



## **Memorandum**

**To:** Planning Commission  
**From:** Niall Connolly, Principal Planner  
**Date:** Aug 1, 2025  
**Re:** Virgin River Management Plan Implementation

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### ***Introduction***

The Planning Commission has recently discussed the Town's regulations on parking spaces within the Special Flood Hazard Area (SFHA). During those discussions, a desire to protect the Virgin River corridor from pollution or over development was expressed by both the Planning Commission and the Town Council. To address these concerns, the Planning Commission has proposed that Low Impact Development (LID) drainage should be used for parking spaces in the SFHA, and that the number of parking spaces in the SFHA should be limited. The Town Council will be considering these recommendations at a public hearing in the near future.

The Planning Commission also expressed interest in a separate, but related project to explore ways to protect the river corridor more broadly. The Springdale Virgin River Management Plan (2019) includes recommendations for the river corridor. This would be a good starting point for such a project. The recommendations include:

- Creating a River Corridor Overlay Zone
- Protecting undisturbed areas in the river corridor
- Encouraging LID and Green Management Practices.

Staff recommends that a subcommittee, including two planning commissioners, staff, and a National Park employee, be formed to look at this in further detail.

### ***Some Points to Consider***

Riparian areas or river corridors perform a number of important functions. Some of these include:

- Storing water during times of flood;
- Providing an important habitat for animal and plant species;
- Visual amenity - the natural, undisturbed river corridor is an integral part of the visual character of the canyon;
- Improving water quality - naturally vegetated riparian zones provide filtration that helps clean the water. The Town relies on the river for culinary and irrigation water;
- Cooling from the tree canopy;
- Recreational opportunities.

### ***Background on the Springdale Virgin River Management Plan***

The Town adopted the Springdale Virgin River Management Plan in 2019. This Plan studied the river corridor and includes goals and strategies for the river. The Goals and Strategies from this plan that most closely overlap with the issues in question are found on pages 11-13 of the plan. These are summarized below:

#### Land Use Goals and Strategies

- *Create a River Corridor Overlay Zone to Buffer the River from Adverse Impacts*
  - This goal recommends a consultant's study to identify realistic boundaries for a river corridor overlay zone. This buffer zone would limit development by the river, while enhancements to the riparian zone would be actively sought. The existing erosion hazard zone partially achieves this aim, but the river corridor overlay zone described in the plan goes a step further.
- *Protect Undisturbed Areas in the River Corridor*
  - This is similar to the river overlay zone idea, but involves developing criteria to identify important natural areas near the river for priority preservation. These areas could then be preserved through new land use ordinances, conservation easements etc. The Town adopted an Open Space Plan, which contains strategies to preserve open space along the river corridor. Any future efforts on this point should be aligned with the Open Space Plan.
- *Encourage Low-Impact Design and Green Management Practices*
  - This involves using sensitive or green construction practices adjacent to the river. This could include requiring permeable paving for parking areas in the river corridor.

#### *River Corridor Overlay Zone*

The Plan envisages that a consultant's study be commissioned to develop this overlay zone. This has not been included in the draft budget for 2025/26, and so it is very unlikely funding would be available for this study in the near future. However, the Commission could consider more simple interventions, such as minimum setbacks for development from the top of the riverbank, or adding restrictions to development in the floodway.

#### *Protect Undisturbed Areas in the River Corridor*

This strategy is similar to the overlay zone, but instead looks at protecting specific areas based on defined criteria. It also suggests the Town could purchase conservation easements or development rights in certain areas along the river. Funding for such interventions is unlikely to be available in the near future, however a Transfer of Development Rights (TDR) program could be implemented with little cost.

#### *Encouraging Low-Impact Design and Green Management Practices*

This strategy includes interventions such as requiring parking spaces within a certain distance of the river to be on permeable paving. The Commission has already recommended similar measures to the Town Council, but an expansion to this could be explored.

***Conclusion***

The Planning Commission should discuss the potential options for greater implementation of the Virgin River Management Plan. Staff recommends that a subcommittee is formed to explore this in greater detail.

## **Appendix: Springdale Virgin River Management Plan**





William Beem

# Springdale Virgin River Management Plan

Springdale, Utah  
2019



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## Acknowledgements:

Sophie Frankenburg, Town of Springdale

Betsy Byrne, National Park Service - Rivers, Trails, & Conservation Assistance

Tom Dansie, Town of Springdale

Ryan Gubler, Town of Springdale

Toni Benevento, Town of Springdale

Randy Aton, Springdale Town Council

Lisa Zumpft, Springdale Town Council

Cassity Bromley, National Park Service - Zion National Park

Steve Meisner, Virgin River Program

Elaine York, The Nature Conservancy

Jim Frandsen, Zion Outfitter

Lori Rose, Virgin River Land Trust

Louise Excell, Resident

Barry Hecht, Hydrologist

## Chapter 1: Introduction and Background

### Introduction

As desert communities go, Springdale is uniquely fortunate to have a perennial stream meandering through the entire length of town. The Virgin River's headwaters originate in deep wilderness and its course takes it largely through remote lands protected by Zion National Park, resulting in relatively unpolluted, inviting waters that provide Springdale's drinking water as well as irrigation water for landscapes and agriculture. The Virgin River supports lush riparian vegetation and aids cooling in the desert heat; it supports an abundance of wildlife and offers solace and recreation to human inhabitants.

The importance of the Virgin River should not be understated; Springdale's *General Plan* notes its role in defining the community in several sections, and Chapter 7.6 of the *General Plan* focuses on "The Virgin River Corridor."<sup>1</sup>

The *General Plan* notes that the river corridor shapes Springdale's character and enhances a world-class aesthetic; it is so inextricably a part of Springdale's village character and beauty one can scarcely imagine the canyon without it. In spite of its obvious importance, the river is often taken for granted, thus making a *Virgin River Management Plan* an essential document.

As noted in the *General Plan*, the Town has no comprehensive analysis or plan for preserving the quality of the river or the habitat of the river corridor. The *General Plan* calls for analysis and guidance on the river corridor in light of continuing development alongside the river and with the understanding that development pressure will only increase with time. The *General Plan* lists several objectives related to the Virgin River:

- Objective 2.2.2.: Protect the natural aesthetic character of the Virgin River corridor. (p.21)
- Objective 7.6.1.: Minimize the impact and effect of the Town and its developments on the Virgin River Corridor. (p.109)
- Objective 7.6.2.: Preserve and protect the environmental resources and natural character of the Virgin River and its corridor. (p.111)

#### Virgin River Goal:

To preserve and protect the natural character of the Virgin River and its corridor, while accommodating appropriate uses by visitors and residents.

*Town of Springdale General Plan, p.109*



<sup>1</sup> Town of Springdale. *General Plan*, Revised and Updated, 2016. Chapter 7.6, p. 109.



- Objective 7.6.3.: Accommodate appropriate uses in the Virgin River Corridor such as trails and paths. (p.113)

With the need for further guidance in mind, the Town developed the *Springdale Virgin River Management Plan*. This plan seeks to define best management practices related to land use, the environment, and recreation with the understanding that these three elements are closely linked and must be considered holistically.

The Town applied for a technical assistance grant from the National Park Service Rivers, Trails, and Conservation Assistance Program. This grant allowed for the development of a collaborative, community driven planning process that led to the creation of this plan.



Figure 1: The Virgin River as it runs past George A. Barker River Park in Springdale.

## Existing Conditions and Key Findings:

### Existing Development

Springdale faces a challenge in developing strategies for preservation and protection of the Virgin River Corridor since the west bank of the river is quite heavily impacted by commercial development in many areas. In some areas, developers have placed buildings, retaining walls, and terraces as close to the river's flow as regulations allow, and some older developments would actually not be allowed under current ordinances. Likewise, much of the earlier development along the Virgin River was implemented without consideration of appropriate stormwater and irrigation drainage plans.

### Flood Events

The Virgin River is subject to extreme flooding. Floods are an essential component of a healthy river system, depositing nutrient-filled sediment on upland portions of the river corridor and helping maintain riparian vegetation. Floods also provide water to initiate new growth of cottonwood seedlings. Allowing the river to flood in a natural way is critical in maintaining river health; however, because of the erosive power associated with floods, flooding can jeopardize buildings and infrastructure in the river corridor. As a result, some property owners have armored the riverbank with hard mechanical armoring such as riprap and gabion baskets. This mechanical riverbank armoring alters natural flood patterns.

### Climate Uncertainty

Flows in the Virgin River vary depending on precipitation amounts and temperature. Climate forecasts predict increasing average temperatures and variability in precipitation patterns. This leads to uncertainty in the amount of water flowing in the river. This uncertainty will affect the health of the river ecosystem and force the Town and others who depend on water from the river to respond to an uncertain water supply.

### Private Property and Community Investment

Throughout the length of Springdale, nearly all of the land adjoining the Virgin River is privately owned, making partnerships with landowners very important. Another neighboring landowner is the Paiute Tribe of Utah, whose 174 acres adjoin the Virgin River in Springdale. Just as important is the perception of the residents in general that the river is an important amenity which they wish to preserve, use, and enjoy, as indicated by responses to a survey conducted by the Town of Springdale in 2018. Further education of the public and landowners and attaining their buy-in for a management plan will be vital to future success.

