise eminent domain to take away property from private owners. Private property rights are to be respected and honored in this plan.

The Plan will highlight areas of opportunity in each of the seven greenways, recommend best management practices, possible policies for implementation, and include a toolbox of design concepts and guidelines. With that being said, this vision cannot happen without voluntary participation from private property owners.

Landowners may open properties to recreational use by formal or informal access agreements. Conservation easements can be sold or donated to protect all or a portion of the riparian corridor, while retaining flexibility in other rights.

Greenways benefit surrounding properties and communities as a whole, by:

- Protecting open space, wildlife habitat, and culturally significant areas for recreation, celebration, learning, and enjoyment
- Improving quality of life and livability by encouraging healthy lifestyles
- Increasing property values and business revenues
- Providing access and community connection;
- Cooling surrounding air temperatures to mitigate the urban heat island effect
- Reducing flood risk and improving water quality through green infrastructure

THE SEVEN GREENWAYS

EMIGRATION

RED BUTTE

MILL

PARLEYS

CITY

HOLLADAY

COTTONWOOD HEIGHTS

SANDY

LITTLE COTTONWOOD

MIDVALE

MILLCREEK

BIG COTTONWOOD

MURRAY

SOUTH SALT LAKE

SALT LAKE CITY

CANYONS

GREEN SPACE

NEIGHBORHOOD

URBAN

CANYONS

Segments in the canyons, to the foothills, and ending at the canyon mouths. They are the most natural areas and should be protected and celebrated.

GREEN SPACE

Segments within parks, natural areas, and open spaces. They are ideal for creek restoration and trails.

NEIGHBORHOODS

Segments within neighborhoods, running past backyards and community spaces. They are great opportunities to gather, engage, and play.

URBAN

Segments in urban areas, often buried or impaired. They offer opportunity for creek daylighting and restoration.

CITY CREEK

QUICK FACTS

Native Name: Nah-po-pah, so'ho-gwa[32,33]
Watershed Size: 24.7 sq. mi.[34]

Stream Length: 14.6 mi.[35]
Buried: 2.0 mi.[36]
Impaired: 0.0 mi.[37]

Avg. Peak Flow: 45 cubic ft. per sec.[38]

City Creek historically had two arms. The main fork traveled west from the mouth of the canyon, paralleling North Temple. The south fork flowed towards the City & County Building on 400 South and met Red Butte, Emigration, and Parleys creeks at about 900 South and West Temple.[5]

According to Stansbury's 1849-50 survey, it was named nah-po-pah by some indigenous tribes.[6] To the Goshute, it was so'ho-gwa.[7] The creek was renamed by colonial settlers due to its proximity to downtown Salt Lake City. The creek was frequented by Indigenous Peoples and eventually became the settlers' first water source. It remains a water source today.

Today, most of the creek is hidden underneath North Temple in downtown Salt Lake City. In 1983, the creek famously overtopped its banks and flooded State Street. In 1995, the creek was uncovered in a former surface parking lot at City Creek Park.

RED BUTTE CREEK

QUICK FACTS

Native Name: Moni-wai-ni (Red Butte Canyon)
Watershed Size: 11.0 sq. mi.

Stream Length: 10.6 mi.
Buried: 3.3 mi.
Impaired: 3.4 mi.

Avg. Peak Flow: 25 cubic ft. per sec.

The Goshute tribe referred to Red Butte Canyon as mo'ni-wai-ni after a bloody conflict over the area.[8] However, the name of Red Butte Creek remains unknown. Just one year upon arrival, colonial settlers quarried the red sandstone in the canyon (to which they would change the creek's name to reflect).

In 1862, the creek was tapped as a water source for Fort Douglas at the canyon mouth. Protections increased when the Forest Service acquired it in 1969, declaring it a Research Natural Area and closing off public access. Upper Red Butte Canyon remains one of our last undisturbed riparian ecosystems.

Today, Red Butte Creek flows through the Lee Charles Miller Bird Refuge and Nature Park, which touts trails, masonry works, and 72 bird species.[9] In 2010, 33,600 gallons of oil spilled into the creek from a Chevron pipeline, significantly impacting the park.[10] This prompted restoration of the creek and its flora.

EMIGRATION CREEK

QUICK FACTS

Native Name: Tsa'po-a (Emigration Canyon)
Watershed Size: 24.0 sq. mi.

Stream Length: 16.4 mi.
Buried: 4.9 mi.
Impaired: 11.5 mi.

Avg. Peak Flow: 30 cubic ft. per sec.

The Goshute name for Emigration Canyon is tsa'po-a, meaning "good road".[11] However, the name of Emigration Creek remains unknown. Indigenous tribes hunted the canyon's abundant fish and game. Colonial settlers arrived through the canyon in 1847. Atop, Brigham Young famously said, "This is the right place."

Hydrologists colloquially call the canyon, "The Sponge," due to its ability to soak up water. Groundwater is discharged at Tunnel Spring, yielding more water than the creek itself.[12]

Today, Emigration Creek flows through Allen Park. The seven-acre farm was originally purchased by the eccentric Dr. George A. Allen in 1931. He built a log home, bird sanctuary, fountains, and numerous works of art, and trucked in old homes from around Utah. In 2020, Salt Lake City purchased the property for $7.5 million to protect the creek, property, and works of art from development.

PARLEYS CREEK

QUICK FACTS

Native Name: Obit-ko-ke-chee, an'ka-so-kuup (Parleys Canyon)
Watershed Size: 58.4 sq. mi.

Stream Length: 19.2 mi.
Buried: 8.8 mi.
Impaired: 9.6 mi.

Avg. Peak Flow: 35 cubic ft. per sec.

The Goshute tribe named Parley's Canyon, an'ka-so-kuup (meaning "red earth"), after the red-tinted rock lining the canyon walls.[13] Stansbury's 1852 map indicates the creek was called obit-ko-ke-chee by other tribes.[14] Later, it was renamed after Parley Pratt, who built the "Golden Pass Toll Road" through the canyon.

Parleys Creek currently flows underneath Interstate-80 through Parleys Canyon. It was buried in a culvert to make room for the highway. Once it exits the canyon, the creek flows underneath Interstate-215 into Parleys Historic Nature Park. Summertime daredevils often dam the creek before the culvert and "shoot the tube."

Downstream, the creek flows through Hidden Hollow, a natural oasis within the bustle of Sugar House. In 1990, Hawthorne Elementary students cleaned up the site and built support to protect the creek. A conservation easement was purchased in 2000.

MILL CREEK

QUICK FACTS

Native Name: Ombit-o-pah, tin'go-u-pi (Millcreek Canyon)
Watershed Size: 36.9 sq. mi.

Stream Length: 20.2 mi.
Buried: 0.9 mi.
Impaired: 8.4 mi.

Avg. Peak Flow: 50 cubic ft. per sec.

Tin'go-u-pi was the Goshute's name for Millcreek Canyon, meaning "rock trap." It was a reference to a gorge and precipice in the canyon where game was surrounded and forced to leap to their death.[15] Ombit-o-pah was other Indigenous Peoples' name for Mill Creek.[16] It was later renamed by colonial settlers for the 20 mills along the creek.[17]

By the 1990s, much of the creek was degraded. A user fee to get into the canyon was instituted at its mouth to repair facilities and restore the riparian ecosystem. In 2016, efforts removed culverts and a small dam that inhibited passage of Utah's only endemic trout, the Bonneville cutthroat.

Today, the creek flows through Fitts Park, South Salt Lake's largest green space—named after its first town president, Robert Fitts. It features Mill Creek, two canals, playgrounds, and pavilions. Efforts are underway to enhance water quality, habitat, and recreation here.

BIG COTTONWOOD CREEK

QUICK FACTS

Native Name: We-en-de-quint, pi'a-bai-gwi-ci
Watershed Size: 81.6 sq. mi.

Stream Length: 25.3 mi.
Buried: 0.4 mi.
Impaired: 24.9 mi.

Avg. Peak Flow: 350 cubic ft. per sec.

According to Stansbury's 1852 map, some indigenous tribes referred to Big Cottonwood Creek as we-en-de-quint.[18] The Goshute tribe named the creek, pi'a-bai-gwi-ci, meaning "big stream."[19] Colonial settlers changed the name to reflect the "bigness" of canyon width and the cottonwood groves along its banks.

Industry has impacted the canyon—timber most severely. The first sawmills were built at the canyon mouth in the 1850s. Over the decades, mills moved further up the watershed as the forest down canyon was decimated.

The creek is one of four protected watersheds in Salt Lake County. It provides the largest source of drinking water to Salt Lake City. The water treatment plant diversion seasonally dewaters four miles between the canyon mouth and Cottonwood Lane. To satisfy water rights, Utah Lake water is pumped into the creek from April to October. This has degraded water quality and the riparian ecosystem.

LITTLE COTTONWOOD CREEK

QUICK FACTS

Native Name: Wa-ko-no-kin, si'a-dai-di-ma
Watershed Size: 39.9 sq. mi.

Stream Length: 22.6 mi.
Buried: 0.7 mi.
Impaired: 21.9 mi.

Avg. Peak Flow: 350 cubic ft. per sec.

The Goshute tribe named Little Cottonwood Creek, si'a-dai-di-ma.[20] To other tribes, it was wa-ko-no-kin.[21] It was used as shared hunting grounds for the Ute, Goshute, and Shoshone.[22] Colonial settlers changed its name to reflect the "littleness" of canyon width and the cottonwood groves along its banks.

The canyon is known for its fabled town, Alta. Extractive industries mined and smelted silver and lead along the creek through the late 1800s. Remnants of three smelters can still be seen at the canyon mouth and heavy metals continue to impact water quality.[23] Now, Alta is better known for its "Greatest Snow on Earth."

The creek is a valuable water source for Salt Lake Valley residents. From July to March, the creek has little flow due to diversions, becoming fully dewatered in dry years. Jordan River water is brought in, via a canal, at Fort Union. This has seriously degraded water quality and the riparian ecosystem.

COTTONWOOD HEIGHTS

QUICK FACTS

City Size: 8.8 sq. mi.[41]
Population: 34,951

Creeks: Big Cottonwood, Little Cottonwood
Stream Length: 6.1 mi.[42]
Buried: 0.2 mi.[43]
Impaired: 5.9 mi.[44]

Diversity Index[39]: 25
Affordability Index[40]: 136

Established out of portions of early colonial settlements, including Union, Butler Bench, Poverty Flats, and Danish Town, Cottonwood Heights emerged after residents petitioned to become a formal municipality. It serves as the gateway to both Big Cottonwood and Little Cottonwood Canyons, home to some of the most popular recreational areas in the Intermountain West and four world-class ski resorts.

Cottonwood Heights features natural stretches of Big Cottonwood and Little Cottonwood Creeks. Big Cottonwood Creek flows by the historic Cottonwood Paper Mill and adjacent Old Mill Open Space. The Big Cottonwood Trail parallels the creek from canyon mouth, through the City, and into Holladay. Little Cottonwood Creek flows through the 58-acre Crestwood Park, featuring natural space and trails.

HOLLADAY

QUICK FACTS

City Size: 8.5 sq. mi.
Population: 31,799

Creeks: Big Cottonwood

Stream Length: 4.0 mi.
Buried: 0.1 mi.
Impaired: 3.9 mi.

Diversity Index: 22
Affordability Index: 123

Known for its old homes and heavily wooded lots, Holladay is a residential suburban-style community. It was established out of an early colonial settlement called Holladay's Burgh, named after the branch president of The Church of Jesus Christ of Latter-day Saints at the time. It was incorporated as Holladay-Cottonwood in 1999 (later shortened to just Holladay) because residents wanted local control of planning and zoning.

Big Cottonwood Creek flows through the heart of Holladay. There are two parks along its path—Knudsen Park and Creekside Park. These parks feature various amenities, including a nature play area, natural space, trails, and a frisbee golf course. Much of the creek flows through private property, including the old Cottonwood Mall site.

MIDVALE

QUICK FACTS

City Size: 5.9 sq. mi.
Population: 33,360

Creeks: Little Cottonwood

Stream Length: 0.3 mi.
Buried: 0.0 mi.
Impaired: 0.3 mi.

Diversity Index: 62
Affordability Index: 121

Midvale is located in the heart of the Salt Lake Valley. It's the smallest in terms of size and its population is tied for the youngest and third most diverse.[24] Originally a farming community on the east-side and a mining community to the west, Midvale developed from two early colonial settlements, Union Fort and Bingham Junction.

Through Midvale, a small stretch of Little Cottonwood Creek flows on its eastern edge at the Shops at Fort Union. At this location, the East Jordan Canal brings water from the upper Jordan River to Little Cottonwood Creek. This water supplements in-stream flows for drinking water and hydropower diversions taken out upstream at the canyon mouth.

MILLCREEK

QUICK FACTS

City Size: 12.9 sq. mi.
Population: 62,619

Creeks: Parleys, Mill, Big Cottonwood
Stream Length: 8.4 mi.
Buried: 0.8 mi.
Impaired: 7.6 mi.

Diversity Index: 37
Affordability Index: 103

The most recently incorporated city along our creeks, Millcreek is surrounded by natural assets, including Mount Olympus to the east, the Jordan River to the west, and Mill and Big Cottonwood Creeks on either side. When compared to the other seven municipalities along our creeks, the City is the second most expensive, in terms of affordability, and has the third highest median home value.[25]

Millcreek has the second highest amount of buried and impaired creeks.[26] Much of Mill Creek (the city's namesake) and Big Cottonwood Creek flow through private property. Scott Avenue Park is the only established green space along one of the creeks within the municipality. It features a detention pond, community garden, and large grass lawns. A small stretch of Parleys Creek flows along the northern boundary of the municipality by the mouth of its canyon—the start of the infamous "Shoot the Tube."

MURRAY

QUICK FACTS

City Size: 12.3 sq. mi.
Population: 50,983

Creeks: Big Cottonwood, Little Cottonwood
Stream Length: 7.0 mi.
Buried: 0.4 mi.
Impaired: 6.6 mi.

Diversity Index: 34
Affordability Index: 121

Murray is situated at the center of Salt Lake County. Its size in population and space, as well as its diversity and affordability fall within the middle when comparing all eight cities.[27]

The City developed from an early colonial agricultural community known as South Cottonwood, which saw explosive growth when the first smelter was built in 1870. Subsequently, additional heavy industry came in. Named after the former territorial governor, Eli Murray, the City was incorporated after a contentious campaign started during a scuffle in a local saloon.

Murray features natural stretches of Big Cottonwood and Little Cottonwood Creeks and regional parks, such as Murray Park and Wheeler Historic Farm, with various amenities from an arboretum and amphitheater to sports fields and a working farm.

SANDY

QUICK FACTS

City Size: 24.2 sq. mi.
Population: 101,608

Creeks: Little Cottonwood

Stream Length: 1.9 mi.
Buried: 0.0 mi.
Impaired: 1.9 mi.

Diversity Index: 30
Affordability Index: 151

Sandy grew from four early colonial settlements—Crescent, Dunyon, Granite, and Union. Early on, construction of three smelters and a rail system facilitated the movement of goods and people to and from the area. When the mines failed in the 1890s, the community turned to agriculture. Most widely believed, its name comes from its sandy soil.

Located at the base of the Wasatch Range, Sandy is a residential community with three mixed-use urban villages. It is the second largest city in both size and population. Of the eight creek-side municipalities, Sandy is the most affordable and the third least diverse.[28]

A short stretch of Little Cottonwood Creek flows through Quail Hollow in Sandy. Although, the City has numerous other natural assets including Dry Creek through Dimple Dell Regional Park and the Jordan River corridor.

SALT LAKE CITY

QUICK FACTS

City Size: 110.8 sq. mi.
Population: 205,439

Creeks: City, Red Butte, Emigration, Parleys
Stream Length: 35.9 mi.
Buried: 14.1 mi.
Impaired: 9.3 mi.

Diversity Index: 63
Affordability Index: 98

As the capital of Utah, Salt Lake City serves as the social, economic, and cultural center of the state. It is the largest city in both size and population.[29]

Salt Lake City features the longest stretches of creek, including City, Red Butte, Emigration, and Parleys. They flow through many parks and natural spaces—Memory Grove, Miller Bird Refuge and Nature Park, Wasatch Hollow, and Hidden Hollow, to name a few. The City holds the most buried and impaired creeks.

Early colonial settlers used the creeks as a source of water and industry. This shaped the waterways. Pollution from industry and development degraded water quality. Creeks were channelized to control flooding. Banks became steep and eroded. This led to the burial of creeks, dubbed a nuisance, in the early 20th Century.

SOUTH SALT LAKE

QUICK FACTS

City Size: 6.9 sq. mi.
Population: 27,894

Creeks: Mill

Stream Length: 3.1 mi.
Buried: 0.4 mi.
Impaired: 2.7 mi.

Diversity Index: 71
Affordability Index: 106

South Salt Lake is the smallest city, in terms of population.[30] In the 1930s, residents needed a sewer system in their neighborhood. When adjacent cities would not provide service, they started their own utility and added other municipal services. South Salt Lake has grown from a single-family suburban-style neighborhood to a burgeoning streetcar urban village. However, much of the city remains commercial and industrial and in need of more parks and open space.

In South Salt Lake, Mill Creek flows through an urbanized channel—much of it straightened and the banks concrete and rip-rap. East of 500 East, Mill Creek is dammed in a large pond that provides flood control and habitat value. The Mill Creek Trail creates an east-west connection between Fitts Park and 300 East and between the Utah Transit Authority's Millcreek Station and the Jordan River Trail.

YOUR VOICE

SURVEY

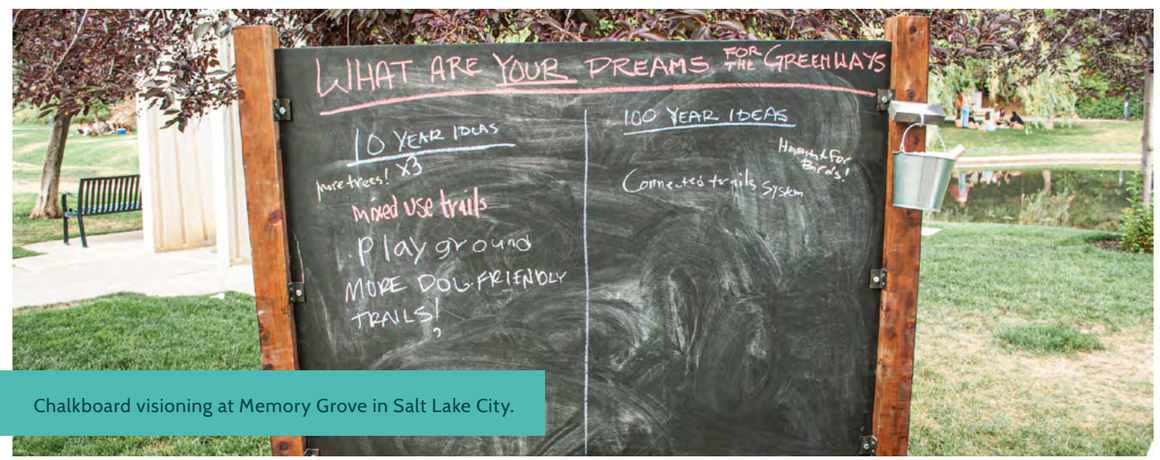
Engagement began with a month-long survey launched February 17, 2021. Community members and stakeholders offered feedback on priorities, opportunities, and challenges. The survey was available in Spanish and English, distributed online, and promoted through the Technical Committee, Focus Groups, social media, email lists, partners, and word of mouth. Paid advertisements and targeting reached specific population groups, including underrepresented areas (Salt Lake City's west-side, South Salt Lake, and Murray) and Spanish-speaking residents. University of Utah students from CMP 6160: Plan Making utilized on-the-ground intercept surveying and targeted outreach, organized around each municipality, to promote equitable engagement.

A total of 1,178 people took the survey. Respondents indicated the environment was most important when spending time outdoors, choosing nature, wildlife, water quality, and access as top priorities. The top three reasons preventing access were not having enough information, not within walking or biking distance, and no adequate access.

Respondents prioritized habitat and natural systems over human interactions with the environment. High importance was placed on acquisitions of open spaces and connecting wildlife corridors. Topics about economy were the least important among all topics. Opportunities to promote mental health emerged as the most important topic. Providing equitable access to the outdoors and increasing access and outdoor recreation for underrepresented populations were highly important topics.

Approximately 548 comments imagined the greenways 100 years from now—their dreams and big ideas. Approximately 1,065 comments imagined the greenways 10 years from now—change that would make an immediate impact.

Five focus group meetings, organized around the core elements, brought together 123 technical experts, stakeholders, and community members. Questions asked attendees about past or present efforts, dreams, big ideas, obstacles, data, and key metrics. Discussions were used to guide the framework of the plan and future engagement opportunities.



Chalkboard visioning at Memory Grove in Salt Lake City.

