

# SEVEN GREENWAYS



# VISION PLAN



## EXISTING CONDITIONS

MAY 2021



SEVEN GREENWAYS  
VISION PLAN

**CORE ELEMENTS EMERGED THROUGH RESEARCH AND ASSESSMENT OF THE EXISTING GREENWAYS SYSTEM. THEY ORGANIZE WHAT THE GREENWAYS ASPIRE TO ACHIEVE, AND SERVE AS A FRAMEWORK FOR OPPORTUNITY AREAS, BEST MANAGEMENT PRACTICES, POLICIES, AND A TOOLBOX OF DESIGN CONCEPTS AND GUIDELINES.**

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# WATER

Our creeks originate high in the Wasatch Range surrounding the 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.

Red Butte Creek at Garden Ward Park in Salt Lake City.

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

### VALUES

In the 2014 “Your Utah, Your Future” survey, residents ranked water as the second-highest priority and level of concern for the future. Of 100 points available, Utahns allocated 37 points to ensure there is enough water in our streams and lakes for wildlife and recreation. This was the highest allocation of all water categories. Farms and food production were allocated at 30 points. One of the recommendations was to: “Ensure water quality and quantity to adequately sustain and maintain the environment by improving watershed management and preserving natural systems.”<sup>1</sup>

In the ten big ideas identified in *Reimagine Nature*, the “From the Mountains to the Lake” idea proposes increasing connectivity among Salt Lake City’s parks and open spaces. Efforts would identify and invest in corridor alignments that connect the Wasatch Range to the Jordan River, especially along our creeks. Additionally, they would identify priority daylighting projects on City, Red Butte, Emigration, and Parleys Creeks.<sup>2</sup>

According to the *Watershed Public Opinion Survey*, Salt Lake County residents valued water quality the most—more than recreation, scenery,

habitat, and the economy combined. Of eight concerns surveyed, an adequate supply of good drinking water, industrial pollution, and litter problems were the top choices. Respondents had varied impressions on the health of the stream closest to them and whether their actions affect water quality. Importantly, four of five residents support more public funding to improve our waterways. Finally, they strongly support four public policies to improve water quality that require:

- Landowners to leave vegetation in place near waterways;
- Landowners to plant new vegetation along waterways;
- New developments to set aside natural open space; and
- New developments create green infrastructure.<sup>3</sup>

### WATER QUALITY & QUANTITY

Our creeks are critical to the Salt Lake Valley’s drinking water supply. Four of our creeks—City, Parleys, Big Cottonwood, and Little Cottonwood Creeks—supply the majority of our water. In the project area, there are nine community water systems: Salt Lake City Water System, Veterans Affairs Medical Center Salt Lake City, South Salt Lake City Water System, Cottonwood Coves Incorporated, Jordan Valley Water Conservation District, Holliday Water Company, Murray City Water System, Midvale City Water System, and Sandy City Water System.

In total, the Jordan River Basin provides 234,795 acre-feet of potable water to approximately 1,111,606 people. An additional 30,699 acre-feet were supplied to users by various canals.<sup>4</sup> Average peak and annual flows are strongly influenced by the melting and size of our snowpack. Additionally, flows are influenced by

3 - Salt Lake County, *Watershed Public Opinion Survey Report of Findings* (2015).  
4 - Utah Division of Water Resources, *Municipal and Industrial Water Use Data* (2015).

Table 1: Beneficial Use Impairments

CREEK	LOCATION	USE	STATUS	CAUSE
City - 1	Memory Grove to treatment plant	2B, 3A	Insufficient data	
City - 2	Treatment plant to headwaters	1C, 2B, 3A	No evidence	
Red Butte - 1	1100 E to reservoir	1C, 2B, 3A	Not supporting	Macroinvertebrates
Red Butte - 2	Reservoir to headwaters	2B, 3A, 4	No evidence	
Emigration - 1	1100 E to Rotary Glen Park	1C, 2B, 3A, 4	Not supporting	<i>E. coli</i>
Emigration - 2	Rotary Glen Park to headwaters	2B, 3A, 4	Not supporting	<i>E. coli</i>
Parleys - 1	1300 E to Mountain Dell Reservoir	1C, 2B, 3A	Not supporting	<i>E. coli</i> , macroinvertebrates
Parleys - 2	Mountain Dell Reservoir to headwaters	1C, 2B, 3A	Not supporting	Cadmium
Mill - 1	Confluence to I-15	2B, 3C, 4	Not supporting	<i>E. coli</i> , macroinvertebrates
Mill - 2	I-15 to Forest Service boundary	2B, 3A, 4	Not supporting	<i>E. coli</i> , macroinvertebrates
Mill - 3	Forest Service boundary to headwaters	2B, 3A, 4	No evidence	
Big Cottonwood - 1	Confluence to treatment plant	2B, 3A, 4	Not supporting	<i>E. coli</i> , macroinvertebrates, temperature
Big Cottonwood - 2	Treatment plant to headwaters	1C, 2B, 3A	Not supporting	Cadmium, copper
Little Cottonwood - 1	Confluence to treatment plant	2B, 3A, 4	Not supporting	Cadmium, <i>E. coli</i> , macroinvertebrates, temperature, total dissolved solids
Little Cottonwood - 2	Treatment plant to headwaters	1C, 2B, 3A	Not supporting	Cadmium, copper, pH, Zinc

Source: Utah Division Of Water Quality, *Combined 2018/2020 Integrated Report* (2021).

precipitation, runoff, tributaries, groundwater, and inputs from canals.

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.<sup>5</sup> In other areas, water sources must travel hundreds of miles through aqueducts to large population centers.

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

quality improvement comes from protecting and restoring our headwaters, according to the Center for Watershed Protection.

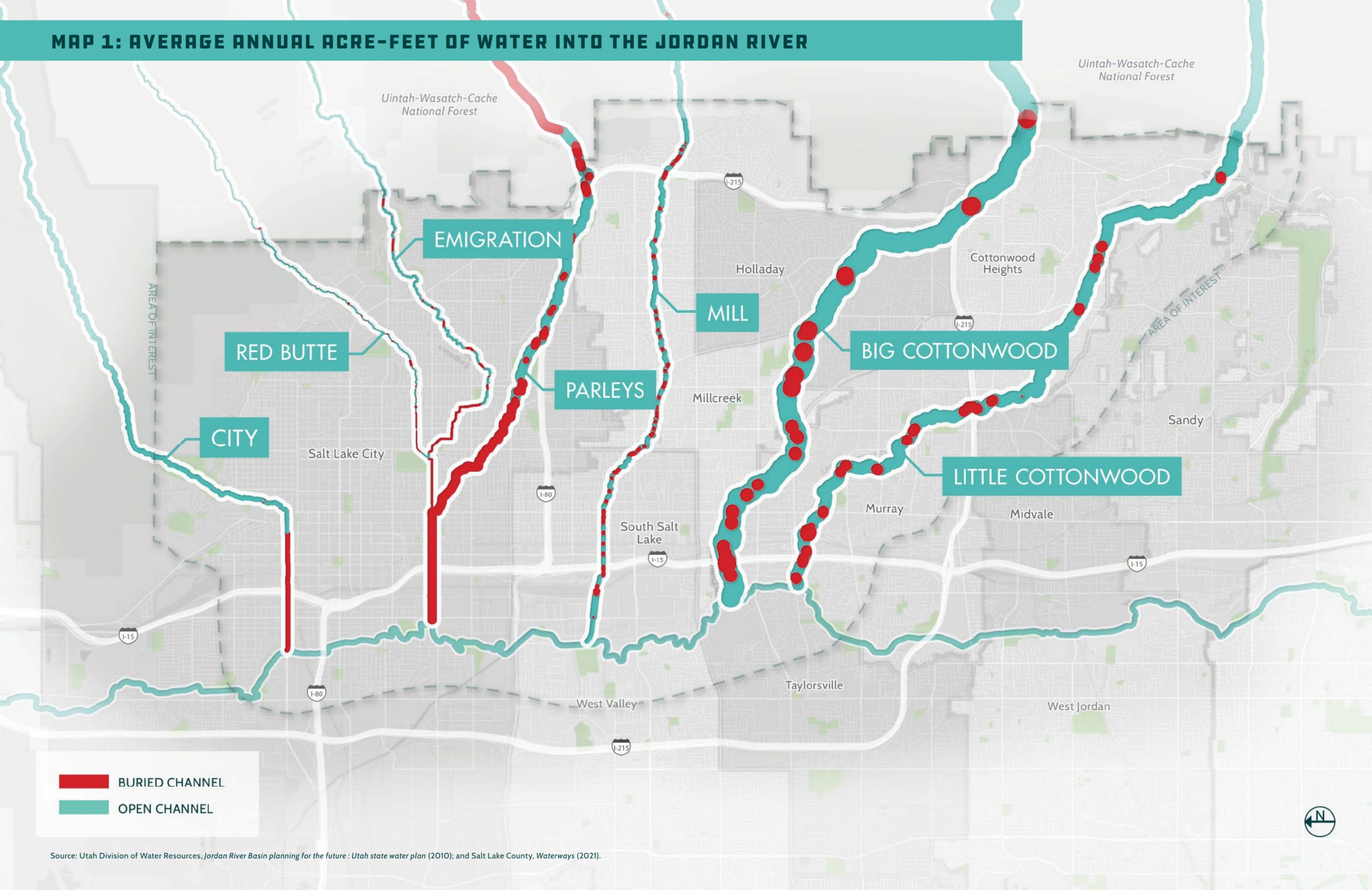
Protections diminish as creeks flow into the urbanized valley, and historic modification has left them in a degraded condition. As the Salt Lake Valley urbanized, riparian ecosystems gave way to concrete and asphalt, bricks and mortar. Portions of our creeks were diverted from aboveground channels into storm water pipes underneath our neighborhoods. Others were channelized to control flooding. Banks steepened and eroded. Dams and aging infrastructure eliminated fish passage, disjointed wildlife corridors, and reduced access.

According to the Utah Division of Water Quality, the lower watersheds of all seven creeks support the following beneficial use classes: 2B – Secondary contact recreation (such as

1 - Envision Utah, *Water Vision Book* (2014).  
2 - Salt Lake City, *Reimagine Nature Preliminary Engagement Findings* (2020).

5 - Briefer, *Drinking Water and the Wasatch Front* (2018).

# MAP 1: AVERAGE ANNUAL ACRE-FEET OF WATER INTO THE JORDAN RIVER



Source: Utah Division of Water Resources, *Jordan River Basin planning for the future: Utah state water plan* (2010); and Salt Lake County, *Waterways* (2021).

Table 2: Average annual acre-feet of water into the Jordan River

CREEK	ACRE-FEET
City	11,750
Red Butte	2,450
Emigration	4,440
Parleys	18,130
Mill	10,760
Big Cottonwood	51,240
Little Cottonwood	46,190

Source: Utah Division of Water Resources, *Jordan River Basin planning for the future: Utah state water plan* (2010),(2021).

wading, fishing, or hunting) and 3A – Cold-water fishery. Lower Red Butte, Emigration, Mill, Big Cottonwood, and Little Cottonwood watersheds support: 4 – Irrigation; Emigration and Parleys support: 1C – Drinking water; and only Mill supports: 3C – Non-game fishery.

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.<sup>6</sup>

Water quality impairments in the seven creeks include:

- Cadmium
- Copper
- pH
- Zinc
- Temperature
- Total dissolved solids
- *E. coli*

6 - Salt Lake County, *Integrated Watershed Plan* (2015).

- Macroinvertebrates

Table 1 shows the beneficial use classes and water quality impairments of each creek.

## CLIMATE CHANGE

Climate change is contributing to snowpack loss all over the western United States. Predictions estimate a 60 percent loss of snowpack water storage within the next three decades.<sup>7</sup> Moreover, expected population growth, longer growing seasons, and hotter temperatures in the Salt Lake Valley may increase water demand.

The snowpack is the most important feature of our drinking water conveyance system. It acts as a reservoir and provides drinkable water as the snow melts. Snow often totals over 500 inches in Little Cottonwood Canyon.<sup>8</sup> Most known for its renowned ski conditions, the “Greatest Snow on Earth” has provided a reliable water source for thousands of years of habitation in the Salt Lake Valley.

However, climate change is impacting the amount of water we have, when snow melts, and its quality. With every degree Fahrenheit increase in temperature, a 3.8 percent decrease in overall water volume is expected in our creeks.<sup>9</sup> 2018 was Utah’s driest on record and only one other year was warmer.<sup>10</sup> In response, Salt Lake City issued a Stage 1 Drought Advisory.

Climate models show precipitation more frequently arriving in the form of rain, rather than snow.<sup>11</sup> Additionally, smaller snow packs are forecasted to melt earlier, all while demand is expected to increase. Climate-driven drought

7 - Fife, *Large near-term projected snowpack loss over the western United States* (2017).

8 - University of Utah, *Hidden Water – A Survey of Salt Lake Valley Survey Water: Little Cottonwood Creek* (2021).

9 - Biskupski, *Testimony before the Committee on Energy and Commerce Subcommittee on Environment and Climate Change* (2019).

10 - Maffly, *Utah just experienced its driest year since scientists have kept records* (2018).

11 - Utah Rivers Council, *Crossroads Utah* (2012).



Figure 1: Burial of City Creek in culvert, circa 1910. Courtesy of Utah State Historical Society.

and changes in the hydrologic cycle will challenge the water resource redundancies in our water system.

Summertime algal blooms in Utah Lake and the Jordan River, due to an increase in temperature, have become the new norm. In 2016, an algal bloom on Utah Lake made over 100 people sick. Farmers scrambled to find alternative water sources and, ultimately, had to make difficult decisions regarding their crops.<sup>12</sup> Conditions are forecasted to continue, threatening all our reservoirs, like Sugar House Pond and Liberty Lake, and our high-alpine lakes critical to drinking water quality.<sup>13</sup>

12 - Associated Press, *Huge toxic algae bloom sickens more than 100 in Utah amid heatwave* (2016).

13 - Biskupski, *Testimony before the Committee on Energy and Commerce Subcommittee on Environment and Climate Change* (2019).

## SEASONAL DEWATERING

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. 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.<sup>14</sup>

14 - Salt Lake County, *Stream Care Guide* (2014).



**Figure 2:** Kayaker on State Street in 1983 flooding of City Creek. Courtesy of Utah State Historical Society.

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.<sup>15</sup>

## WATER BANKING

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) to improve water quality, recreation, and habitat.

## FLOODING & URBANIZATION

Urbanization markedly increased flooding during the 20th century. 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 of our cities and into

the storm water system.

Historic 100-year floods double in size with 30 percent imperviousness.<sup>16</sup> Salt Lake County’s average impervious area is estimated at 33 percent.<sup>17</sup> Channeling and piping streams transferred impacts downstream, increasing flooding and erosion in our west-side communities along the Jordan River. Smooth concrete pipes and straightened, deepened streams speed up water velocity.

In 1983, a large snowpack and fast spring melt caused historic flooding “termed the worst in Salt Lake County history,” according to the *Deseret News*. Over 1,000 homes were 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.