### Agricultural Use

There is a long history of agricultural use along the Virgin River, as both the Paiute tribe and Mormon pioneers settled by the river and cultivated crops. Over time, land along the river transitioned away from agricultural use and was developed for other uses such as hotels, businesses, and housing. There are still some parcels of land that are used for agriculture and livestock grazing, and these parcels represent both a tie to Springdale's history as well as open space that is part of the beauty of the river corridor. Conversion of these last parcels to developed land may be a threat to the health and quality of the river if that development does not protect the qualities of the river and riparian habitat that are so important to the Springdale community.

### Federal and State Stakeholders

Zion National Park is the most notable federal partner since they share with Springdale a section of the east bank as the river leaves the southern boundary of the park. In addition, the Virgin River is protected by a 1996 “Zion National Park Water Rights Settlement Agreement”<sup>2</sup> which essentially prevents dams on the main stems of the East Fork and North Fork of the Virgin River and establishes a federal reserved water right for the park. While this agreement may not have a significant impact on land use along the river through Springdale, its existence should be noted. Another federal stakeholder is the Army Corps of Engineers since the Virgin River is listed as a “waters of the United States” in federal legislation.<sup>3</sup> Additional state and local stakeholders, primarily those downstream, should be invited to provide input in a river management plan as appropriate.

### Wild and Scenic River Designation

Inside Zion National Park, the Virgin River has “Wild and Scenic” Designation. According to the U.S. Forest Service, “a wild and scenic river is our nation’s strongest form of protection for free-flowing rivers and streams. They have remarkable scenic, recreational, geologic, fish and wildlife, historic or other similar values that led Congress to add these waterways to the National Wild and Scenic Rivers System.”<sup>4</sup> In 2009, 169.3 miles of the Virgin River and its crucial tributaries were designated as “Wild and Scenic;” it is the only river in Utah to have this designation. While the Wild and Scenic designation does not apply to sections of the Virgin River in Springdale, the river in Springdale has the same remarkable values as in Zion National Park. For all intents and purposes the Virgin River in Springdale can be considered wild and scenic.

### Recreational Use on the Virgin River

Both residents and visitors use the Virgin River corridor in a recreational capacity. Current non-motorized recreational uses include hiking, swimming or wading, tubing, kayaking, dog walking, bird watching, trail running, or simply being near the river to enjoy nature. Motorized recreation is not allowed in the corridor. There are certain issues or impacts associated with recreational use that are of concern to residents, including trespassing on private property, trash or litter, noise, and erosion. Some residents are also concerned about human waste and E. coli coming from upstream recreational use in Zion National Park. These issues must be considered as the Town plans for appropriate recreational access and use of the river corridor.

### Existing Programs Addressing Non-Native Species

There are many past and ongoing efforts of Virgin River non-native plant and animal control by the Virgin River Program; Utah Division of Wildlife Resources; Natural Resources Conservation Service (NRCS); Utah Division of Forestry, Fire and State Lands; Zion National Park; Lake Mead Exotic Plant Control Group; Bureau of Land Management (BLM); and The Nature Conservancy.

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<sup>2</sup> Document is available upon request.

<sup>3</sup> <https://www.spk.usace.army.mil/Missions/Regulatory/RegulatoryJurisdiction/NavigableWatersoftheUS.aspx>

<sup>4</sup> <https://www.fs.fed.us/managing-land/wild-scenic-rivers>

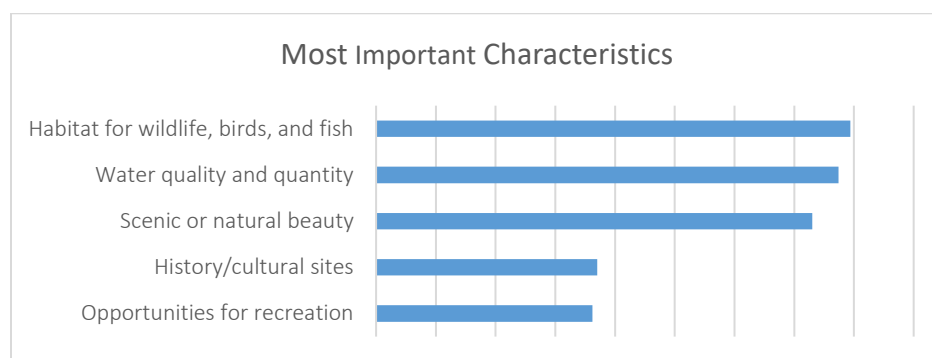


## Virgin River Community Survey

In January of 2018, the Town of Springdale sent out a brief survey to residents to create a better understanding of the community's concerns and values related to the Virgin River. The survey received a great response, with about 195 people taking part (approximately 1/3 the population of the town).

The survey responses indicated that the community has a strong understanding of issues facing the river as it flows through town, as well as a deep sense of appreciation and respect for the river. Residents are interested in doing what they can to protect and preserve the aspects of the river they think are important to the quality of life of the town.

The first question asked residents what they thought were the most important characteristics of the Virgin River in Springdale<sup>5</sup> (see table 1). 'Habitat for wildlife, birds, and fish' ranked the highest overall, followed by 'water quality and quantity' and 'scenic or natural beauty'. Residents also had the opportunity to write in an open-ended response what they felt was important about the river corridor. A number of people mentioned the river as a sanctuary, a place for solitude and mental recharge. Others mentioned the river's importance as a floodplain, both controlling and conveying floodwater, and expressed concerns about how development and alterations to the riverbank might affect flood control.

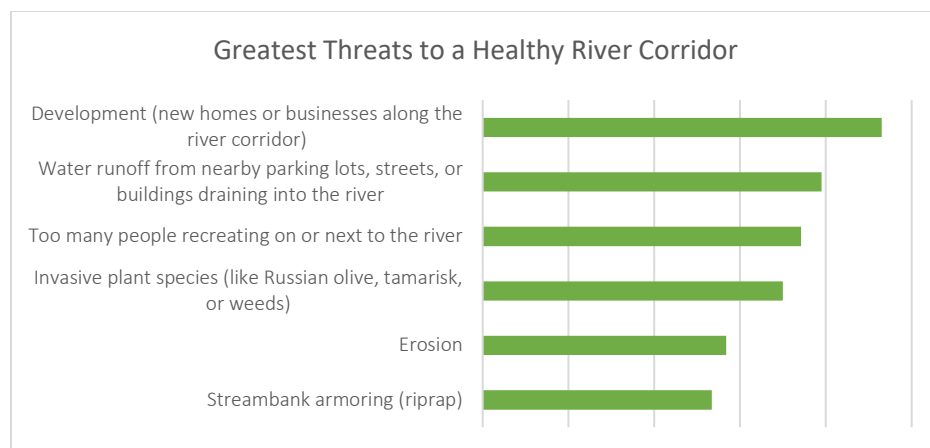


*Table 1: Responses to Question 1 What do you think are the most important characteristics of the Virgin River in Springdale?*

Next, the survey asked what people thought were the greatest threats to a healthy river corridor<sup>6</sup> (see table 2, next page). Forty-three percent of respondents chose development (in the form of new homes or businesses along the river corridor) as the top threat to the river. Water runoff from nearby parking lots, streets, or buildings draining into the river and too many people recreating on or next to the river also ranked high. In the open-ended field after this question, people expressed concerns about a number of things including trash and human waste contamination from recreational use; impacts from agricultural uses and irrigation; and alterations of the riverbank and habitat along the corridor.

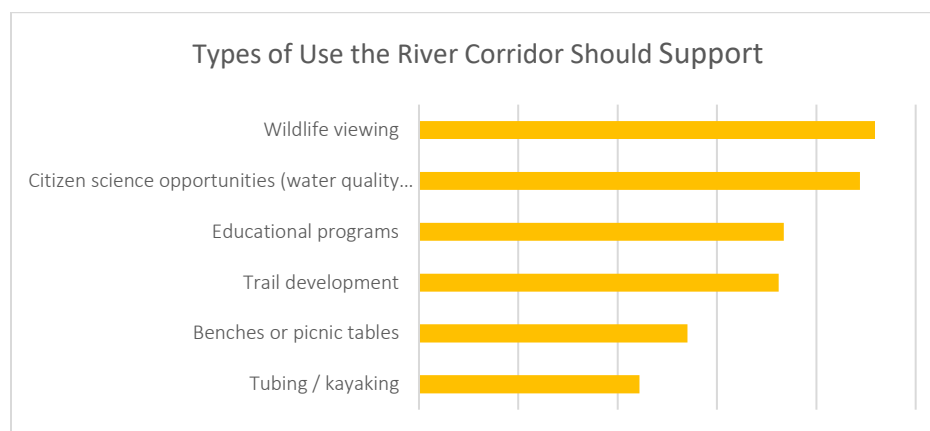
<sup>5</sup> Survey respondents were asked to rate five characteristics with number one as the most important and number five the least important. A follow-up question provided an open-ended space for additional comments.

<sup>6</sup> Survey respondents were asked to rate six threats with number one as the biggest threat and number six the least threat. A follow-up question provided an open-ended space for additional comments.