VISION WORKSHOP

Engagement moved into an online workshop and series of in-person pop-up workshops during the month of July 2021. University of Utah students, community members, and stakeholders shared feedback on identified opportunity areas, mapped opportunity areas of their own, and provided 10-year and 100-year visions for the seven greenways. The platform was available in Spanish and English, distributed online, and promoted through the Technical Committee, Focus Groups, social media, email lists, partners, and word of mouth. Over 100 yard signs, posted throughout the Salt Lake Valley, promoted equitable engagement in all eight municipalities.

Social Pinpoint was used for the online mapping platform. The map shared core element themes, goals, and case studies, opportunity areas identified by municipalities and stakeholders, and a comment wall. Participants used pins, organized by the core elements, to highlight locations for improvements. Corresponding comments were used to share more information about the opportunity. Participants could also like, dislike, or comment on other opportunity areas.

A series of 15 pop-up workshops, hosted in parks and open spaces throughout the Salt Lake Valley, mirrored online methods, including a printed map with core element stickers and post-it notes, vision boards with core element themes, goals, and case studies, and a chalkboard comment wall to capture 10-year and 100-year visions for the greenways. Approximately 298 people were engaged across the workshops. In addition, there were 868 views of the online platform, spending an average of over three minutes browsing.

There were 46 pinned locations for community-suggested improvements across the core elements. Recreation was the most selected (17 pins), followed by Nature (11 pins), Water (9 pins), and Community (8 pins). Last was Urban (1 pins).

DRAFT PLAN REVIEW

The final engagement opportunity was a thorough review of the draft plan document. It was published on January 25, 2022 and was available for two weeks. The plan was distributed online and promoted through the Technical Committee, Focus Groups, social media, email lists, partners, and word of mouth.

Pop-up vision workshop at Memory Grove in Salt Lake City.

CASE STUDY

CITY CREEK PARK

In 1983, a large snowpack and fast spring melt caused historic flooding "termed the worst in Salt Lake County history" by the Deseret News. Over 1,000 homes flooded, and an estimated 400 people were forced to evacuate. Mud and rockslides closed Big and Little Cottonwood Canyons. The water treatment plant at the mouth of Big Cottonwood was forced to shut down as four feet of mud inundated the area. Famously, City Creek overtopped its banks and ran down State Street in a sandbagged channel. Kayakers were photographed in the new "State Street River" and it was rumored a cutthroat trout was caught in the channel.

Similarly, Red Butte, Emigration, and Parleys Creeks were sandbagged down 1300 South. The estimated cost of the three-mile Red Butte, Emigration, and Parleys canal was over $500,000. The combined flow of the creeks was 736 cubic feet per second. Approximately $2 million was spent repairing City Creek, which peaked at 305 cubic feet per second (nearly double the record from 1921). Over 2.6 million sandbags were filled and placed throughout Salt Lake County. Damages were estimated at $34 million across 1,500 identified sites.[31]

In 1995, Salt Lake City began to reconsider the last century of water management, realizing its inadequacy as a long-term solution, due to the catastrophic flooding. One of first glimmers of this change was the transformation of a parking lot into City Creek Park. A public-private partnership between Salt Lake City and The Church of Jesus Christ of Latter-day Saints, exchange the ownership of the lot for rights to underground parking. A donation from the church helped uncover the creek through the new park.

City Creek re-emerged from a buried pipe to flow above ground once again—grey to green. Benches, green space, and a stone-lined creek create an oasis in the heart of downtown Salt Lake City. Hundreds of visitors can be seen enjoying the solace of the flowing water here. This project was the first in daylighting our urban creeks.

Corner of North Temple and State Street pre-project.

QUICK FACTS

Location:	Salt Lake City
Cost:	$2.3M
Year:	1995
Best Practices:	Stream daylighting, access/connection
Stream Length:	400 ft.

City Creek at City Creek Park in Salt Lake City.

Little Cottonwood Creek at Fort Union in Midvale.

In This Section:

- Water
- Nature
- Community
- Recreation
- Urban

CORE ELEMENTS

The five core elements—water, nature, community, recreation, and urban—emerged through research and assessment of the existing greenways system. They organize what the *Seven Greenways Vision Plan* aspires to achieve and serves as a framework for the vision. Research is summarized for each core element.

OUR URBAN CREEKS HAVE THE POTENTIAL TO BECOME AN EQUITABLE, INNOVATIVE, AND RESILIENT SYSTEM OF GREENWAY CORRIDORS.

WATER

Our creeks originate high in the Wasatch Range surrounding the Salt Lake Valley. Our snowpack melts, flowing into our cities, and providing water for our people, plants, and wildlife. Greenways carry water from our high-alpine headwaters and reservoirs through our backyards, connecting us to the very water that sustains us.

HYDROLOGY

Four of our creeks—City, Parleys, Big Cottonwood, and Little Cottonwood Creeks—supply the majority of the Salt Lake Valley's water. Our water supply is unique because consumers are so close to the source waters. It takes an estimated 24 hours or less for a drop of water in one of the creeks, at the top of the Wasatch, to reach a faucet in the Valley.[45] In total, the Jordan River Basin provides 234,795 acre-feet of potable water to approximately 1,111,606 people around Salt Lake County. An additional 30,699 acre-feet were supplied to users by various canals.[46]

The snowpack is the most important feature of the drinking water conveyance system. It acts as a reservoir and provides drinkable water as the snow melts. Average peak and annual flows are strongly influenced by the melting and size of our snowpack. Additionally, flows are influenced by precipitation, runoff, tributaries, groundwater, and inputs from canals.

Water quality is heavily monitored and controlled in the protected upper watershed areas of City, Parleys, Big Cottonwood, and Little Cottonwood Creeks. Dogs and horses are prohibited in these areas. Water treatment plants are located at the mouth of each of these canyons.

Protections diminish as creeks flow into the urbanized valley. Historic modification has left them in a degraded condition. As the Valley urbanized, portions of the creeks were diverted from aboveground channels into stormwater pipes underneath our neighborhoods. Others were channelized to control flooding. Banks steepened and eroded.

INFRASTRUCTURE

Conventional approaches utilize pipes to convey water away from the built environment as fast as possible. This led to the degradation of creeks through erosion, water quality impairments, and outright burial. Pipes often dump pollutants directly into creeks. Loss of riparian buffers further deteriorates water quality.

Green infrastructure slows water velocities, increases groundwater infiltration, and treats water at its source to improve the health of our creeks and reduce the frequency and severity of flooding. It reduces the need for costly grey infrastructure. The life cycle costs associated with the construction, maintenance, and replacement of underground culverted systems often prove more expensive than stream daylighting without the added benefits.

Imperviousness is categorized by changes in land-use that do not allow for precipitation to soak into the ground, such as roads, sidewalks, and buildings. Rather, water runs off the surface and into the stormwater system. Historic 100-year floods double in size with 30 percent imperviousness.[47] Salt Lake County's average impervious area is estimated at 33 percent.[48]

Utah Hazard Mitigation is evaluating the Salt Lake County Flood Insurance Rate Maps for accuracy. These maps identify the flood risk and areas where flood insurance is required for property owners. It is important development occurs away from the floodplain. Otherwise, owners may be required to buy flood insurance.

WATER QUALITY & QUANTITY

Beneficial use classes determine water quality standards necessary to meet uses. Creek segments that are not able to meet the standards are placed on the Clean Water Act's Section 303(d) List of Impaired Waters. They are then prioritized for developing total maximum daily loads (TMDLs) to determine the factors contributing to the impairment and solutions to the issue. TMDLs for Emigration Creek (*E. coli*) and Little Cottonwood Creek (zinc) have been developed, approved, and are being implemented.[49]

Table 1: Beneficial use impairments[76]

CREEK	LOCATION	STATUS	CAUSE
City - 1	Memory Grove to treatment plant	Not impaired	
City - 2	Treatment plant to headwaters	Not impaired	
Red Butte - 1	1100 E to reservoir	Impaired	*E. coli*, macroinvertebrates, dissolved oxygen
Red Butte - 2	Reservoir to headwaters	No evidence	
Emigration - 1	1100 E to Rotary Glen Park	Impaired	*E. coli*
Emigration - 2	Rotary Glen Park to headwaters	Impaired	*E. coli* (Approved TMDL)
Parleys - 1	1300 E to Mountain Dell Reservoir	Impaired	*E. coli*, macroinvertebrates, dissolved oxygen
Parleys - 2	Mountain Dell Reservoir to headwaters	Impaired	*E. coli*, cadmium
Mill - 1	Confluence to I-15	Impaired	*E. coli*, macroinvertebrates
Mill - 2	I-15 to Forest Service boundary	Impaired	*E. coli*, macroinvertebrates
Mill - 3	Forest Service boundary to headwaters	Not impaired	
Big Cottonwood - 1	Confluence to treatment plant	Impaired	*E. coli*, macroinvertebrates, temperature
Big Cottonwood - 2	Treatment plant to headwaters	Impaired	*E. coli*, cadmium, copper
Little Cottonwood - 1	Confluence to treatment plant	Impaired	*E. coli*, cadmium, macroinvertebrates, temperature, total dissolved solids
Little Cottonwood - 2	Treatment plant to headwaters	Impaired	Cadmium, copper, pH, zinc

Climate change is impacting the amount of water we have, when snow melts, and its water quality. With every degree Fahrenheit increase in temperature, a 3.8 percent decrease in overall water volume is expected in our creeks.[50] Climate models show precipitation more frequently arriving in the form of rain, rather than snow.[51] Smaller snowpacks are forecasted to melt earlier, while demand is expected to increase. Climate-driven drought and changes in the hydrologic cycle will challenge the redundancies in our water system.

Infrastructure on Little Cottonwood Creek in Sandy.

WATER CONDITIONS ALONG THE SEVEN CREEKS[52]

RED BUTTE

EMIGRATION

MILL

BIG COTTONWOOD

LITTLE COTTONWOOD

PARLEYS

CITY

N

AREA OF INTEREST

Uintah-Wasatch-Cache National Forest

Salt Lake City

Holladay

Millcreek

Cottonwood Heights

Sandy

Murray

Midvale

South Salt Lake

West Valley

Taylorsville

West Jordan

FOOTHILL BLVD.

WASATCH BLVD.

HOLLADAY BLVD.

HIGHLAND DR.

VAN WINKLE

BENGAL BLVD.

FT. UNION BLVD.

STATE ST.

REDWOOD RD.

MEADOWBROOK EXPY.

I-215 I-80 I-15

S TEMPLE

1300 E 700 E 900 E

500 S 900 S 1300 S 1700 S 2100 S 2300 E 3300 S 3900 S 4500 S 4700 S 5300 S 5900 S 7200 S

400 N 400 S 1700 S 2100 S 3300 S 3900 S 4500 S 5300 S

3000 E

OPEN CHANNEL

BURIED CHANNEL

NOT IMPAIRED

NO EVIDENCE

IMPAIRED, APPROVED TMDL

IMPAIRED

TOTALS

Not Impaired/No Evidence: 28.2 mi.

Impaired/Approved TMDL: 79.7 mi.

Buried: 21.0 mi.

NATURE

Our creeks flow from high-alpine coniferous forests to the scrub oak and maple forests of the foothills and into the human-impacted ecosystems within our cities. These ecosystems are vital habitat, providing food, water, shelter, and space, for our wildlife in the Salt Lake Valley and neotropical migratory birds traveling to and from South America to Canada every year. Greenways carry wildlife through riparian corridors to provide a refuge for rest and refuel.

RIPARIAN HABITATS

Riparian ecosystems are habitats located along the banks of a waterway. In the western United States, riparian areas occupy less than two percent of the landscape. In Salt Lake City, they represent only one percent of land cover. However, they provide critical ecosystem services for human and wildlife populations. An estimated 80 percent of Utah species rely on riparian areas for a portion of their lifecycle.[53] There are an estimated 114 acres of riparian habitat and 777 acres of wetlands within one-quarter of a mile of the seven creeks.

The Great Salt Lake, along with the seven creeks and Jordan River corridor, is an important piece of the Central Flyway—a migratory path between South America and Canada. Over 257 bird species utilize these ecosystems and over 7.5 million individual birds. They feature the largest staging concentration of phalaropes and over half the North American population of eared grebes.[54]

Public lands play an important role in achieving numerous goals, such as outdoor recreation, enjoyment and relaxation, water quality protection, and wildlife habitat. The seven creeks flow through 29 parks and three golf courses. They provide varying levels of significance from turf grass with little habitat value to healthy riparian forests with high value. There are an estimated 280,000 acres of natural areas in Salt Lake County.[55] However, urbanization continues to encroach on natural areas and past disturbances impact their health.

Dragonfly at Mill Creek Confluence in South Salt Lake.

Table 2: Sensitive species in Salt Lake County[77]

	SCIENTIFIC	COMMON
01	*Iotichthys phlegethontis*	least chub
02	*Rana luteiventris*	Columbia spotted frog
03	*Anaxyrus boreas*	western boreal toad
04	*Opheodrys vernalis*	smooth green snake
05	*Picoides dorsalis*	American three-toed woodpecker
06	*Haliaeetus leucocephalus*	bald eagle
07	*Cypseloides niger*	black swift
08	*Dolichonyx oryzivorous*	bobolink
09	*Athene cunicularia*	burrowing owl
10	*Buteo regalis*	ferruginous hawk
11	*Accipiter gentilis*	northern goshawk
12	*Charadrius nivosus*	snowy plover
13	*Danaus plexippus*	monarch butterfly
14	*Bombus occidentalis*	western bumblebee

ECOSYSTEM THREATS

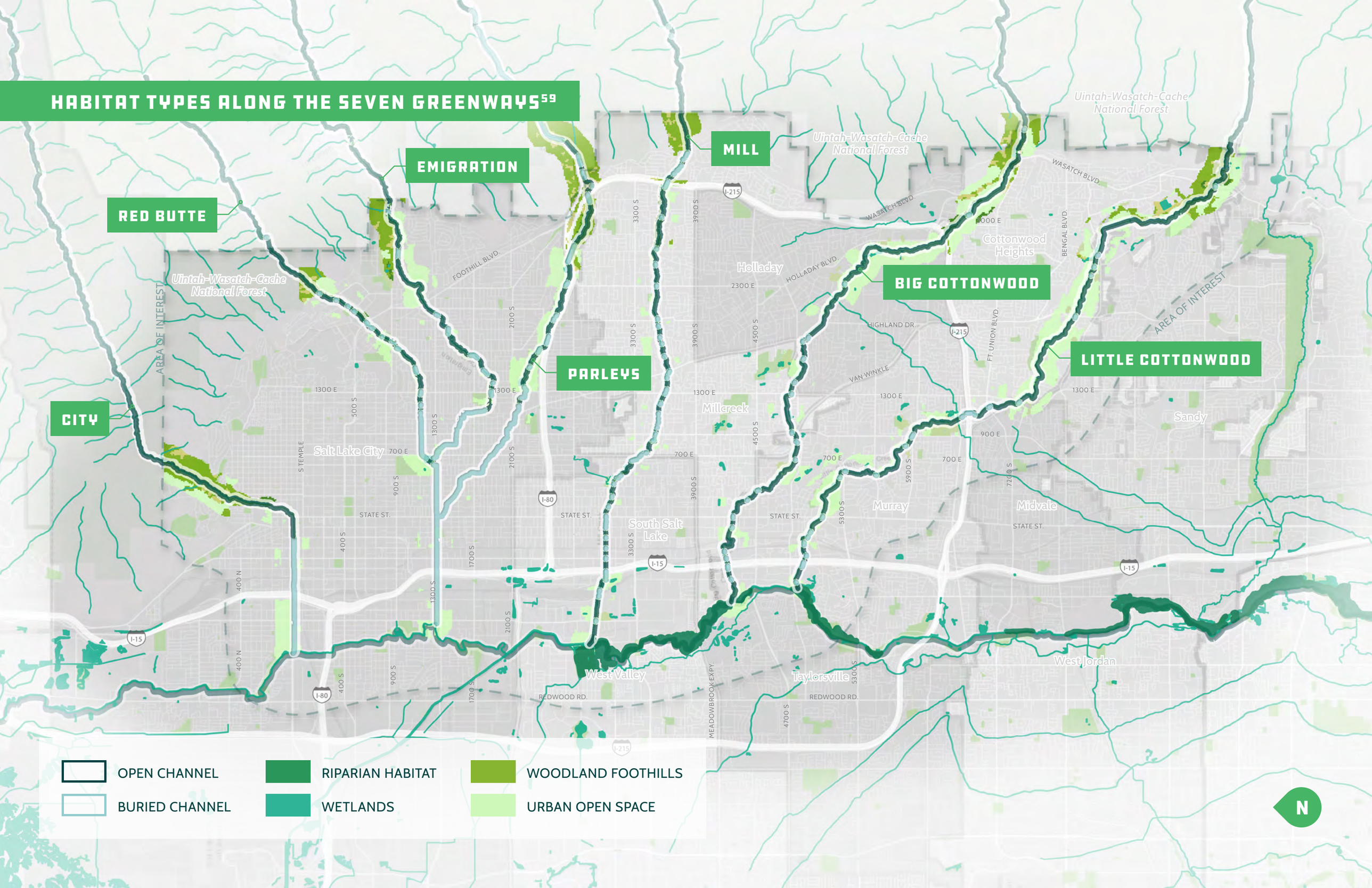
By the 1980s, the Utah Division of Wildlife Resources estimates approximately 30 percent of Utah's riparian, wetland, and aquatic habitats were destroyed.[56] As the Salt Lake Valley's population grows, habitat will be further stressed. Water consumption and the subsequent alteration of aquatic habitats are the most significant source of stress for wildlife in Utah, according to the *Utah Wildlife Action Plan*. Introduced species pose the second largest threat to indigenous wildlife. Introduced species become noxious when they out-compete indigenous species. Their populations explode with no natural predators. There are 54 species on the *Salt Lake County Noxious Weed List*, many along our creeks.

By 2050, Salt Lake City's temperatures are predicted to rise ten degrees—what Las Vegas feels like today.[57] This will severely impact our flora and fauna species as air and water temperatures increase, precipitation regimes change, and drought is extended. Roughly half of the species on the planet are on the move to seek proper climates—those on land at an average of ten miles per decade.[58] Ecosystems will shift over time as new species colonize, while other species may not be able to adapt in time. Pests and diseases are also migrating, moving into new areas, and impacting natural ecosystems and agriculture.

Along our open creeks, wildlife are less likely to encounter hazards, such as roads, fences, pets, and people. Hazards create dangerous encounters between wildlife and development, where they may be forced to cross busy roads, jump over fences, and travel through human developments. Automobile collisions are often deadly for wildlife and dangerous for humans. Scared wildlife can become aggressive, as humans and wildlife compete for space in the urban environment.

Habitat fragmentation is the primary threat for aquatic species. They need connected streams to migrate and complete their lifecycle. Barriers jeopardize their survival. These may be natural, like waterfalls. Others are man-made (culverts, buried streams, or dams) or physio-chemical (temperature or toxicity). According to the *Utah Fish Passage Barrier Assessment and Inventory*, there is one barrier on City Creek, two on Red Butte, one on Emigration, nine on Parleys, eight on Mill, six on Big Cottonwood, and 11 on Little Cottonwood. In an analysis of land cover within one-quarter of a mile of our creeks, Little Cottonwood Creek has the most intact wildlife habitat. Mill Creek is the worst with over 80 percent of its land cover developed.

HABITAT TYPES ALONG THE SEVEN GREENWAYS[59]



COMMUNITY

Parks and green spaces in our backyards contribute to our wellbeing, social connection, and enjoyment of the outdoors for all ages, abilities, and backgrounds. In the Salt Lake Valley, barriers between east and west-side communities limit mobility, access to employment, services, and entertainment, and silo communities. Greenways carry people across these divides, bridging communities and ecosystems from the Wasatch Range to the Jordan River.

ENVIRONMENTAL JUSTICE

According to the Environmental Protection Agency, environmental justice is "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." Put simply, the conditions of our creeks that flow through wealthy areas should be the same as those that flow through our lower-income communities. That is not the case in Salt Lake County. According to the *Environmental Justice Screening and Mapping Tool*, many of the environmental justice parameters—particulate matter 2.5, ozone, traffic, Superfund sites, hazardous waste, and wastewater—are concentrated along western stretches of the creeks, particularly along the Interstate-15 corridor and west.

There continues to be a divide between east and west-side communities in the Salt Lake Valley. The north-south Interstate-15 and railroad tracks create a barrier to connectivity and cultural exchange. This limits mobility, decreases access to jobs, and silos communities. Three of five most diverse Utah cities fall within the scope: South Salt Lake, Midvale, and Salt Lake City.