Although, it wasn’t all fun and games. 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.<sup>18</sup>

In 2017, a 200-year precipitation event overwhelmed Salt Lake City’s storm water system in areas surrounding our underground creeks, primarily the Ballpark and Sugar House neighborhoods, as well as across the Jordan River corridor. Parleys Creek overtopped its culvert at Hidden Hollow, leaving five feet of water in the basement of the historic Sprague Library. Over 1,000 books ended up in the dumpster. Damage was estimated at \$1.5 to \$2 million, and the branch was closed for four months.<sup>19</sup> The Salt Lake City Fire Department estimated 100 homes were flooded. Over 5,000 customers in Salt Lake County experienced power outages. Utah Transit Authority reported delays as tracks and roads were submerged.<sup>20</sup> Salt Lake City School District estimated \$2 to \$3 million worth of damage at four schools.<sup>21</sup>

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 and in safe areas as deemed by the flood mapping. Otherwise, property owners may be required to pay for flood insurance.

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.<sup>22</sup> Flooding can spell tragedy for tenants as belongings are destroyed, and they are forced to move from homes.

15 - Salt Lake County, *Stream Care Guide* (2014).

16 - Hollis, *The effect of urbanization on floods of different recurrence interval* (1975).

17 - Salt Lake County, *2015 Salt Lake County Integrated Watershed Plan* (2017).

18 - Hooton, *Memorial Day Weekend 1983* (1999).

19 - Stevens, *Sugar House library re-opens after devastating flood that destroyed thousands of books* (2017).

20 - Williams, *Waist-deep water floods homes, cuts power in Salt Lake* (2017).

21 - Mims, *‘Torrential’ thunderstorms flood East High School, SLC’s Sprague Branch, Wasatch Front intersections* (2017).

22 - Doswell, *The Future of Flood Insurance and its Environmental Justice Implications on North Carolina’s Low-Income Communities* (2020).

## OPPORTUNITY

### 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.

Creeks have a profound effect on the surrounding environment. Evaporation and shade from the urban forest can decrease surrounding air temperatures to mitigate the urban heat island effect. Cities and the built environment can be significantly hotter than surrounding rural areas.

In 2010, Salt Lake City ranked in the top three urban heat island cities in the United States. The study identified sprawl as a critical factor in increasing urban air temperatures and recommended urban green spaces break up the built environment.<sup>23</sup> Additionally, urban forests can also cool surrounding air temperatures. Moreover, they improve air quality by putting out oxygen and filtering pollutants.<sup>24</sup>

By re-establishing naturally-functioning ecosystems, water velocity is slowed through meanders and rocky, vegetated banks. Especially with the inclusion of a floodplain, groundwater infiltration and storage are increased.<sup>25</sup> Natural creeks retain nutrients and clean water quality through streamside vegetation, streambank deposition, and groundwater infiltration. Removal of culverts alleviates choke points and can replace under-capacity or deteriorating culverts. We must also keep in mind the changing climate when managing water, and be active in

assessing our vulnerabilities to adapt.

Natural, open space has a much 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.<sup>26</sup> By creating more of these spaces, we allow more water to soak into the ground.

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

Developments serve as an important tool in implementation. Developers can be incentivized to uncover and restore creeks as an amenity for tenants and to improve property value. Furthermore, they can build publicly-accessible trails and other recreation opportunities along the creeks. Design standards can further require implementation of recommendations through ordinances, overlay zones, or other strategies.



Figure 3: Daylighting of Red Butte, Emigration, and Parleys Creek at the Three Creeks Confluence in Salt Lake City.

23 - Debbage, *The urban heat island effect and city contiguity* (2015).

24 - Klapproth, *Understanding the science behind riparian forest buffers* (2009).

25 - Trice, *Daylighting Streams* (2016).

26 - Salt Lake County, *Integrated Watershed Plan* (2015).



# 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.

Dragonfly at Mill Creek Confluence in South Salt Lake.

**OUR URBAN CREEKS  
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**VALUES**

Utahns want to maintain and improve ecosystem and watershed health and ensure access to low-impact recreation, like wildlife watching, hiking, and biking. They allocated 39 points of 100 to these topics. These improvements were two of the three highest public lands categories in the “Your Utah, Your Future” survey.

The *Reimagine Nature* survey further highlights the desire for additional riparian and natural areas in Salt Lake City and beyond. Approximately 65 percent of respondents wanted to increase the size of existing habitats and connect wildlife corridors. Over half wanted to acquire lands adjacent to our creeks to support riparian health and reduce flooding.<sup>1</sup>

According to the *Watershed Public Opinion Survey*, six times more Salt Lake County residents felt an above-average commitment, compared to a below-average commitment, to conservation of the natural environment. Residents would like to see more wildlife habitat, natural stream corridors, and protection of open space. They strongly supported public policies that would require landowners to preserve and restore vegetation along waterways and require new developments to preserve habitat and

create green infrastructure. Finally, there was overwhelming support for four strategies to increase public funding for these efforts:

- Fees for canyon and trail usage;
- A small property or sales tax increase;
- Bonding; and
- A small household fee.<sup>2</sup>

**HABITAT**

The Wasatch Range hosts the most frequented national forest in the United States, receiving nine million visitors per year. This equates to the visitation rate of all five of Utah’s national parks combined.<sup>3</sup> Our creeks flow through this wildland-urban interface, connecting the Wasatch Range to the Jordan River. They act as key wildlife corridors connecting habitats along the Wasatch and Oquirrh Mountains to the Jordan River and Great Salt Lake.

In 1848, to reduce predators and pests, a hunt in the Salt Lake Valley included, “two bears, two wolverines, two wildcats, 783 wolves, 409 foxes, 31 minks, nine eagles, 530 magpies, hawks, and owls, and 1,026 ravens.” This was one of the only inventories of wildlife in early colonial settlement of the Valley. These larger mammals and predators could freely travel from the mountains to the valley along with the seasons. Additionally, the Salt Lake Valley was a seasonal or year-round home to bighorn sheep, mule deer, coyote, beaver, muskrat, jackrabbits, rodents, waterfowl, wading birds, shorebirds, and various migratory birds. Many of the animals found in the Salt Lake Valley have changed as a result of hunting, habitat fragmentation, and predation by domestic pets.<sup>4</sup>

Riparian areas, such as those along our creeks, are habitat located along the banks of a waterway. In



**Figure 4:** Mill Creek at Fitts Park in South Salt Lake.

the western United States, riparian areas occupy less than two percent of the landscape.<sup>5</sup> In Salt Lake City, they represent only 1.2% 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.<sup>6</sup> There are an estimated 114 acres of riparian habitat and 777 acres of wetlands within ¼ mile of the seven creeks.

The Salt Lake Valley features hemispherically significant habitat for neotropical migratory birds. The Great Salt Lake, along with the seven creeks and Jordan River corridor, is an important piece of the Central Flyway, connecting ecosystems between South America and Canada. The area is important for breeding, migration, and wintering. Birds utilized the area to molt, fatten, court, and stage for migration.

Raptors take the opportunity to forage on high

concentrations of migrant birds. Over 257 bird species utilize these ecosystems—over 7.5 million individual birds. They feature the largest staging concentration of phalaropes, approximately 1/3 of the world population, and over half the North American population of eared grebes (over 2.5 million birds).<sup>7</sup>

It is not uncommon to see wildlife in our cities—many of which have adapted to our urban ecosystems. However, the 2014 Mountain Accord identified a lack of baseline data describing existing habitat and ecosystem function in the area.<sup>8</sup> Key indicators of a healthy wildlife population include:

- Herd size and demographics
- Recruitment
- Range trend
- Roadkill / human conflicts
- Active territories
- Habitat condition
- Population estimates

1 - Salt Lake City, *Reimagine Nature Engagement Window #1 Summary Report* (2020).

2 - Salt Lake County, *Watershed Public Opinion Survey Report of Findings* (2015).  
3 - Wild Utah Project, *Wasatch Wildlife Watch* (2021).  
4 - National Audubon Society, *Jordan River Natural Conservation Corridor Report* (2000).

5 - Poff, *Threats to Western United States Riparian Ecosystems* (2012).  
6 - BIO-WEST, Inc., *Salt Lake City Riparian Corridor Study: City Creek Management Plan* (2010).

7 - Utah Division of Wildlife Resources, *Great Salt Lake Waterbird Survey* (2001).  
8 - Mountain Accord, *Final Report* (2016).

Table 3: Sensitive Species

	SCIENTIFIC NAME	COMMON NAME
1	<i>Notichthys phlegethontis</i>	least chub
2	<i>Rana luteiventris</i>	Columbia spotted frog
3	<i>Anaxyrus boreas</i>	western boreal toad
4	<i>Opheodrys vernalis</i>	smooth green snake
5	<i>Picoides dorsalis</i>	American three-toed woodpecker
6	<i>Haliaeetus leucocephalus</i>	bald eagle
7	<i>Cypseloides niger</i>	black swift
8	<i>Dolichonyx oryzivorus</i>	bobolink
9	<i>Athene cunicularia</i>	burrowing owl
10	<i>Buteo regalis</i>	ferruginous hawk
11	<i>Accipiter gentilis</i>	northern goshawk
12	<i>Charadrius nivosus</i>	snowy plover
13	<i>Danaus plexippus</i>	monarch butterfly
14	<i>Bombus occidentalis</i>	western bumblebee

Source: Bureau of Land Management, *Utah Sensitive Wildlife Species List* (2018).

## SENSITIVE SPECIES

Utah ranks 10th in biological diversity and 5th in species only found in the state, when compared to all 50 states. However, it also ranks 5th in species extinction risk and 17th in actual extinctions.<sup>9</sup> The Salt Lake Valley’s wildlife diversity comes from its various biomes from high alpine mountains to our wooded foothills and beyond to broad grasslands.

## PARKS & NATURAL AREAS

Parks and natural areas are important infrastructure for the flora, fauna, and people that call the Salt Lake Valley home. The seven creeks flow through 29 parks and 3 golf courses. They provide varying levels of significance from turf grass with little habitat value to healthy riparian forests with high value.

Public lands play an important role in achieving numerous community goals, such as opportunities for outdoor recreation, enjoyment and relaxation, water quality protection, and wildlife habitat. The 2015 Integrated Watershed Plan states, “Recognizing and managing for residents’ desire for open space, and the recreation that goes along with it, can also provide opportunities for water quality protection... undeveloped open space provides areas that can naturally filter more storm water and reduce more runoff compared to more-developed areas.”<sup>10</sup> There are an estimated 280,000 acres of natural areas in Salt Lake County—55 percent of the total land area.<sup>11</sup> However, urbanization continues to encroach on natural areas, and past disturbances impact the health of our ecological systems.

Wasatch Hollow provides an example of protecting our creeks and achieving conservation goals. The 13-acre nature preserve features a half-mile of Emigration Creek, wildflower meadows, towering Fremont cottonwoods, trails, and a spring-fed wetland. Parts of the area had been privately-owned for 45 years and, over the years, a handful of multi-unit development projects were proposed.

In 2009, community advocates, Salt Lake County, Utah Open Lands, and the Church of Jesus Christ of Latter-day Saints worked to purchase and protect this area in perpetuity through a conservation easement. In 2015, Salt Lake City underwent a restoration project to develop pathways, re-establish riparian function, restore habitat value, and reconnect Hodgson’s Spring to Emigration Creek. “It’s a little oasis on a creek in the city,” said Lewis Kogan, Salt Lake City Trails and Natural Lands Division Director. “It’s a remnant ecosystem that still looks like it did back when the pioneers entered the valley.”<sup>12</sup>

10 - Salt Lake County, *Integrated Watershed Plan* (2015).

11 - Salt Lake County, *Natural Areas Land Management Plan* (2007).

12 - Klopsch, *Wasatch Hollow Preserve, A Jewel in the Neighborhood* (2018).

## URBAN FOREST

Urban forests come in many different forms. They include trees in and along urban parks and natural spaces, waterways, streets, landscaping, and on our buildings. Our urban forest helps filter pollutants, especially important with the Salt Lake Valley’s poor air quality—often some of the worst in the United States.<sup>13</sup> In the “Your Utah, Your Future” survey, residents ranked air quality as the third-highest priority and level of concern for the future.<sup>14</sup>

Poor air quality impacts our residents. Asthma incidents increase in neighborhoods with fewer trees.<sup>15</sup> The urban forest can help. A single tree absorbs ten pounds of air pollutants yearly.<sup>16</sup> The total value of air pollution reduction by Sacramento’s 6 million trees is estimated at almost \$30 million.<sup>17</sup>

The urban forest provides shade, reducing the urban heat island effect and protecting us from harmful ultra-violet radiation. Trees sequester carbon and provide oxygen. A single tree produces nearly 260 pounds of oxygen—enough to support two individuals.<sup>18</sup>

Research shows that trees near roads slow down traffic, making our streets safer.<sup>19</sup> Trees create jobs, from entry-level landscaping and nursery work to skilled arborists. An additional 100 million trees in the United States could save \$2 billion in energy costs annually—that’s three additional trees per building.<sup>20</sup> Trees on the west side of a building reduce electric bills by an average of \$47 a year.<sup>21</sup> Urban forests create a sound buffer, reducing noise pollution. Moreover, the urban forest provides a buffer for

13 - Neugebauer, *Salt Lake City has the worst air quality in the nation* (2017).

14 - Envision Utah, *Your Utah, Your Future Survey* (2014).

15 - Southern Group of State Foresters, *Health Benefits of Urban Trees* (2021).

16 - American Forests, *Clean Air & Water* (2021).

17 - McPherson, *Atmospheric carbon dioxide reduction by Sacramento’s urban forest* (1998).

18 - American Forests, *Clean Air & Water* (2021).

19 - Wolf, *Safe Streets – A Literature Review*. In: *Green Cities: Good Health* (2010).

20 - Nowak, *Sustaining America’s Urban Trees and Forest* (2010).

21 - Energy.gov, *Energy Saver 101 Infographic* (2021).

our creeks to filter pollutants in urban runoff.<sup>22</sup>

One 20-year old tree can:

- Remove 3,100 pounds of carbon dioxide from the atmosphere;
- Save 570 kWh of electricity;
- Intercept 27,000 gallons of rainfall; and
- Filter 15 pounds of air pollution.<sup>23</sup>

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.<sup>24</sup> Holladay implemented a tree preservation ordinance to protect the existing urban forest and require replacement of protected trees that are removed.<sup>25</sup> Holladay, Murray, Sandy, Salt Lake City, and South Salt Lake are designated on the Tree City USA list.<sup>26</sup>

## CLIMATE CHANGE

The Salt Lake Valley is already experiencing impacts of climate change. Increases in frequency and severity of extreme weather events have significant costs to governments, community members, and our ecosystems.

Over 100 homes were flooded and 5,000 customers in Salt Lake County experienced power outages during a 200-year precipitation event in 2017.<sup>27</sup> The storm overwhelmed Salt Lake City’s storm water system in areas surrounding our underground creeks, primarily the Ballpark and Sugar House neighborhoods, as well as across the Jordan River corridor. Damages required costly stream restoration efforts, as well as repair of a public library and two schools, estimated at \$5 million.<sup>28</sup>

22 - California Urban Forests Council, *Why Urban Forests* (2021).

23 - i-Tree, *Tree Benefits* (2019).

24 - Salt Lake City, *Urban Forestry* (2021).