*Table 2: Responses to Question 2 What do you think are the greatest threats to a healthy river corridor?*

Survey respondents were also asked what types of uses the river corridor should support<sup>7</sup> (see table 3). Over 90% of people indicated wildlife viewing. There was also a strong interest in citizen science opportunities and educational programs, followed by trail development.



*Table 3: Responses to Question 3 What type of uses should the river corridor support?*

The fourth question in the survey asked respondents if they felt connected to the Virgin River and if so, how. Many people talked about the important connection between the river, the town, the canyon, and Zion National Park. People value the river as a source of water, a place for both active and passive recreation, and a place of personal and community history. The responses overwhelmingly indicated the love the community has for this river and a sense of responsibility to care for it.

The last question allowed for any last comments that people wanted to share. Many people reiterated concerns about the impacts from development and increased recreational use. There were differences of opinion, with some people wanting to put limits on certain types of uses while others wanted to improve access to the river. However, the common interest that people expressed was a desire to protect and preserve the river due to its importance to the town.

For the complete survey including all respondent comments, see Appendix F.

<sup>7</sup> Survey respondents were allowed to check all that applied.

Once a draft of the Plan was done in March, 2019, the Town held a River Walk and Talk to share the Plan and its contents with the public (see figure 2). The Town also made it available to the public and sent out a short follow-up survey to gather feedback on whether the Plan addresses the issues surrounding the Virgin River and the concerns that people indicated in the original survey. Thirty-four responses were gathered. The responses from the River Walk and from the survey indicated that people largely felt that the Plan addressed their concerns. Some respondents made comments and suggestions that were then incorporated into the final draft of the plan.



*Figure 2 Springdale community members joined the River Walk and Talk on March 25, 2019 to learn about the Plan.*

## Chapter 2: Virgin River Goals and Strategies

The following goals and strategies were developed to guide the Town as it works to protect and promote the health of the Virgin River corridor. There are three broad topic areas: Land Use, which is focused on land use and development near the river; Environment, which addresses protecting and restoring the natural river function, habitat, and water quality of the Virgin River; and Recreation, which encourages appropriate recreational use of the river corridor. Each topic area contains several goals to guide efforts and describes the benefits and strategies associated with those goals. It is important to keep in mind the interconnectedness of these topics. Many of the concepts relate to each other, and a number of the benefits and strategies are linked.

While the Town will take the lead on implementing many of these strategies, residents, business owners, and visitors can carry out many action steps or best practices themselves.

### Section 1: Land Use Goals and Strategies

#### Create a River Corridor Overlay Zone to Buffer the River from Adverse Impacts

##### Goal:

Provide a designated buffer between the river and adjacent developed lands to allow the river corridor to function as naturally as possible to accomplish the following:

1. Limit development and construction to levels deemed appropriate for the river's natural function and flooding events.
2. Protect / re-establish native riparian vegetation.
3. Provide area for natural river function in flooding events (accommodation of floodwaters and provision of area for river to deposit sediment/nutrients).
4. Improve bank stability.
5. Provide habitat and migration routes for wildlife.

##### Why This Is Important:

A river corridor overlay zone will allow a protective buffer zone between the river itself and development or other activities such as chemical nutrient run-off that may adversely affect water quality, native vegetation, wildlife habitat, and fragile aquatic species. Additionally, a well-designed overlay zone will provide space to control periodic flooding and manage bank erosion. An overlay zone creates space for re-establishment of native vegetation that enhances the river's natural beauty and recreational experiences.

##### Benefits:

- Improved water quality
- Maintained species diversity for flora and fauna
- Reduction of costly damage to property from flooding and erosion
- Enhanced recreational experiences
- Enhanced scenic beauty and village aesthetic



Strategies:

- Based on a consultant study, identify realistic boundaries for a River Corridor Overlay Zone.
- Based on a consultant study, establish erosion hazard setback limits that guide development to areas least likely to be impacted by erosion associated with flood events.
- Use the overlay zone and erosion hazard setback limit to ensure development on property near the river does not impact the health and natural function of the river. Specifically, the overlay zone should require all new development, including new utility lines, to be located as far away from the river corridor as possible.
- Continue program of invasive species removal and continued maintenance (see Environment Goals - Manage Invasive and Nuisance Species).

## Protect Undisturbed Areas in the River Corridor

Goal:

Protect river quality and natural character by preserving open space adjacent to the river corridor.

Why This Is Important:

Because undisturbed lands act as natural stormwater filters and reduce sedimentation, significant areas of natural open space contribute to a healthy Virgin River, and they function at virtually no cost. Furthermore, Springdale's *General Plan* recognizes the importance of the natural resources and features that are part of the town's character and notes the town's adjacency to the undisturbed natural features of Zion National Park. These melded open lands provide wildlife corridors and habitat for a variety of native species.

Benefits:

- Improved water quality
- Preserved scenic beauty
- More natural character along the river
- Potential of increased property values for lands adjoining protected open spaces
- More connectivity between open spaces in Springdale to protected open spaces in Zion National Park, enhancing wildlife access and movement through the canyon

Strategies:

- Develop criteria to identify important natural areas for priority preservation.
- Enact land use ordinances requiring/encouraging preservation of high priority areas, as identified through the criteria established (above).
- Encourage conservation easements for protection of large natural open areas near the river.
- Make funds available for the purchase of conservation easements.
- Increase open space area requirement for properties in the river corridor.
- Require planned development (cluster) zone for proposed subdivisions near the river and require new development to be placed away from the river and the flood hazard area.

## Encourage Low-Impact Design and Green Management Practices

### Goal:

Require site-sensitive design and construction practices on properties in the river corridor, as well as throughout the community.

### Why This Is Important:

Site-sensitive design and construction practices preserve environmentally fragile land and open space by carefully locating new development away from the river buffer, wildlife corridors, and significant extant flora, such as large trees or groves. Green designs and construction practices use more nature-based techniques and materials to reduce impervious surfaces and protect the lands and developments adjacent to the river from damaging erosion and floods.

### Benefits:

- Protected open space and wildlife habitat
- Enhanced stormwater management and filtration
- Improved natural river function
- Improved aesthetics and natural character of the property
- Potential for reduced maintenance costs and increased property values

### Strategies:

- Require careful attention to and analysis of streambank protection proposals for properties along the river:
  - Encourage property development that does not require streambank protection.
  - When streambank protection is necessary, use natural channel design and soft armoring for streambank protection as first option.
  - Minimize riprap and other mechanical types of hard stream bank protection
    - Use only as last option or in areas that need to be protected for essential utilities (water lines, sewer lines).
    - Require vegetative mix of willows and native riparian species in riprap protection when it is used.
- Require green stormwater infrastructure for properties in the river corridor, encourage green stormwater infrastructure on all properties in Springdale.
  - Use bioswales, natural retention/detention basins, rainwater harvesting, and other techniques.
- Encourage planted green roofs for new development.
- Require permeable pavement for parking areas in the river corridor, encourage it elsewhere.

## Embrace the River as an Essential Element in Springdale's Community Character

### Goal:

Increase awareness of the importance of a healthy Virgin River as part of Springdale's community character.

### Why This Is Important:

As residents become more informed regarding the characteristics and benefits of a healthy river, the more invested they become in promoting best practices to preserve its health. With more opportunities to interact positively with the Virgin River, community members will be motivated to defend it from degradation by damaging and/or inappropriate development.

### Benefits:

- Increased awareness of the river and matters affecting it
- Engaged constituency for river-compatible land use, site designs and natural aesthetics
- Citizen buy-in for zoning and regulation affecting the Virgin River

### Strategies:

- Complete streambank restoration project on Town-owned property adjacent to the river as a demonstration project and example of a healthy river buffer (figure 3; see Appendix C for more).
- Encourage property owners to reestablish a healthy river buffer on their properties, patterned after the Town's demonstration project.
- Encourage property owners to landscape using riparian vegetation in the river corridor.
- Encourage property owners to place value on protection and restoration of the river corridor in its natural condition.
- Encourage property development projects to provide public access to the river as a community amenity or to grant an easement for the proposed river trail, where appropriate, by offering incentives such as easement donations in lieu of fees, or easement donations for a density bonus.
- Develop outreach and education programs for residents and visitors regarding the benefits of a healthy Virgin River.
- Develop citizen science opportunities to get community members engaged in monitoring and interacting with the river ecosystem (see inset box below).



*Figure 3: River Park could be used as a demonstration area to illustrate riparian restoration practices.*

### Citizen Science Programs:

- [Utah Water Watch](#): water quality education and data collection program.
- [Stream Side Science](#): workshops and lesson plans for students and teachers.
- [iNaturalist](#): record observations of organisms and share data.
- [Utah Master Naturalist](#): certification program that teaches and certifies master naturalist volunteers to promote stewardship and education.
- [Utah Community Science Story Map](#): showcases upcoming and active citizen science activities in Utah.

## Section 2: Environment Goals and Strategies

### Improve Natural River Function

#### Goal:

Minimize the degradation of this asset by enhancing and conserving the function and flow of the Virgin River.