Western and central areas of Salt Lake City, South Salt Lake, and western areas of Millcreek have higher concentrations of underrepresented groups, such as people of racial and ethnic minorities, people that are 65 years or older, people with physical or cognitive disabilities, people with housing insecurity or experiencing unsheltered homelessness, and people with low income (below twice the poverty threshold or $38,000 for a family of four). The poverty rate in these communities ranged from 11 to 31 percent, compared two to 16 percent in other Salt Lake County communities. Of the 12 census tracts that border the western edge of the creeks, racial and ethnic minorities make up an average of 59 percent of the population.[60]

The Salt Lake Valley includes the ancestral lands of the Eastern Shoshone Tribe, Goshute Indian Tribe, Northwestern Band of the Shoshone Nation, Ute Indian Tribe, and Shoshone-Bannock Tribes. These communities stewarded our creeks for centuries—hunting, fishing, and gathering along their banks. As colonial settlers moved into the Valley and spread along the Wasatch Front, indigenous peoples were displaced and conflicts arose. Many were pushed to the eight reservations in Utah. However, not all live on reservations. Approximately 46 percent of the total population of Indigenous Peoples in Utah live in Salt Lake County.[61]

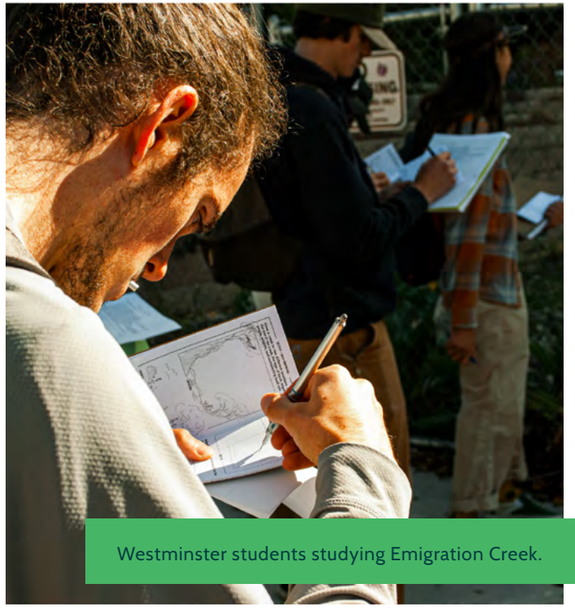
Volunteers at the Three Creeks Confluence in Salt Lake City.

Table 3: Race & ethnicity within one mile of creeks[78]

RACE/ETHNICITY	NUMBER	PERCENT
White	293,644	82
Black	7,696	2
American Indian	3,764	1
Asian	13,214	4
Pacific Islander	3,732	1
Other	22,818	7
Two or More	11,335	3

Air quality is the Salt Lake Valley's biggest environmental injustice. Atmospheric inversions cause acute air pollution days and limit urban outdoor activity. The highest concern air pollutants are PM 2.5 and ozone. Travel east to higher elevations and one can see the thick layer of pollution in the western part of Salt Lake County. Geography plays a role as pollution settles in the lower parts of the Salt Lake Valley. However, the largest emitters are located in west-side neighborhoods—factories, highways, and refineries.

Nearly nine percent of Utah adults and six percent of children have asthma. During air pollution days, more emergency room visits and hospital admissions occur. Climate change threatens to make pollution worse. Higher temperatures due to climate change will increase extreme heat events and wildfires. Summertime PM 2.5 from wildfire smoke creates poor air quality. In some cases, it can lead to premature death.



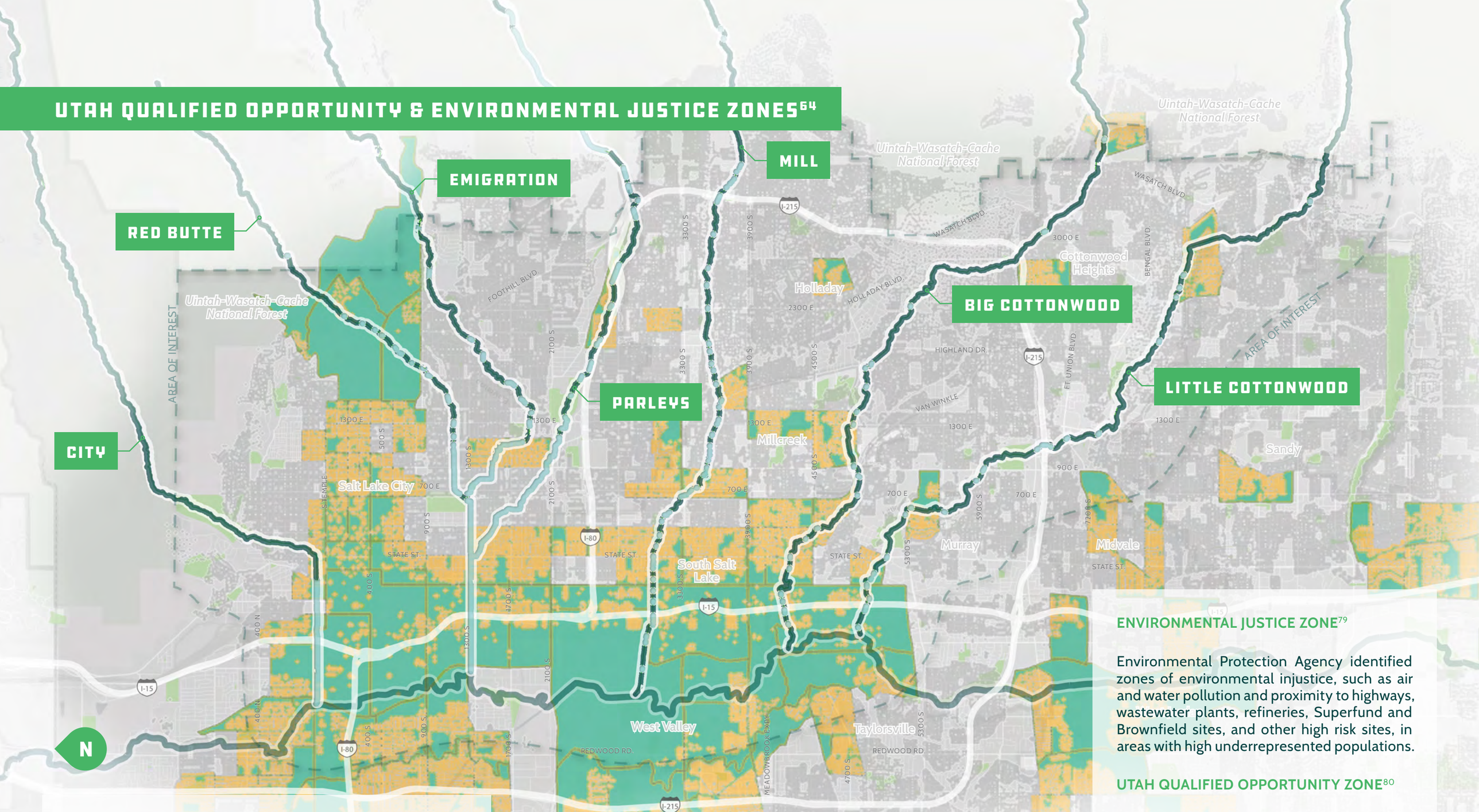
Westminster students studying Emigration Creek.

NEEDS ASSESSMENT

According to the *Salt Lake City Parks & Public Lands Needs Assessment*, the Central, Northwest, and West Salt Lake communities, in Salt Lake City, are the highest need areas. These are Salt Lake City's most diverse and lowest income. The Central Community has the least access to parks and trails and is slated for the most future growth. An estimated 94 acres of new green space, throughout Salt Lake City, is required to meet future needs at the same level of service.[62]

According to the *Parks & Public Lands Needs Assessment*, most respondents felt safe alone in their neighborhood parks during the day and at night. When asked about the two major trail networks in Salt Lake City, 73 percent felt safe alone during the day and 44 at night on the Bonneville Shoreline Trail. On the Jordan River Trail, 43 percent felt safe alone during the day and 16 at night.[63] Integrated approaches will create and maintain safer parks and open spaces through design, programming, maintenance, and engagement. Efforts should address safety equally in all genders and cultures.

UTAH QUALIFIED OPPORTUNITY & ENVIRONMENTAL JUSTICE ZONES[64]



ENVIRONMENTAL JUSTICE ZONE[79]

Environmental Protection Agency identified zones of environmental injustice, such as air and water pollution and proximity to highways, wastewater plants, refineries, Superfund and Brownfield sites, and other high risk sites, in areas with high underrepresented populations.

UTAH QUALIFIED OPPORTUNITY ZONE[80]

Utah Governor's Office of Economic Development identified zones of economic distress where new investments may be eligible for preferential tax treatment.

RECREATION

The Salt Lake Valley is known for a high quality of life due in part to our renowned outdoor recreation opportunities. Recreating in nature boosts quality of life by encouraging discovery, exploration, socialization, stewardship, and physical activity. Greenways carry people, on foot or wheels and along trails or in the water, to increase quality of life, activity, and livability.

OUTDOOR RECREATION

Outdoor recreation opportunities are ample in the Salt Lake Valley. A fact which, according to a Gallup study, makes Utah one of the best states to live in due to our proximity to clean water and exercise, low obesity rates, and optimism that our cities are "getting better."[65] In 2019, outdoor recreation generated an estimated $6.4 billion and 83,000 jobs in Utah.[66]

The Coronavirus (COVID-19) pandemic underscored the need for parks and recreational facilities, especially those close to home. They provide a way to get outdoors and exercise in our backyards. Greenways should focus on equitable access, especially for residents without the means to travel to canyons for recreation and exercise.

Physical activity is critical to our mental and physical well-being. The annual cost of obesity-related illness in the United States was $190.2 billion—21 percent of all medical spending.[67] The Centers for Disease Control and Prevention recommends 2.5 hours of moderate exercise each week. Many do not achieve this goal. Refer to **Table 4** for behavioral risk factors by city and neighborhood.

USERS

Walking and bicycling are basic forms of physical activity and recreation. They link with daily commuting, running errands, or leisure. Residents are more likely to recreate and exercise in natural surroundings. Outdoor recreation provides greater social interaction and reduces stress levels.

Bikers riding City Creek Canyon in Salt Lake City.

Canoers on the Jordan River during the Range 2 River Relay in Salt Lake City.

Table 4: Population getting recommended exercise and population that is obese by city and neighborhood[81]

CITY - NEIGHBORHOOD	RECOMMENDED EXERCISE (PERCENT)	OBESITY (PERCENT)
Cottonwood Heights	60	16
Holladay	58	24
Millcreek - East	62	17
Millcreek - South	60	21
Midvale	49	31
Murray	51	29
Sandy - North-East	68	17
Salt Lake City - Avenues	65	13
Salt Lake City - Downtown	54	17
Salt Lake City - East Bench	61	14
Salt Lake City - Glendale	34	38
Salt Lake City - Southeast Liberty	62	16
Salt Lake City - Sugar House	57	22
South Salt Lake	48	30

Water-based recreation is growing. Nearly 90 percent of respondents report being very or somewhat interested in paddling opportunities in the *Blueprint Jordan River Refresh Survey Findings*. Several informal boat ramps exist along the Jordan River with plans to improve them for the future, legitimize access, and create new ramps into a formal water trail.

Navigational hazards, like dams, culverts, grates, pipes, and other debris, present dangerous conditions for boaters. In the Jordan River, partners are mapping and mitigating the significant hazards. The deadly "Winchester Hazard," a pipe-river crossing that claimed a life in 2010, was re-engineered in 2015. The resulting rapid is now a safe and fun feature for boaters.

Recreational fishing is growing as well. In 2019, 17 percent of people tried fishing in the United States.[68] According to the Outdoor Industry Association, fishing is one of the most popular "gateway" activities which lead to other forms of outdoor recreation. Our creeks provide accessible angling opportunities in our backyards.

Dog walking is a popular form of recreation along our creeks. Demand for dog parks has dramatically increased in our cities over the last decade. Since 2009, there has been a 40 percent increase in dog parks across the United States.[69] There are four dog parks along our creeks: Memory Grove (City), Herman Franks Park (Emigration), Rotary Glen (Emigration), and Parleys Historic Nature Park (Parleys).

In areas with high dog use, streambank erosion is often evident and ground vegetation trampled. This can jeopardize larger shrubs and trees. Increased sedimentation loads, due to erosion, affect water quality for trout downstream. Dogs carry harmful bacteria and pathogens, like *Escherichia coli*. Dog feces left near our creeks wash into the water and create impairments harmful to humans and pets alike. Finally, dogs discourage wildlife from remaining in or returning to a natural area. Access for pets and habitat needs should be carefully balanced.

EXISTING TRAILS, BIKE LANES, & AMENITIES[70]

EMIGRATION

RED BUTTE

MILL

BIG COTTONWOOD

PARLEYS

LITTLE COTTONWOOD

CITY

AREA OF INTEREST

Uintah-Wasatch-Cache National Forest

Salt Lake City

Millcreek

Holladay

Cottonwood Heights

Sandy

Murray

Midvale

South Salt Lake

West Valley

Taylorsville

West Jordan

FOOTHILL BLVD

WASATCH BLVD

HOLLADAY BLVD

HIGHLAND DR

VAN WINKLE

STATE ST.

REDWOOD RD.

I-15

I-80

I-215

N

OPEN CHANNEL

BURIED CHANNEL

EXISTING TRAILS

PROPOSED TRAILS

BIKE LANES

NEIGHBORHOOD BYWAYS

TRAILHEADS

PARKS

GOLF COURSES

NATURAL AREAS

CIVIC

URBAN

From the Indigenous Peoples and original inhabitants of the Salt Lake Valley, to the colonial settlers, and beyond to modern society, our creeks are the lifeblood of our cities. They are important areas of activation in our communities and connect us to place in this oasis on desert's edge. Greenways carry people to parks, open spaces, and civic, commercial, and recreational nodes throughout the Valley—allowing us all to prosper.

As our cities grew, settlers imposed the Plat of Zion on the geography of the Wasatch Front. Houses were concentrated along creeks and floodplains for its water source and cooling in the summer. However, spring brought snowmelt and, with it, flooding. Instead of moving houses out of the floodplain to prevent damage, creeks were channelized as they entered the broad valley bottom, straightening the previously meandering channels. Banks eroded and steepened—a safety concern for early residents. A solution was found by building makeshift bridges spanning the nearly ten to 20-foot vertical banks. Regarded as a nuisance in the early 20th Century, creeks were buried.

Industry along the creeks put the waters to use. Mining and logging in the canyons impacted water quality and laid creek banks bare, leaving wildlife without food or shelter. Waterways became the early sewer system, flowing east-west out of our cities. Pollution from sewage, agriculture, and industry degraded water quality. Many of the early canals, diversions, and dams left channels devoid of water.

ACCESS & TRANSPORTATION

Activation points provide access to the various amenities greenways provide and connectivity between them. Points are recreational (parks, natural areas, and open spaces), commercial (shopping centers, retail areas, and restaurants), or civic (schools, churches, and community institutions). An estimated 20 commercial activation points, 80 civic activation points, and 116 recreation activation points exist within one-half mile of the seven creeks.

Active transportation—any human-powered mode of travel in our communities—is a critical component of the urban transportation network. Walking, biking, rolling, and even boating (where feasible) are affordable transportation options available to all ages and abilities. These increase physical activity levels and improve air quality by reducing reliance on personal automobiles. In 2014, Utah ranked 15th in bicycle commuting by state. Along the Wasatch Front, walking represents 7.8 percent and biking: 1.7 of all trips taken.[71] In Salt Lake City, an estimated 2.5 percent commuted by bicycle in 2014.[72]

Utah Transit Authority TRAX train passes over Big Cottonwood Creek in Murray.

According to the 2017 *Salt Lake County Parks and Recreation Mail-in Needs Assessment Survey*, 75 percent of respondents are within a 15-minute walk to a park. Yet, 89 percent said they travel by car. In Salt Lake City, most parks are easily accessible by car. However, according to the *Salt Lake City Parks and Public Lands Needs Assessment*, pedestrian and bicycle access needs improvement through added bike lanes and trail connections.

In the 2020 *Blueprint Jordan River Refresh Survey Findings*, those with incomes less than $40,000 were more likely to choose public transportation improvements as their first or second choice when asked what would enhance access to the Jordan River corridor. Plentiful and diverse connections to the greenways should service lower-income residents, including regional public transit connections on buses, trains, and other forms of transit. There is one commuter rail stop, ten light rail stops, and 1,049 bus stops within one-quarter of a miles of our creeks.

URBAN FORESTS

Urban forests come in many different forms, including trees in urban parks and natural spaces, waterways, streets, landscaping, and on our buildings. Urban forests filter pollutants, especially important with our poor air quality. Yet, tree coverage in Salt Lake County declines in neighborhoods with higher percentages of underrepresented populations—residents most impacted by poor air. Asthma incidents increase in neighborhoods with fewer trees.

In 2010, Salt Lake City ranked in the top three urban heat island cities in the United States. A study identified sprawl as a critical factor in increasing urban air temperatures and recommended urban green spaces break up the built environment.[73] Urban forests provide shade to reduce the effect and protect us from harmful ultra-violet radiation. They create a sound buffer, reducing noise pollution, and filter pollutants in urban runoff.

UNSHELTERED HOMELESSNESS

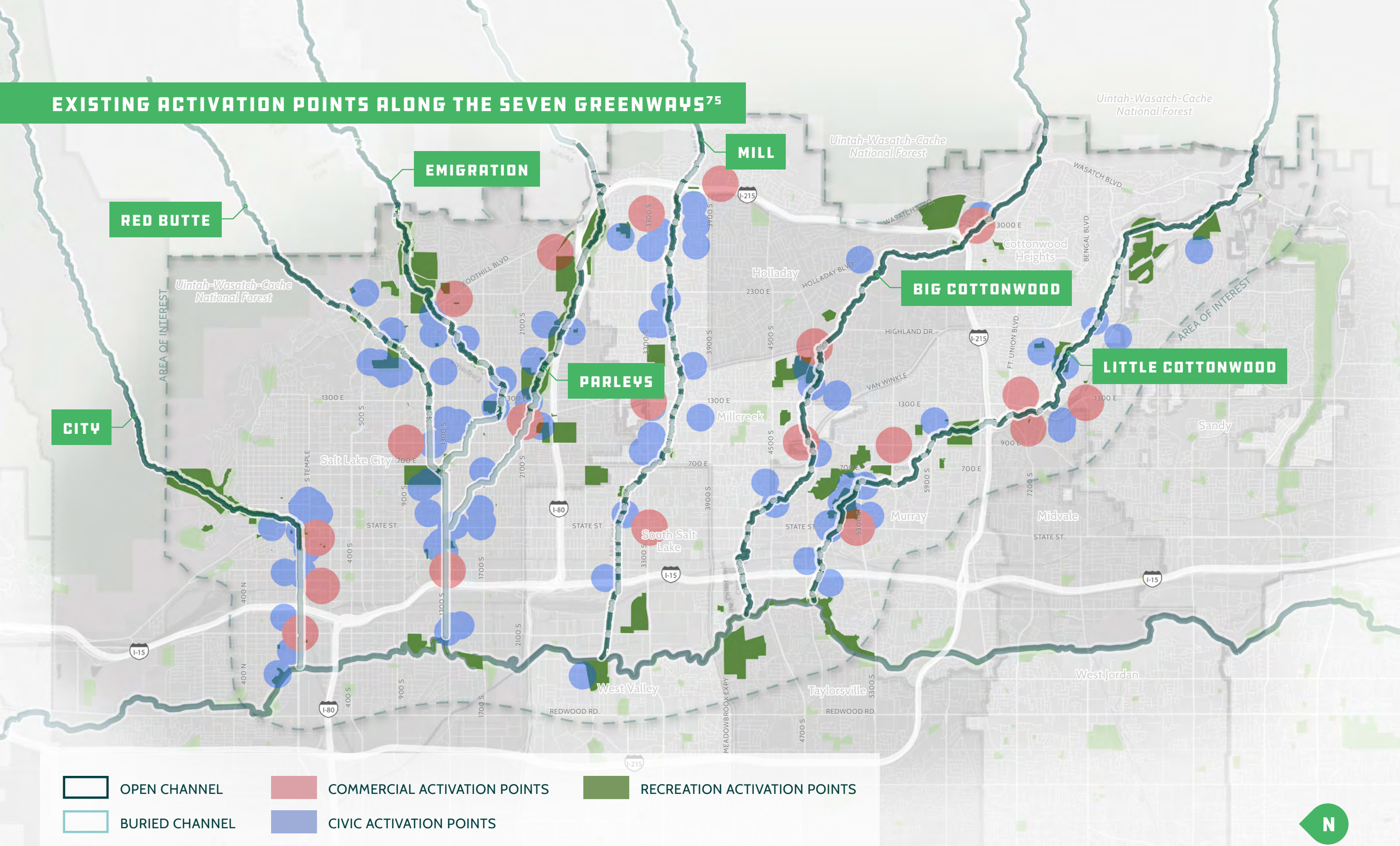
According to 2019's Point-in-Time count, approximately 1,844 people are experiencing unsheltered homelessness on any given night in Salt Lake County. Public parks and open spaces sometimes provide more comfortable spaces for those experiencing homelessness than resource centers. In our greenways, evidence of homelessness is often seen as unsanctioned encampments.

The most immediate impact is personal belongings within encampments. While the belongings do not present an ecological impact, the visual impact can affect user experience. Public complaints to park managers, health departments, and police enforcement lead to costly clean-up and removal of individuals, camps, belongings, and waste left behind. However, for individuals living on as little as $11 a day, belongings are not easily replaced.[74]

Additional ecological impacts from encampments may include bank erosion, trampling of sensitive habitat areas, and water quality issues related to microplastics and *E. coli*. According to researchers, impacts may be overstated to justify removal and clean-up mitigation efforts.