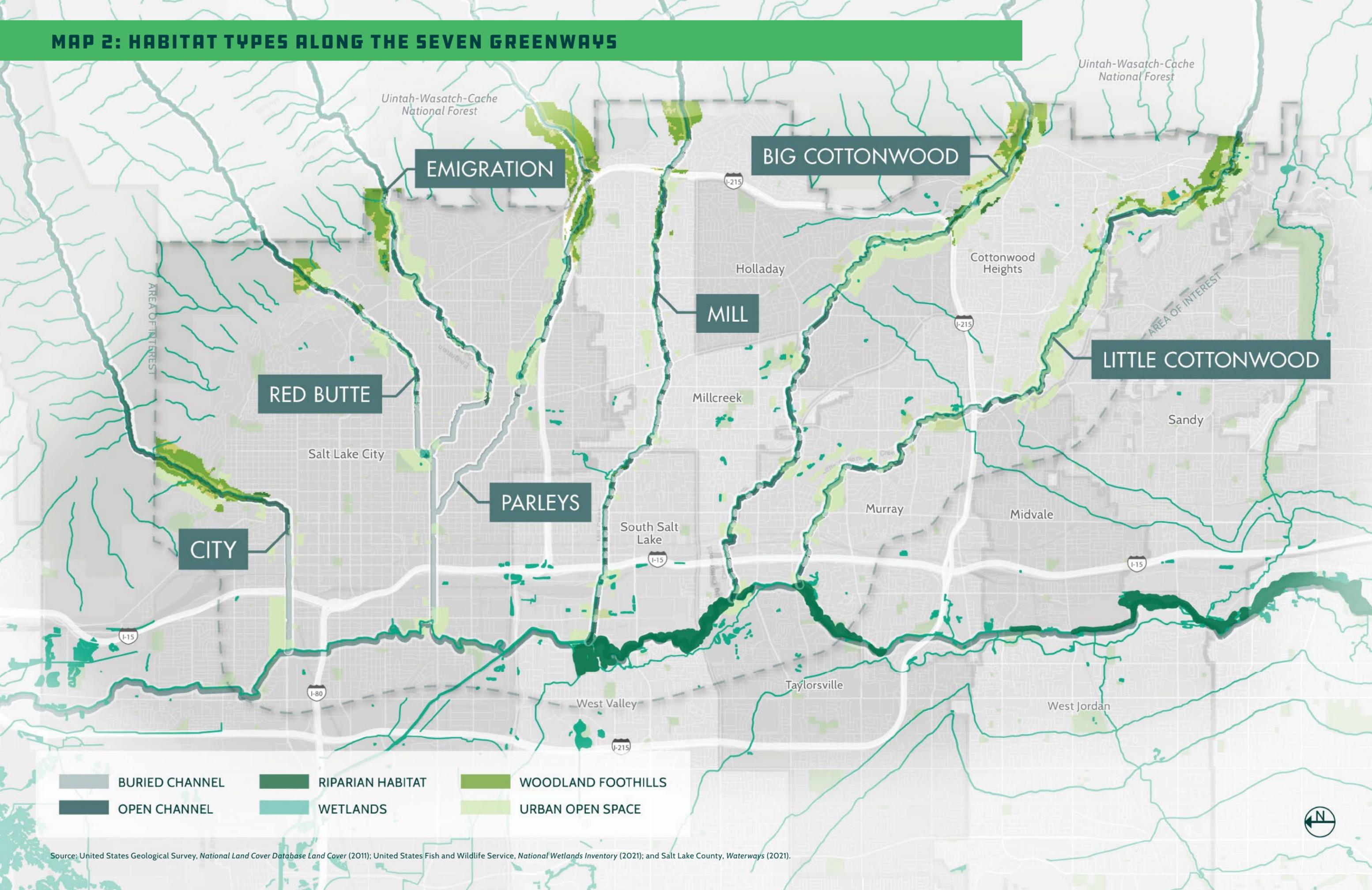
25 - Holladay, *Holladay’s Sentinels* (2019).

26 - Arbor Day Foundation, *Utah 2018 Tree City USA List* (2018).

27 - Williams, *Waist-deep water floods homes, cuts power in Salt Lake* (2017).

28 - Mims, *‘Torrential’ thunderstorms flood East High School, SLC’s Sprague Branch, Wasatch Front intersections* (2017).

# MAP 2: HABITAT TYPES ALONG THE SEVEN GREENWAYS



Source: United States Geological Survey, *National Land Cover Database Land Cover* (2011); United States Fish and Wildlife Service, *National Wetlands Inventory* (2021); and Salt Lake County, *Waterways* (2021).

By 2050, Salt Lake City's temperatures are predicted to rise ten degrees—what Las Vegas feels like today.<sup>29</sup> 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 plant are on the move—those on land at an average of 10 miles per decade.<sup>30</sup>

The Salt Lake Valley's ecosystems will shift over time as new species colonize, while other species may not be able to adapt in time. New arrivals can outcompete indigenous flora and fauna. Pests and diseases are also migrating, moving into new areas, and impacting natural ecosystems and agriculture.<sup>31</sup>

Pests also impact humans. According to the Centers for Disease Control and Prevention, Lyme disease is trending upward in Utah due to the warming climate. Confirmed cases jumped from three in 2000 to 19 in 2016. West Nile Virus and other mosquito-borne illnesses are also on the rise.<sup>32</sup>

Wildfires are predicted to increase with climate change. In 2020, over 1,500 fires burned over 300,000 acres, the worst on record for human-caused fire starts.<sup>33</sup> The forest area susceptible to wildfire has doubled since 1984 due to higher temperatures and less rainfall. Furthermore, the fire season has been extended by six weeks, compared to a few decades ago.<sup>34</sup> Hospital visits spike as air pollution from smoke gets trapped in the Salt Lake Valley.<sup>35</sup>

Wildfires in our natural areas in the Salt Lake

29 - Alberty, *Climate study predicts in 30 years, Salt Lake City weather will be like the Nevada desert's is today* (2019).

30 - Chen, *Rapid Range Shifts of Species Associated with High Levels of Climate Warming* (2011).

31 - Welch, *Half of All Species Are on the Move—And We're Feeling It* (2017).

32 - Penrod, *Lyme-carrying ticks and other dangerous pests are creeping into Utah, thanks to climate change* (2018).

33 - Williams, *Wildfire season recap: 2020 produced most human-caused fires on record in Utah, \$60M in costs* (2020).

34 - Gehrke, *A changing climate demands a holistic response to preventing wildfires—not a partisan one* (2020).

35 - Biskupski, *Testimony before the Committee on Energy and Commerce Subcommittee on Environment and Climate Change* (2019).

Valley are especially dangerous and costly with development and infrastructure nearby. In 2020, the 13,000-acre Knolls Fire spread into residential areas in Saratoga Springs, destroying a home and displacing many. In 2018, wildfires burned 500,000 acres across Utah at a cost of \$150 million in suppression.<sup>36</sup>

## CHALLENGES

By the 1980s, the Utah Division of Wildlife Resources estimates approximately 30 percent of Utah's riparian, wetland, and aquatic habitats were destroyed.<sup>37</sup> As the Salt Lake Valley's population grows an additional 600,000 people by 2065, wildlife habitat impacts will be further compounded.<sup>38</sup> 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 often explode when there are no natural predators to keep populations in check. There are 54 species on the Salt Lake County Noxious Weed List. Many are found along our creeks.

More wildfires due to climate change increase the impact on wildlife habitat. An acre of a restoration project at the Mill Creek Confluence burned in 2017 and 2020. Desirable vegetation, such as Woods' rose and coyote willow, was burned in the fire. In addition to the fires themselves, the loss of habitat impacted a skulk of red fox at the site.<sup>39</sup> Urbanization further threatens our wildlife habitat as natural, open

36 - Maffly, *The coronavirus pandemic is behind Utah's record number of human-caused wildfires, officials say* (2020).

37 - Utah Division of Wildlife Resources, *Utah Wildlife Action Plan* (2015).

38 - Perlich, *Utah's Long-Term Demographic and Economic Projections Summary* (2017).

39 - Seven Canyons Trust, *Mill Creek Confluence Adaptive Weed Management Plan* (2020).

spaces are replaced with development.

## BARRIERS

Our creeks are wildlife corridors. Species use them to navigate 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. Along our open creeks, they are less likely to encounter hazards, such as roads, fences, pets, and people. These corridors are vital to the long-term health of wildlife.

However, hazards create dangerous encounters between wildlife and development. Wildlife 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.

Fragmentation is the primary threat for aquatic species. Many need connected streams to migrate and complete their lifecycle. Barriers jeopardize their survival. They may be natural, like waterfalls. Others are anthropogenic—culverts, buried streams, dams, or physio-chemical (temperature or toxicity).<sup>40</sup>

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 1/4 mile of our creeks, Little Cottonwood Creek has the most intact wildlife habitat with the most open space adjacent. Mill Creek is the worst with over 80 percent of its land cover developed. As the Salt Lake Valley continues to increase in population, along with a rise in popularity of outdoor recreation, conflicts may increase if space is not

40 - Utah Wildlife Migration Initiative, *Barriers* (2021).

provided for wildlife.

## WASATCH WILDLIFE WATCH

The Wasatch Wildlife Watch program seeks to fill our data gap in understanding urban wildlife populations, habitats, and responses to urban development. Over 1,000 camera traps are scattered throughout the Wasatch Range and Salt Lake Valley green spaces. Volunteers pour over thousands of images to identify wildlife captured.

Thus far, almost two million individual wildlife have been photographed across 46 different species. The top wildlife species detected are mule deer, northern raccoon, wild turkey, elk, red fox, moose, and rock squirrel.<sup>41</sup> Camera trapping identifies key habitat for future restoration and identifies important corridors for migration and movement. Additionally, efforts monitor trends in populations of urban wildlife species to make recommendations for future management.

41 - eMammal, *Wasatch Wildlife Watch Summary* (2020).

## OPPORTUNITY

### Encouraging NATURE to thrive

Restoration of riparian ecosystems with beneficial plants will increase habitat value and biodiversity for wildlife and neotropical migratory birds. Biodiversity is an important factor in combating future 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.

The greenways are significant pieces of infrastructure to support our communities of people, plants, and wildlife. Through the addition of trees to the urban forest, we can better filter air and water, control more urban runoff, and provide additional wildlife habitat. By focusing the canopy increase in areas with low tree density, such as those on the west-side along our buried creeks, we can strengthen communities by filtering air pollution, decreasing pollution-related health impacts, providing shade, reducing noise from nearby freeways and railroads, soaking up carbon emissions, and adding economic value.

Stream restoration and daylighting will further enhance habitat value by 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 decrease habitat fragmentation and form wildlife corridors by connecting stream channels and adjacent riparian habitat. By removing dams and culverts and replacing aging infrastructure through stream restoration and daylighting, we can improve fish passage and migration for survival and spawning.

Where appropriate, natural space with limited access would improve wildlife corridors by mitigating conflict with humans and pets. In the *Blueprint Jordan River Refresh Survey Findings*, respondents ranked natural areas with limited access in their top two improvements.<sup>42</sup> Limited-access natural areas give space for wildlife to find food, water, shelter, and space for migration between summer and winter habitats. They also take wildlife out of dangerous interactions with humans, requiring relocation or, in some cases, extermination.

With space to travel and the elimination of barriers with proper road crossing, wildlife collisions could be reduced. Car collisions with deer cost an average of \$8,190, while collisions with elk and moose cost \$25,319 and \$44,546. Crossings that guide wildlife under or over busy roads, in key areas, can reduce collisions by 85 to 95 percent.<sup>43</sup> Well-connected corridors also give residents improved wildlife viewing opportunities—an activity more than 65 percent of Wasatch Front residents were interested in.<sup>44</sup>

In the Salt Lake Valley, all of 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.<sup>45</sup>

Our natural areas in Salt Lake Valley have become novel ecosystems. Many introduced species would require costly and land-intensive mitigation to remove. They are likely here to stay.

Considering that, vegetation should be managed based on their habitat value, rather than the native versus non-native dichotomy. When noxious weeds or other vegetation is removed, a diversity of species in different sizes and ages should be used to replace. Removal and revegetation efforts should be phased to not undermine habitat value through clear-cutting. Oftentimes, birds can be seen using Russian olive and tamarisk, two notorious noxious weeds along our creeks, in absence of indigenous vegetation.

Biodiversity is an important factor to combat the effects of climate change for wildlife as species migrate and others are not able to adapt. Stream daylighting creates new riparian habitat, and biodiversity, in areas that were once developed or degraded. Restoration repairs impacted ecosystems to increase biodiversity.



Figure 5: Restoration seeding at Mill Creek Confluence in South Salt Lake.

42 - Envision Utah, *Blueprint Jordan River Refresh Survey Findings* (2020).

43 - Vartan, *How wildlife bridges over highways make animals—and people—safer* (2019).

44 - Envision Utah, *Blueprint Jordan River Refresh Survey Findings* (2020).

45 - Morse, *Novel ecosystems in the Anthropocene* (2014).



# 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.

Bikers in City Creek Canyon during the Range 2 River Relay.

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

### VALUES

Based on response in the 2014 “Your Utah, Your Future” survey, Utahns want to provide outdoor recreation opportunities close to home. To do this, they want a connected and expanded network of trails, parks, and bike infrastructure through our cities to promote healthier living, personal enjoyment, and happiness. Approximately 67 percent support more funding, even if it meant a small tax increase, to establish interconnected parks and trails.<sup>1</sup>

In the ten big ideas identified in *Reimagine Nature*, the “From the Mountains to the Lake” idea proposes increased connectivity among Salt Lake City’s parks and open spaces. Efforts would identify and invest in recreation opportunities that connect the Wasatch Range to the Jordan River, especially along our creeks.<sup>2</sup> Salt Lake City residents particularly enjoy parks and open spaces that support hiking, walking, running, and non-programmed activities.<sup>3</sup>

In the *Blueprint Jordan River Refresh Survey Findings*, over 60 percent thought an expanded trail network along the Jordan River and connections to regional trails, like the greenways, was extremely or very important.

Connections to regional trails were ranked third on improvements to travel along the Jordan River corridor, just after improved crossings and a wider trail.<sup>4</sup>

More than 75 percent of Salt Lake County residents enjoy parks at least monthly. Large numbers accessed wilder areas regularly. Nearly two-thirds of residents in Salt Lake County report time spent outdoors as very important to their overall satisfaction and happiness. They would like to see more recreational opportunities available to them.<sup>5</sup>

### OUTDOOR RECREATION

Outdoor recreation can take on many different forms. It can be as simple as walking a neighborhood trail, a bike ride around the block, or a child playing along a creek that flows through their neighborhood. Alternatively, it can be as time and monetary intensive as skiers flocking to Big Cottonwood and Little Cottonwood Canyons for the “Greatest Snow on Earth” and the four world-class ski resorts.

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.”<sup>6</sup> Outdoor recreation also strengthens Utah’s economy. In 2019, it generated an estimated \$6.4 billion and 83,000 jobs.<sup>7</sup>

The Coronavirus (COVID-19) pandemic underscores the need for parks and recreational facilities, especially those close to home. They provide a way to get outdoors and exercise while protecting yourself and others. Greenways



Figure 6: Person enjoying Emigration Creek at Westminster College in Salt Lake City.

should focus on equitable access, especially for residents without the means to travel to canyons for outdoor recreation and exercise. They can connect communities, and ecosystems, from the Wasatch Range to the Jordan River—a range to river connection.