#### Why This Is Important:

Springdale resides in a unique location, at the mouth of Zion Canyon, and along the beautiful Virgin River. The Virgin River and its tributaries provide diverse habitats for many species. The river also provides reliable drinking water for the entirety of the Zion Canyon Corridor.

Rivers are dynamic, they are a result and response of human use, seasonal and annual changes, and temperature fluctuations. Rivers have several jobs to accomplish 1) to transport water, 2) to transport energy, 3) to dissipate energy, and 4) provide habitat for plants and animals, including humans. The Virgin River experiences fluctuation of flow throughout the seasons and varies year to year, and also due to the increases in development and climate change impacts. The techniques used to prevent erosion and flooding impact the natural river function, flow and ecosystem. Areas of the Virgin River that have seen changes to the meander and natural flow due to development can create issues up and down river. As development encroaches on the river, the human manipulation on the dimensions of the river can cause major destruction up and down stream. Areas that have been channelized or cut can create a higher risk for bank failure and flooding (see figure 4). Preservation of the natural processes can be the cheapest protection against flooding and other serious damages that come as consequence of river fluctuations.



*Figure 4: Natural meanders broke through a channelized section of the Walla Walla River in a 1964 flood. (OSU archives)*

#### Benefits:

- Flood and erosion control
- Improved water quality
- Habitat for native fish and wildlife.
- Naturalized deposition of sediments
- Lower water velocity
- Stable streambanks
- Protection of sensitive species
- Native populations can rebound from lowered numbers and regain strength to provide more biodiversity
- Enhanced recreation opportunities



Strategies:

- Identify areas of concern through natural channel design methods
  - o Broaden the scope up and downstream to determine where the problem begins
- Provide information for future landowners on the function of the river, specifically in regards to their property
- Allow for the river to connect with its flood plain. The river must be able to release velocity onto areas that are gentle. Development within floodplains change the natural flow of the river and exposes infrastructure to great risk.
  - o Terracing slopes can help with the gentle release of velocity. It is a great option for areas that may be able to handle that force of water rather than areas downstream with larger risks (see figure 5).
  - o This can prevent erosion and allow for the correct amounts of stream deposition sediment to occur.



Figure 5: Naturally terraced bank along the Virgin River.

## Improve Bank Stability

Goal:

Enhance the bank stability to prevent future hazards and damage along with enhancing the natural function of the river.

Why This Is Important:

As Springdale grows, the development along the riverbank increases as well because of the narrowness of the canyon. As development encroaches on the river, some landowners want to install bank protection to prevent erosion that threatens their land, and that stabilization can have major consequences if done incorrectly. Bank stabilization through hardscape methods such as concrete or riprap can have major effects up- and downstream due to less roughness, less natural absorption of water, and increased meander and sediment deposition.

Effective methods to create a more stable bank structure include combining natural vegetation and live materials along with biotechnical slope stabilization techniques. The combination of these materials can provide more stability to areas where planting alone cannot withstand the water velocity. This best

practice technique can improve bank stability, habitat effectiveness, riparian functions and even aesthetics (figure 6). Increases in filtration, flood plain storage, and organic matter input are all direct outcomes of a more stable, healthy bank.

Another effective technique is to grade the bank to create a sustained gentle slope that will dissipate high velocity water. Designating a specific location to take the impacts of a constrained river upstream will allow for a release in an area that is not threatening to habitat or development.

Benefits:

- Potential to neutralize velocity, deposition, and erosion up and downstream
- Protection of existing habitat and new habitat created
- Re-establishment of healthy riparian zone functions
- Potential reduction of long-term maintenance costs
- Diverse materials can be aesthetically pleasing

Strategies:

- Conduct survey of river channel banks to determine bank conditions (slope, location, and stability) and appropriate biotechnical methods and placement.
- Require careful attention to and analysis of streambank protection proposals for properties along the river:
  - Encourage development to be placed farther from stream channel outside of the 100 year floodplain so that it does not require streambank protection.
  - When streambank protection is necessary, use natural channel design and soft armoring for streambank protection as first option.
  - Minimize riprap and other mechanical types of hard stream bank protection
    - Use only as last option or in areas that need to be protected for essential utilities (water lines, sewer lines).
    - Require vegetative mix of willows and native riparian species in riprap protection when it is used.
- Conduct site-specific designs.
- Ensure landowners acquire appropriate permits.
- Institute density of planting according to slope steepness.
- Educate the community about appropriate stabilization techniques and the impacts of hardening the bank.
- Develop a floodplain acquisition program.

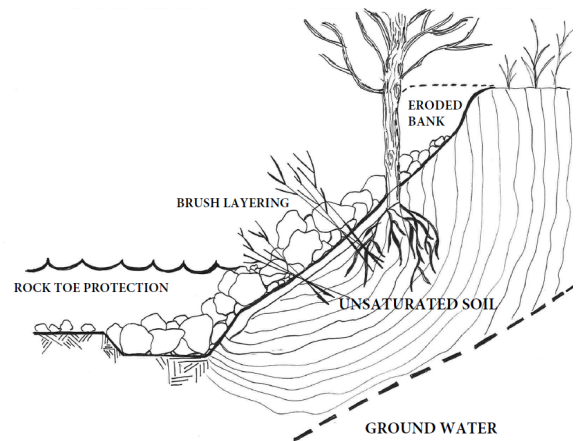


Figure 6: Example of vegetative riprap.

## Manage Invasive and Nuisance Species

### Goal:

Manage invasive and introduced non-native plants and animal species that can out-compete, reduce, or eliminate native species and negatively affect habitat quality and suitability, species diversity, and ecosystem function.

### Why This Is Important:

Invasive and nuisance species are plant and animal species introduced and successfully spread to an environment outside their native range that cause economic or environmental harm to human, animal, or plant health. Invasive and nuisance species often thrive in the wake of human settlement and urban or agricultural disturbance. The success of invasive species is often due to a competitive advantage over native species, such as the ability to spread and reproduce rapidly in the absence of predation and other limiting environmental factors present in their native habitats and superior tolerance of environmental and climatic fluctuations. Within the Virgin River corridor, there are many introduced trees and shrubs, invasive weed species (see figure 7), and non-native or nuisance fish, bird, and mammal species. The most important management approach to invasive plant and animal species is prevention, as total eradication can be difficult. Once established, best practices should aim to reduce and control the spread of invasive and non-native or nuisance species using species specific approaches that work with natural cycles to maximize removal and minimize environmental impacts. Managing invasive species is the first step in successful habitat restoration projects along the Virgin River corridor. See Appendix B for a list of invasive species.



Figure 7: Tamarisk (left), Russian thistle or tumbleweed (center), and puncture vine (right) are common invasive plant species.

### Benefits:

- Improved erosion control
- Enhanced nutrient cycling
- Improved aesthetics for recreational users of the river corridor.
- Increased safety from wildfires
- Improved habitat for wildlife

### Strategies:

- Prevent further establishment of invasive plant species as the most cost-effective approach to accomplishing the goal of restoring the natural river corridor.
- Develop a comprehensive management strategy to prioritize invasive species control.
- Implement a program to improve detection and identification of invasive species.

- Coordinate response efforts to eradicate species before they are established and spread.
- Create a map showing invasive species on both public and private lands.
- Identify side drainages of the Virgin River that contain invasive plants and take steps to eradicate them to prevent seeds from washing down and establishing along the Virgin.
- Establish communication with private landowners about eradication and control of invasive species on their land.
  - o Expect that this process will take 3-5 years to implement and ongoing diligence.
- Educate and train the public on prevention and control of invasive species.

## Improve and Restore Native Plant Diversity

### Goal:

Improve or restore the number and diversity of native plants to enhance wildlife habitat, environmental quality, and value for recreational user groups.

### Why This Is Important:

Restoration of native plant diversity and wildlife habitat describes best practices designed to improve three habitat communities: aquatic, riparian, and upland that naturally occur along the length of the Virgin River. Restoration of the three habitat communities can increase native wildlife habitat area and species diversity. Increasing species diversity can enhance ecological functioning, reduce the spread of invasive species, and minimize long-term vegetation management costs. Aquatic, riparian, and upland communities describe unique plant and wildlife assemblages associated within and adjacent to the river and contiguous manicured open space zones. Restoration requires an initial evaluation of the level of tree removal or trimming necessary to minimize flood hazards, weed removal and long-term weed management, as well as naturalized planting of native tree and plant mixes designed to introduce the structural complexity of each specific habitat community (figure 8).

A survey by a consultant will determine the existing conditions and identify areas that need native plant restoration. The survey will also determine areas where the river needs to have its energy reduced by native plantings. The corridor has been degraded by uncoordinated bank modifications that reduce local erosion, but promote much worse conditions either upstream or downstream. A comprehensive corridor plan needs to be made and implemented. Using native plants in this restoration effort will be the best-case scenario for both the river and its native wildlife. Long-term maintenance costs (invasive plant species clearing) will be reduced. See Appendix B for a list of some of the native plants to be used in restoration efforts.