Wildfires are possibly the largest risk of encampments in natural areas. Fires can easily get out of hand when vegetation is dry. Natural areas frequently burn along the Jordan River, jeopardizing habitat, homes, utilities, and other infrastructure. For example, an acre of wildlife habitat, in a restoration project at the Mill Creek Confluence, burned in 2017 and then again in 2020. Fires were linked to campfires in encampments at the site.

EXISTING ACTIVATION POINTS ALONG THE SEVEN GREENWAYS[75]



CASE STUDY

PARLEYS TRAIL

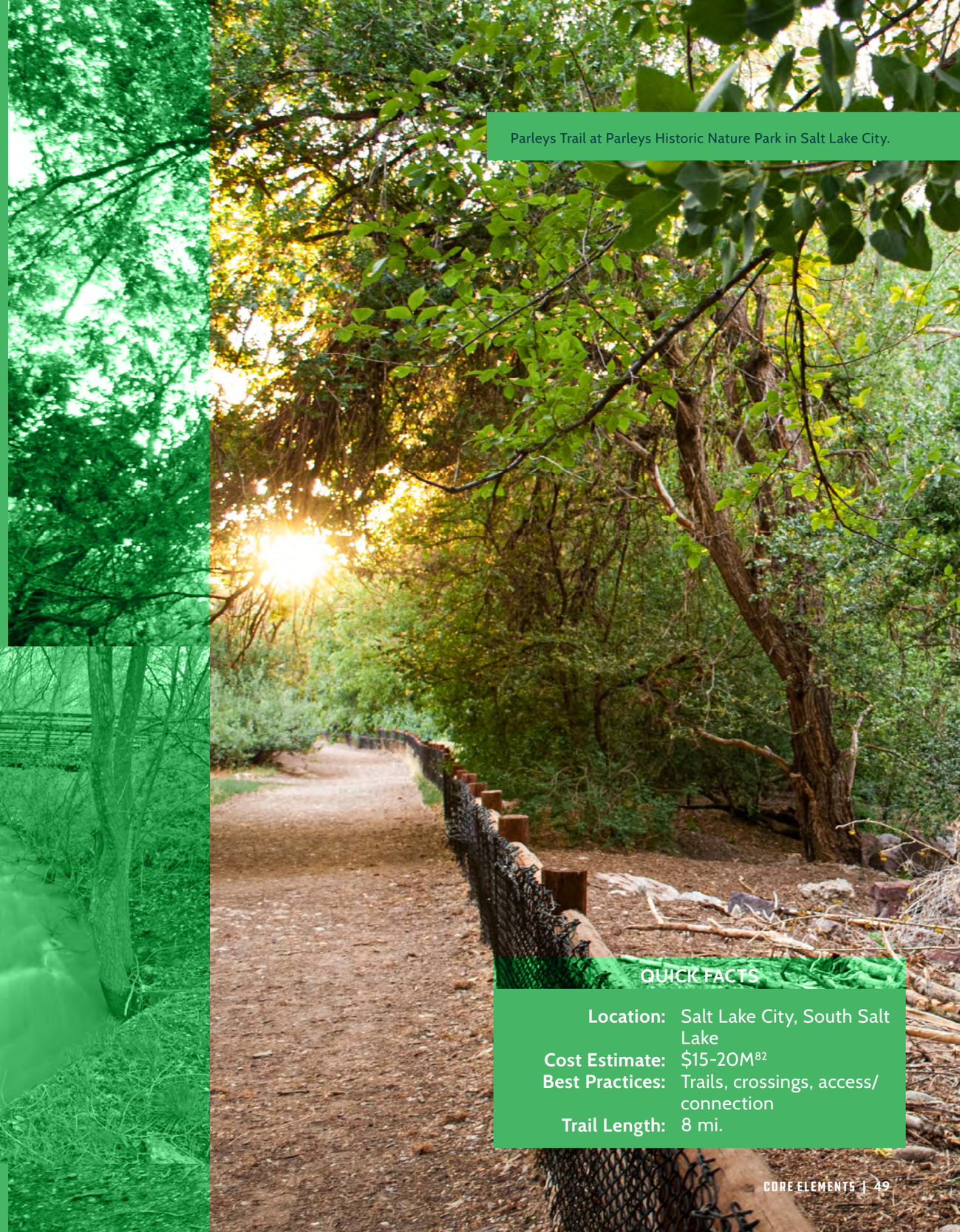
The Parleys Trail is an eight-mile paved pathway, connecting Parleys Canyon and the Bonneville Shoreline Trail to the Jordan River Trail. It features a ten-foot-wide mixed-use trail, popular among commuters and recreators. Walkers, runners, bikers, rollerbladers, wheelchair riders, skateboarders, and more are seen zooming up and down the corridor.

The trail closely parallels Parleys Creek as it flows on the east-side of Salt Lake City from the mouth of the canyon through Parleys Historic Nature Park, Sugar House Park, and Hidden Hollow. From there, the trail goes down a rail right-of-way paralleling the Utah Transit Authority's S Line Streetcar and other rail lines on the west-side. The creek goes underground into the stormwater system after Hidden Hollow (surfacing again for a short distance at Intermountain Healthcare's Memorial Clinic). Funding has been secured for the final stretch of trail between 900 West and the Jordan River Trail. The Parleys Trail is the most complete of the seven greenways.

Numerous soft-surface connector trails weave throughout the trail's length at the numerous parks and open spaces. For example, Hidden Hollow is a serene, natural oasis within the bustle of the Sugar House neighborhood. Surrounded by tall riparian trees with Parleys Creek flowing through its heart, the park offers a half-mile loop trail connected to Sugar House Park through a pedestrian tunnel under 1300 East called The Draw.

In 1990, a group of elementary kids from Hawthorne Elementary—exploring their neighborhood through Kids Organized to Protect the Environment (KOPE)—stumbled upon this abandoned creek. After removing the debris clogging its channel, they learned this area was slated to become a parking lot for a new shopping mall. The students successfully built support and raised the funds to protect the area. They received the 1991 President's Environmental Youth Award for their accomplishments. President George H. W. Bush said, "Together they transformed that unsightly trash heap into a nature park, and they gave it a new name, Hidden Hollow. And today, it's a learning center for other students, a kind of outdoor classroom. And what you've done tells other kids that you can make a difference." In 2000, Salt Lake City permanently protected Hidden Hollow through a conservation easement to Utah Open Lands.

Parleys Creek at Hidden Hollow in Salt Lake City.



Parleys Trail at Parleys Historic Nature Park in Salt Lake City.

QUICK FACTS

Location:	Salt Lake City, South Salt Lake
Cost Estimate:	$15-20M[82]
Best Practices:	Trails, crossings, access/ connection
Trail Length:	8 mi.

Mapping opportunity areas at Memory Grove in Salt Lake City.

In This Section:

- Water
- Nature
- Community
- Recreation
- Urban

VISION

Core elements further organize the vision for the seven greenways. Goals emerged through research and outreach about the future greenways system. Opportunity areas, arranged by element, identify projects that would create significant and impactful change in implementing goals. Five “Big Ideas” illustrate possibilities when applying goals in a transformational way.

OPPORTUNITY AREAS ALONG THE SEVEN GREENWAYS

EMIGRATION

RED BUTTE

Bonneville Golf Course 04

PARLEYS

Bonneville Shoreline Trail to Miller Park 03

MILL

BIG COTTONWOOD

Wasatch Blvd to Crestwood Park 19

16 Holladay Hills to Creekside Park

WASATCH HOLLOW TO WESTMINSTER

LITTLE COTTONWOOD

07 Sugar House

Herman Franks Park 06

3300 S 700 E 11

10 Scott Ave Park

17 Ivy Place Shopping Village

FORT UNION TO WHEELER FARM

Fitts Park 12

200 E TO 200 W

CITY

08 Ballpark

NORTH TEMPLE

21 Murray Park to Jordan River Trail

I-15 Crossing 14

STATE ST TO JORDAN RIVER TRAIL

09 1300 S

02 Folsom Corridor

Mill Creek Confluence 15

OPEN CHANNEL

BURIED CHANNEL

EXISTING TRAILS

PROPOSED TRAILS

PARKS

GOLF COURSES

NATURAL LANDS

00 OPPORTUNITY AREA

N

OUR URBAN CREEKS HAVE THE POTENTIAL TO BECOME AN EQUITABLE, INNOVATIVE, AND RESILIENT SYSTEM OF GREENWAY CORRIDORS.

RESTORING OUR WATER

Stream restoration and daylighting aims to re-establish a naturally functioning waterway and riparian ecosystem—or to the most natural state possible. This depends on factors upstream, surrounding land-use, and the space available. Efforts improve water quality through plantings, bank stabilization, and other green infrastructure. They recreate channel meanders, remove dams, and replace aging infrastructure.

DAYLIGHT & RESTORE STREAMS

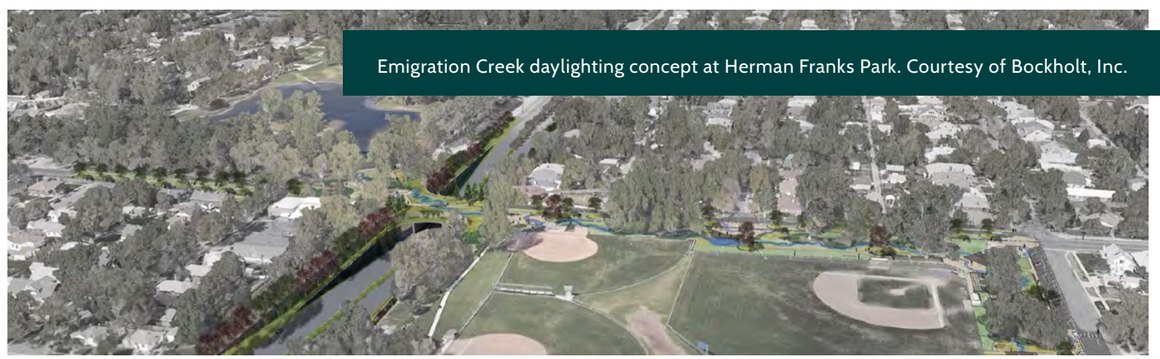
Stream daylighting and restoration slows water velocities through meanders and rocky, vegetated banks. With inclusion of a floodplain, groundwater infiltration is increased. We reduce habitat fragmentation and form wildlife corridors by connecting streams and adjacent riparian habitat. Removing dams and culverts and replacing aging infrastructure improves fish passage and migration for survival and spawning.

Natural creeks retain nutrients and clean water quality through streamside vegetation, streambank deposition, and groundwater infiltration. Removal of culverts alleviates choke points and replaces under-capacity or deteriorating culverts. We must keep in mind the changing climate when managing water and be active in assessing our vulnerabilities to adapt.

IMPROVE INFRASTRUCTURE

Green infrastructure is an important tool in restoring our creeks. It retains, treats, and absorbs stormwater and pollutants at the source, before entering our creeks. Bioswales catch runoff, filtering pollutants, and trapping sediment. Permeable pavements allow water to soak into the soil, rather than running off into the stormdrain and then into our creeks.

Natural, open space has higher permeability and a lower impervious factor than other land uses. Open space averages between nine and 12 percent. Whereas, commercial areas are 85 percent and residential areas, 32 percent.[83] By creating more of these spaces, more water soaks into the ground.



Emigration Creek daylighting concept at Herman Franks Park. Courtesy of Bockholt, Inc.

WATER | GOALS

- Improve flood resiliency through streambank stabilization, recreating channel meanders, and reconnection to wetlands and floodplains.
- Daylight creeks through natural, architectural, and cultural methods to enhance visibility and awareness of the creeks.
- Improve water quality through green infrastructure and other stormwater management best practices.
- Increase instream flows through water rights agreements and policy with consideration of changes in waterflow due to climate.
- Remove dams and replace aging infrastructure.
- Create educational opportunities around water quality and conservation.

Table 5: Water opportunity area matrix

	OPPORTUNITY	TYPE	CREEK	CITY	DESCRIPTION
01	North Temple	10-Year	City	Salt Lake City	As Salt Lake City develops, daylight City Creek along North Temple and create a trail connection to the Folsom Corridor between West Temple and 400 West.
06	Herman Franks Park	100-Year	Emigration	Salt Lake City	Daylight Emigration Creek to activate and enhance the park space, create a community amenity, and improve connectivity to Liberty Park through a trail and signage.
09	1300 S	100-Year	Red Butte, Emigration, Parleys	Salt Lake City	Daylight Red Butte, Emigration, and Parleys creeks east of the Three Creeks Confluence along 1300 South, enhancing east-west connections to the Jordan River.

City Creek along North Temple in Salt Lake City.

Open space along 1300 South at 800 West.

WATER | BIG IDEA

NORTH TEMPLE

Category: 10-Year
City: Salt Lake City

Typology: Urban Downtown
Creeks: City

Stream Length: 0.5 mi.
Buried: 0.5 mi.

Estimated Cost: $5-10M

As cranes dot the Salt Lake City skyline, downtown open spaces—like parking lots and rights-of-way—will give way to infill development. Currently, the 10-acre Pioneer Park is the only public green space in the Downtown neighborhood. To increase green space, 1992's *Open Space Plan* imagined City Creek flowing along North Temple, around the Jazz Arena, through the Gateway, and connecting into the Folsom Corridor—an effort to revitalize an abandoned rail corridor into a paved trail and uncovered channel of City Creek. The 2016 *Downtown Community Plan* further "encourage[s] the continued 'daylighting' of City Creek to link the mountains with the Jordan River through downtown." The proposed Green Loop transforms Salt Lake City's wide rights-of-way—typically 132 feet—into linear park space. Corridors along North and South Temple provide opportunity for linear daylighting of City Creek.

Along North Temple between West Temple and 300 West, large surface parking lots—owned by The Church of Jesus Christ of Latter-day Saints and its subsidiaries—are prime infill redevelopment areas. As these properties are reimagined, City Creek could be uncovered, connecting into previous daylighting efforts outside the Church History Library and Conference Center and, upstream, at City Creek Park and within the median of Canyon Road. Downstream, the creek could be uncovered near the Jazz Arena, or adjacent properties, to 400 West. From there, it could flow into the Gateway Mall. This idea was proposed in *The Gateway Specific Plan* but was never pursued. In addition, City Creek Center features an artificial recreation of the south fork of City Creek.

Daylighting of City Creek, and creation of a linear park, would increase downtown green space. When connected with Memory Grove and the Folsom Corridor, City Creek would unite communities (and ecosystems) from the Wasatch Range to the Jordan River, bridging east-west divides and breaking down barriers created by Interstate-15. Increases to the urban forest would improve air quality and reduce the urban heat effect. Green infrastructure, such as bio-swales, would filter runoff before entering the stream and reduce flooding downstream.

NEXT STEPS

- Inventory parcels adjacent to the corridor to prioritize purchase of properties or easements to facilitate goals.
- Meet with The Church of Jesus Christ of Latter-day Saints, The Gateway Mall, and other interested landowners to discuss the vision and facilitate partnerships.
- Culturally daylight the creek in the public right-of-way through paint, signage, or other works of art to build support for the project.
- Create a policy that requires (or incentivizes) developers along this stretch contribute to goals.

Rendering of City Creek daylighting along North Temple.

STRATEGIES

01. Create a linear park and multi-use trail to connect City Creek Canyon, Memory Grove, and the Folsom Corridor.

02. Daylight City Creek, connecting to previous efforts at the City Creek Park and along North Temple, as well as future efforts at the Folsom Corridor.

03. Integrate green infrastructure to control urban runoff and turn paved surfaces into green space with riparian plantings.

ENCOURAGING NATURE TO THRIVE

Restoration of riparian ecosystems with beneficial plants increases habitat value and biodiversity—an important factor in combating changes in climate and vegetation shifts. Greenways provide vital wildlife corridors through our urbanized valley between the Wasatch Range and the Jordan River. They decrease habitat fragmentation and improve fish passage by connecting green spaces, removing aging infrastructure, and daylighting streams.

RESTORE HABITAT VALUE

In the Salt Lake Valley, our urban ecosystems have been altered by humans. The term "novel ecosystems" is often used to describe the unique assembly of species and environmental conditions from intentional or unintentional alterations, such as introduced species or hydrologic changes to our creeks. This creates a new ecosystem trajectory and makes returning to a previous trajectory nearly impossible. Novel ecosystems are self-sustaining in composition, structure, and ecosystem services.

Our natural areas in Salt Lake Valley have become novel ecosystems. Many introduced species would require costly and land-intensive mitigation to remove. Considering that, vegetation should be managed based on their habitat value, rather than the native versus non-native dichotomy. Removal and revegetation efforts should be phased to not undermine habitat value through clear-cutting and a diversity of species in different sizes and ages should be used.

Goals for our greenways can seem contradicting. Healthy riparian habitat with a dense vegetation structure, including ground, shrub, understory, and canopy layers, can feel wild and unmaintained with plenty of places to hide. However, removal of all or some of these layers diminishes habitat value. Achieving a balance between these two factors is important to increasing safety, while balancing wildlife habitat. Desirable vegetation supports insects, pollinators, and small mammals critical to the food chain.

ENHANCE URBAN FORESTS

Through additions to the urban forest, we can better filter air and water, cool temperatures, control more urban runoff, and provide additional wildlife habitat. We can strengthen communities with low tree density, such as those on the west-side along our buried creeks, by focusing canopy increase there. This will filter air pollution and decrease pollution-related health impacts, provide shade, reduce noise from nearby freeways and railroads, and add economic value.

CREATE WILDLIFE CORRIDORS

Our creeks serve as key wildlife corridors, navigating from one patch of habitat to another in the Salt Lake Valley between the Wasatch and Oquirrh Mountains to the Jordan River and Great Salt Lake. Where appropriate, natural space with limited access would improve wildlife corridors by mitigating conflict with humans and pets. Limited-access natural areas give space for wildlife to find food, water, shelter, and space for migration between summer and winter habitats.

With space to travel and the elimination of barriers with proper road crossings, wildlife collisions are reduced. Crossings that guide wildlife under or over busy roads in key areas reduces collisions by 85 to 95 percent.[84] Well-connected corridors also improves wildlife viewing, an activity more than 65 percent of Wasatch Front residents were interested in.[85]

NATURE | GOALS

- Create healthy fish habitats by increasing channel diversity, removing aging infrastructure, and daylighting streams.
- Restore natural channel meanders and riparian habitats with desirable vegetation.
- Program environmental education to grow a generation of stewards.
- Promote biodiversity by increasing urban tree canopy for climate resiliency.
- Interconnect greenways for vital wildlife corridors to decrease habitat fragmentation.
- Protect sensitive species and ecosystems through open space preservation and acquisition.

Table 6: Nature opportunity area matrix

	OPPORTUNITY	TYPE	CREEK	CITY	DESCRIPTION
04	Bonneville Golf Course	10-Year	Emigration	Salt Lake City	Create a protected trail connection along Emigration Creek, restore riparian habitat and the floodplain, replace or remove aging infrastructure, and stabilize streambanks.
10	Scott Ave Park	10-Year	Mill	Millcreek	Create a trail connection to surrounding neighborhoods along Mill Creek, restore riparian habitat, and recreate a floodplain.
12	Fitts Park	10-Year	Mill	South Salt Lake	Improve water quality through green infrastructure, restore riparian habitat and the floodplain, and enhance recreation along Mill Creek in the park.
15	Mill Creek Confluence	10-Year	Mill	South Salt Lake	Restore riparian habitat, improve water quality through wetlands, and provide recreation connections to the Jordan River Trail.
18	State St to Jordan River Trail	10-Year	Big Cottonwood	Millcreek, Murray	Create a trail connection along Big Cottonwood Creek, add seasonal boat ramps, create a floodplain in open lots, and restore riparian habitat.

Mill Creek at Mill Creek Confluence in South Salt Lake.

Mill Creek at Fitts Park in South Salt Lake.

NATURE | BIG IDEA

STATE STREET TO JORDAN RIVER TRAIL

As Big Cottonwood Creek flows west, it becomes highly channelized—often looking more like a canal than a natural stream channel. West of State Street, the creek is flanked by mostly industrial land-use and large parking lots. Along the Birkhill Apartments and KPC Promise Hospital of Salt Lake, a wonderful mixed-use paved trail runs parallel to the creek with benches, pavilions, and other amenities. This reflects the potential along this 1.6-mile section of Big Cottonwood Creek to turn underutilized lots into a healthy riparian ecosystem, floodplain, and community amenity.

As redevelopment occurs, a Big Cottonwood Trail would serve new tenants and connect existing open spaces along the creek. Bridging barriers, such as Interstate-15 and the railroad tracks, would link communities to the confluence of Big Cottonwood Creek and the Jordan River Trail. Industrial land-uses and underutilized lots provide ideal space to re-establish stream meanders, restore riparian ecosystems, and recreate a floodplain. Efforts would improve habitat value, linking this critical wildlife corridor to the Jordan River. They would also mitigate flooding downstream by slowing down water velocities through meanders and rough and woody creek beds and banks. With the addition of a floodplain, floodwaters can spread out and infiltrate into the ground.