### EXISTING FACILITIES

Along City Creek, soft-surface trails and a paved road extend between the upper canyon, Memory Grove, along Canyon Road, City Creek Park, and along North Temple. In 1995, City Creek was daylighted through the grassy median on Canyon Road and in the former surface parking lot at City Creek Park. 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.

Along Red Butte Creek, a paved road extends from the mouth of the canyon to the base of Red Butte Reservoir. Soft-surface trails wind around the Miller Bird Refuge and Nature Park and Bonneville Glen. Soft-surface and paved trails surround Liberty Pond, the confluence of Red Butte and Emigration Creeks. The Three

Creeks Confluence provides a trailhead to the Jordan River Trail at the confluence of Red Butte, Emigration, and Parleys Creeks, where they flow into the Jordan River.

Along Emigration Creek, soft-surface and paved trails wind through parks and open spaces along the creek, including Rotary Glen Park, Donner Trail Park, Wasatch Hollow, and Blaine Natural Area. Salt Lake City recently acquired Allen Park for \$7.5 million. Allen Park Drive serves as a pedestrian-only road to view the eclectic mix of historic homes, works of art, and the natural beauty of the creek. On Westminster College’s campus, paved and soft-surface trails parallel the creek.

Along Parleys Creek, the Parleys Trail closely parallels the length of the 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 existing tracks on the west-side. At this point, the creek goes underground into the storm water system. A trail gap exists at 900 West to the Jordan River Trail. The Parleys

1 - Envision Utah, *Recreation Vision Book* (2014).

2 - Salt Lake City, *Reimagine Nature Preliminary Engagement Findings* (2020).

3 - Salt Lake City, *Parks & Public Lands Needs Assessment* (2019).

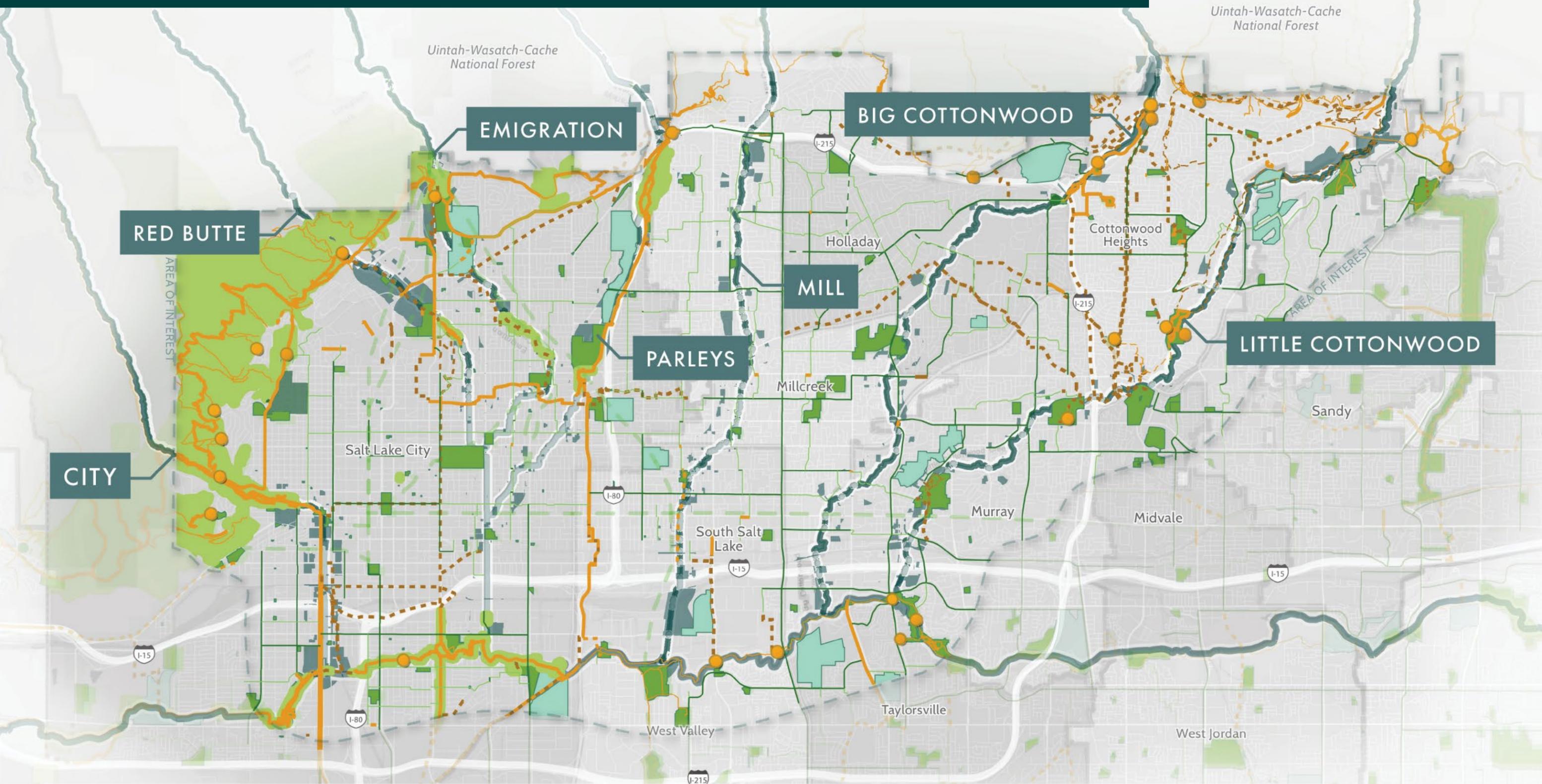
4 - Envision Utah, *Blueprint Jordan River Refresh Survey Findings* (2020).

5 - Salt Lake County, *Watershed Public Opinion Survey Report of Findings* (2015).

6 - Witters, *Utah Poised to Be the Best U.S. State to Live In* (2012).

7 - Bureau of Economic Analysis, *Outdoor Recreation Satellite Account – Utah* (2019).

# MAP 3: TRAILS, BIKE LANES, & AMENITIES WITHIN SCOPE



- |                |                 |                    |            |               |       |
|----------------|-----------------|--------------------|------------|---------------|-------|
| BURIED CHANNEL | TRAILS          | BIKE LANES         | TRAILHEADS | GOLF COURSES  | CIVIC |
| OPEN CHANNEL   | PROPOSED TRAILS | NEIGHBORHOOD BYWAY | PARKS      | NATURAL AREAS |       |



Source: Utah Automated Geographic Reference Guide, *Trails and Trailheads, Golf, Civic, and Parks datasets* (2021); Cottonwood Heights, Holladay, Midvale, and Salt Lake City, *Trails and Parks datasets* (2021); Salt Lake County and Wasatch Front Regional Council, *Active Transportation Implementation Plan datasets* (2021); United States National Park Service, *Historic Trails* (2021); and Salt Lake County, *Waterways* (2021).



**Figure 7:** People enjoying Red Butte Creek at Miller Bird Refuge & Nature Park in Salt Lake City.

Trail is the most complete greenway of the seven.

Along Mill Creek, trails exist in Evergreen Park and Scott Avenue Park. The Mill Creek Trail, in South Salt Lake, begins at 500 East in Monarch Park and parallels the creek through Fitts Park. The Mill Creek Trail picks back up at the Utah Transit Authority's Millcreek Station on 3300 South and extends, as a widened sidewalk, to the Jordan River Trail. The Mill Creek Confluence provides an existing trailhead to the Jordan River Trail, where the creek flows into the Jordan River.

Along Big Cottonwood Creek, the Big Cottonwood Trail begins at the mouth of the canyon and parallels the creek through the Old Mill Open Space to Knudsen Park. Soft-surface and paved trails wind through parks and developments along the creek, including Big Cottonwood Regional Park, KPC Promise Hospital of Salt Lake, and the Birkhill Apartments.

Along Little Cottonwood Creek, the Little Cottonwood Trail extends from the canyon

mouth to the Temple Quarry Ruins within the canyon. A soft-surface trail parallels the creek in Quail Hollow Park until it flows to the water treatment plant. Additional soft-surface and paved trails wind along the creek in Crestwood Park, Wheeler Historic Farm, Murray Park, and the Intermountain Medical Center. Arrowhead Park and the Little Confluence Trailhead provide access to the Jordan River Trail, where the creek flows into the Jordan River.

The seven greenways feed into the Golden Spoke trail system, which includes over 100 miles of safe and nearly-connected multi-use trails from Provo to Ogden along the Wasatch Front, including the Provo River Parkway, Murdock Canal Trail, Jordan River Trail, Legacy Trail, Denver and Rio Grande Western Rail Trail, and Ogden River Parkway. The greenways also provide connectivity between existing or proposed sections of the Bonneville Shoreline Trail to the east.

## PLANNED FACILITIES

Along City Creek, the Folsom Trail will connect Utah Transit Authority's North Temple Station to the Jordan River Trail through an abandoned railroad corridor. The corridor will improve access from west-side neighborhoods to employment, services, and entertainment in Downtown Salt Lake City. Construction is expected to begin Spring 2021. Adjacent to the trail, City Creek is proposed to be uncovered and restored. In 1992's *Open Space Plan*, City Creek was proposed to be uncovered along North Temple, around the Jazz Arena, flow through the Gateway Redevelopment Area, and connect into the Folsom Corridor.<sup>8</sup>

Along Red Butte Creek, efforts are underway at the University of Utah to create a trail adjacent to the creek from Red Butte Garden, through Research Park, to Foothill Boulevard.<sup>9</sup> According to Salt Lake City Transportation, Utah Department of Transportation has tentatively agreed to a below-grade crossing for the trail underneath Foothill Boulevard. The *Pedestrian & Bicycle Master Plan* proposes to extend the trail through the United States Department of Veterans Affairs campus and Sunnyside Park to Sunnyside Avenue.<sup>10</sup> This would nearly bring the trail to existing pathways at Miller Park and beyond.

Along Emigration Creek, a paved trail is proposed through Bonneville Golf Course. The 1992 *Open Space Plan* imagined a paved trail extending from the golf course, through Westminster College, and connecting into the McClelland Trail. With Salt Lake City's recent acquisition of Allen Park, this vision is possible. There are two miles of contiguous, accessible, and preserved riparian ecosystem between Wasatch Hollow, Blaine Natural Area, Allen Park, and Westminster College. Some private property still exists

along this stretch. However, through access agreements, this corridor could have a trail soon.

Along Parleys Creek, partners are working to complete the major gap on the Parleys Trail between 900 West and the Jordan River Trail and to create more formal connections in the Sugar House Business District and between State Street and 300 West.

Along Mill Creek, South Salt Lake has plans to extend the Mill Creek Trail from Fitts Park, through a Utah Transit Authority right-of-way along the creek, then south to the existing trail at the Utah Transit Authority's Millcreek Station. Further proposals suggest a trail through the Central Valley Wastewater Treatment Plant property to the Mill Creek Confluence, connecting to the Jordan River Trail.<sup>11</sup> Interstate-15 and several large swathes of railroad tracks create a formidable barrier for the Mill Creek Trail in South Salt Lake.

Along Big Cottonwood Creek, Murray's 2003 General Plan suggests a trail through the city, but the alignment was not determined.<sup>12</sup>

Along Little Cottonwood Creek, the 2021 Cottonwood Heights Parks, Trails, & Open Space Master Plan envisions a 6-mile trail from the canyon mouth to Wheeler Farm in Murray. There are two possible alignments: one closely following the creek and the other following the hillside between Crestwood Park and Brighton High School. The trail would extend through multiple municipalities and across mostly privately-owned property, requiring additional research, planning, and public outreach.<sup>13</sup> The *East West Recreation Trails Master Plan* suggests a trail along Vine Street, which closely follows the creek at 900 East. It continues through Murray Park, across State Street, and connecting to the Jordan River Trail at Arrowhead Park and

8 - Salt Lake City, *Open Space Plan* (1992).

9 - University of Utah, *Red Butte Creek Strategic Vision* (2015).

10 - Salt Lake City, *Pedestrian & Bicycle Master Plan* (2015).

11 - EPG, *Mill Creek Trail Feasibility Study* (2009).

12 - Murray, *General Plan* (2003).

13 - Cottonwood Heights, *Parks, Trails, & Open Space Master Plan* (2021).

the Little Confluence Trailhead.<sup>14</sup>

## DOG PARKS

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.<sup>15</sup> In Utah, 36 percent of households own dogs.<sup>16</sup>

Salt Lake County and many municipalities are rapidly developing plans for more dog parks. However, they are a relatively new phenomenon in parks and open spaces. Best management practices are slow to follow. Design, operation, and maintenance are still evolving through trial and error, creating issues with water quality, erosion, and user conflicts.

In areas with high dog use, streambank erosion is often evident and ground vegetation trampled. This can jeopardize larger vegetation along banks—shrubs and trees. Increased sedimentation loads, due to erosion, affect water quality for Bonneville cutthroat trout downstream. Dogs also 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.

The *Parleys Historic Nature Park Comprehensive Use and Management Plan* points out, “While most dog walkers are responsible, some of the problems pointed out are a lack of understanding on the boundary, little enforcement of the leash policy in on-leash areas, violators of the two dog limit (often professional dog-walking services), and leaving dog waste behind.”<sup>17</sup>

In the *Parks & Public Lands Needs Assessment*, Salt Lake City residents were split on whether dogs create conflicts with other trail users. Approximately 30 percent of respondents agree dogs cause conflicts. Yet, 17 percent of those, who agreed are dog owners. This suggests issues could escalate as population increases and more conflicts occur.<sup>18</sup>

In identifying strategies, almost half of respondents agree with more enforcement and fines for not following off-leash regulations. Approximately 36 percent wanted more off-leash dog areas to lessen conflicts.<sup>19</sup> Salt Lake County’s *Off-Leash Dog Park Master Plan* suggests protecting environmentally sensitive areas and improving enforcement. High dog use areas should be constructed away from areas and buffer zones used to protect sensitive and erodible areas. Access should only be given at controlled points. Seasonal closures should be considered for nesting, breeding, and rearing of wildlife.<sup>20</sup>

For enforcement, regulations should be posted prominently at dog parks and on applicable websites. Phone numbers of enforcement should be posted prominently underneath regulations. Volunteer groups could 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.<sup>21</sup>

There are four dog parks along our creeks: Memory Grove (City Creek), Herman Franks Park (Emigration Creek), Rotary Glen (Emigration Creek), and Parleys Historic Nature Park (Parleys Creek).

At Parleys Historic Nature Park, restoration

Table 4: Behavioral Risk Factors for Health by City

CITY - NEIGHBORHOOD	RECOMMENDED PHYSICAL ACTIVITY (%)	OBESITY (%)
Cottowood 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

Source: Utah Department of Health, *Behavioral Risk Factor Surveillance System* (2020).

efforts worked to mitigate the impacts of dogs and protect Parleys Creek. The riparian corridor was closed off except at designated access points. Education signage and periodic enforcement further decrease impacts.<sup>22</sup>

## HEALTH & WELLNESS

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.<sup>23</sup> The Centers for Disease Control and Prevention recommends 2.5 hours of moderate exercise each week.