### Benefits:

- Improved habitat for native wildlife



*Figure 8: Coyote willow is a Utah native species commonly found in riparian areas.*



- Enhanced natural ecosystem and ecological function (water filtration, erosion control, and nutrient cycling)
- Increased potential for wildlife viewing and native bird watching
- Improved aesthetics for recreational user groups (walkers, wildlife viewers, tubers) and residents

Strategies:

- Engage a consultant to conduct a site inventory and analysis that will result in a corridor restoration design.
  - o Develop a plan for removing invasive plant species and planting native plants.
  - o Identify the underlying causes of disturbances (plant or erosion) that destroy the health of the river corridor and suggest remedies.
  - o Determine a site-specific adaptive management strategy for different portions of the corridor and address them as necessary. Some established trees might need their trunks wrapped with wire or “sand” painting for protection.
- Plant plugs for native trees and seed mixes for both short term aesthetics (fast growing native species which dominate the fire growing season) and long term community establishment goals (over a 7-10 year time frame).
- Monitor vegetation for its success annually.
- Encourage planting of “pollinator gardens” in places where irrigation water is readily available.
- Emphasize native plantings in demonstration project on Town property by River Park (see Land Use Strategies - Embrace the River as an Essential Element in Springdale’s Community Character)
- Control noxious weeds and water native plants regularly during the initial growing season.

## Enhance Connectivity between Habitat Patches

Goal:

Enhance and maintain connectivity between habitat patches to maintain species diversity and sustainability, mitigate long-term habitat degradation, and allow movement of wildlife and birds along the Virgin River Corridor.

Why This Is Important:

Historical alteration, human settlement, and development have resulted in fragmentation of terrestrial, aquatic, and plant habitat along the Virgin River. The result is disconnected patches of habitat that vary in size, shape, and quality and, therefore, in value to native wildlife. The value of habitat is generally measured by its ability to provide adequate foraging, breeding, and cover opportunities for long-term survival. Long-term survival of many migratory and resident species depends on connected habitat patches. Connectivity allows movement between habitat areas and safeguards species from natural and man-made environmental disturbance. Best practices that enhance connectivity create links between otherwise isolated patches of wildlife habitat and circumvent existing manmade barriers (see figure 9).

Benefits:

- Improved plant and wildlife habitat
- Improved health of ecosystem
- Increased erosion control and nitrogen deposition control
- Connection of river corridor habitat to adjacent open spaces
- Increased aesthetics and quality for recreational user groups

Strategies:

- Conduct a site inventory of existing habitat condition and fragmentation, and man-made or natural barriers.
- Conduct a biological survey of the existing habitat areas and targeted species.
  - o Identify indicator species that maximize movement opportunities for a biological community.
- Establish an effective monitoring program that manages and controls invasive plant and animal species.
- Continue with invasive plant removal and planting of a native vegetation mix that addresses short- and long-term habitat goals. (See Manage Invasive and Nuisance Species and Improve and Restore Native Plant Diversity sections)

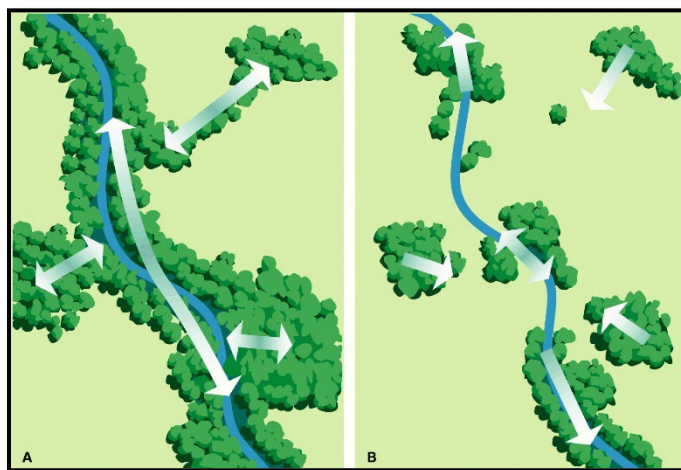


Figure 9: Landscapes with high and low degrees of connectivity.  
*Stream Corridor Restoration: Principles, Processes, and Practices,*  
10/98, Federal Interagency Stream Restoration Working Group.

## Protect and Improve Water Quality

Goal:

Maintain the wild and scenic nature of the Virgin River, and in doing so maintain ground and surface water for public health, welfare, agricultural usage, recreation, fish and wildlife habitat, and aesthetic.

Why This Is Important:

Due to the increase of development along the Virgin River, many negative impacts have been added to the system. Regardless of zoning criteria, landscaping is prominent on almost every property along the Virgin River. Fertilizer is commonly used in an attempt to create inviting landscapes in a harsh desert climate. As storms make their way through the canyon, water runoff often picks up those toxins and carries them to the river. Fertilizers also make their way into the system when landowners dump their landscaping waste where it can be washed into the river. An excess of fertilizers can cause an increase of algae, which in turn can deplete oxygen levels in waterways and damage aquatic habitats. Pesticides or herbicides are also commonly used in landscaping. Several residents have expressed concerns about use of pesticides in riparian habitat or near the river, and the potential impacts of its use should be considered in landscaped areas along the river.

Areas in which permeable ground is replaced by hardscape surfaces are also apparent throughout town. When the soil is converted to asphalt and pavement, the permeable surface that once allowed for percolation of water into the underlying soils can no longer act as a buffer. Now areas that are impervious not only repel water but they also allow for water to carry unnatural pollutants such as sediment, heavy metal, oils, grease, and even grass clippings.

Benefits:

- Removal of pollutants
- Reduction of downstream erosion
- Reduction of downstream pollution
- Stormwater infiltrated at the source
- Clean drinking water
- Healthy habitat for wildlife
- Retain the *wild and scenic* nature of the river
- Improved filtration of nutrients and processing of organic waste while minimizing temperature fluctuations.

Strategies:

- Educate property owners on natural landscaping techniques and the potential impacts of fertilizers or pesticides in the river corridor.
- Educate on how to properly dispose of weeds, grass clippings, unwanted plants etc. instead of dumping them in or near the river.
- Create closed loop systems on agricultural lands.
- Create buffers between developed areas and the river with permeable surfaces.
  - o Buffers can be enhanced by trees, shrubs, and even trails.
- Encourage improvements in water drainage management.
  - o Capture and let stormwater infiltrate on site to minimize runoff (through bioswales, rainwater harvesting, retention basins, or other green stormwater infrastructure.)
- Minimize hardscape surfaces.
  - o Replace existing impervious paving with permeable paving or landscaping.
- Protect water quality through state and federal water quality regulations.
  - o Make sure source protection plans are up to date.
- Adopt development criteria for Springdale that is designed to protect water quality.

## Section 3: Recreation Goals and Strategies

### Provide River Access Where Appropriate

Goal:

Provide practical public access points to designated recreation areas along the Virgin River while preserving the natural river function and flow.

Why This Is Important:

The Virgin River provides the opportunity for people to recreate in a number of different ways. River recreation by its nature can be disturbing to the delicate river habitat. Evidence of this human impact can

be found along the Virgin River corridor. In addition, several property owners along the river have expressed frustration with trespassing by river users who don't understand where it is private property and where it is appropriate to recreate. By providing access points to designated recreation areas, we can find the necessary balance between appropriate river recreation and preservation by facilitating and managing where people use the river.

#### Benefits:

- Improved management of visitors to and from the river
- Reduced number of informal trails
- Improved monitoring and encouragement of appropriate, low-impact recreation
- Improved maintenance of recreation areas by parks staff
- Reduced number of people trespassing on private property
- Reduction in erosion and increased bank stability

#### Strategies:

- Locate areas that provide easy access to the river that the public will naturally gravitate towards, including beaches and areas that have already shown signs of human impact.
- Make designated area as accommodating and inviting as possible.
- Provide people tubing or kayaking with a practical location to pull out of the river at George Barker River Park (figure 10).
  - o Improve takeout spot on the riverbank and make it clear to users that this is the appropriate place to take out.
  - o Designate a staging area where people can wait with their equipment for transportation.
- Create maps and signage to designate recreation and river access points.
- Identify potential easement locations within the Virgin River corridor.
  - o Conservation easements
  - o Trail easements
  - o River access easements



Figure 10: The current take out spot for tubers at River Park needs improvements to make it safer and more accessible, and to limit erosion and other impacts.



## Foster Stewardship of the River Corridor through Recreation

### Goal:

Protect and enhance river function through appropriate types of recreation and encouraging visitors to act as stewards of the river.

### Why This Is Important:

A fundamental element of river preservation is low-impact recreation. By discouraging those types of activity that would greatly disturb the habitat in and around the river, we can better foster a healthy Virgin River corridor.

### Benefits:

- Reduced signs of human impact
- Preservation of the river ecosystem and wildlife habitat
- Sustainable management that will allow people to enjoy the river for years to come
- Enhanced knowledge, understanding, and stewardship of the corridor

### Strategies:

- Work with local businesses that provide recreational services to help educate on appropriate types of recreation and Leave No Trace practices (figure 11).
- Designate appropriate areas for specific activities.
  - o Manage off trail activities, such as undesignated river access and “take-out” locations for tubers, boaters, etc.
  - o Restrict all motorized vehicles (OHV’s, ATV’s, etc.) in the river corridor
- Provide items such as trash receptacles, doggie bags, etc. to help minimize litter and other signs of human impact.
- Create education and outreach programs to encourage the public’s involvement in stewardship activities such as managing invasive and nuisance species.