Seasonal boat ramps on Big Cottonwood Creek would connect into the Jordan River Water Trail. Restoration would improve fishing opportunities for urban anglers. Increased housing stock and commercial businesses would bring new visitors to the creek. Gathering spaces and soft-surface trails would create future stewards with access to enjoy nature and environmental education opportunities. Integrating art into the corridor would further activate the space. To attract a diverse population of new residents, developers should consider a mixture of affordable and market rate housing.

Category: 10-Year
City: Millcreek, Murray

Typology: Industrial, multi-family residential
Creeks: Big Cottonwood

Stream Length: 1.6 mi.
Buried: 0.2 mi.
Impaired: 1.4 mi.

Big Cottonwood Trail at Birkhill Apartments in Murray.

NEXT STEPS

- Inventory parcels adjacent to the corridor to prioritize purchase of properties or easements to facilitate goals.
- Design and implement goals on public lands.
- Add the trail corridor and proposed recommendations to master planning efforts in Millcreek and Murray.
- Create a policy that requires (or incentivizes) developers along this stretch contribute to goals.

Big Cottonwood Creek Trail at Birkhill Apartments in Murray.

STRATEGIES

01. Turn underutilized lots into robust riparian ecosystems with restored meanders, a floodplain, trails, park space, and community amenities.

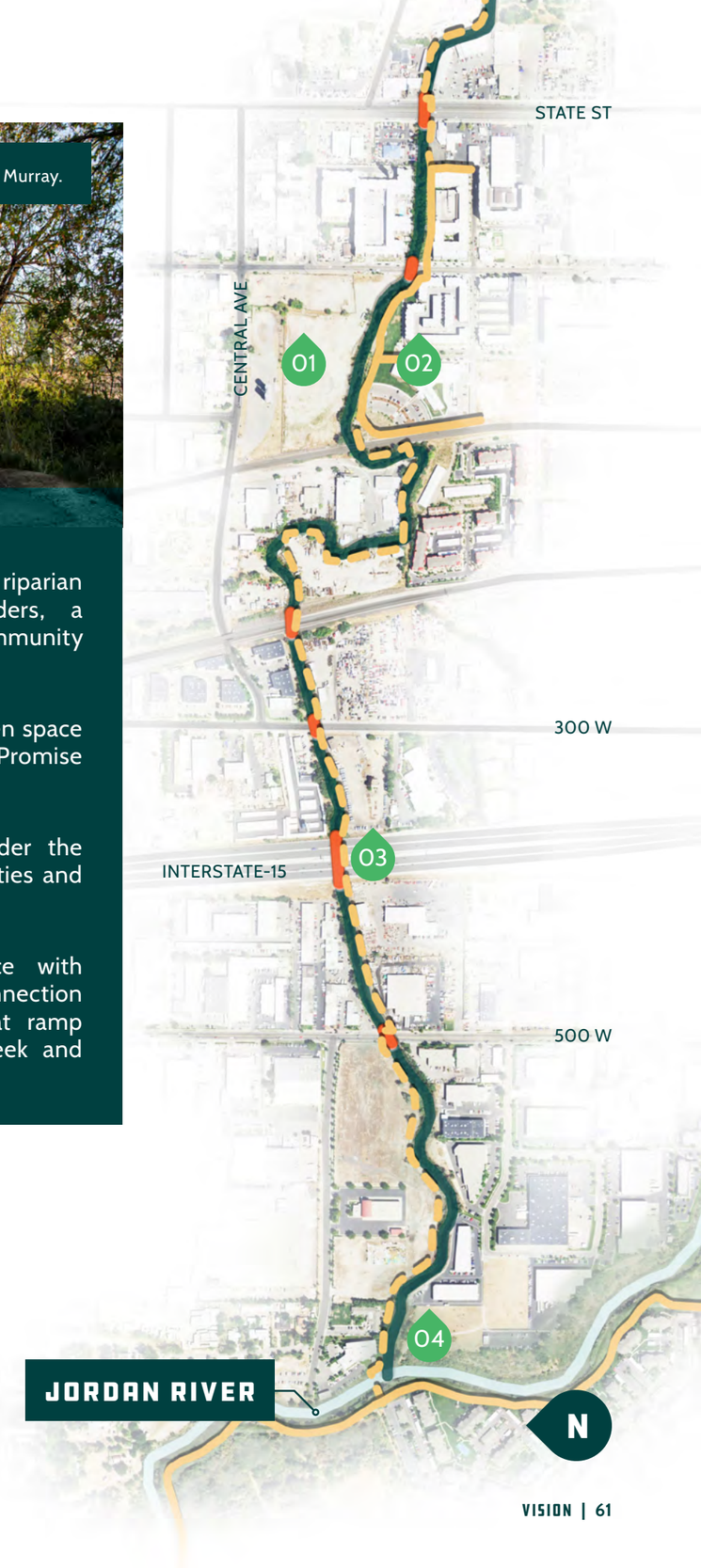
02. Connect to existing trails and open space at the Birkhill Apartments and KPC Promise Hospital of Salt Lake.

03. Create connection over or under the Interstate-15 barrier to link communities and recreational opportunities east-west.

04. Celebrate the Big Confluence with community and natural space, a connection to the Jordan River Trail, and boat ramp for in-stream recreation on the creek and downstream on the Jordan River.

OPEN CHANNEL
BURIED CHANNEL
EXISTING TRAILS
PROPOSED TRAILS*

*Actual trail alignment to be determined.



ADDRESSING EQUITY & ACCESS IN OUR COMMUNITY

Greenways bridge the east-west divide in the Salt Lake Valley to create a more resilient society and environment. Communities from the Wasatch Range to the Jordan River will have equitable access to public lands and connections to recreation, celebration, learning, and enjoyment. Inclusive planning and design will reduce barriers for underrepresented populations and provide space for diverse cultures, traditions, interests, uses, abilities, and ages.

BRIDGE DIVIDES

Greenways mitigate environmental injustices experienced by many in Salt Lake County. Through daylighting and restoration, creeks and adjacent riparian forests can more effectively clean water and air quality. Downstream communities on the west-side are faced with water quality issues from the more affluent east-side. Pollutants, including fertilizers, lawn debris, and other floatables, enter the stormdrain and end up in the Jordan River. Creeks retain nutrients and clean water quality through streamside vegetation, streambank deposition, and groundwater infiltration. Whereas, buried streams cannot filter the air and water.

Greenways link communities from the Wasatch Range to the Jordan River, overcoming east-west barriers created by the railroads and interstates. Connections to destinations, regional transit systems, and other active transportation corridors reduces reliance on vehicles to commute, run errands, and recreate. Destinations vary from parks to trailheads, small seating areas to libraries and schools. Gathering spaces can be created with simple intervention—a sign or bench—or with more costly features, such as a plaza space or amphitheater. Corridors provide access to services, jobs, and entertainment with focus on adding parks and trails in the highest need communities.

INTEGRATE ART & COMMUNITY SPACE

Greenways provide spaces for cultural activities, and for artists to perform, create, and display their works. Art can engage communities and represent a neighborhood's voice. At the Three Creeks Confluence in Salt Lake City, community designs were laser cut into steel plates featured on the east-west bridge that spans the uncovered creeks. Efforts showcase local west-side artists and designs that represent the surrounding community, while offering generous stipends to artists for their work. Similar opportunities exist throughout the greenways.

Greenways are pleasant, welcoming, and well-used spaces. Graffiti, vandalism, and littering in natural, outdoor spaces is less frequent than comparable vegetation-devoid spaces. There is a link between vegetation and lower crime in residential areas, particularly low-income and diverse urban neighborhoods. The presence of trees strengthens ties among neighbors, increase informal surveillance, and deter crime. By forming partnerships with community groups and schools, we foster stewardship through programming that increases creek awareness.

ATTRACT ALL

Greenways should welcome all ages and abilities. Identifying underrepresented populations is an important first step in removing barriers for equal access. An estimated 22 percent of Utah adults are living with disabilities.[86] To ensure equitable access, greenways should prioritize ADA-accessible trails, crossings, and facilities. Additionally, facilities and signage should use inclusive language and include Spanish translations. A well-defined and regionally unified system of wayfinding signage communicates routes, access to landmarks, destinations, and facilities, and increases safety. Free green spaces provide recreation, health, and fitness benefits for all income levels.

COMMUNITY | GOALS

- Program environmental education, volunteer events, and service projects to help maintain the greenways.
- Reduce physical and psychological barriers to access.
- Encourage healthy physical and mental lifestyles to improve quality-of-life and livability.
- Work with residents, community groups, developers, and government leaders to mitigate the impacts of green gentrification.
- Improve access to information about the creeks and opportunities for outdoor recreation, active transportation, and leisure.
- Create locations for community gathering, cultural events, and art to share the story of our creeks and people.

Table 7: Community opportunity area matrix

	OPPORTUNITY	TYPE	CREEK	CITY	DESCRIPTION
02	Folsom Corridor	10-Year	City	Salt Lake City	Revitalize a rail corridor into a multi-use trail and daylight City Creek, connecting east and west-side neighborhoods.
07	Sugar House	10-Year	Parleys	Salt Lake City	Culturally daylight Parleys Creek through signage and art in the Sugar House neighborhood of Salt Lake City.
13	200 E to 200 W	10-Year	Mill	South Salt Lake	Create a linear urban park along Mill Creek with trails, natural space, amenities, public art, and signage.
14	I-15 Crossing	100-Year	Mill	South Salt Lake	Create a pedestrian crossing over Interstate-15 along Mill Creek to connect recreational access and east-west communities.
17	Ivy Place Shopping Village	10-Year	Big Cottonwood	Murray	Create a trail connection along Big Cottonwood Creek, transform abandoned parking lots into green space, restore riparian habitat, create a floodplain, and add a seasonal boat ramp.

Folsom Trail construction in Salt Lake City.

Big Cottonwood Creek at Ivy Place Shopping Village in Murray.

COMMUNITY | BIG IDEA

200 EAST TO 200 WEST

In South Salt Lake, Mill Creek flows through patches of residential, industrial, and park. The stream is nearly a straight line through the city and much of the channel is reinforced with concrete—devoid of habitat value. Natural stretches of Mill Creek at Fitts Park show promise for wildlife, trails, and community amenities. West, an abandoned rail corridor and underutilized parcels along the creek present opportunity for a linear park from 200 East to 200 West. The creek should be given a larger riparian buffer and meanders re-established in the channel to improve habitat value. Daylighting Mill Creek west of Main Street would remove a barrier for wildlife and people. Green infrastructure would improve creek health, filter stormwater pollutants, and mitigate downstream flooding.

Amenities, such as bike rentals, seating, art, and interpretive signage, and trail-side development would create a unique experience. A paved mixed-use trail, and adjacent soft-surface trails, would provide opportunities to enjoy nature and learn about our hydrology. The trail would link neighborhoods to the Utah Transit Authority's Millcreek TRAX Station and a key transit corridor. Strategic areas for access would provide angling opportunities. Efforts would greatly benefit South Salt Lake, our most culturally diverse city.

Category: 10-Year
City: South Salt Lake

Typology: Utility corridor
Creeks: Mill

Stream Length: 0.6 mi.
Buried: 0.1 mi.
Impaired: 0.5 mi.

Estimated Cost: $4-8M

NEXT STEPS

- Update the *Mill Creek Trail Feasibility Study* and include an inventory of adjacent parcels to prioritize acquisition.
- Partner with Utah Transit Authority and other landowners to link trail through private properties.
- Add signage and art in the corridor, such as murals highlighting the creek, and build a brand for the Mill Creek Trail to raise awareness for the vision.
- Create a policy that requires (or incentivizes) developers contribute to goals.

Rendering of Mill Creek in South Salt Lake.

Mill Creek at Main Street in South Salt Lake.

STRATEGIES

01. Connect public and private spaces along the creek with a trail.

02. Daylight the creek and replace culverted street crossings with bridges, where feasible.

03. Increase riparian buffer, enhance the urban forest, and create access for fishing and other recreational opportunities.

OPEN CHANNEL
BURIED CHANNEL
OPPORTUNITY AREA
EXISTING TRAILS
PROPOSED TRAILS*
PARKS

*Actual trail alignment to be determined.

EXPANDING RECREATION & INCREASING WALKABILITY

Efforts are already underway to create trails and recreation opportunities along our seven creeks. Access on public lands provides attractive, safe, and comfortable places for residents of all ages and abilities to enjoy creeks and trails. Stream daylighting can increase this access. Anglers can cast a line in our urban streams and in-river recreation opportunities are possible where water depth is sufficient. Greenways support active lifestyles and encourage exercise to improve public health and quality-of-life.

DESIGN HEALTHY COMMUNITIES

The design of our communities, at all levels, affects our ability to reach the recommended 30 minutes of daily physical activity. The Centers for Disease Control and Prevention determined creating places in our communities for activity would increase those who exercise at least three times a week by 25 percent.[87] This is significant. Even small increases in activity foster measurable physical and mental health benefits.

Greenways provide access to walk, roll, and run for all ages and abilities. Facilities should be ADA-accessible whenever possible, including paved and soft-surface trails. Efforts are underway at Miller Bird Refuge and Nature Park to make the soft-surface nature trails completely ADA-accessible.

EXPAND RECREATIONAL OPPORTUNITIES

Greenways provide robust and unique outdoor recreation opportunities while making connections with family, friends, and neighbors. They provide valuable shade in hot summer months. Seasonal opportunities exist on the lower portions of Mill, Big Cottonwood, and Little Cottonwood Creeks for in-stream recreation,

Trail at Old Mill Open Space in Cottonwood Heights.

including canoeing, kayaking, and floating. This would connect into efforts on the Jordan River for a regional water trail. Opportunities also exist for paddling in ponds along our creeks, like the rentable paddle boats in Liberty Pond. Community fisheries can dot our creeks; places for residents to fish in their backyards. Additional partnerships with developments, schools, churches, and other institutions can expand the greenways network through trail connections and public access agreements.

Golf courses along our streams can provide communities with more benefits than just hitting the links, providing trails, habitat, biodiversity, and green infrastructure. Off-leash dog days at golf courses could increase the acreage of dog-friendly areas in our cities. Plans at Bonneville Golf Course include the Emigration Creek Trail Connector, a proposed trail through the course adjacent to the creek. In addition, efforts identified in the *Emigration Creek Management Plan* would improve water quality through restoration and daylighting, enhance bank stability, and increase wildlife habitat.

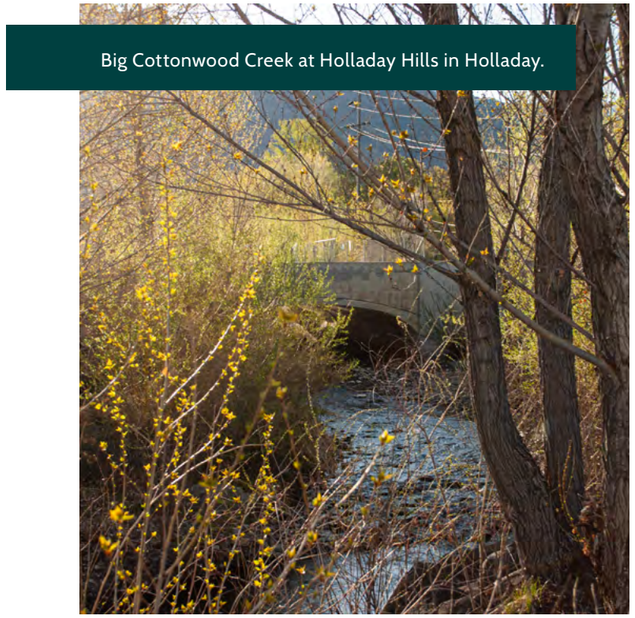
Programmed recreation can act as a gateway to outdoor recreation. According to the *Parks & Public Lands Needs Assessment*, there is a lack of reservable field space in Salt Lake City. Peak demand makes it difficult to rotate fields and let turf recover from activity. Where feasible, programmed recreation can be added to the greenways.

RECREATION | GOALS

- Promote safety through maintenance and design.
- Create unique and diverse opportunities for interaction, such as angling, water recreation, community gardening, wildlife watching, and other trail-based activities.
- Improve infrastructure and connectivity for all users, ages, and abilities—on a variety of surfaces.

Table 8: Recreation opportunity area matrix

	OPPORTUNITY	TYPE	CREEK	CITY	DESCRIPTION
03	Bonneville Shoreline Trail to Miller Park	10-Year	Red Butte	Salt Lake City	Create a trail connection between public spaces along Red Butte Creek, form partnerships with University of Utah for research, and create angling opportunities at key locations.
05	Wasatch Hollow to Westminster	10-Year	Emigration	Salt Lake City	Create a trail connection between public spaces along Emigration Creek, restore riparian habitat, and stabilize streambanks.
16	Holladay Hills to Creekside Park	10-Year	Big Cottonwood	Holladay	Create a trail connection along Big Cottonwood Creek, restore riparian habitat, create angling opportunities at key locations, and create a floodplain where feasible.
19	Wasatch Blvd to Crestwood Park	10-Year	Little Cottonwood	Cottonwood Heights, Sandy	Using public property and neighborhood by-ways, create a trail connection near Little Cottonwood Creek.



Big Cottonwood Creek at Holladay Hills in Holladay.

Emigration Creek at Allen Park in Salt Lake City.

Red Butte Creek at Miller Park in Salt Lake City.

RECREATION | BIG IDEA

WASATCH HOLLOW TO WESTMINSTER

A string of parks and open spaces exist along Emigration Creek between Wasatch Hollow and Westminster College. The 1992 *Open Space Plan* imagined a paved trail extending from the Bonneville Golf Course to Westminster College and connecting into the McClelland Trail. With Salt Lake City's recent $7.5-million acquisition of Allen Park, this vision is nearly possible.[88] There are two miles of contiguous, accessible, and preserved riparian ecosystem between Wasatch Hollow, Blaine Natural Area, Allen Park, and Westminster College. However, some private property still exists along this stretch.

Paved and soft-surface trails would link parks and recreational opportunities. Private property conflicts could be solved through access agreements or utilizing neighborhood by-ways on public rights-of-way. Riparian restoration would improve habitat value, recreate a floodplain, and remove aging and unnecessary culverts, dams, and infrastructure that impact creek health. Access at key locations would provide opportunities for engagement and angling. Bank stabilization would alleviate incised and eroding banks.

There are many community anchor institutions along this reach, including Westminster College, Garfield School, Clayton Middle, and several churches. Programming could involve them in meaningful, on-the-ground activities to improve our creeks. In addition, Allen Park serves as a community destination along the corridor. With Salt Lake City's acquisition, the property was saved from development. Partners are working on a plan to reimagine this unique location as a community amenity. Restoration of Emigration Creek and a series of trails could provide a means to appreciate the creek, discover the many artworks, and learn about the legacy of Dr. George Allen and his family.

Category: 10-Year
City: Salt Lake City

Typology: Parks, open space
Creeks: Emigration

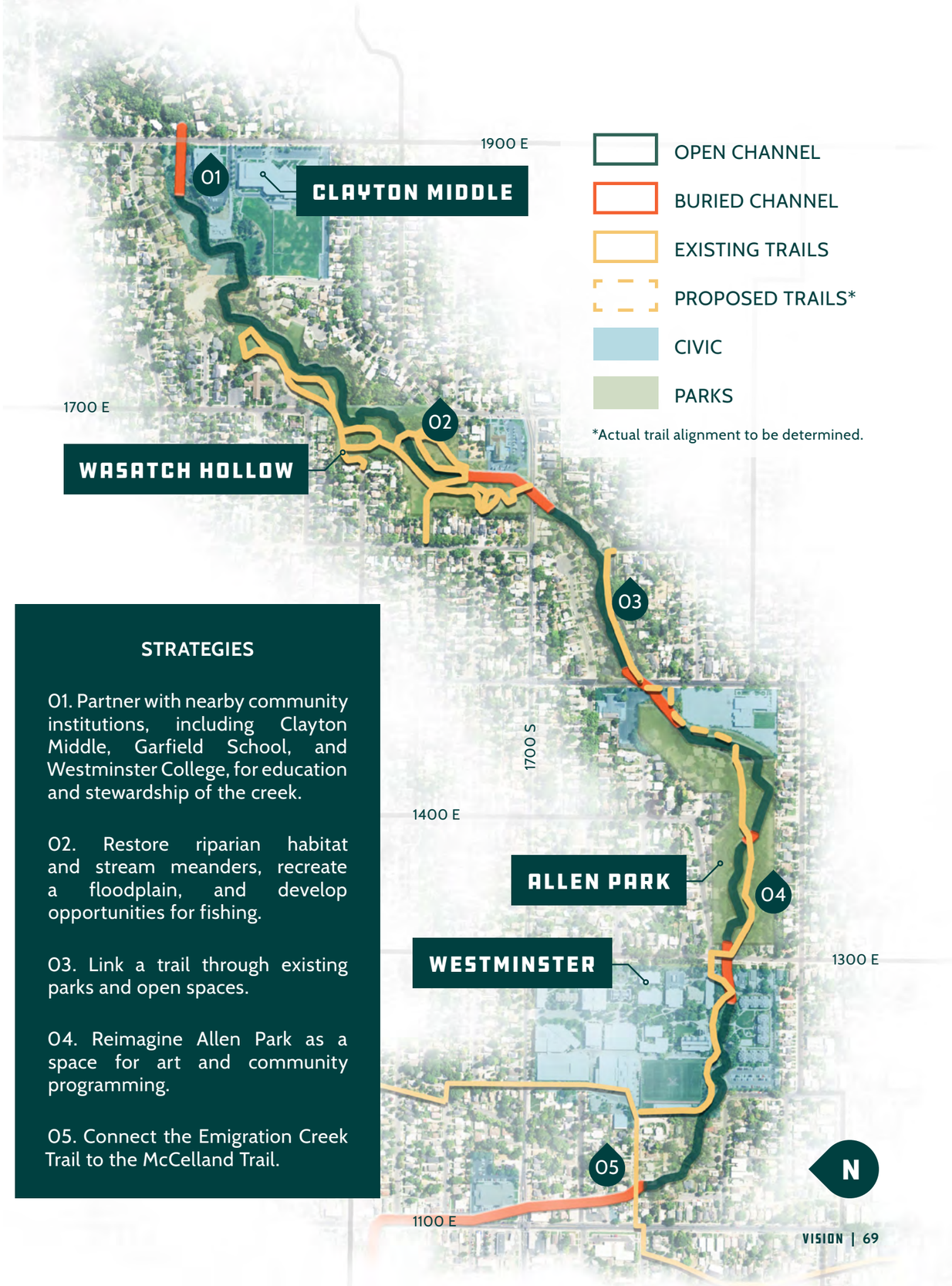
Stream Length: 1.8 mi.
Buried: 0.4 mi.
Impaired: 1.4 mi.