Nearly half of Salt Lake County residents do not meet recommendations for physical activity. Lack of physical activity increases risk of many health problems, particularly obesity, diabetes,

and heart disease.<sup>24</sup> In Salt Lake County, 29 percent of residents are obese. Table 3 shows the breakdown of behavioral risk factors by City.

Walking and bicycling are basic forms of physical activity and recreation. They link with daily commuting, running errands, or leisure to connect residents with convenient exercise options. Residents are more likely to recreate and exercise in natural surroundings.<sup>25</sup> Outdoor recreation provides greater social interaction and reduces stress levels. Merely the sight of trees improves recovery from stress by reducing blood pressure and muscle tension.<sup>26</sup>

Residents in Salt Lake County experience particularly high rates of asthma due to poor air quality. Red air quality days prevent outdoor recreation and active transportation, impacting underrepresented populations disproportionately. Additionally, low incomes

14 - Salt Lake County, *East West Recreation Trails Master Plan* (2015).

15 - Trust for Public Land, *Dog park rankings for the 100 largest U. S. cities* (2018).

16 - American Veterinary Medical Association, *Pet Ownership & Demographics Sourcebook* (2018).

17 - Salt Lake City, *Parleys Historic Nature Park Comprehensive Use and Management Plan* (2011).

18 - Salt Lake City, *Parks & Public Lands Needs Assessment* (2019).

19 - Salt Lake City, *Parks & Public Lands Needs Assessment* (2019).

20 - Salt Lake County, *Off-Leash Dog Park Master Plan* (2008).

21 - Salt Lake County, *Off-Leash Dog Park Master Plan* (2008).

22 - Salt Lake City, *Parleys Historic Nature Park Comprehensive Use and Management Plan* (2011).

23 - Cawley, *The medical care costs of obesity* (2012).

24 - North Carolina Department of Health and Human Services, *Eat Smart, Move More NC* (2021).

25 - Donovan, *The relationship between trees and human health* (2013).

26 - Southern Group of State Foresters, *Health Benefits of Urban Trees* (2021).



**Figure 8:** People enjoying City Creek at Memory Grove in Salt Lake City.

undermine public health. Low-income communities often have a lack of access to fresh, healthy foods, a lack of time or resources for exercise or recreation, and lack of access to affordable healthcare options.<sup>27</sup>

## PROGRAMMED RECREATION

Many children are introduced to the outdoors through youth programs, such as soccer teams and baseball leagues. Where adequate space is available, programmed recreation can be offered. These large fields can also mitigate flooding by acting as flood detention and retention areas in high flows.

In Holladay, Big Cottonwood Regional Park features a disc golf course that winds its way through riparian forests and wetlands along Big Cottonwood Creek. The surrounding area acts as a detention area in the event of flooding. The surrounding vegetation makes for a more interesting and enjoyable course while adding important wildlife habitat value.

Golf courses provide recreational opportunities

along our creeks while preserving green, open space and wildlife habitat. The Bonneville Golf Course in Salt Lake City features a natural stretch of Emigration Creek, winding through several of the holes. The creek creates an interesting water hazard for golfers and provides vital habitat value. Deer and other wildlife frequent the course. On the other hand, courses privatize portions of our creek and make access and enjoyment of them expensive.

Murray Park serves as a recreation hub along Little Cottonwood Creek. The park features an outdoor swimming pool, an outdoor ice rink, a rugby field, a softball field, a soccer field, and multi-purpose fields. After programming at the park, youth and families can explore the natural wonders of Little Cottonwood Creek and enjoy its flowing solace.

There are 34 soccer or multi-purpose fields, 47 basketball, tennis, or multi-purpose courts, eight golf courses, and 24 baseball diamonds within 1/4 miles of our creeks.

## ACTIVE TRANSPORTATION

Walking, biking, rolling, and even boating (where feasible) are affordable transportation

options available to all ages and abilities. Active transportation is any human-powered mode of travel in our communities. It can be a passive form of recreation as activity is combined with a commute to work or running errands. Greenways strengthen active transportation networks by providing buffered, safe, and beautiful space.

Active transportation improves air quality by reducing the reliance on personal automobiles. It diminishes costs associated with the purchase, maintenance, and fuel of vehicles. In 2020, the cost to own and operate a car in the United States was \$9,561.<sup>28</sup> Bicycles cost an estimated \$350 per year.<sup>29</sup> Walking is virtually free. Businesses often situate themselves along waterways, trails, and other amenities. Increasingly relocation decisions for professionals are based on quality of life considerations, such as robust active transportation networks and greenways.

## ANGLING & WATER 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.

However, 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*.<sup>30</sup> 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.

28 - AAA, *Your Driving Costs* (2020).

29 - Schwartz, *Americans Work 3.84 Minutes Each Day To Pay For Their Bicycles* (2011).

30 - Envision Utah, *Blueprint Jordan River Refresh Survey Findings* (2020).

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, one of the last remaining along the Jordan River—perfect for wildlife viewing.

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. In 2019, 17 percent tried fishing in the United States. According to the Outdoor Industry Association, fishing is one of the most popular “gateway” activities—accessible activities that lead to other forms of outdoor recreation.<sup>31</sup> Our creeks provide accessible angling opportunities in our backyards.

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 of the springs feeding the pond were uncovered and restored. New vegetation along the pond and streams provides wildlife habitat and improves water quality. Additional community fisheries dot the Jordan River corridor.

31 - Outdoor Industry Association, *Special Report on Fishing* (2020).

## OPPORTUNITY

### Expanding RECREATION and increasing walkability

Efforts are already underway to create trails and recreation opportunities along our seven creeks. Access on public lands and through stream daylighting provides attractive, safe, and comfortable places for residents of all ages and abilities to enjoy creeks and trails. Anglers can cast a line, 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.

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.<sup>32</sup> This is significant. Even small increases in physical activity foster measurable health benefits.

The greenways provide robust and unique outdoor recreation opportunities while making connections with family, friends, and neighbors. Seasonal opportunities exist on the lower portions of Mill, Big Cottonwood, and Little Cottonwood Creeks for in-water recreation, including canoeing, kayaking, and floating. These 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, allowing residents to toss a line right in their backyards. Additional partnerships with developments, schools, churches, and other institutions can expand the greenways network through trail

connections and public access agreements.

Greenways provide access to safe, comfortable, and convenient places 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.

Golf courses along our streams can provide communities with more benefits than just hitting the links. They can provide trails, habitat value, biodiversity, storm water management, and green infrastructure. Off-leash dog days at golf courses could increase the acreage of dog-friendly areas in our cities.

For example, plans at Bonneville Golf Course include the Emigration Creek Trail Connector, a proposed trail through the course adjacent to the creek. In addition, restoration efforts are being pursued, identified in the *Emigration Creek Management Plan*, to uncover and restore portions of the creek to improve water quality, enhance bank stability, and increase wildlife habitat value.<sup>33</sup>

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.<sup>34</sup> Where feasible, programmed recreation can be added to the greenways.



Figure 9: Canoers in the Jordan River during the Range 2 River Relay in Salt Lake City.

32 - Kahn, *The effectiveness of interventions to increase physical activity: a systematic review* (2002).

33 - Salt Lake City, *Emigration Creek Management Plan* (2010).

34 - Salt Lake City, *Parks & Public Lands Needs Assessment* (2019).



# 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.

Youth clean the Three Creeks Confluence in Salt Lake City.

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

### VALUES

According to the “Your Utah, Your Future” survey, Utahns want their communities to be:

- Safe, secure and resilient;
- Prosperous;
- Neighborly, Fair and Caring; and
- Healthy, Beautiful and Clean.

Respondents want communities that provide convenient access to nature and recreation. Furthermore, they want these destinations to be accessible by walking, biking, and transit, rather than driving alone. Of 100 points available, 23 were allocated to improving alternative transportation systems without a vehicle. To do so, a key strategy is to “connect communities with a system of trails and parks.” It is particularly important to integrate trails into regional systems and provide access to destinations and transit. The *Transportation & Communities Vision Book* suggests cooperatively planning networks at both the community and regional levels before significant population growth.<sup>1</sup>

### DEMOGRAPHICS

Approximately 388,908 residents live within one

mile of the seven creeks. The total population of Salt Lake County is 1,204,222. The population living within one-mile of the creeks grew by one percent between 2010 and 2020. For comparison, the population in Salt Lake County, as a whole, grew by 1.5 percent between these ten years.<sup>2</sup>

The population within one-mile of the creeks is 50-50 male and female. The median age is 35. The gender distribution is the same county-wide and the median age is similar at 33. The majority of the population is 82 percent white, compared to 87 percent in Salt Lake County. Table 4 shows the population by race within one mile of the creek corridors.

There are 155,329 households within one-mile of the seven creeks, compared to 397,918 in Salt Lake County. The average household size is 2.47–2.99 in Salt Lake County. Nearly 80 percent of homes within one-mile of the creeks were constructed before 1990. County-wide, 65 percent of homes were constructed before 1990. Median price of homes within one mile of the seven creeks is \$374,384, compared to \$345,284 County-wide.<sup>3</sup>

According to membership figures provided by the Church of Jesus Christ of Latter-day Saints, approximately 49 percent of Salt Lake County residents are Mormon, which includes active and nonactive members. The number of devout Mormons is lower. It is estimated about 40 percent of Mormons are active—24 percent of Salt Lake County residents as a whole.<sup>4</sup> This dichotomy plays into the cultural narrative of the Salt Lake Valley between religious folks and the counterculture.

2 - Esri, *Forecasts for 2020 and 2025 with converted Census 2000 data into 2010 geography using one-mile buffer to creek* (2021).

3 - Esri, *Forecasts for 2020 and 2025 with converted Census 2000 data into 2010 geography using one-mile buffer to creek* (2021).

4 - Associated Press, *Mormons now a minority in Utah's biggest county, new figures show* (2018).

Table 5: Race & Ethnicity Within One Mile of Creeks

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
Some Other Race	22,818	7
Two or More Races	11,335	3

Source: Esri, *Forecasts for 2020 and 2025 with converted Census 2000 data into 2010 geography using one-mile buffer to creek* (2021).

### INDIGENOUS PEOPLES

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. Each creek tells a story that makes up the cultural narrative of tribes in the Salt Lake Valley.<sup>5</sup>

As Mormon settlers moved into the Salt Lake Valley and spread along the Wasatch Front, native peoples were displaced and conflicts arose. Many tribes were pushed to the eight reservations in Utah. However, not all live on reservations. Approximately 46% of the total population of indigenous peoples in Utah live in Salt Lake County.<sup>6</sup>

### UNDERREPRESENTED POPULATIONS

In the Salt Lake Valley, there is a divide between east and west-side communities. The north-south Interstate-15 and railroad tracks create a barrier to connectivity and cultural exchange between these communities. This limits mobility, decreases access to jobs, creates dangerous

5 - Seven Canyons Trust, *Land Acknowledgement* (2020).

6 - U.S. Census Bureau, *2009-2013 ACS 5-Year Estimates* (2010).

encounters between people, cars, and trains, and silos communities.

Examples of underrepresented groups include: 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 official poverty threshold or \$38,000 for a family of four). Western and central areas of Salt Lake City, South Salt Lake, and western areas of Millcreek have higher concentrations of underrepresented groups. The poverty rate in these communities ranged from 11 to 31 percent, compared 2 to 16 percent in other Salt Lake County communities. Of the 12 census tracts that border the western edge of the creek corridors, racial and ethnic minorities make up an average of 59 percent of the population.<sup>7</sup>

### ENVIRONMENTAL JUSTICE

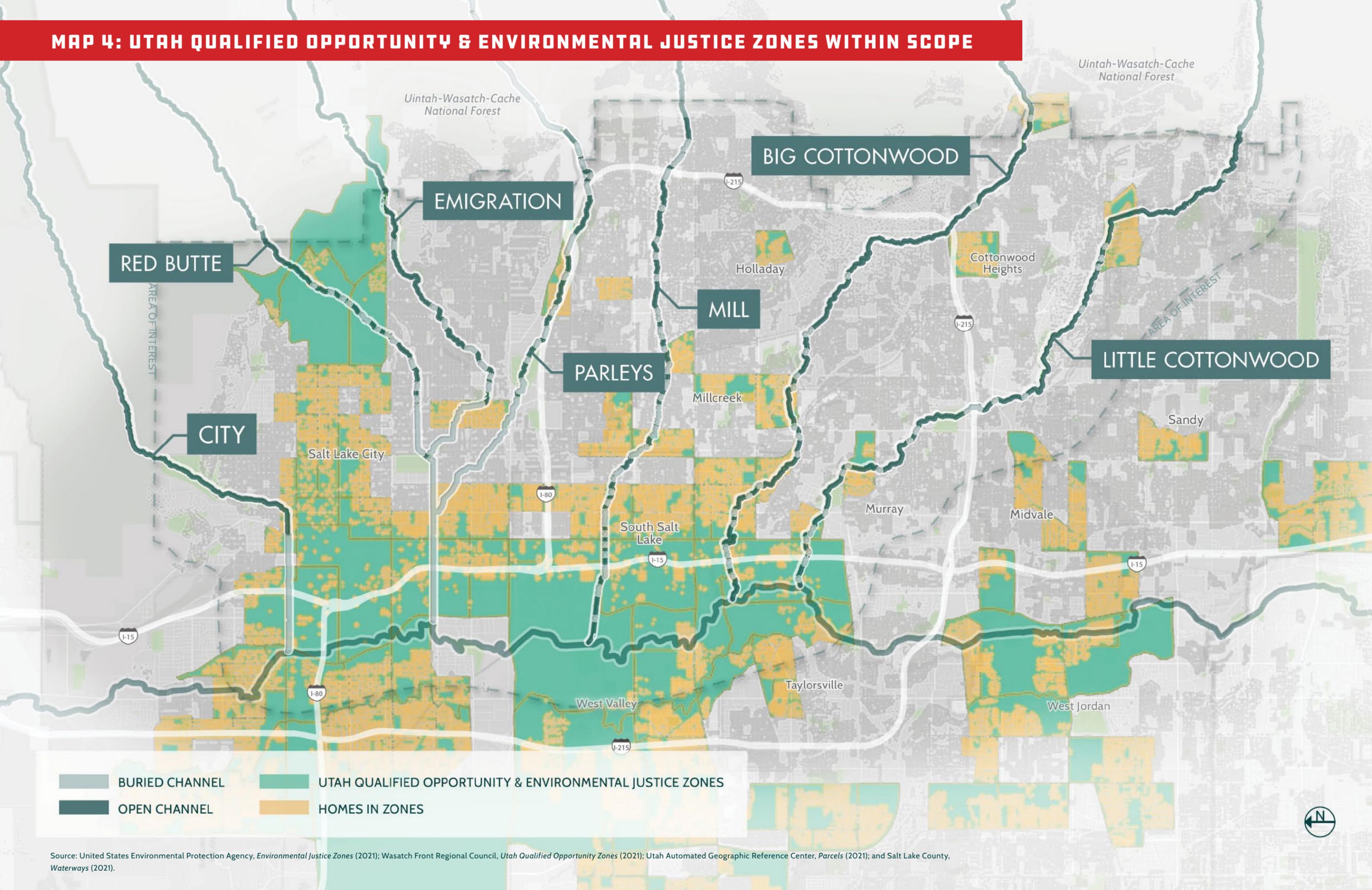
Our creeks slip underground as they flow west, passing unseen through west-side neighborhoods until spilling into the Jordan River within buried culverts. Three of the top five most diverse cities in Utah fall within the project area: South Salt Lake, Midvale, and Salt Lake City.<sup>8</sup>

In South Salt Lake, Mill Creek is impaired for *E. coli*, dissolved oxygen, and degraded aquatic habitat condition (observed-to-expected bioassessments). In Salt Lake City, City, Red Butte, Emigration, and Parleys Creeks flow underground as they pass underneath Interstate-15 and the central city core. Additionally, the lower watersheds of the creeks are impaired for *E. coli* and degraded aquatic habitat condition (observed-to-expected bioassessments). Midvale features only a small portion of Little Cottonwood Creek, which is impaired for *E.*

7 - Esri, *Forecasts for 2020 and 2025 with converted Census 2000 data into 2010 geography using one-mile buffer to creek* (2021).