Figure 11: Leave No Trace principles from the Center for Outdoor Ethics. (Graphic by Earth River SUP)

## Create and Maintain a Connected System of Trails

### Goal:

Construct low-impact trails where appropriate and maintain or enhance existing trails along river corridor.

### Why This Is Important:

Well-designed and designated trails allow the public to enjoy nature while also minimizing the amount of disturbance. By creating and maintaining trails, we can provide the public with the opportunity to take in the beauty of the canyon and enjoy what makes Springdale such a unique community. In addition, the development of more east-west trails linking the corridor to the neighborhoods around it improves connectivity and allows for active transportation, alleviating congestion in areas of high impact.

### Benefits:

- Increased property value
- Additional source of recreation
- Cleaner alternatives to driving cars
- Reduction in the number of informal trails and the erosion that accompanies them
- Increased access in the case of emergency events (floods, etc.)

### Strategies:

- Post signs that clearly indicate trailheads.
- Develop a continuous trail along the river linking to Zion National Park as envisioned in the *Zion Canyon Trail Feasibility Study*<sup>8</sup>.
- Create a well-connected system by linking to other trails or sidewalks.
- Construct and maintain trails that are sustainable, low-maintenance, and designed with the appropriate width, slope, and clearing height.
- Avoid sensitive environments, native plant communities, and important wildlife habitat.
- Consider flood plain and river meander patterns to reduce risk of trail being washed out.
- Develop partnerships with other landowners in construction of new trails and access points.



<sup>8</sup> Zion Canyon Trail Feasibility Study, 2007: <https://www.springdaletown.com/215/Zion-Canyon-Trail>



## Conclusion

The Virgin River is an essential part of the community of Springdale, valued by residents as a source of water, a place to enjoy the beauty of nature, and a site of personal and community history. The *Springdale Virgin River Management Plan* defines best management practices that will help protect and preserve the Virgin River corridor as it leaves Zion National Park and passes through the Town. The practices described in this plan focus on land use, the environment, and recreation and are intended to guide the Town and its citizens as they work to preserve the qualities of the river that make it such a special place.

The elements of the plan are closely tied together and yield several broad benefits, including improving the function of the river, protecting the riparian ecosystem and habitat, and providing appropriate recreational opportunities. By following these strategies, the Town can work together with landowners, businesses, residents, and visitors to safeguard the special qualities of the river corridor as future development occurs.



## Appendices

### Appendix A: Glossary

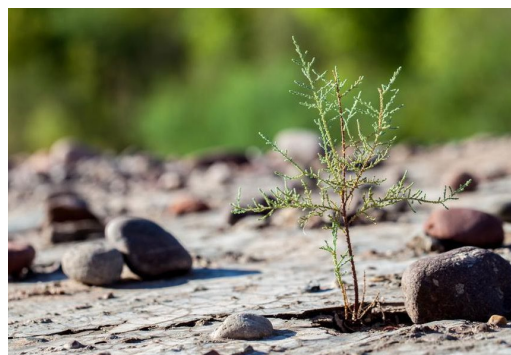
Term	Definition
Bioswale	Vegetated, shallow, landscaped depressions designed to capture, treat, and infiltrate stormwater runoff as it moves downstream.
Biotechnical stabilization	Combines live and dead plant materials with structural engineering techniques to stabilize slopes and stream banks. Also known as bioengineering.
Buffer	Naturally vegetated area along a river or stream corridor that separates it from development. Serves to filter runoff, control sediment and nutrient movement, and protect fish and wildlife habitat.
Cluster subdivision	Grouping of residential properties on a development site in order to use the extra land as open space, recreation or agriculture.
Conservation easement	Voluntary legal agreement between a landowner and a land trust or government agency that limits uses of the land in order to protect its conservation values in perpetuity.
Density bonus	Incentive based tool that permits increase in maximum allowable development on a site in exchange for funds or in-kind support for specified public policy goals.
Deposition	The geological process in which sediments, soil, and rocks are added to a landform or land mass.
Easement	A right to cross or otherwise use someone else's land for a specified purpose.
Ecosystem	A biological community of interacting organisms and their physical environment.
Flood hazard area	An area that has a 1-percent chance of being inundated by a flood event in any given year. FEMA uses this to identify flood hazard areas on the Flood Insurance Rate Map.
Floodplain	An area of low-lying ground adjacent to a river, formed mainly of river sediments and subject to flooding.
Gabion	A wirework container filled with rock, broken concrete, or other material, used in the construction of dams, retaining walls, etc.
General plan	A broad planning guideline to the Town's future development goals and provides policy statements to achieve those development goals.

Green stormwater infrastructure	Green infrastructure uses vegetation, soils, and other elements and practices to restore some of the natural processes required to manage water, reducing and treating stormwater at its source.
Habitat	The natural home or environment of an animal, plant, or other organism.
Habitat patches	Any discrete area with a definite shape, spatial and configuration used by a species for breeding or obtaining other resources.
Indicator species	A species whose presence, absence, or relative well-being in a given environment is indicative of the health of its ecosystem as a whole. A species used to locate another, less visible species.
Infrastructure	The basic physical and organizational structures and facilities (e.g. buildings, roads, power supplies) needed for the operation of a society or enterprise.
Invasive species	Plant and animal species inadvertently or deliberately introduced, or successfully spread, to an environment outside their native range and may cause economic or environmental harm or harm to human, animal, or plant health.
Native species	A species that normally lives and thrives in a particular ecosystem.
Permeable pavement	Permeable pavements infiltrate, treat, and/or store rainwater where it falls. Can be made of pervious concrete, porous asphalt, or permeable interlocking pavers.
Pollinator gardens	An area that is planted and designed with specific nectar and pollen producing native plants that attract pollinating insects.
Riprap	Rock or other materials used to armor banks against scour and water erosion.
Sand painting trees	A mixture of latex paint and sand applied to the bottom 3-4 feet of a tree trunk to protect the tree from erosional forces.

## Appendix B: Invasive and Native Plant Species Lists

### Common Non-native, Invasive Plant Species

Botanical Name	Common Name
<i>Acroptilon repens</i>	Russian Knapweed
<i>Arundo donax</i>	Giant Reed
<i>Cardaria draba</i>	Whitetop (hoary cress)
<i>Centaurea solstitialis</i>	Yellow Starthistle
<i>Centaurea maculosa</i>	Spotted Knapweed
<i>Cirsium vulgare</i>	Bull Thistle
<i>Elaeagnus angustifolia</i>	Russian Olive
<i>Onopordum acanthium</i>	Scotch Thistle
<i>Phalaris arundinacea</i>	Reed Canary Grass
<i>Phragmites australis</i>	Phragmites
<i>Solanum elaeagnifolium</i>	Silverleaf Nightshade
<i>Sorghum sp.</i>	Sorghum
<i>Tamarix ramosissima</i>	Tamarisk (Salt Cedar)
<i>Tribulus terrestris</i>	Puncturevine (goathead)



New tamarisk



Tumbleweed when green

### Select list of native plants recommended for riparian restoration

(see next page for a complete list of plants recommended for the Town of Springdale)

Botanical Name	Common Name	Botanical Name	Common Name
<i>Acer grandidentatum</i>	Bigtooth maple	<i>Prunus virginiana</i>	Chokecherry
<i>Acer negundo</i>	Box elder	<i>Quercus gambelii</i>	Gambel oak
<i>Agropyron smithii</i>	Western wheatgrass	<i>Rhus trilobata</i>	Skunkbush sumac
<i>Baccharis salicifolia</i>	Seep willow	<i>Robinia neomexicana</i>	New Mexico locust
<i>Cornus sericea</i>	Red osier dogwood	<i>Salix exigua</i>	Coyote willow
<i>Fraxinus velutina</i>	Velvet ash	<i>Salix gooddingii</i>	Gooddings willow
<i>Herrickia glauca</i>	Gray aster	<i>Salix laevigata</i>	Red willow
<i>Juniperus utahensis</i>	Utah juniper	<i>Schoenoplectus acutus</i>	Hard stem bulrush
<i>Populus angustifolia</i>	Narrowleaf cottonwood	<i>Solidago sp.</i>	Goldenrod