Estimated Cost: $8-12M

Emigration Creek at Wasatch Hollow in Salt Lake City.

NEXT STEPS

- Inventory parcels adjacent to the corridor to prioritize purchase of properties or easements to facilitate goals.
- Meet with willing landowners to discuss the vision and facilitate partnerships.
- Design and implement goals on public lands, utilizing neighborhood by-ways for on-street connections.
- Implement wayfinding signage to demarcate the trail and build a brand for the Emigration Creek Trail to build support for further connections.



STRATEGIES

01. Partner with nearby community institutions, including Clayton Middle, Garfield School, and Westminster College, for education and stewardship of the creek.

02. Restore riparian habitat and stream meanders, recreate a floodplain, and develop opportunities for fishing.

03. Link a trail through existing parks and open spaces.

04. Reimagine Allen Park as a space for art and community programming.

05. Connect the Emigration Creek Trail to the McCelland Trail.

ACTIVATING & CONNECTING OUR URBAN AREAS

The Salt Lake Valley and our cities are experiencing tremendous growth, an additional 600,000 people by 2065.[89] As urbanization continues, our creek corridors are increasingly important areas for connection, activity, recreation, entertainment, and solitude. Greenways sell homes, increase property values and business revenues, and improve quality-of-life. Developments along the greenways, where appropriate, can help build the system through trail creation, stream restoration, and daylighting.

CONNECT REGIONAL SYSTEMS

Greenways strengthen community connections by providing buffered, safe, and beautiful space for leisure, commuting, and running errands—on wheels or by foot. Increasingly, relocation decisions for professionals are based on quality-of-life considerations, such as robust active transportation networks and greenways.

Greenways, active transportation, and public transit networks connect underrepresented residents to jobs, services, entertainment, and recreation. First-mile last-mile gaps are barriers in transit that discourage ridership because stations and stops cannot be accessed from home, work, or other destinations. Greenways should prioritize connections between transit and destinations to fill critical gaps in the regional network.

INTEGRATE GOALS IN DEVELOPMENTS

Trail-oriented developments fulfill the desire of residents and businesses to live and locate along waterways and greenways. They bring density to corridors and offer amenities beyond the norm, such as bicycle storage, workrooms, rentals, and shower/locker facilities. They serve as an important tool in implementation, especially in urban areas where land is scarce and expensive. Developers should be incentivized to uncover and restore creeks and build publicly accessible trails and other recreation opportunities as amenities for tenants and to improve property value. Ordinances, overlay zones, or other strategies can be used to require they assist in implementing goals.

Privately-owned public spaces are important for implementation of greenways. Through partnerships with landowners, access has been granted in formal or informal agreements. Corporate centers, commercial areas, and large apartment complexes can provide access on private property for its tenants and other users. Additionally, churches, schools, and other institutions, situated along our creeks, can serve as additional points of access and connectivity.

ENSURE EQUITY

Residents from communities in which efforts would benefit should be involved in projects. Highly visible daylighting and restoration projects increase community consciousness about our streams. A knowledgeable community likely supports restoration and stewardship. At the design stage, community members should be involved in deciding which amenities the greenways provide. During implementation, particular emphasis should be given to involve local community members. Greenways create jobs in plumbing, landscaping, engineering, building, and design. Conservation corps and other entry-level jobs build capacity and technical expertise for residents. Efforts can lead to fulfilling careers in improving neighborhood health and resiliency. After completion, communities should be engaged in programming, activation, and works of art featured in the corridors.

URBAN | GOALS

- Create opportunities for connection at civic, commercial, and recreation activation points to increase awareness and enjoyment of our creeks.
- Reclaim underutilized land to connect the greenways and create stream-side amenities.
- Improve air quality and minimize heat island effects by increasing the urban forest, stream restoration, and daylighting.
- Incentivize developers to help build the greenways through creation of trails, open space, stream restoration, and daylighting.
- Increase connectivity between active transportation networks, public transit, and the greenways.

Table 9: Urban opportunity area matrix

	OPPORTUNITY	TYPE	CREEK	CITY	DESCRIPTION
08	Ballpark	100-Year	Red Butte, Emigration, Parleys	Salt Lake City	Daylight Red Butte, Emigration, and Parleys creeks and increase the urban forest as Salt Lake City's Ballpark neighborhood experiences growth and redevelops.
11	3300 S 700 E	10-Year	Mill	South Salt Lake	During redevelopment of the shopping center, daylight Mill Creek, add a trail connection, and create a public amenity.
20	Fort Union to Wheeler Farm	100-Year	Little Cottonwood	Cottonwood Heights, Midvale, Murray	Create a trail connection along Little Cottonwood Creek (over Interstate-215), daylight the creek, and implement green infrastructure to improve water quality and connect communities.
21	Murray Park to Jordan River Trail	100-Year	Little Cottonwood	Murray	Create a trail connection along Little Cottonwood Creek, add seasonal boat ramps, restore riparian habitat, and create a floodplain in parks and redevelopment areas.

Little Cottonwood Creek at Wheeler Farm in Murray.

Little Cottonwood Creek at Murray Park in Murray.

URBAN | BIG IDEA

FORT UNION TO WHEELER FARM

Fort Union features a major commercial node in the heart of the Salt Lake Valley. The urban-style high-rise development and suburban-style mall features a natural stretch of Little Cottonwood Creek. With no trail, little programmed space along the creek, and adjacent large surface parking lots, the creek is undervalued and degraded.

Paved and soft-surface trails along the creek would promote healthy lifestyles and increase active transportation connections in an environment dominated by automobiles. They would connect Fort Union to surrounding neighborhoods and, with a connection over the barrier created by Interstate-215, to Wheeler Farm.

More space allotted to the creek, riparian buffer, and floodplain would improve habitat value and flood mitigation. Unused parking lots could be transformed into additional park space. Green infrastructure, such as bio-swales along large parking lots and permeable pavement, would prevent urban runoff from entering the creek and filter out pollutants. Culverts that impact creek health should be replaced with bridges, whenever feasible.

Gathering spaces and outdoor dining areas, overlooking the creek, would provide amenities for visitors and tenants. Amenities, such as interpretive signage, nature play areas, and entertainment spaces, would create unique experiences to transform the center into a multi-use destination and community asset.

Category:	100-Year
City:	Cottonwood Heights, Midvale, Murray
Typology:	Urban, commercial
Creeks:	Little Cottonwood
Stream Length:	1.9 mi.
Buried:	0.2 mi.
Impaired:	1.7 mi.
Estimated Cost:	$5-10M

Little Cottonwood Creek at Fort Union in Midvale.

NEXT STEPS

- Inventory parcels adjacent to the corridor to prioritize purchase of properties or easements to facilitate goals.
- Meet with the Utah Department of Transportation and other willing landowners to discuss the vision and facilitate partnerships.
- Create a policy that requires (or incentivizes) developers contribute to goals.

Rendering of Little Cottonwood Creek at Fort Union in Midvale.

STRATEGIES

01. Create a trail connection and daylight Little Cottonwood Creek on the existing Interstate-215 overpass to connect neighborhoods and the Shops at Fort Union to Wheeler Farm.

02. Turn extra parking lots into green space with riparian habitat, restore the floodplain and channel meanders, and integrate green infrastructure, such as bioswales and permeable paving.

CASE STUDY

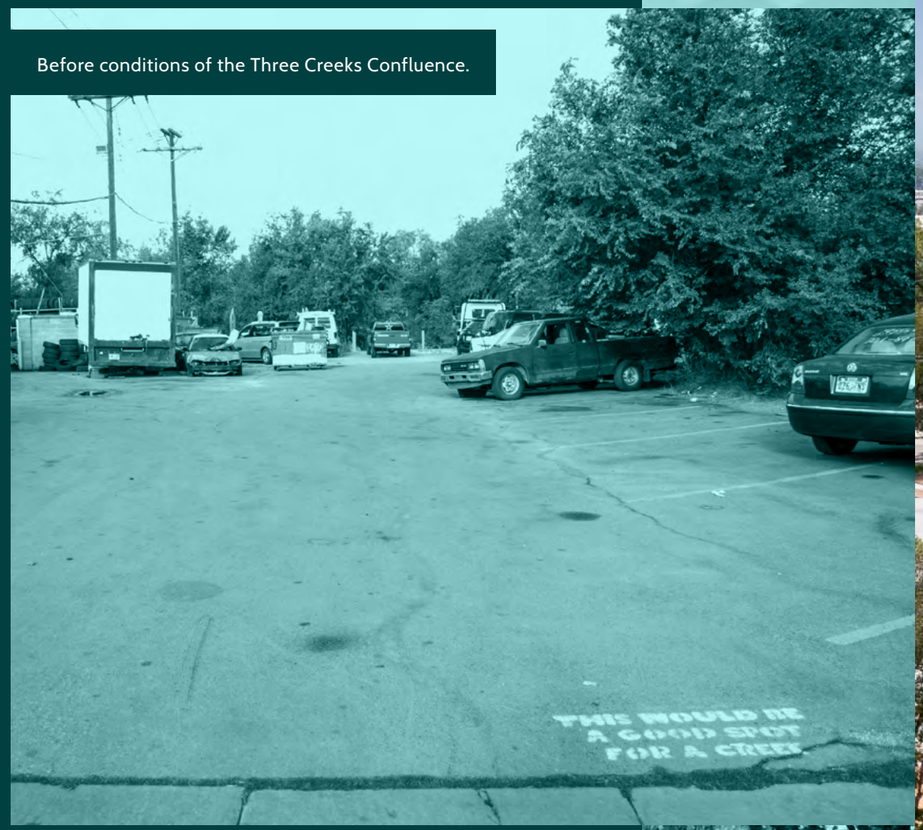
THREE CREEKS CONFLUENCE

In 2014, a group of University of Utah students imagined an ambitious vision, *100 Years of Daylighting* (2015 Utah American Planning Association Achievement Award recipient). This work became the foundation for the Seven Canyons Trust. Starting with City Creek, students traced each of Salt Lake County's seven major creeks from the headwaters in the Wasatch to their confluence with the Jordan River. It was realized that three of these creeks—Red Butte, Emigration, and Parleys—spilled out at the same location: 1300 South and 900 West in Salt Lake City.

Sandwiched between an auto shop and half-burnt home, the initial visit revealed a degraded site. The area was paved over with a dead-end segment of 1300 South—weeds, garbage, and encroachments abound. Back in the classroom, renderings and site plans were created to demonstrate the location's potential. Highlighted as the centerpiece of *100 Years of Daylighting*, the Three Creeks Confluence was thus conceived.

In 2021, approximately 200 feet of creek was uncovered at the Three Creeks Confluence. The delta shape slows down water, spreads it out, and allows it to soak into the ground. It can accommodate up to 500-year floods. A low-flow channel conveys baseflows through much of the year. A new eddy allows boaters an opportunity to rest, relax, and enjoy the creeks. It serves as an alternative put-in/take-out along the Jordan River Water Trail.

The east-west bridge connects the site to the Jordan River Trail. It serves as a gateway for nearby community anchor institutions and the surrounding neighborhood to the Jordan River and a 120-mile trail system across the Wasatch Front. The north-south bridge provides opportunity for anglers to toss a line in at one of the most popular fishing holes along the Jordan. It doubles as a community art installation, featuring twenty unique pieces designed by local west-side artists. The laser-cut steel panels depict Salt Lake City's waterways, riparian wildlife, and the Glendale neighborhood. The plaza provides a venue for relaxation, education, and celebration. A nature play space salvaged trees from 2020's windstorm into a creative, fun area for children. In 2017, the Three Creeks Confluence received an *Achievement Award* from the Utah American Planning Association.



Before conditions of the Three Creeks Confluence.

The completed Three Creeks Confluence in Salt Lake City. Courtesy of Salt Lake Tribune.

QUICK FACTS

Location:	Salt Lake City
Cost:	$3M
Year:	2021
Best Practices:	Stream daylighting, green infrastructure
Stream Length:	200 ft.

Youth chalk overtop an underground creek in Salt Lake City.

In This Section:

- Best Practices
- Design
- Policy
- Funding
- Partnerships

TOOLBOX

The toolbox guides municipalities, land managers, and organizations in the creation of the seven greenways, including design guidelines, best management practices, policies, funding, and partnerships. Examples included offer a range of options to address the varying conditions along each corridor.

OUR URBAN CREEKS HAVE THE POTENTIAL TO BECOME AN EQUITABLE, INNOVATIVE, AND RESILIENT SYSTEM OF GREENWAY CORRIDORS.

BEST MANAGEMENT PRACTICES

The following section identifies the best practices available today for creek management. While not an exhaustive list, ideas should motivate further research into specifics that meet the goals established by your project.

STREAM RESTORATION

A century of taming and tapping our urban creeks left them in a degraded condition. Industry and development polluted water quality. Creeks were channelized to control flooding. Banks steepened and eroded. Dams and aging infrastructure eliminate fish passage, disjoined wildlife corridors, and reduced access.

Stream restoration aims to improve the flows, quality, and health of a waterway and riparian ecosystem. Efforts improve water quality through plantings, bank stabilization, and other green infrastructure. Restoration recreates channel meanders, removes dams, and replaces aging infrastructure. Inclusion or reconnection of a floodplain reduces water velocities to decrease erosion and mitigates flooding.

STREAM DAYLIGHTING

In the early 20th century, as urbanization gripped the Salt Lake Valley, creeks gave way to concrete and asphalt, bricks and mortar. Waterways were diverted from aboveground channels into stormwater pipes underneath our neighborhoods.

Stream daylighting uncovers a stream previously buried in a pipe or a culvert, bringing it back to the surface and restoring its natural stream channel—or to the most natural state possible. Benefits are abundant, including water and air quality improvements, flood mitigation, habitat creation, economic benefit, expanded recreational opportunities, and more. Other forms of daylighting include architectural and cultural. Architectural daylighting brings a stream to the surface in an engineered channel, characterized by a concrete streambed and banks. Whereas, cultural daylighting celebrates a buried stream through markers or public art to showcase its historic path.

Natural Daylighting | Architectural Daylighting | Cultural Daylighting

GREEN INFRASTRUCTURE

Green infrastructure is a cost-effective, resilient tool to manage water in our cities.

Bioswales

Shallow depressions filled with vegetation and rock that contain stormwater and runoff, allowing water to infiltrate into the ground and filter pollutants before reaching waterways. Groundwater is an increasingly important drinking water source with climate change uncertainty. Swales reduce pressure on the stormwater system. Plantings can be chosen for habitat value and highlight those found along our creeks. Swales should be implemented at stormwater outlets along our creeks.

Permeable Paving

Materials that allow stormwater to percolate through and filter into the groundwater, rather than run off the surface. This reduces flash flooding in our creeks by retaining stormwater on-site. Parking lots and impervious surfaces near our creeks should be shifted to permeable paving.

STABILIZATION

Streambank stabilization reduces erosion and excess sedimentation of our creeks. Efforts should utilize natural methodology, such as bioengineering, to stabilize banks through plantings and root material that hold soil in place. This also provides habitat along the banks and in-stream.

Slopes should be kept at two-to-one. This ensures people can easily escape the channel in dangerous situations. For incised creeks, retaining walls outside the floodplain can reduce elevation. Then, banks stabilized from the wall to the annual high-water level.

If conventional, hardening approaches are deemed necessary, natural rock with desirable plant materials, such as willow and cottonwood, between the rock should be used. This is a safe, aesthetically pleasing approach that provides habitat, when compared to concrete, gabion baskets, or other rip-rap.

RIPARIAN BUFFERS

Riparian buffers are important to mitigate polluted urban runoff from entering our creeks. Vegetation acts as a barrier, soaking up excess nutrients, especially in locations nearby turf grass in parks, golf courses, and residential lawns. In some areas, creeks are used to create man-made ponds, such as Liberty Pond. Naturalizing pond edges with wetland vegetation improves habitat value, while managing runoff and improving water quality. Buffers are also a simple and effective strategy homeowners can implement to steward our creeks.

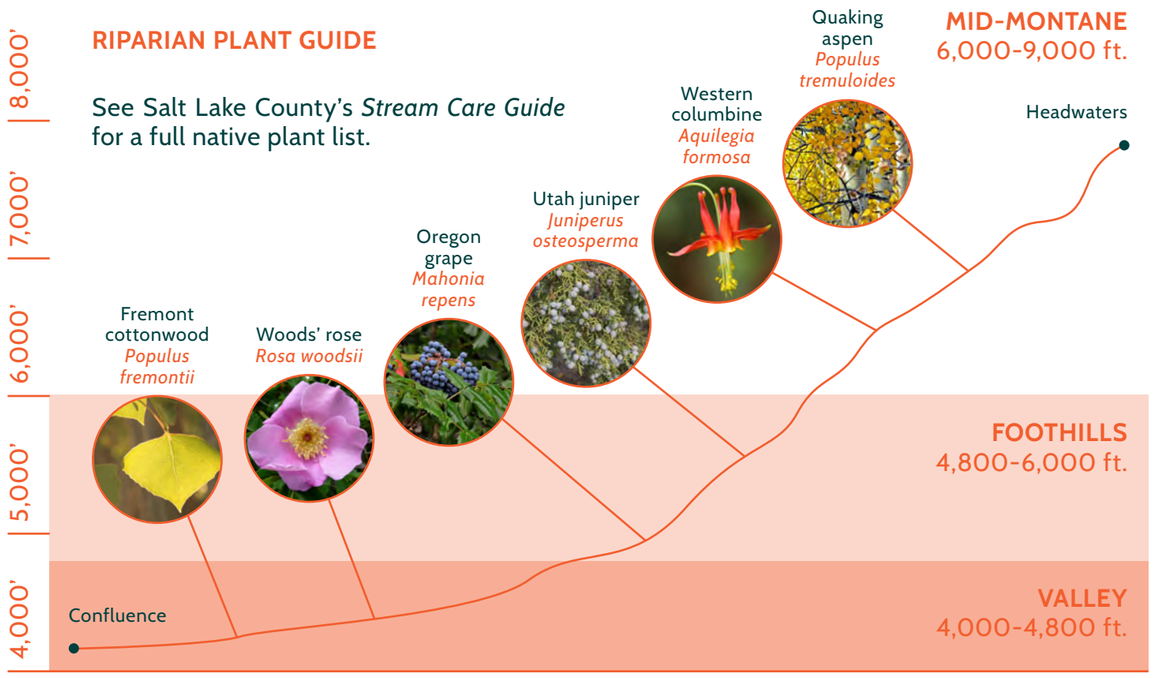
WILDLIFE CORRIDORS

Emphasis should be placed on lateral habitat connectivity to create wildlife corridors along our creeks. Infrastructure, such as culverts, buried streams, and dams, should be replaced to improve connectivity. Bridges should be used for stream crossings whenever possible. They provide the lowest impact to hydrology and connectivity and have low maintenance needs. If deemed not possible, open-bottom culverts—with a natural creek bed—can be used for crossing. The width of the culvert should extend out to the full channel width, providing adequate space for the surface water, banks, and adjacent floodplain.

Stream daylighting eliminates buried creeks. Aging infrastructure, such as dams, that is no longer in use should be removed and the creek restored. This improves sediment transport, water quality, and habitat value. Dams that are deemed necessary should be redesigned to limit wildlife disturbance, such as utilizing fish ladders. Operations should also be improved, such as increasing releases at strategic times or during low flow.