8 - U.S. Census Bureau, *2015-2019 ACS 5-Year Estimates* (2021).

# MAP 4: UTAH QUALIFIED OPPORTUNITY & ENVIRONMENTAL JUSTICE ZONES WITHIN SCOPE



Source: United States Environmental Protection Agency, *Environmental Justice Zones* (2021); Wasatch Front Regional Council, *Utah Qualified Opportunity Zones* (2021); Utah Automated Geographic Reference Center, *Parcels* (2021); and Salt Lake County, *Waterways* (2021).

**Table 6: Utah Qualified Opportunity & Environmental Justice Zones**

ZONE	DESCRIPTION
Environmental Justice Zone	Environmental Protection Agency identified zones of greater environmental injustices, such as air and water pollution, in areas with greater densities of underrepresented populations
Utah Qualified Opportunity Zone	Utah Governor's Office of Economic Development identified zones of economically distressed communities where new investments may be eligible for preferential tax treatment

Source: Utah Governor's Office of Economic Development, *Opportunity Awaits: Statewide Opportunity Zones Announced* (2018).

*coli*, cadmium, temperature, total dissolved solids, and degraded aquatic habitat condition (observed-to-expected bioassessments).<sup>9</sup> Loss of green space due to creek burial and water quality impairments have left many residents on the west-side without access to nature or connectivity via riparian corridors and pathways.

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.” In the United States, communities of color are three times more likely than white communities to live in a place that is nature deprived. An estimated seventy percent of low-income communities live in nature-deprived areas.<sup>10</sup>

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.<sup>11</sup>

Air quality is the Salt Lake Valley's biggest environmental injustice. Atmospheric inversions cause acute air pollution days, and limit urban outdoor activity. Travel east to higher elevations and one can see the thick layer of pollution in the western part of Salt Lake County. In December 2019, a red-level day registered particulate levels nine times greater than Los Angeles.<sup>12</sup>

Pollution is the leading cause of disease and death in the world, contributing to nine million deaths in 2015 alone. Health effects caused by pollution are most severe among low-income and underrepresented communities.<sup>13</sup> The Utah Society for Environmental Education conducted a study asking west-side residents about problematic issues in their community. The most noted problem was air quality.<sup>14</sup>

Geography plays a role as pollution settles in the lower parts of the Salt Lake Valley. Additionally, the largest emitters are located in west-side neighborhoods—factories, highways, and refineries. A 2014 study found higher pollution days increase school absenteeism. By cutting pollution in half, the Salt Lake City School District would save \$426,000 per year. Benefits would be greatest in schools located in underrepresented areas.<sup>15</sup>

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.<sup>16</sup> Climate change threatens to make pollution worse. Higher temperatures due to climate change will increase extreme heat events and wildfires. Summertime PM 2.5, created by wildfire smoke, decreases air quality and the health of residents. In some cases, it can lead to premature death.<sup>17</sup>

The urban forest plays a key role in improving air quality. Yet, tree coverage in Salt Lake County declines in neighborhoods with higher percentages of underrepresented populations—residents who are most impacted by poor air quality.<sup>18</sup> In new neighborhoods, there is no relationship between household income and vegetation abundance. However, as neighborhoods age, time strengthens the relationship as low-income residents do not have the financial resources or social capital to replace trees after their natural life span.<sup>19</sup>

According to the *Parks & Public Lands Needs Assessment*, the Central, Northwest, and West Salt Lake communities, in Salt Lake City, are the highest need planning 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.<sup>20</sup>

Communities on the west-side have high numbers of park acres and amenities due to the Jordan River corridor. However, west-side residents are less likely to visit parks. When they do, they are more likely to travel and use east-side parks.<sup>21</sup> Many west-side residents feel their parks and open spaces do not get the same level of maintenance. In *Reimagine Nature*, Salt

Lake City is committed to investments in capital improvements and maintenance on the Jordan River Trail that matches Liberty Park, acre for acre.<sup>22</sup>

## 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 can be seen as unsanctioned encampments.

The most immediate impact can be 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 camps, belongings, and waste left behind. However, for individuals living on as little as \$11 a day, belongings are not easily replaced.<sup>23</sup>

Additional ecological impacts from encampments may include bank erosion when regrading or digging into the creek bank is involved, trampling of sensitive habitat areas, and water quality issues related to microplastics and *E. coli* from feces running into waterways. According to researchers, these impacts may be overstated to justify removal and clean-up mitigation efforts. Drug paraphernalia presents a safety hazard for volunteer groups without experience handling sharp materials.

Wildfires are possibly the largest risk of encampments in natural areas. Fires easily get

9 - Salt Lake County, *Integrated Watershed Plan* (2015).

10 - Borunda, *How 'nature deprived' neighborhoods impact the health of people of color* (2020).

11 - Environmental Protection Agency, *Environmental Justice Screening & Mapping Tool* (2020).

12 - Biskupski, *Testimony before the Committee on Energy and Commerce Subcommittee on Environment and Climate Change* (2019).

13 - The Lancet, *Commission on Pollution & Health* (2017).

14 - Chand, *Environmental Racism* (2018).

15 - Mendoza, *Impact of low-level fine particulate matter and ozone exposure on absences in K-12 students and economic consequences* (2020).

16 - Utah Department of Health, *Asthma basics* (2014).

17 - Biskupski, *Testimony before the Committee on Energy and Commerce Subcommittee on Environment and Climate Change* (2019).

18 - Lowry, *Spatial Analysis of Urbanization in the Salt Lake Valley* (2010).

19 - Martin, *Neighborhood socioeconomic status is a useful predictor of perennial landscape vegetation in residential neighborhoods and embedded small parks of Phoenix, AZ* (2004).

20 - Salt Lake City, *Parks & Public Lands Needs Assessment* (2019).

21 - Salt Lake City, *Parks & Public Lands Needs Assessment* (2019).

22 - Salt Lake City, *Reimagine Nature Preliminary Engagement Findings* (2020).

23 - Neild, *An exploration of unsheltered homelessness management on an urban riparian corridor* (2018).

out of hand in the summertime when vegetation is dry. Natural areas frequently burn along the Jordan River, jeopardizing habitat, 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.<sup>24</sup>

## SAFETY

Our communities are grappling with designing parks and open space for safety, while balancing goals for access, wildlife habitat, and water quality.

Utah's violent crime rate of 2.3 residents per 1,000 is lower than the national average. The national average is 3.7. South Salt Lake reports 9.6, Salt Lake City: 7.3, Murray: 4.3, Sandy: 1.6, and Cottonwood Heights: 1.3. Holladay, Millcreek, and Midvale were not reported. Being assaulted by a stranger is the number one violent crime concern in Utah, and it's the crime most people feel is most likely to happen.<sup>25</sup>

According to *Blueprint Jordan River Refresh Survey Findings*, 24 percent said they don't feel safe visiting the Jordan River Trail. When surveying by gender, females' concern for safety went up to 35 percent. Out of 100 points, females spent 17 points on safety, the highest of their allocation to improve the Jordan River corridor. Most did not feel safety prevented them from using the river corridor.<sup>26</sup>

The *Parks & Public Lands Needs Assessment* shows some inconsistencies. 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.<sup>27</sup>

According to the National Recreation and Park Association, "keeping park and recreation facilities safe is a key to community wellness and has a direct relationship to their usage rate." Integrated approaches are required to create and maintain safer parks and open spaces, including design, programming, maintenance, and engagement.<sup>28</sup> Efforts should address safety equally in all genders and cultures.

## COMMUNITY INSTITUTIONS

An estimated 20 commercial activation points, 80 civic activation points, and 116 recreation activation points are located within 1/2 mile of the seven creeks. Currently, access to our greenways is focused at existing public lands, such as parks, natural areas, and open space. Private property complicates access. However, through partnerships with landowners, especially near commercial and civic activation points, access has been granted in formal or informal agreements.

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.<sup>29</sup> 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 the rest of the city of Holladay.

Access agreements and partnerships with schools, churches, and other community

24 - Seven Canyons Trust, *Mill Creek Confluence Adaptive Weed Management Plan* (2020).

25 - United States Federal Bureau of Investigation, *Crime in the United States* (2018).

26 - Envision Utah, *Blueprint Jordan River Refresh Survey Findings* (2020).

27 - Salt Lake City, *Parks and Public Lands Needs Assessment* (2019).

28 - National Recreation and Park Association, *Creating Safe Park Environments to Enhance Community Wellness* (2012).

29 - Chakraborty, *5-mile trail coming to foothills near you* (2006).



Figure 10: Students learn about the Three Creeks Confluence in Salt Lake City.

institutions create quasi-public private space for the greenways. At the Bonneville First Ward in Salt Lake City, access agreements have extended the Miller Bird Refugee and Nature Park into The Bonneville Glen along Red Butte Creek. The connection creates access from 1500 E and 1000 S up to 900 S and 1700 E.

Our creeks flow within 1/4 miles of 40 schools and universities, 90 churches and other religious institutions, 11 community centers, and 10 other anchor community institutions.

## PROGRAMMING

Activation is one of the key ways to improve safety. Programs, events, maintained landscaping, infrastructure, and facilities, particularly in low-income and diverse neighborhoods, draw more users to green spaces.<sup>30</sup> Events bring positive activity.

Through programming, participants interact with and learn about our creeks and the surrounding riparian environment. Environmental education teaches about ecosystems, issues they face, and ways humans cause harm. Participants are empowered through teachings to take action, become stewards, and improve ecosystems around them.

The Seven Creeks | Walk Series is a program to

30 - Dolash, *Factors that influence park use and physical activity in predominantly Hispanic and low-income neighborhoods* (2015).

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.<sup>31</sup>

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.

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.

31 - Seven Canyons Trust, *Seven Creeks | Walk Series survey data* (2021).

## OPPORTUNITY

### Addressing equity and 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 park planning and design will systemically reduce barriers for underrepresented populations and provide space for diverse cultures, traditions, interests, uses, abilities, and ages.

Greenways are important to 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 pollution from the more affluent east-side, including fertilizers, lawn debris, and other floatables that enter the storm drain. Natural creeks retain nutrients and clean water quality through streamside vegetation, streambank deposition, and groundwater infiltration.<sup>32</sup> Increasing the urban forest and tree coverage, through the greenways, would filter air pollutants in the most impacted communities.<sup>33</sup> Whereas, underground streams provide no filtering of air and water through vegetation, both in-river and along streambanks.

Greenways will link west and east-side communities from the Wasatch Range to the Jordan River. Connections to destinations, regional transit systems, and other active transportation corridors reduces reliance on vehicles to commute, run errands, and recreate. Corridors will provide access to services, jobs,

entertainment, recreation, and leisure with a focus on adding parks, open space, and trails in the highest need communities.

Meaningful engagement requires building trust and a forum for dialogue. Addressing environmental injustices requires hearing from the populace that solutions would benefit. Programming should partner with existing community groups to engage residents through existing and trusted channels, while building capacity for the future.

Greenways provide spaces for cultural activities, as well as space for artists to perform, create, and display their works. 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 artists generous stipends for their work. Similar opportunities exist throughout the greenways.

Goals for our greenways can be 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 can diminish habitat value.

Nevertheless, greenways can be pleasant, welcoming, and well-used spaces. Graffiti, vandalism, and littering in natural, outdoor spaces is less frequent than comparable vegetation-devoid spaces.<sup>34</sup> There is a link between vegetation and lower crime in residential areas, particularly low-income and diverse urban neighborhoods. The presence of trees and well-maintained understory can strengthen ties among neighbors, increase informal surveillance, and deter crime.<sup>35</sup>



Figure 11: A painted creek channel above underground creeks in Salt Lake City.

Conventional mitigation strategies for unsheltered homeless often have the opposite effect. They increase dependency on parks for residency with displacement and loss of belongings. Housing can take longer than 6 months to secure.<sup>36</sup> A comprehensive strategy to address unsheltered homeless in our greenways will be required. 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 folks. 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.

Greenways should prioritize 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.<sup>37</sup> 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, where feasible.

Loneliness in older adults is linked to higher risks for a variety of physical and mental conditions.<sup>38</sup> Greenways provide a place for meaningful activity, which maintains well-being and may improve cognitive function.<sup>39</sup> They can be areas to recharge our “Vitamin N,” as Richard Louv put it in his 2005 book, *Last Child in the Woods*.

32 - Salt Lake County, *Stream Care Guide* (2014).

33 - Klapproth, *Understanding the science behind riparian forest buffers* (2009).

34 - Brunson, *Resident Appropriation of Defensible Space in Public Housing* (1999).

35 - Kuo, *The Role of Arboriculture in a Healthy Social Ecology* (2003).

36 - Neild, *An exploration of unsheltered homelessness management on an urban riparian corridor* (2018).

37 - Utah Department of Health, *Disabilities and Health in Utah* (2020).

38 - Cacioppo, *Older adults reporting social isolation or loneliness show poorer cognitive function 4 years later* (2013).

39 - Cacioppo, *Loneliness: clinical import and interventions* (2015).



# URBAN

From the Indigenous Peoples of the Salt Lake Valley, to the Mormon settlers, and to the present, 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.

Youth chalk overtop an underground creek in Salt Lake City.

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

### VALUES

The Coronavirus (COVID-19) pandemic underscores the need for parks and recreational facilities, especially those close to home. They provide a way to get outdoors and exercise while protecting yourself and others. Salt Lake City's parks and public lands have seen an estimated 25% increase in visitation. Increases in visitation result in more user conflicts for pedestrians, cyclists, and other users. Conflicts lead to a perception of a diminished outdoor experience and view of our parks and open spaces.<sup>1</sup>

Respondents to the 2014 "Your Utah, Your Future" survey want communities that provide convenient access to nature and recreation by walking, biking, and transit. They want to "connect communities with a system of trails and parks," especially those that integrate into other regional trail systems and provide access to destinations and public transit. Cooperatively planning networks at both the community and regional levels should be completed before significant population growth, according to the *Transportation & Communities Vision Book*.<sup>2</sup>

In the ten big ideas identified in *Reimagine Nature*, an urban green space network was

1 - Salt Lake City, *Reimagine Nature Engagement Window #1 Summary Report* (2020).  
2 - Envision Utah, *Transportation & Communities Vision Book* (2014).

selected by 43 percent. It proposes developing a connected system of urban public space assets with a robust urban forest and diverse activities.<sup>3</sup> Approximately 65 percent supported acquiring additional natural lands to connect wildlife habitat, and 55 percent supported acquiring additional riparian lands next to our creeks.