## Town of Springdale Approved Plant List

<i>Botanical Name</i>	<i>Common Name</i>	<i>Botanical Name</i>	<i>Common Name</i>
<b>Drought Tolerant Lawn Grasses (Adapted to Region)</b>		<b>Drought Tolerant Shrublets &amp; Succulents (&lt;2')</b>	
<i>Agropyron sp.</i>	Wheatgrass	<i>Echinoderma sp.</i>	Cactus
<i>Bouteloua gracilis</i>	Blue gramma	<i>Encelia frutescens</i>	Brittle brush
<i>Buchloe dactyloides</i>	Buffalo grass	<i>Eriogonum sp.</i>	Buckwheat
<i>Festuca sp</i>	Fescues	<i>Gutierrezia sarothrae</i>	Snakeweed or Broomweed
<i>Lolium sp.</i>	Ryegrass	<i>Mahonia repens</i>	Creeping Oregon grape
<b>Drought Tolerant Grasses</b>		<i>Mirabilis multiflora</i>	Four o'clock
<i>Agropyron smithii</i>	Western wheatgrass	<i>Oenothera sp.</i>	Primrose sp.
<i>Aristida purpurea</i>	Purple threeawn	<i>Opuntia sp.</i>	Prickly pear cactus
<i>Elymus elymoides</i>	Squirrel tail	<i>Salvia dorrii</i>	Desert sage
<i>Festuca arizonica</i>	Arizona fescue	<i>Sphaeralcea sp.</i>	Globemallows
<i>Hilaria jamesii</i>	Galleta grass	<i>Vitis arizonica</i>	Canyon grape*
<i>Oryzopsis hymenoides</i>	Indian ricegrass	<b>Drought Tolerant Shrubs &amp; Succulents (2' - 5')</b>	
<i>Poa fendleriana</i>	Mutton grass	<i>Agave sp.</i>	Agave species
<i>Schizachyrium scoparium</i>	Little bluestem	<i>Amorpha fruticosa</i>	Indigo bush
<i>Sporobolis contractus</i>	Spike droseed	<i>Arctostaphylos pungens</i>	Manzanita
<i>Sporobolis cryptandrus</i>	Sand dropseed	<i>Artemesia tridentata</i>	Sagebrush
<i>Sporobolis giganteus</i>	Giant dropseed	<i>Artemesia filifolia</i>	Old man sage
<i>Sporobolis airoides</i>	Alkali sacaton	<i>Asclepius tuberosa</i>	Butterfly milkweed
<i>Stipa comata</i>	Needle and thread	<i>Aster glaucodes</i>	Glaucous aster
<i>Stipa speciosa</i>	Desert needlegrass	<i>Atriplex canescens</i>	Four-wing saltbush
<b>Drought Tolerant Forbs</b>		<i>Baccharis emoryi</i>	Baccharis
<i>Achillea millefolium</i>	Yarrow	<i>Chrysothamnus nauseosus</i>	Rabbitbrush
<i>Argemone munita</i>	Prickly-poppy	<i>Coleogyne ramosissima</i>	Blackbrush
<i>Astragalus sp.</i>	Milkvetch	<i>Datura wrightii</i>	Datura
<i>Baileya multiradiata</i>	Desert marigold	<i>Ephedra viridis</i>	Mormon tea
<i>Calochortus nuttallii</i>	Sego lily	<i>Fallugia paradoxa</i>	Apache plume
<i>Castilleja linariifolia</i>	Linearleaf paintbrush	<i>Hesperaloe parviflora</i>	Red yucca
<i>Castilleja chromosa</i>	Common paintbrush	<i>Lycium andersonii</i>	Anderson wolfberry
<i>Dalea purpurea</i>	Common prairie clover	<i>Malva neglecta</i>	Common mallow
<i>Dalea searlsiae</i>	Searls prairie clover	<i>Oenothera sp.</i>	Yellow primrose
<i>Dichelostemma pulchellum</i>	Blue dicks, wild hyacinth	<i>Penstemon palmerii</i>	Palmer penstemon
<i>Erigeron utahensis</i>	Utah daisy	<i>Purshia tridentata</i>	Bitterbrush
<i>Eriogonum sp.</i>	Buckwheat	<i>Ribes aureum</i>	Golden current
<i>Erysimum asperum</i>	Western wallflower	<i>Rosa woodsii</i>	Wood's rose
<i>Gaillardia aristata</i>	Blanketflower	<i>Salix exigua</i>	Coyote willow*
<i>Gaillardia pinnatifida</i>	Hopi blanketflower	<i>Sarcobatus vermiculatus</i>	Greasewood
<i>Gilia aggregata</i>	Scarlet gilia	<i>Shepherdia rotundiflora</i>	Buffaloberry
<i>Gilia subnuda</i>	Gilia	<i>Stanleya pinnata</i>	Prince's plume
<i>Grindelia squarrosa</i>	Curlycup gumweed	<i>Yucca sp.</i>	Yucca
<i>Heterotheca villosa</i>	Hairy goldenaster	<b>Drought Tolerant Large Shrubs (5' - 10' +)</b>	
<i>Hymenoxys scaposa</i>	Perky sue	<i>Amelanchier utahensis</i>	Utah Serviceberry
<i>Linum lewisii</i>	Flax	<i>Cercocarpis ledifolius</i>	Curl leaf mountain mahogany

Botanical Name	Common Name	Botanical Name	Common Name
<b>Drought Tolerant Forbs (cont.)</b>		<b>Drought Tolerant Large Shrubs (5' - 10' +) (cont.)</b>	
<i>Lotus plebeius</i>	Deerclover	<i>Chilopsis linearis</i>	Desert willow*
<i>Penstemon ambiguous</i>	Bush penstemon	<i>Cowania neomexicana</i>	Cliff rose
<i>Penstemon eatonii</i>	Eaton penstemon	<i>Garrya flavescens</i>	Silk tassel
<i>Penstemon linarioides</i>	Toadflax penstemon	<i>Larrea tridentata</i>	Creosote
<i>Penstemon sp.</i>	Penstemons	<i>Prunus fasciculata</i>	Desert almond
<i>Phlox austromontana</i>	Creeping phlox	<i>Purshia mexicana</i>	Mexican cliff rose
<i>Senecio crassulus</i>	Mt. Groundsel	<i>Quercus turbinella</i>	Shrub live oak
<i>Solidago sp.</i>	Goldenrod	<i>Rhus glabra</i>	Smooth sumac
<i>Sphaeralcea coccinea</i>	Scarlet globemallow	<i>Rhus trilobata</i>	Three leaf sumac
<i>Sphaeralcea ambigua</i>	Desert globemallow	<i>Sacrobatus vermiculatus</i>	Greasewood
<i>Sphaeralcea grossularifolia</i>	Gooseberry-leaf globemallow	<i>Sambucus cerulea</i>	Blue elderberry
<i>Trifolium macilentum</i>	Lean clover	<i>Sambucus utahensis</i>	Utah elderberry
<b>Drought Tolerant Trees</b>		<b>Prohibited Plants</b>	
<i>Acer glabrum</i>	Rocky Mountain maple	any plant listed as a noxious weed (see websites below)	
<i>Acer negundo</i>	Boxelder	<i>Ailanthus altissima</i>	Tree of heaven
<i>Celtis reticulata</i>	Hackberry	<i>Arundo donax</i>	Giant reed
<i>Cercocarpus montanus</i>	Alderleaf Mountain Mahogany	<i>Convolvulus arvensis</i>	Morning glory
<i>Forestiera neomexicana</i>	Desert olive	<i>Eleagnus angustifolia</i>	Russian olive
<i>Fraxinus anomala</i>	Singleleaf ash	<i>Linaria genistifolia</i>	Dalmatian toadflax
<i>Fraxinus velutina</i>	Desert ash	<i>Lythrum salicaria</i>	Purple loosestrife
<i>Juniperus utahensis</i>	Utah juniper	<i>Paulownia tomentosa</i>	Princess tree
<i>Juniperus osteosperma</i>	Utah juniper	<i>Pennicetum setaceum</i>	Fountain grass
<i>Juniperus scopulorum</i>	Rocky Mountain juniper	<i>Robinia pseudoacacia</i>	Black locust
<i>Picea pungens</i>	Blue spruce	<i>Tamarix sp</i>	Tamarisk
<i>Pinus edulis</i>	Pinyon pine	<i>Tamarix aphylla</i>	Blue Athel
<i>Pinus flexilis</i>	Limber pine	<i>Ulmus pulmila</i>	Chinese Elm
<i>Pinus ponderosa</i>	Ponderosa pine		
<i>Platanus wrightii</i>	Arizona sycamore		
<i>Populus fremontii</i>	Fremont cottonwood*		
<i>Prunus virginiana</i>	Chokecherry		
<i>Quercus gambelli</i>	Gambel's oak		
<i>Robinia neomexicana</i>	New Mexico locust		
<i>Salix gooddingi/fremontii</i>	Native willows*	*designates species that need additional water	

## Other References:

## Acceptable Plants:

<https://www.nps.gov/zion/learn/nature/plants.htm>

Waterwise: Native Plants for Intermountain Landscapes Mee et. al, USU Press 2003

Plants of Zion National Park: Wildflowers, Trees, Shrubs, and Ferns Nelson & Blaue, ZNHA 1976

Wildflowers of Zion National Park Welsh, ZNHA 1990

## Prohibited Plants:

<http://www.utahweed.org/weeds.htm>

<https://www.nps.gov/subjects/invasive/plants.htm>



## Appendix C: Town Riverbank Restoration Project

### Purpose

One of the land use strategies in this plan calls for the Town of Springdale to conduct a riverbank restoration demonstration project on Town-owned property (figure 12). The demonstration project will provide the Town an opportunity to implement many of the best practices and management strategies in this plan to create a healthy river system. The Town can then use the demonstration project to: 1) help educate the community about the importance of a healthy river corridor, 2) show how the management strategies and concepts in the Plan can be developed, and 3) encourage owners of riverfront property to pursue similar restoration projects on their properties.