RIPARIAN PLANT GUIDE

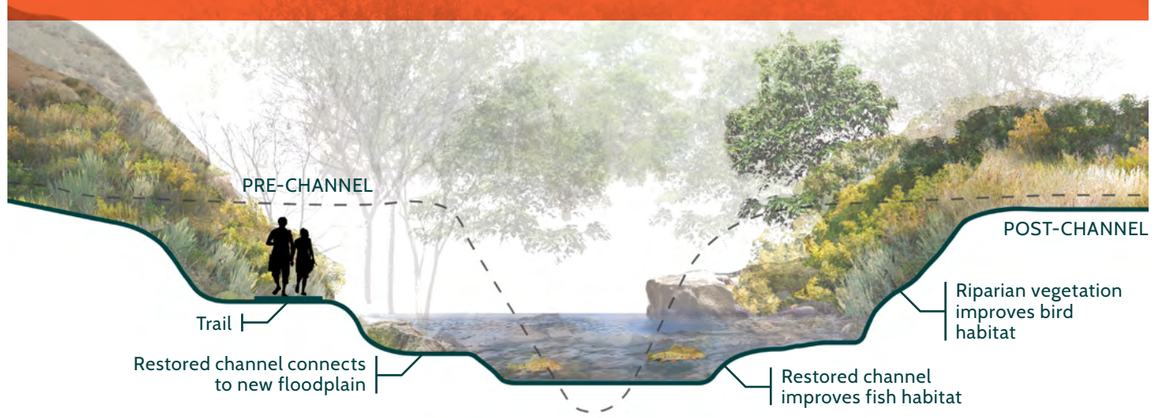
See Salt Lake County's *Stream Care Guide* for a full native plant list.



FLOODPLAINS

Insurance costs can burden low-income residents living in flood hazard areas. Additionally, they are often less able to rebuild or relocate after disasters. Residents that rent properties within hazard areas are not required to buy flood insurance but are at no less risk. The Federal Emergency Management Agency determined that 51 percent of the non-policyholder households in flood hazard areas are low-income.[90]

Existing parks, open spaces, and golf courses are excellent areas to recreate floodplains. Floodplain creation should include riparian vegetation restoration, wetland creation, channel remeandering, and streambank stabilization, where feasible. In urban areas, floodplain creation can be more challenging. Surface parking lots and underutilized or vacant parcels provide opportunities to implement these practices.



WETLANDS

Wetlands are habitats where standing water is at or near the surface for all or a portion of the year. They support critical habitat for aquatic and terrestrial species, improve water quality through nutrient uptake, mitigate flooding by containing and holding high flows, and promote groundwater infiltration. Existing wetlands should always be protected from disturbance. They are also opportunities for targeted restoration to improve habitat value and increase wetland size. In conjunction with floodplain creation, wetlands can add additional habitat value and water quality benefits at existing parks, open spaces, and golf courses or replace underutilized surface parking lots and other parcels along our creeks.

URBAN FOREST

Existing urban forests should be protected and maintained whenever possible. If trees are removed, the urban tree canopy should be replaced two-fold. A diversity of species, age, and size will create a more resilient ecosystem in the face of growing urban pressures and climate change uncertainty. Municipalities should consider ordinances or other policy tools to preserve existing urban forests and encourage planting along our creeks. Holladay implemented a tree preservation ordinance to protect the existing urban forest and require replacement of protected trees that are removed.

In Salt Lake City, the urban forest consists of

an estimated 85,000 public trees—63,000 on streets and 22,000 in parks and open spaces.[91] The City's 1,000 Trees Campaign promises to deliver 1,000 trees to the urban forest every year. It focuses efforts on the City's west-side where tree canopy is lowest and air quality worst. The effort took on greater importance when hurricane-force winds tore through the Salt Lake Valley in September 2020, knocking down thousands of trees county-wide.

ACCESS & CONNECTION

Access to our greenways is currently focused on existing public lands, such as parks, natural areas, and open space. Private property complicates access. However, access has been granted in formal or informal agreements through partnerships with landowners, especially near commercial and civic activation points.

For example, a trail winds along Big Cottonwood Creek through the Cottonwood and Old Mill Corporate Centers. The landowner donated rights-of-way as a means for tenants to access the creek and recreation opportunities. The trail connects the city of Cottonwood Heights, the Old Mill Open Space, and the mouth of the Big Cottonwood Canyon underneath Interstate-215 to Knudsen Park and Holladay.

Schools, churches, and other community institutions create additional quasi-public private space for the greenways. For example, access agreements, with Bonneville First Ward, have extended the Miller Bird Refugee and Nature Park into Bonneville Glen along Red Butte Creek to create access on both sides of the park.

Neighborhood connections provide the most critical access points for our greenways. Networks of sidewalks and bike lanes from all stream-side communities should lead safely to the creek corridors. When private property prevents passage on the greenways, neighborhood byways can be used to circumvent, especially in the short-term, as access agreements or acquisition fill gaps in the system.

Signage and pavement markings can make connections easy for users. Paved trails, bridges, ramps, and overlooks along our greenways should be made ADA accessible. Non-paved trails should limit steep grades, steps, and mitigate barriers, such as excessive roots or large rocks.

IN-STREAM RECREATION

Our creeks provide unique opportunities for swimming, wading, fishing, paddling, and floating, where feasible. Long-time residents of the Salt Lake Valley have fond memories of visiting swimming holes along our creeks to escape the summertime heat. Channelization, lack of access, and water quality concerns have diminished the safety and interest in these activities.

At the Little Confluence Trailhead in Taylorsville, where Little Cottonwood Creek meets the Jordan River, a boat ramp was constructed with a turnaround for vehicles pulling trailers. Paddlers can travel upstream on Little Cottonwood Creek until culverts, street crossings, or dams turn them around. Elsewhere at the site, a soft-surface trail winds through a restored cottonwood grove.

Angler on Big Cottonwood Creek.

The Utah Division of Wildlife Resources is committed to creating more community fisheries; places where youth, families, and community members can walk, bike, or ride transit to catch a fish. For example, Fairmont Pond in Salt Lake City was dredged and turned into a community fishery in 2018. Rainbow trout were stocked and elevated boardwalks and walkways circle the pond. Several springs feeding the pond were uncovered and restored. New vegetation provides habitat and improves water quality. Additional community fisheries dot the Jordan River.

MAINTENANCE

Maintenance is intricately linked to making greenways feel well cared for and safe. Regular maintenance, such as trash removal, weeding, landscaping, sweeping, and long-term repairs, are essential to a functional user experience. Greenways designed with intention provide community identity and pride.

Volunteers can assist municipalities with the upkeep of corridors, while developing long-term stewardship. Municipal-run volunteer programs fill maintenance gaps. Additionally, municipalities should consider financial support for community-based organizations who run robust volunteer programs. This can fill additional gaps in maintenance and upkeep of the greenways.

UNSHELTERED HOMELESSNESS

Conventional mitigation strategies for unsheltered homelessness often have the opposite effect. They increase dependency on parks for residency with displacement and loss of belongings. Housing can take longer than six months to secure.[92] A comprehensive strategy to address unsheltered homeless in our greenways is essentially to ensuring safety of all users—sheltered or not. Limiting clean-up of camps and longer posting times would mitigate loss of belongings. Helping individuals get access to services or having service providers respond to public complaints would address the underlying reasons of homelessness.

Efforts are underway to provide resources and facilities for unsheltered people. Practitioners along Red Butte Creek are exploring platforms that could serve as unsanctioned campgrounds. To provide bathrooms facilities for those experiencing homelessness, park managers are developing easily cleanable portable toilets housed within established framed outhouses. Showers can be an added amenity to support transitions into finding employment and housing.

DOG PARKS

In a survey identifying strategies to mitigate impacts of dog parks on our streams, almost half of respondents agree with more enforcement and fines for not following off-leash regulations.[93] High dog use areas should be constructed away from buffer zones used to protect sensitive areas. Access should only be given at controlled points. Seasonal closures should be considered for nesting, breeding, and rearing of wildlife.

Regulations should be posted prominently at dog parks and on applicable websites. Phone numbers for enforcement should be posted prominently underneath regulations. Volunteer and community groups can assist with clean-up of dog parks and education around regulations. Finally, a fee forfeiture schedule, similar to parking tickets, could offer an alternative to criminal prosecution when taking enforcement action.

At Parleys Historic Nature Park, restoration efforts worked to mitigate the impacts of dogs and protect Parleys Creek. The riparian corridor was closed off except at designated access points. Educational signage and periodic enforcement further decreased negative impacts.

DESIGN GUIDELINES

TRAILS

Multiple uses, abilities, and scales must be accommodated by our trails. Community feedback expressed a desire for different types of surfaces to accommodate multiple recreational uses. Soft-surface trails were prioritized over paved surfaces. This may be due to the current lack of these types of facilities along our creeks.

Regional trails are important to the active transportation network, connecting municipalities and major community and recreational nodes. They are ideally ten to 15 feet wide to allow for heavy two-way travel. The paved trail can be accompanied with a two to five foot soft-surface edge to allow for multiple uses. Concrete is most desirable because it is longest lasting and has low maintenance needs. All paved trails should be ADA accessible.

Soft-surface trails can spur off main paved trails to accommodate walkers, runners, and equestrians that desire a softer trail surface. Trails should be six to ten feet wide. Crushed stone is a popular surface as it is affordable, durable, ADA compliant, and compliments the surrounding environment. Edging along trails can hold crushed stone in place, so it does not erode into adjacent creeks. Soft-surface trails should be made ADA accessible wherever possible.

Unpaved trails for hiking and/or mountain biking are appropriate on uneven terrain that does not require ADA access. They should only be considered for our greenways after a paved trail has already been included. Widths can be one to three feet depending on use. Trails should be defined by compacting soil and using rocks or branches to line edges. Social trails should be eliminated by stick piles or rerouting to eliminate erosion and preserve habitat quality.

Big Cottonwood Trail at Old Mill in Cottonwood Heights.

When trails pass through environmentally sensitive areas, vegetative buffers and spilt rail fencing prohibit access, screen wildlife, and protect habitat. In residential areas, fencing and vegetative screening protect privacy for adjacent properties.

Trailheads serve as primary access points. They should be visible, informative, and easily accessible. Signage should feature regional trail connectivity. Restrooms, waste disposal, and parking should be accommodated whenever possible.

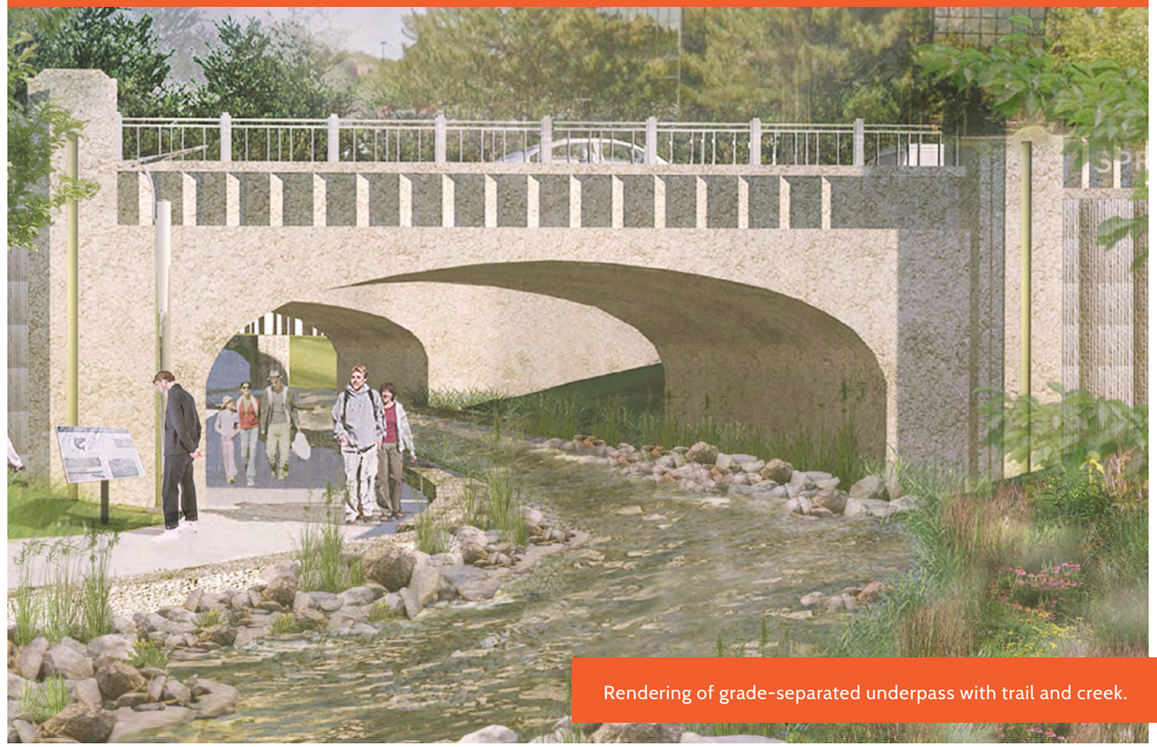
SIGNAGE

Wayfinding signage breaks down barriers and improves access to the greenways and destinations. Directional signs, street crossings, and mile markers provide users with knowledge of where they are. Unified branding and graphics create a cohesive experience that transcends municipal boundaries. Emergency location markers, at regular lengths along the trail, help emergency services provide quick care. Regional trails maps should be incorporated into trailhead signage. Interpretive signage educates users about the benefits of our creeks and promotes stewardship of the greenways. They share the stories of significant places and people connected to the creeks throughout our history. All signs should be multi-lingual to promote inclusivity for all community members.

CROSSINGS

Safe and comfortable road crossings are critical to user experience. Crossings can be significant physical or perceived barriers for users. Whenever possible, grade-separated crossings are preferred. They minimize conflicts with traffic and provide a continuous pathway for recreation activities. Crossings of any type provide an opportunity to integrate art, placemaking, and signage.

Underpasses can be integrated into existing creek crossings beneath roads. Bridges easily accommodate trails underneath. Open-bottom culverts can be widened to feature both a trail and creek. In high flows, these culverts can flood out to provide additional capacity. Overpasses create grade-separated connectivity whenever underpasses are not feasible. However, they may require stairs or steep ramps that prohibit easy ADA accessibility and bike usage. At-grade crossings are the least desirable. If used, they should be safe and comfortable to preserve positive user experience. Pedestrian hybrid beacons, such as a HAWK beacon, should be used. They make for quick and comfortable crossings by stopping traffic and prioritizing users. Rapid flashing beacons can be used for less frequented crossings. However, they do not stop traffic and can be harder to see for vehicles. Crosswalks can feature painted artistic designs to slow vehicles. Crossing should also be combined with other street design elements, such as bump outs, lane narrowing, and mid-street refuges.



Rendering of grade-separated underpass with trail and creek.

ART & PLACEMAKING

Our creeks can be culturally daylighted through art and placemaking. Cultural daylighting creates connectivity and brings awareness of our buried creeks to the collective consciousness. Temporary opportunities can be achieved through tactical urbanism—low-cost, short-term projects to catalyze long-term change.

Paint can challenge passersby to think about our buried creeks. For example, community members assisted in painting a stream over buried creeks in the Glendale neighborhood of Salt Lake City. A series of prompts, starting with "This would be a good spot for a creek," guided users along the painted stream. For a more permanent solution, concrete could be used to represent the underground creeks. One idea is to pour concrete into a meandering channel design, coloring it a different shade to stand out. Prompts, depicting the creek names, could be pushed into the concrete. Thermoplastic markings could also be used for more intricate designs, such as logos, graphics, poetry, or narratives.

Murals along our greenways can highlight community connection to our hydrology. Stormdrain murals highlight stormwater infrastructure that empty into our creeks. Temporary or permanent installations are another way to draw attention to our creeks. They are a great opportunity for community engagement. For example, wooden fish—painted by community members—can be affixed to fences or other structures following the path of our creeks. A piece near the Three Creeks Confluence used three bridges to represent the underground waters of Red Butte, Emigration, and Parleys Creeks flowing on the west-side of Salt Lake City. Effort should be made to engage artists within the community the piece is placed.

Site features, such as benches or lighting, can be colored to stand out and depict the creek names, especially in areas with underground creeks. In the short-term, fountains can bring creek water to the surface to allow residents the opportunity to enjoy the water. Another idea is to put a pipe down into the culvert to listen to the running water underneath. Creative art and placemaking elements activate the greenways and creating engaging spaces that reflect nature and community.

Laser-cut community designs on bridge at Three Creeks Confluence in Salt Lake City.

SAFETY

Our communities are grappling with designing parks and open space for safety, while balancing goals for access, habitat, and water quality. Crime Prevention through Environmental Design is a recognized standard for approaching safety in the public realm. The principles include natural surveillance and space management. Greenways should aim for a constant stream of users at all times of the day to help with community surveillance. Night-time use, such as evening destinations along the trail, can go a long way towards deterring crime. Spaces should be attractive and well maintained. By engaging residents in the design of spaces, people feel more ownership over them. All design principles should be balanced with restoration goals and habitat value.

AMENITIES

Comfortable and engaging experiences create memories and future stewards of our greenways. Amenities are critical in forming those experiences. They help users plan outings by knowing what will be available. Amenities should be prioritized based on a high to low need and high to low cost. High need amenities should be considered for each space along our greenways; low may be characterized by one or two per greenway or city. Consistent materials and color palettes build a cohesive branding for the greenways.

Table 10: Priority for greenway amenities

AMENITY	COST	PRIORITY
Bicycle racks	Low	High
Nature play spaces	Low	High
Interpretative and wayfinding signage	Low	High
Trash and recycling bins	Low	High
Seating and gathering spaces	Low	High
Pet waste stations	Low	High
Bathrooms	Medium	High
Living laboratories and outdoor classrooms	Medium	Medium
Outdoor exercise equipment	Medium	Medium
Pavilions and gazebos	Medium	Medium
Traditional playgrounds	Medium	Medium
Play fields	Medium	Low
Equipment rental stations (bikes, kayaks, paddleboards, etc.)	High	Low
Golf or frisbee golf courses	High	Low
Stages and amphitheaters	High	Low

LIGHTING

Lighting can increase the sense of comfort during evenings, reduce crashes and falls due to uneven paving, and prevent collisions with other users and objects. However, it also increases light pollution and negatively impacts wildlife. To prevent impacts, lighting should be limited to key locations (parking lots, trailheads, plaza and gathering spaces, and other access points), trail crossings and along streets, on signage, and at bridges, underpasses, and overpasses. Dark sky compliant fixtures limit light pollution and buffer glare to adjacent residences. To address concerns, many facilities close after sundown, limiting their utility to trail users. With proper lighting at key locations, hours of operation can be extended. Lighting should be paired with educational efforts about bike lights, headlamps, and bright or reflective clothing for users.

If lighting is deemed necessary along a stretch of trail, low-level bollards can be used to cast just enough light. Lighting can be turned on mornings from 5AM to sunrise and evenings from sunset to 11PM to promote commuting and recreation. Lighting should be placed 100 feet apart, depending on the curves of the path. Solar and battery-powered options are the preferred option. They limit energy use and maintenance needs. In environmentally sensitive areas, lighting should not be installed.

FUNDING

Greenway implementation will require significant funding and alignment of resources. Sources are categorized by private, local, state, and federal and should be targeted based on the specific goals of each source. Greenways feature a number of different elements, including art and placemaking, playgrounds and play fields, park amenities, trails, and more. Creativity in funding sources for the different elements can improve effectiveness.

PRIVATE

Private sources provide the greatest amount of flexibility and creativity in approach. Funds can be attained in countless ways. Many community foundations, nonprofits, and corporations provide grants for trails, open space, waterways, community development, and public health. Start with local community foundations and nonprofits, as well as corporations with headquarters nearby, then branch out. Land trusts, such as Utah Open Lands, provide an intermediary between cities and private landowners to negotiate acquisition of conservation easements or other strategies. To raise funds from community members, sections of trail or adjacent amenities can be sponsored, such as benches, trees, plazas, or buildings.

LOCAL

The most common source is at the municipal and county-level. Funds may be from a municipalities' general fund or a specific department. They could be included in a capital improvement project budget. Or, a portion of sales tax set aside for greenways development.

Bonds can be used to raise significant funds. Like any campaign, you need strong community support, participation from elected officials, and hard work. Approved by voters in 2016, Salt Lake County successfully issued $90 million in bonds to build new parks, trails, and recreational facilities, as well as to renovate and improve existing facilities—many along our creeks.

Impact fees are a one-time charge imposed by municipalities to mitigate the impact on infrastructure caused by new development. They are a promising source to implement our greenways. For example, impact fees were a major funding source for the Three Creeks Confluence in Salt Lake City.

Tax-increment financing is a tool for municipalities to incentivize development in established areas. For example, tax increment dollars generate by developments within a buffer of our creeks could be collected and put towards implementation of the greenways. This would further increase property values and, thus, revenues for further efforts.

Potential local assistance ideas:

- Community Development Block Grant Program
- Salt Lake County's Zoo, Arts & Parks Program
- Wasatch Front Regional Council's Congestion Mitigation and Air Quality Program and Transportation and Land Use Connection Program

STATE

Funding for greenways from the State of Utah is administered through many state programs.