According to the *Watershed Public Opinion Survey*, Salt Lake County residents do not believe water quality should be impacted to facilitate development. Furthermore, they strongly support policies that require landowners to leave vegetation in place and plant new vegetation along waterways. In addition, policies that require new developments to set aside natural open space and create green infrastructure are strongly supported.<sup>4</sup>

### HISTORY

Some 60 to 90 million years ago, rock layers folded, compressed, and thrust along the Wasatch Front. Erosion from glaciers and rivers further cut the seven major canyons in Salt Lake County. Out of each canyon flows melted snow and runoff to the Jordan River and onto the Great Salt Lake.

In 1852, Captain Stansbury came to the Salt Lake Valley to survey the land for the United States. Of the Valley, he said, "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."<sup>5</sup>

Our creeks have sustained human settlement of the Salt Lake Valley for thousands of years. The Valley was of the ancestral lands of the

3 - Salt Lake City, *Reimagine Nature Preliminary Engagement Findings* (2020).  
4 - Salt Lake County, *Watershed Public Opinion Survey Report of Findings* (2015).  
5 - Stansbury, *Exploration of the Great Salt Lake of Utah* (1852).



**Figure 12:** Banks of City Creek eroding near Canyon Road in Salt Lake City, circa 1909. Courtesy of Utah State Historical Society.

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.

Mormon settlers came to the Salt Lake Valley in 1847, looking for religious freedom. Within the first day, the new inhabitants began to impact our hydrology. City Creek in Salt Lake City was dammed for five acres of potatoes within the first two hours of arrival.<sup>6</sup>

Mills along the creeks put the waters to use. There were as many as 20 mills along Mill Creek at one point.<sup>7</sup> Mining and logging in the canyons impacted water quality and laid creek banks bare, leaving wildlife without food or shelter.<sup>8</sup>

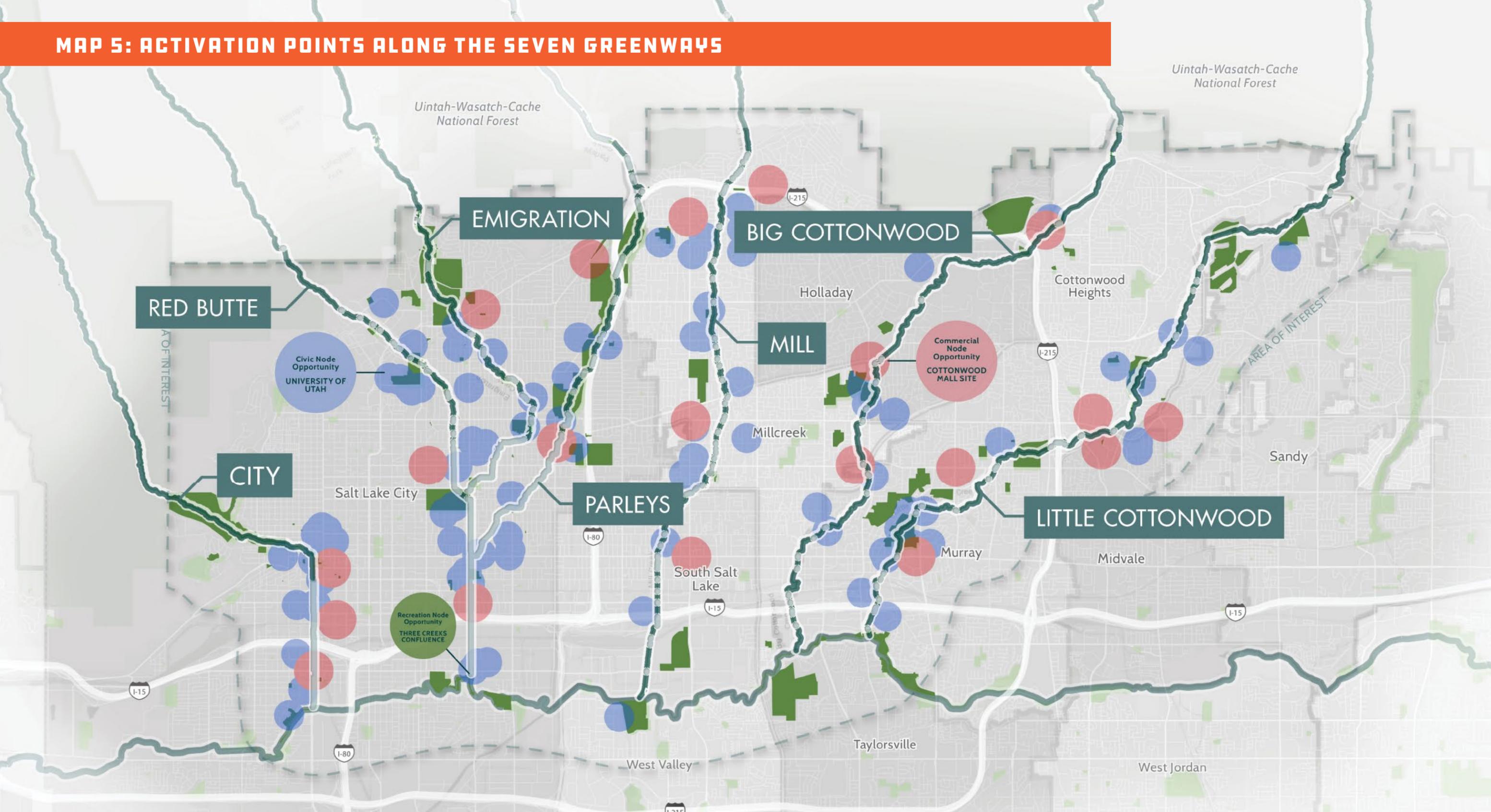
6 - Watson, *A Stream That Built A City* (1995).  
7 - Salt Lake County, *Stream Care Guide* (2014).  
8 - Bowman, *From Silver to Skis: A History of Alta, Utah, and Little Cottonwood Canyon, 1847-1966* (1967).

Waterways became the early sewer system due to their hydrology, 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.

As our cities grew, white settlers imposed the Plat of Zion on the geography of the Wasatch Front. Houses were concentrated along creeks for its water source and cooling in the summertime. However, spring brought snowmelt and, with it, flooding. Floodwaters ravaged fields and houses along the banks.

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 channel. This caused banks to steepen and erode, creating a safety

# MAP 5: ACTIVATION POINTS ALONG THE SEVEN GREENWAYS



 BURIED CHANNEL	 CIVIC ACTIVATION POINTS	 RECREATION ACTIVATION POINTS
 OPEN CHANNEL	 COMMERCIAL ACTIVATION POINTS	

Source: Wasatch Front Regional Council, *Civic and Commercial Activation Points datasets* (2021); Utah Automated Geographic Reference Center, *Recreation Activation Points* (2021); and Salt Lake County, *Waterways* (2021).



issue for early residents.<sup>9</sup> Pedestrians found a solution by building makeshift bridges spanning the nearly ten to 20-foot vertical banks.

This led to the burial of some creeks, which were dubbed a nuisance, in the early 20th Century. The green veins that once transported clean water, fish, and wildlife from the Wasatch Mountains downstream were replaced with bricks and mortar, concrete and asphalt. Even then, residents saw the damaging outcome.

A 1921 article from the Deseret News explains, “To cover City creek from Main to Third West streets and make of North Temple just an ordinary down-town thoroughfare, would be a desecration... In that open stream, with all its historic significance, in addition to its possibilities for beauty and attractiveness, the city has an asset of great value. 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.”<sup>10</sup>

## CONNECTIVITY

An activation point is a node at which users can access the system of greenways. They can be recreational—parks, natural areas, and open spaces, commercial—shopping centers, retail areas, and restaurants, and civic—schools, churches, and community institutions. Activation points provide community members access to the various amenities greenways can provide, and connectivity between them.

An estimated 20 commercial activation points, 80 civic activation points, and 116 recreation activation points are located within 1/2 mile of the seven creeks. Currently, access to our greenways is focused at existing public lands, such as parks, natural areas, and open space.

Private property complicates access. However, through partnerships with landowners, especially near commercial and civic activation points, access has been granted in formal or informal agreements.

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.<sup>11</sup> 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 the rest of the city of Holladay.

Schools, churches, and other community institutions can create additional quasi-public private space for the greenways. 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 to the surrounding neighborhood.

According to the *Parks and Recreation Mail-in Needs Assessment Survey*, 75 percent of respondents are within a 15-minute walk to a park. However, 89 percent said they travel by car.<sup>12</sup> In Salt Lake City, most parks are easily accessible by car. According to the *Parks and Public Lands Needs Assessment*, pedestrian and bicycle access needs improvement through added bike lanes and trail connections.<sup>13</sup> In the *Blueprint Jordan River Refresh Survey Findings*, most drive to the Jordan River—approximately 55 percent. However, those that live in northern communities of Salt Lake County and those that visit the corridor weekly more frequently walk, run, or bike.<sup>14</sup>

11 - Chakraborty, *5-mile trail coming to foothills near you* (2006).

12 - Guy, *Salt Lake County Parks and Recreation Mail-in Needs Assessment Survey* (2017).

13 - Salt Lake City, *Parks and Public Lands Needs Assessment* (2019).

14 - Envision Utah, *Blueprint Jordan River Refresh Survey Findings* (2020).

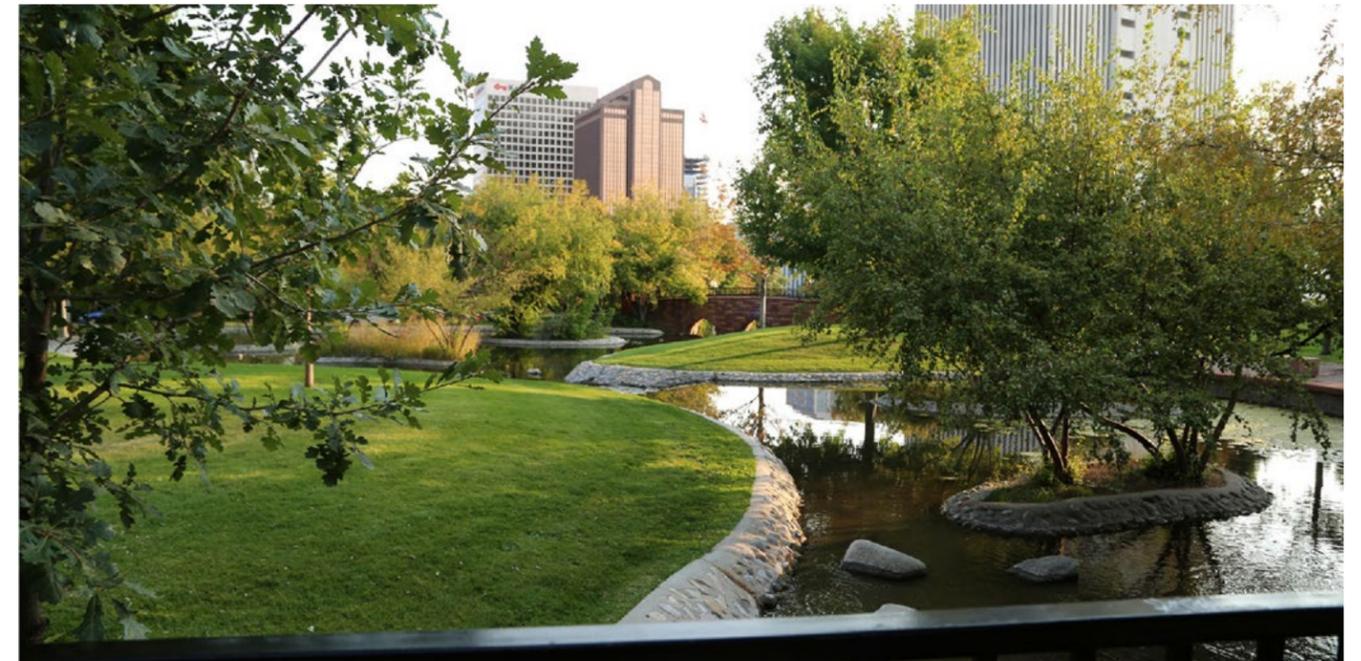


Figure 13: City Creek at City Creek Park in Salt Lake City.

In the *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.<sup>15</sup> This underscores the need to provide plentiful and diverse connections to the greenways for lower-income residents, including regional public transit connections on buses, trains, and other forms of transit.

Community members may not have regular access to a personal automobile for recreation or are unwilling to drive to recreation opportunities. When asked about actions to improve livability in Salt Lake City, 46 percent responded improving networks for active transportation.<sup>16</sup>

There are 1 commuter rail stops, 10 light rail stops, and 1,049 bus stops within 1/4 miles of our creeks.

15 - Envision Utah, *Blueprint Jordan River Refresh Survey Findings* (2020).

16 - Salt Lake City, *Reimagine Nature Preliminary Engagement Findings* (2020).