Potential state assistance ideas:

- Utah Office of Outdoor Recreation's Utah Outdoor Recreation Grant
- Utah State Parks' Land and Water Conservation Fund, Recreational Trails Program, Boater Access Grant, and Outdoor Recreation Legacy Partnership
- Utah Quality Growth Commission's LeRay McAllister Critical Land Conservation Fund
- Utah Division of Water Quality's Section 319
- Utah's Watershed Restoration Initiative
- Utah Department of Agriculture and Food's Invasive Species Mitigation Weed Control Grant

FEDERAL

Sources from federal programs often have the highest revenue potential but can be burdensome, competitive applications. Some federal sources may require an environmental impact statement, which can complicate processes and increase expense.

Potential federal assistance ideas:

- Environmental Protection Agency's Urban Waters Federal Partnership, Five Star and Urban Waters Restoration Grant, and Superfund and Brownfields Program
- National Park Service's Rivers, Trails and Conservation Assistance Program
- National Endowment for the Arts' Our Town

MODEL PROJECT BUDGET

The following budget can help municipalities develop an estimate for proposed projects. Low, medium, and high estimates are based on average costs for standard items. Materials and, thus, costs vary widely.

Table 11: Model project budget estimates[97]

IMPROVEMENT	UNIT	LOW	MEDIUM	HIGH
Pre-Construction				
Grading & Excavation	cubic yard	$10	$50	$200
Stream Work				
Daylighting	linear ft	$500	$1,000	$2,000
Restoration	linear ft	$200	$500	$1,000
Bank Stabilization	linear ft	$35	$75	$100
Landscaping				
Potted Plants	per	$5	$50	$500
Weed Control	ac	$600	$750	$900
Grass or Wetland Sod	square yard	$250	$600	$1,000
Irrigation System	per	$25,000	$50,000	$80,000
Amenities				
Trail	linear ft	$5	$25	$200
Bridge	per	$50,000	$70,000	$250,000
Signage	per	$500	$1,000	$2,500
Lighting	per	$10,000	$25,000	$50,000
Play space	per	$7,500	$20,000	$50,000

POLICY RECOMMENDATIONS

Policy will be crucial in achieving goals for the greenways. As creeks flow through numerous jurisdictions, recommendations represent an overall guiding document for policy considerations.

PLAN ALIGNMENT

The first step for municipalities and land managers is to integrate the *Seven Greenways Vision Plan* into plans and projects already underway. Future general plans, parks and trails plan, economic and capital improvement plans, and ordinances should integrate these recommendations.

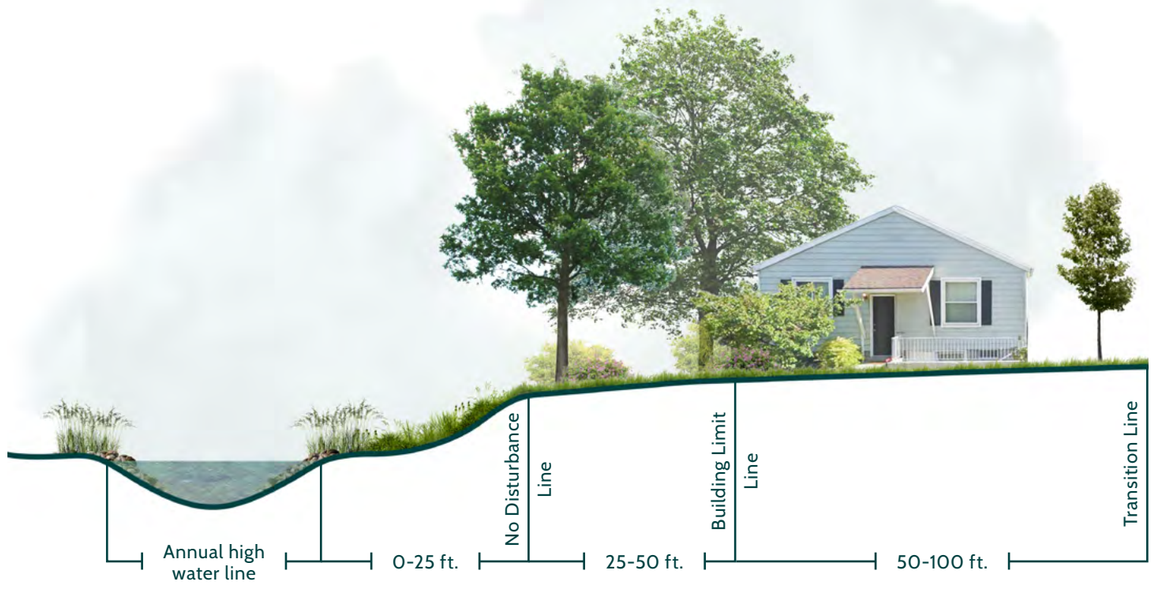
RIPARIAN CORRIDOR ORDINANCE

All municipalities along our creeks should adopt a riparian corridor ordinance. It is the next step towards implementing the vision and can be used to frame additional policy tools, such as development requirements or incentives, transfer of development rights, and acquisition.

Ordinances should begin with a purpose statement that describes the benefits of protecting riparian habitats—improving water quality, providing habitat, mitigating flooding, enhancing recreational opportunities, and more. The applicability section states what is and isn't subject to the ordinance standards, including geographic area, activities, and circumstances. A map further depicts where this overlay applies.

If permits are required to build in riparian areas, the ordinance should layout the type of permit and review process. It is common to require applicants do a resource inventory and impact analysis for the proposal. If impacts are anticipated, alternatives that avoid impacts should be included and weighed. If impacts are unavoidable, the proposal should be declined or, if deemed necessary, minimize and mitigate impacts.

The standards section should include the buffer zone standards. Salt Lake City's Riparian Corridor Overlay Zoning District Ordinance divides the corridor into three zones: No Disturbance Area – 0 to 25 feet; Structure Limit Area – 25 to 50 feet; and Buffer Transition Area – 51 to 100 feet. Zones dictate activities allowed. Standards might address grading, structures, roads, vegetation protection and weed control, reduction of impervious surfaces, access and maintenance, land-use restrictions, landscaping, fencing, and flood control facilities. Additional permitting, such as the Utah Division of Water Rights' Stream Alteration Permit, may be required.



The ordinance should allow for flexibility of unforeseen circumstances. This may be a process for landowners to modify requirements within defined parameters and subject to review. Enforcement of ordinance should be clear and include who is responsible for enforcement. Penalties and enforcement measures should be available for violations.

DEVELOPMENTS

Creek-side properties are desirable areas to live, work, and play. Developments along our creeks represent our biggest opportunity to perpetuate the vision. When developers integrate goals, this provides amenities for their tenants, such as trail access, parks and open spaces, and access to nature, while improving their property values and bottom-line.

On properties within an established buffer of aboveground and belowground creeks, new developments should be required to uncover or restore creeks. If stream daylighting is not possible, the developer must show evidence. While the buffer is flexible, it could correspond to a riparian corridor ordinance, which typically extends out 100 feet from stream edge. Developers in underutilized lots adjacent to the greenways should be required to preserve a certain percentage of open space, cluster buildings (if applicable), and provide pathways and amenities adjacent to the stream. Public easements should be negotiated to ensure all community members benefit and have access.

Less ideally, incentives could be used to encourage developers to contribute to goals. A density bonus could be offered—greater square footage or number of units—to encourage stream restoration or daylighting, open space preservation, or trail creation. A planned unit development is a regulatory process that trades flexibility in the zoning code, such as building heights, density, or setbacks, for goals the municipality would like to achieve. Goals can align with those established in this vision. Developments go through an extra level of regulation, including a public engagement opportunity. This would be the ideal time to require developers study the possibility of stream restoration or daylighting. Funding or rebates for developers could be offered at the municipal or County-level to implement goals.

In Salt Lake City, Hidden Hollow is a serene, natural oasis within the bustle of the Sugar House neighborhood. In 1990, a group of elementary kids from Hawthorne Elementary cleaned up around Parleys Creek and successfully protected it through a conservation easement. Wilmington Flats and other dense urban apartment buildings have been constructed near this area, advertising "as a gateway to Hidden Hollow and Sugar House Park."

CREEK-FRIENDLY CERTIFICATION

A standardized certification process could be created for developments adjacent to our creeks within an established riparian corridor ordinance or overlay zone. Similar to certifications, such as Leadership in Energy and Environmental Design (LEED), the Creek-Friendly Development certification would follow a checklist of goals to achieve. The development is then awarded a level of certification (Bronze, Silver, Gold, etc.). This process would encourage developments achieve goals established by municipalities and this vision. The process could be managed by Salt

Lake County, the municipalities, or a community organization, such as the Seven Canyons Trust.

TRANSFER OF DEVELOPMENT RIGHTS

Used to protect open space and environmentally sensitive areas, transfer of development rights is an innovative program to move development away from our creeks and floodplains to more suitable areas. In identified protection areas, such as those associated with a riparian corridor ordinance or overlay zone, development potential is sold to receiving areas in other identified areas of the municipality. The land is then protected in perpetuity through a conservation easement.

PROPERTY ACQUISITION

Acquiring strategic parcels along our creeks is a critical way to build out the greenways. First, parcels within an established buffer of our creeks—a riparian corridor ordinance or overlay can be used to dictate this buffer—should be inventoried for the highest priority acquisitions. A number of considerations can guide prioritization including zoning, existing land-use, structures on-site, size, cost, and more. Once properties are prioritized into a list, municipalities and partners can go top-down to inquire about acquisition.

Fee simple acquisitions are the simplest, yet most expensive. They transfer full ownership of the property including the title from the landowner to the buyer. Easements are one of the most widely used tools for conservation and public access. They can take many forms including utilities, roads, trails, or conservation. Conservation easements are best utilized for a property already in a natural condition, which the property owner is interested in protecting in perpetuity. Utility easements may be the most useful in facilitating stream daylighting. Landowners with buried streams may place a portion of their property into a utility easement. Once enough easements are obtained in a row stream daylighting becomes economically viable. Landowners receive compensation for these easements while obtaining valuable tax deductions.

WATER BANKING

Many water rights claims from mining operations and farmers predate the formation of cities along the Wasatch Front. This has led to intricate and complex exchange agreements. Cities get high-quality drinking water at the water treatment plants in exchange for rights to lower quality Utah Lake water through canals.

Big Cottonwood Creek is seasonally dewatered for four miles between the canyon mouth and Cottonwood Lane. From November to March, an estimated 50 percent of the creek runs dry within the scope area.[94] Between April and October, Utah Lake water is pumped into the creek to satisfy water rights. This has seriously degraded water quality and the riparian ecosystem. Little Cottonwood Creek has little to no flow in the scope area from July to March due to culinary and hydropower diversions. To supplement, Jordan River water is brought in, via a canal, at Fort Union Boulevard. This nine-mile stretch from canyon mouth to Fort Union is seriously impacted.

In 2020, the Utah State Legislature approved the Utah Water Banking Strategy, a three-year pilot program to study alternatives to water transfers. Utah is a “use-it-or-lose-it” state. If water rights are not put to beneficial use over a certain period, the right may be forfeited. Through the water banking program, rights holders can temporarily sell water rights without risk of losing this water permanently. This program could be critical to securing water for instream flows (such as in Big Cottonwood and Little Cottonwood Creeks to prevent seasonal dewatering), which improves water quality, recreation, and habitat.

Dance Intervention at the Three Creeks Confluence in Salt Lake City.

GENTRIFICATION

The phenomenon of green gentrification can be an unfortunate impact of investments in our urban ecosystems, such as greenway creation, stream restoration, and daylighting. Efforts create desirable places to live, work, and play that attract wealthier and predominantly white populations. Without comprehensive strategies in place to prevent displacement, the residents these strategies are designed to benefit can be excluded.

Policy strategies at the city, county, or state-level are needed to prevent displacement due to gentrification. First, displacement should be tracked through migration demographics to understand how communities are changing. Projects that are inclusive and have broad benefits should be prioritize. In redevelopment projects adjacent to greenways, existing housing should be protected or efforts should ensure the same amount of housing stock, based on income level. Put simply, if replacing low-income housing, the same amount of low-income housing should be provided in the redevelopment. Additional affordable housing stock should be a critical part of any creek-side development. Rent subsidies, well-devised forms of rent control, and community land trusts to protect low-income and affordable housing are important city-wide tools to prevent displacement.

SPECIAL DISTRICTS

Special service districts are independent governmental entities separate from municipal and county governments. They can be used to meet a specific need, such as creek restoration, daylighting, and protection. They supplement existing services provided by municipal and county-level governments, extend across municipal boundaries, and can overcome financial barriers. However, they can also struggle with accountability and transparency. There are 400 local and special service districts operating in Utah.[95]

PARTNERSHIPS

Collaboration, across governmental entities, nonprofits, community-based organizations, stakeholders, and residents, is essential to achieve this ambitious 100-year vision. This plan lays out general vision and strategies, but partnerships are critical in implementing projects. Stewardship of the greenways is fostered through increased awareness, enjoyment, and empowerment.

EMPOWERING VOICES

Greenways are a place for community to come together in connection with nature. While governmental entities are essential for the development and improvements of our creeks, community members play an important role in advocating for these places. Programs should bring together local organizations, stakeholders, and community leaders. Partnerships with educational institutions and universities, such as the University of Utah and Westminster College, can contribute to research efforts along the creek corridors.

For example, A forum for collaboration could be established between the eight stream-side municipalities, Salt Lake County, and the various stakeholders to advance implementation. This would bring together representatives and agencies with interests along the corridors and encourage them along the path towards implementation. Lessons learned and best practices could be shared to create more successful efforts.

EVENTS & PROGRAMMING

Activation is one of the key ways to improve safety. Programs, events, and gatherings draw more users to green spaces and bring positive activity. Programming improves inclusion. Events can express community identity, promote shared values, and create a sense of place. They can showcase underrepresented voices and be a format for public discourse. Parks and open spaces provide residents with gathering space to celebrate diverse traditions.

The Range 2 River Relay explores the conditions of the Salt Lake Valley's waterways from pristine headwaters to buried creeks and channelized canal to meandering river. Competitors bike, boat, and run from the Wasatch Range to the Jordan River. The event maps a drop of water through Salt Lake City's hydrology from a snowflake in the Wasatch, through above and below ground stretches of City Creek, and into the Jordan River. It gets residents outdoors and active in family-friendly fun, improving public health and quality of life. Money is raised for efforts to create a greenway along City Creek, while building support for its future implementation.

Opening celebration at Three Creeks Confluence in Salt Lake City.

Environmental education at Three Creeks Confluence in Salt Lake City.

ENVIRONMENTAL EDUCATION

This outreach teaches about our creek ecosystems, issues they face, and ways humans cause harm. Participants are empowered through teachings to take action, become stewards, and improve ecosystems around them. For example, the Seven Canyons Trust's Seven Creeks | Walk Series is a program to observe and share stories, insights, and visions to better manage, restore, and love our creeks. Participants engage in on-the-ground actions to build community connection and improve their local ecosystems. After programming, 90 percent of participants reported they understood why creeks are important and 90 percent understood the issues they face. Approximately, 64 percent felt they made a difference during programming and 65 wanted to participate in stewardship actions again.[96]

Creeks function as living laboratories for nearby schools and institutions. For example, Westminster College students in the Environmental Studies program survey the hydrology of Emigration Creek, through the Seven Creeks | Walk Series. Students follow the creek as it goes below ground outside of campus, tracing it underneath houses, parking lots, and roads, to Liberty Park. They learn about opportunities to uncover the creek and actions they can take to improve its health. Students take this knowledge back to campus and use it to frame water quality testing on the creek and further education on its hydrology.

Service-oriented volunteer efforts can ground environmental education teaching with on-the-ground, meaningful activity. Efforts can directly implement goals in this vision, such as habitat restoration, landscaping, and hardscaping. Partnerships with corporations, places of worship, clubs, and community-based organizations provide a valuable source of labor for efforts.

CASE STUDY

MY CREEKS WEBSITES

The My Creeks interactive websites highlight the seven creek watersheds. They pinpoint areas for recreation and public access, including trails, amenities, and events, and locations of each waterway. Users can trace the creeks as they flow through the Salt Lake Valley, including above and below ground stretches. The platform spans the east and west-sides to bridge barriers as users explore waterways, report issues, and highlight stories, history, culture, and destinations. Seven learning pathways follow narratives of community, ecology, history, recreation, and water.

Users share their voice through “Submit a Story” to enhance education, visibility, and stewardship, including poetry, photos, videos, text, quizzes, and more. Stops educate about watershed protection, individual action, and behavioral change to improve water quality impairments in downstream communities. They develop community leaders and stewards to protect riparian habitat, water quality, and the natural beauty of the creeks. Users can also submit events to the sites. Community events draw people to the corridors and activate public space. Stakeholders can use this function to advertise community clean-ups, volunteer events, and celebrations.

The “Report an Issue” feature allows users to share social and environmental concerns within each watershed. This develops ownership over the waterways as users see the benefit of cleaning them up and mitigating reoccurring issues. This feature streamlines our ability to better manage public lands and decrease response time to concerns.

Identifying macro-invertebrates using the My Creeks websites.

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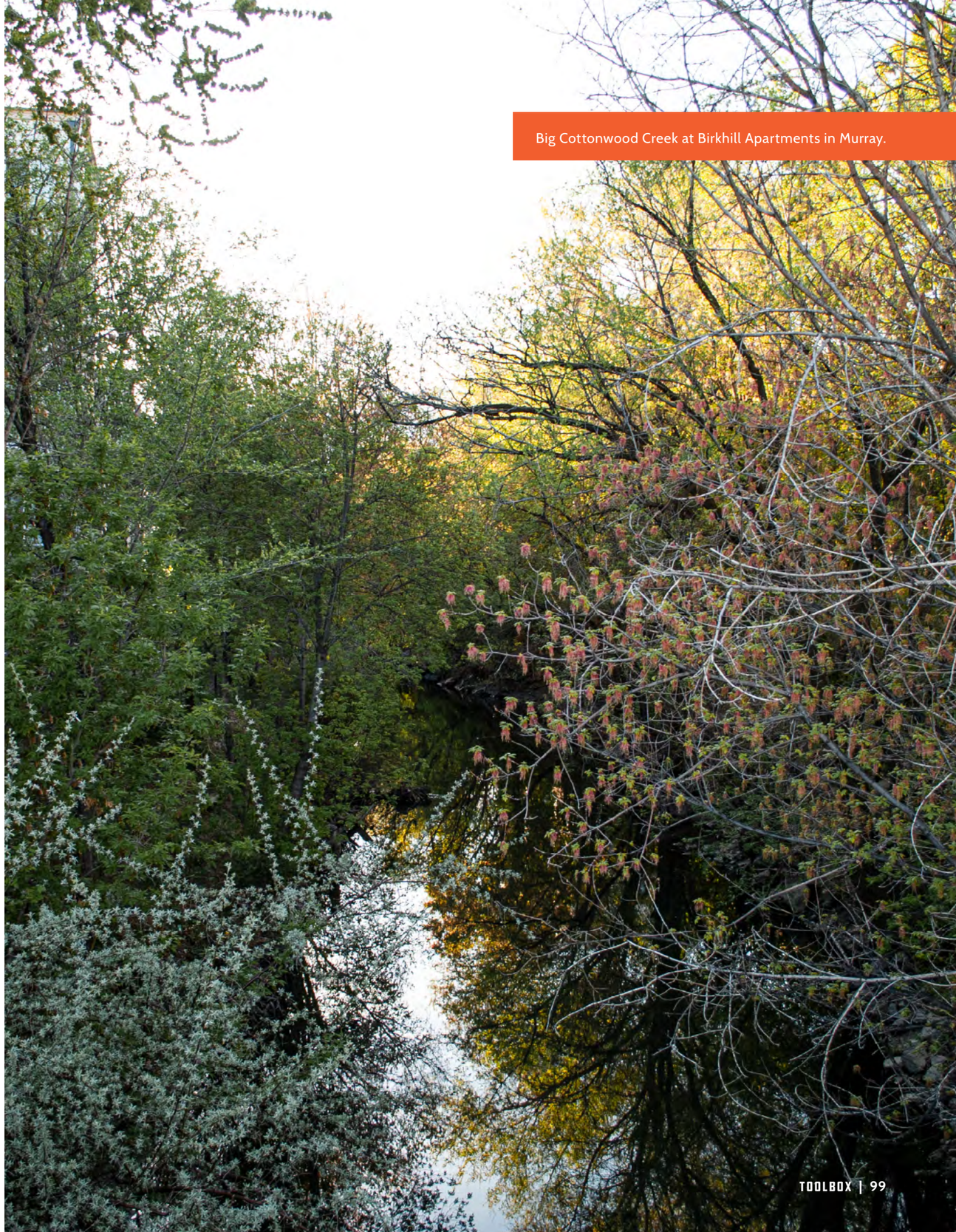

Big Cottonwood Creek at Birkhill Apartments in Murray.

CONNECTING PEOPLE THROUGH NATURE & OUR WATERWAYS.

A Seven Canyons Trust & Design Workshop Collaboration.