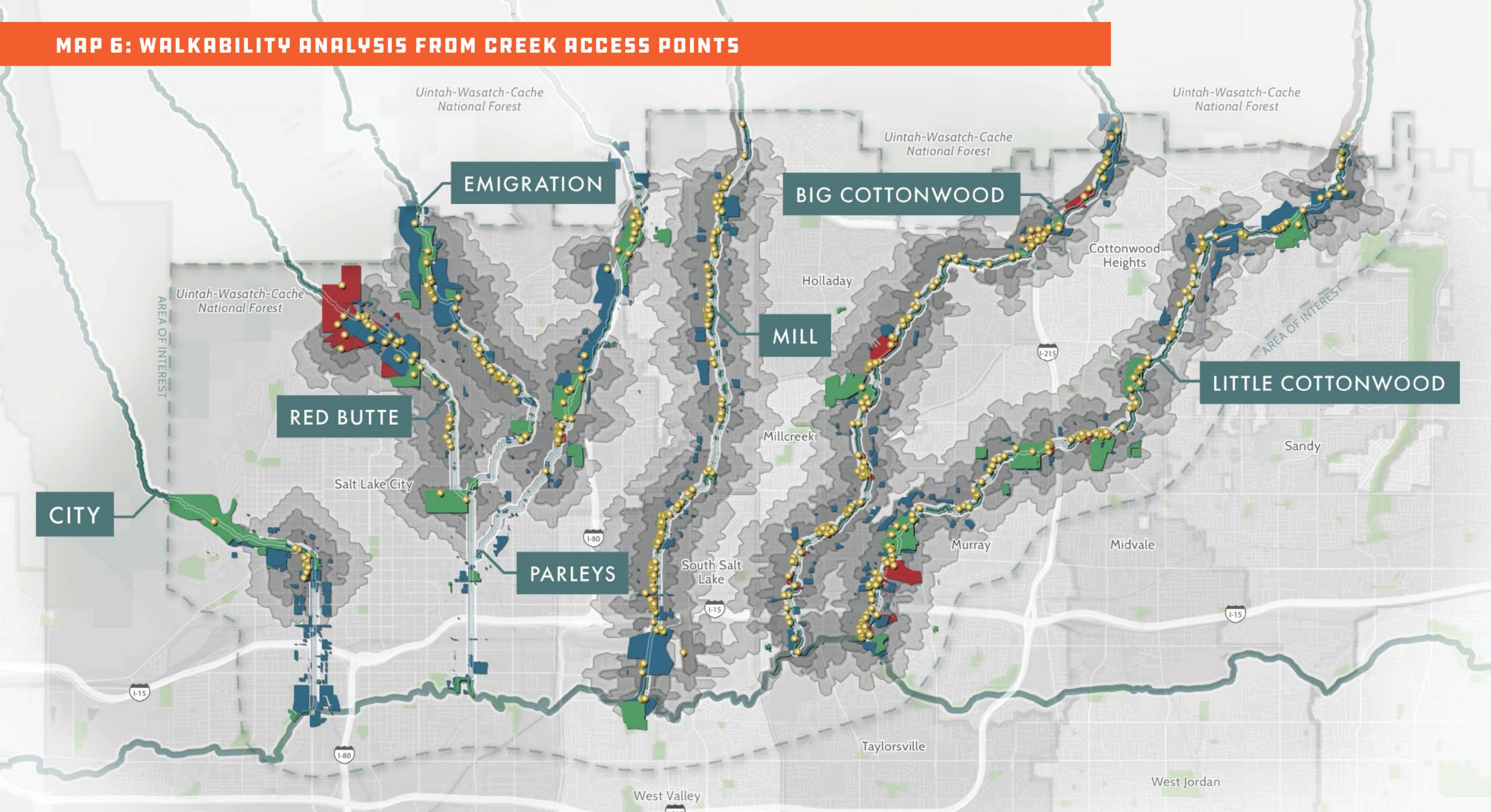
## INFRASTRUCTURE & ECONOMICS

Many communities are finding cheaper alternatives to traditional methods of storm water management. As defined by the Clean Water Act, green infrastructure is “the range of measures that use plant or soil systems, permeable pavement or other permeable surfaces or substrates, storm water harvest and reuse, or landscaping to store, infiltrate, or evapotranspire storm water and reduce flows to sewer systems or to surface waters.”<sup>17</sup> It can be a cost-effective, resilient tool to manage water in our cities. Conventional approaches, or “grey” infrastructure, utilize pipes to convey water away from the built environment as fast as possible. This has led to the degradation of our creeks—erosion, water quality impairments, and outright burial. Green infrastructure reduces and treats water at its source while improving the health of our creeks and delivering additional benefits.

Green infrastructure reduces the need for costly

17 - United States Environmental Protection Agency, *Green Infrastructure* (2021).

# MAP 6: WALKABILITY ANALYSIS FROM CREEK ACCESS POINTS



**EMIGRATION**

**BIG COTTONWOOD**

**MILL**

**RED BUTTE**

**LITTLE COTTONWOOD**

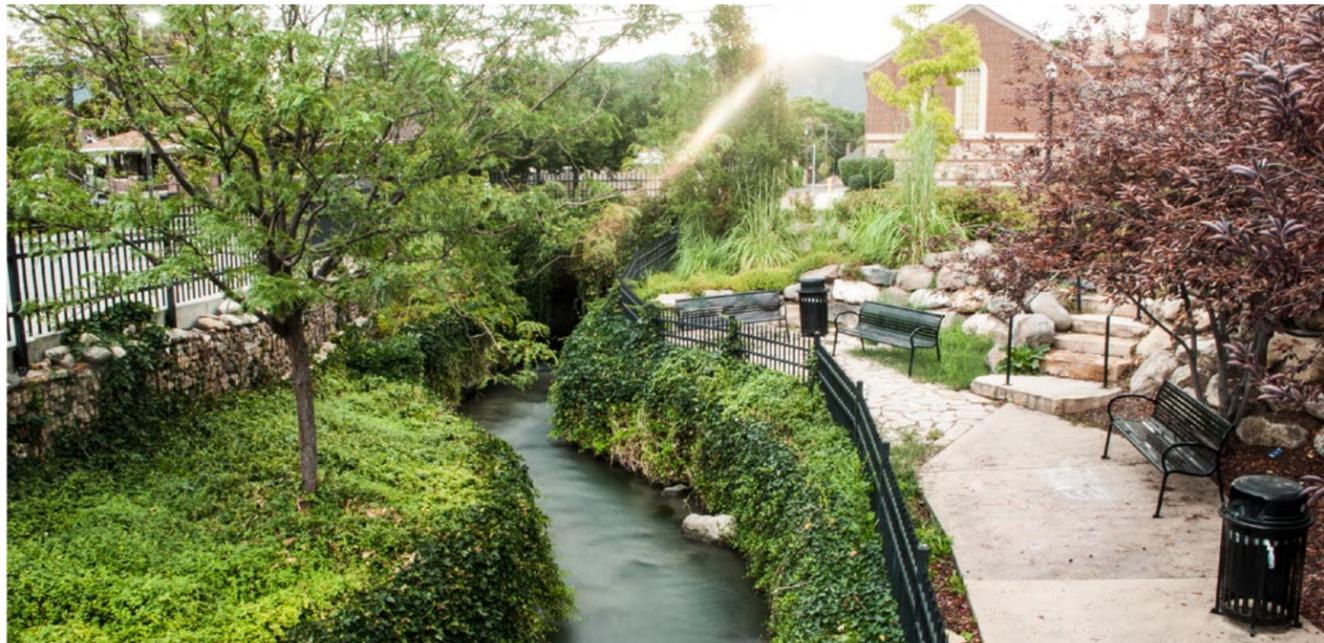
**CITY**

**PARLEYS**

- BURIED CHANNEL
- PARK
- COMMERCIAL AREA
- 5-MINUTE WALK
- 15-MINUTE WALK
- OPEN CHANNEL
- PUBLIC SPACE
- POTENTIAL ACCESS POINT
- 10-MINUTE WALK



Source: Utah Automated Geographic Reference Center, Parks, Public Space, and Commercial Areas datasets (2021); and Salt Lake County, Waterways (2021).



**Figure 14:** Parleys Creek at Intermountain Memorial Clinic in Salt Lake City.

grey infrastructure.<sup>18</sup> In Kalamazoo, Michigan, city engineers found uncovering the creek would be cheaper than excavating, replacing, and reburying the deteriorating culvert.<sup>19</sup> The life cycle costs associated with the construction, maintenance, and replacement of underground culverted systems often prove more expensive, or only marginally less, than uncovering the stream (without the additional benefits of daylighting).

By reducing the amount of runoff, green infrastructure reduces the frequency and severity of flooding.<sup>20</sup> Historic flooding, in 1983, resulted in an estimated \$34 million in damages through Salt Lake County.<sup>21</sup> In 2017, a 200-year precipitation event, in Salt Lake City, resulted in \$1.5 to \$2 million in damages to the historic Sprague Library and \$2 to \$3 million in damages to four schools. One hundred homes were flooded and over 5,000 customers experienced

power outages.<sup>22</sup>

Creek-side properties are desirable areas to live, work, and play. The \$8.4 million restoration project along the Ogden River, in 2011, has seen a significant return on investment. Between 2000 and 2017, the number of housing units around the project area increased by 37 percent, the number of jobs increased by 36 percent, and the area's median income increased by 34 percent. This is compared to increases across the entire city of 21, 16, and 28 percent, respectively.<sup>23</sup>

The 60-acre River Bend Redevelopment Project Area plans to channel the momentum from the restoration project to create a mixed-use and mixed-income urban riverfront neighborhood. Residential developments, such as The Meadows at Riverbend and The View on 20th, have popped along the restored Ogden River, as well as retail spaces, like Gear:30, Ogden River Brewing, Slackwater, and others.<sup>24</sup>

18 - Center for Neighborhood Technology, *The Value of Green Infrastructure* (2010).  
 19 - Trice, *Daylighting Streams* (2016).  
 20 - Center for Neighborhood Technology, *The Value of Green Infrastructure* (2010).  
 21 - Hooton, *Memorial Day Weekend 1983* (1999).

22 - Mims, 'Torrential' thunderstorms flood East High School, SLC's Sprague Branch, Wasatch Front intersections (2017).  
 23 - Hinners, *The Socio-Economic Impacts of the Ogden River Restoration* (2019).  
 24 - Shaw, *Ogden Riverbend project still moving along, with new apartment complex possible* (2017).

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 in this area, 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."<sup>25</sup>

Recreation, along greenways, also generates economic value. In Utah, anglers contributed \$259 million in direct spending to fish in 2011. Overall, the industry output was \$460 million with \$50 million in state and local tax revenue.<sup>26</sup> In Jackson Hole, Wyoming, increased recreational trails generated over \$18 million in economic activity in 2010. The original investment, over ten years, is estimated at \$1.7 million. Local businesses agree sales and rentals increased as trails increased.<sup>27</sup>

## ACTIVE TRANSPORTATION

Walking, biking, rolling, and even boating (where feasible) are affordable transportation options available to all ages and abilities. Active transportation is any human-powered mode of travel in our communities. It increases physical activity levels and improves air quality by reducing reliance on personal automobiles. It diminishes costs associated with the purchase, maintenance, and fuel of vehicles. In 2020, the cost to own and operate a car in the United States was \$9,561.<sup>28</sup> For comparison, bicycles cost an estimated \$350 per year.<sup>29</sup> Walking is virtually free.

25 - Wilmington Flats, *Home* (2021).  
 26 - Man-Keun, *The Economic Contribution and Benefits of Utah's Blue Ribbon Fisheries* (2013).  
 27 - Kaliszewski, *Jackson Hole Trails Project Economic Impact Study* (2011).  
 28 - AAA, *Your Driving Costs* (2020).  
 29 - Schwartz, *Americans Work 3.84 Minutes Each Day To Pay For Their Bicycles* (2011).

In 2014, Utah ranked 15th in bicycle commuting by state.<sup>30</sup> Along the Wasatch Front, walking represents 7.8 percent and biking: 1.7, of all trips taken.<sup>31</sup> In Salt Lake City, an estimated 2.5 percent commuted by bicycle in 2014.<sup>32</sup> Due to the 27 increase in bicycling in 2011, Salt Lake City jumped from 43rd (2010) to 26th (2012) in the "America's Most Bicycle-Friendly Cities" ranking.<sup>33</sup>

## 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 often white, populations. Without comprehensive strategies in place to prevent displacement, the residents these strategies are designed to benefit can be excluded.<sup>34</sup>

Policy strategies at the city, county, or state-level are needed to prevent displacement due to gentrification. In redevelopment projects adjacent to greenways, 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.

30 - The League of American Bicyclists, *Where We Ride* (2014).  
 31 - Resource Systems Group, Inc., *Utah Travel Survey* (2013).  
 32 - The League of American Bicyclists, *Where We Ride* (2014).  
 33 - Salt Lake City, *Pedestrian & Bicycle Master Plan* (2015).  
 34 - Wolch, *Urban green space, public health, and environmental justice: The challenge of making cities 'just green enough'* (2014).

## OPPORTUNITY

### Activating and connecting our URBAN areas

The Salt Lake Valley and our cities are experiencing tremendous growth, an additional 600,000 people by 2065.<sup>35</sup> As urbanization continues, our creek corridors are increasingly important areas for connection, activity, recreation, solitude, entertainment, and enjoyment. Greenways help sell homes, increase property values and business revenues, and improve quality of life.<sup>36</sup> Developments along the greenways, where appropriate, can help build the system through trail creation, stream restoration, and daylighting.

Greenways are central to connecting and activating our urban cores. They 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.

Well-connected greenways, active transportation, and public transit networks connect underrepresented residents to employment, services, entertainment, recreation, and leisure. First-map 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.

A highly-accessible and connected system of greenways reduces the need for parking as users can utilize corridors to travel to and from destinations. Adequate parking should be a key consideration at parks and green spaces

that function as trailheads to the greenways. Connections to and from public transit are critical to move beyond the need for personal automobiles.

Trail-oriented developments fulfill the desire of residents and businesses to live and locate along waterways, trails, and other amenities. 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 can be incentivized to uncover and restore creeks as an amenity for tenants and to improve property value. Furthermore, they can build publicly-accessible trails and other recreation opportunities along the creeks. Design standards can further require implementation of recommendations through ordinances, overlay zones, or other strategies.

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 are situated all along our creeks and should be identified to serve as additional points of access and connectivity.

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 further 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 their neighborhood health and resiliency.

After completion, communities should be engaged in programming, activation, and works of art featured in the corridors. Artists

from surrounding communities can perform, create, and display their works in greenways. 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 artists generous stipends for their work. Similar opportunities exist throughout the greenways.

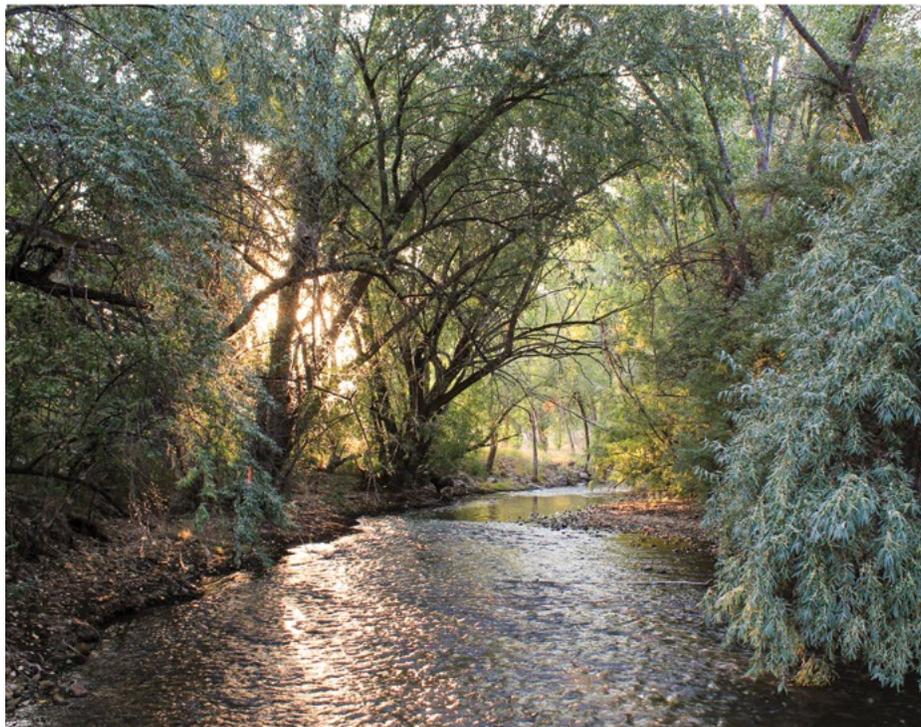


Figure 15: Parleys Creek at the Sugar House Shopping Center in Salt Lake City.

35 - Perlich, *Utah's Long-Term Demographic and Economic Projections Summary* (2017).

36 - Crompton, *Perceptions of How the Presence of Greenway Trails Affects the Value of Proximate Properties* (2001).

DESIGNWORKSHOP



SEVEN GREENWAYS  
VISION PLAN

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