### Outline

The demonstration project will:

- Recreate a riverbank with multiple levels of bank terraces (rather than a continuous steep riverbank)
- Use native vegetation, soft armoring, and other natural channel design techniques to manage river flows and floodwater
- Enhance habitat for native species (aquatic and terrestrial) by removing invasive species, re-establishing native vegetation, creating protected pools and bank overhangs for aquatic species, and other similar techniques

The demonstration project will be located on the banks of the Virgin River in the Town's River Park. The Town will engage consultants to select the exact location for the project. The location will be selected based on where, according to the consultant, the project will be most feasible to complete, and will provide the most benefit to the health of the river. This project proposal will need additional community outreach to build support for the idea as well as educate the community on what the project would entail. Feedback from the Town as well as those with interests in the Park will be important to this idea's success.

### Funding

Funding for the project could come from a variety of sources, including the Town's general fund, the Land and Water Conservation Fund, the Utah Conservation Corps, and other similar funding sources. The Town should seek funding from a variety of sources and be creative in funding the project.



Figure 12 Aerial view of the proposed restoration area at River Park.

## Appendix D: Funding Opportunities

	<i>Name</i>	<i>Eligible Projects</i>	<i>Process Timing</i>	<i>Local Match Required</i>	<i>Funding Amount</i>	<i>Contact</i>	<i>Website</i>
Local	<b>Washington County RAP</b>	Can be used for cultural arts, natural history, art, music, etc.	Fall; check website	Not specified	Not specified	Cheyenne Bentley (435) 986-3349 cheyenne.bentley@washco.utah.gov	<a href="https://portal.washco.utah.gov/rap/">https://portal.washco.utah.gov/rap/</a>
State	<b>Utah Outdoor Recreation Grant</b>	Outdoor recreation infrastructure including trails, trail facilities, all-ability outdoor rec facilities, whitewater parks, not-for-profit camping facilities, etc. Cannot be used for project planning, maintenance of existing trails, or the purchase of property.	Application period open Jan-Feb	Given as a 50/50 match. Up to 25 percent of total may be an in-kind match.	Up to \$150,000	Tara McKee (801) 538-8686 tmckee@utah.gov	<a href="https://business.utah.gov/outdoor/">https://business.utah.gov/outdoor/</a>
	<b>Recreational Trail Program</b>	Construction and maintenance of trails and facilities; trailheads; restroom facilities; trail signage; acquisition of property or easements; purchase / lease of trail construction and maintenance equipment; educational programs to promote safety and environmental protection	Application period open February - May 1	50% (cash, in-kind services, volunteer labor, or donations)	Depends on federal funding	Utah DNR State Parks Chris Haller, chrishaller@utah.gov (801) 349-0487	<a href="http://stateparks.utah.gov/resources/grants/recreational-trails-program/">http://stateparks.utah.gov/resources/grants/recreational-trails-program/</a>
	<b>Land &amp; Water Conservation Fund</b>	Ball fields, sports courts, spray parks, golf courses, public restrooms, swimming pools, skate parks, walking trails, land acquisition for recreation (must relate to the 2019 Utah State Comprehensive Outdoor Recreation Plan (SCORP))	Application period open February - May 1	50%	Depends on federal funding	Utah DNR State Parks Susan Zarekarizi, susanzarekarizi@utah.gov (385) 239-3232	<a href="http://stateparks.utah.gov/resources/grants/land-and-water-conservation-fund/">http://stateparks.utah.gov/resources/grants/land-and-water-conservation-fund/</a>
	<b>LeRay McAllister Critical Land Conservation Fund</b>	Purchase of land or conservation easements (costs can include environmental assessments); restoration projects (including project planning or engineering, stabilization, revegetation, etc.)	Applications due in May; check website	At least 50% (On average, Commission funds about 20 to 25% of total project costs.)	Not specified. Funding availability varies from year to year.	Evan Curtis ecurtis@utah.gov (801) 538-1424	<a href="https://gomb.utah.gov/2019-leray-mcallister-application/">https://gomb.utah.gov/2019-leray-mcallister-application/</a>

	<b>Watershed Restoration Initiative</b>	Watershed rehabilitation processes such as reduction of invasive plant species, fire prevention and reseeding, restoring degraded stream systems and reversing aspen forest decline	Check website	None specified	Varies	Tyler Thompson tylerthompson@utah.gov	<a href="https://watershed.utah.gov/">https://watershed.utah.gov/</a>
	<b>UDAF Invasive Species Mitigation Grant</b>	Detection and treatment of noxious weeds; monitoring and prevention; research	August-September (check website)	Not specified, but encouraged for higher ranked application	approx. \$150,000 - \$200,000	Aaron Eagar (801) 538-7186 aeagar@utah.gov	<a href="https://ag.utah.gov/home/news/428-invasive-species-mitigation-grant-application.html">https://ag.utah.gov/home/news/428-invasive-species-mitigation-grant-application.html</a>
	<b>Utah Permanent Community Impact Fund Board (CIB)</b>	Planning, construction and maintenance of public facilities, and provision of public services; may include public infrastructure traditionally provided by governmental entities.	Applications reviewed and authorized on a trimester basis; applications due June 1, Oct 1, Feb 1. (see website)	50% cash contribution; in-kind contributions are ineligible (except for real property).	Not specified; max. \$5,000,000	Gary Zabriskie (435) 673-3548 x 126 gzabriskie@fivecounty.utah.gov	<a href="http://www.fivecounty.utah.gov/programs/community/capital.php">http://www.fivecounty.utah.gov/programs/community/capital.php</a>
<b>Federal</b>	<b>National Park Service Challenge Cost Share Program</b>	Promote improved access and opportunities for outdoor recreation, environmental stewardship, and education in our National Parks, National Trails and / or Wild and Scenic Rivers. Projects must be endorsed and submitted by NPS staff.	Spring; check website	50% (cash or in-kind )	Max \$25,000	Check with local park unit	<a href="https://www.nps.gov/ccsp">https://www.nps.gov/ccsp</a>
<b>Non-Profit &amp; Foundation Funding</b>	<b>Doppelt Family Trail Development Fund (Rails-to-Trails Conservancy)</b>	New multi-use trail construction, trail facility/infrastructure (e.g., trailheads, bathrooms), improvements to existing trails; land acquisition; trail signage; significant maintenance tasks; capacity building for nonprofits or friends groups. (Preference given for rail-trails)	January	None	Project Transformation grant: \$15,000 - \$50,000; Community Support grant: \$5,000 - \$10,000	grants@railstotrails.org	<a href="https://www.railstotrails.org/our-work/doppelt-family-trail-development-fund/">https://www.railstotrails.org/our-work/doppelt-family-trail-development-fund/</a>
	<b>People for Bikes Community Grants</b>	Bike paths, lanes, trails, bridges, rail-trails, mountain bike trails, bike parks, BMX facilities, bike racks, bike parking/storage. Not eligible: trailheads, kiosks, signs, maps, planning.	Two grant cycles a year, Spring and Fall; check website for process	None specified, but grant must not amount to >50% of project budget	\$5,000 to \$10,000	Zoe Kircos zoe@peopleforbikes.org (303) 449-4893 x106	<a href="http://www.peopleforbikes.org/pages/community-grants">http://www.peopleforbikes.org/pages/community-grants</a>

## Appendix E: Resources

### Model Ordinance Examples:

[\*Best Practices for Riverfront Communities\*](#) Jordan River Commission. Appendix B: Annotated Outline of a Riparian Protection Ordinance pgs. 44-47

[Riparian Buffer Model Ordinance](#) Huron River Watershed Council

[Model Ordinances for Regulating Wetlands, Riparian Habitats and Stream Buffers](#) Association of State Wetland Managers

[Guidebook for Riparian Corridor Conservation](#) Montgomery County, Pennsylvania. Model Ordinance Riparian Corridor Conservation District pgs. 15-27

[Riparian Zone Model Ordinance](#) Passaic River Coalition & New Jersey Department of Environmental Protection, Division of Watershed Management

### Municipal or County Ordinance Examples:

Salt Lake City [Riparian Corridor Overlay District](#) 21A.34.130

Salt Lake County [Jordan River Flood Channel Management](#) Chapter 17.10

Lehi City [Jordan River Protection Overlay Zone](#) Chapter 36-B

Boise, Idaho [Boise River System Overlay Districts](#) Chapter 11-05-06

Madison County, Idaho [Sensitive Lands Overlay \(SLO\) Zone](#) Sec. 117-61

Oro Valley, Arizona [Riparian Habitat Overlay Zone](#) Addendum I.II

Portland, Oregon [Greenway Overlay Zone](#) Chapter 33.440

Medford, Oregon [Riparian Corridor Ordinance](#) Section 10.920

Santa Cruz, California [Riparian Corridor and Wetlands Protection](#) Chapter 16.30

Chapel Hill, North Carolina [Resource Conservation District](#) 3.6.3

Other State of Utah zoning ordinance examples: [Land Use Ordinance Library](#)

### Permit Application Checklist Examples:

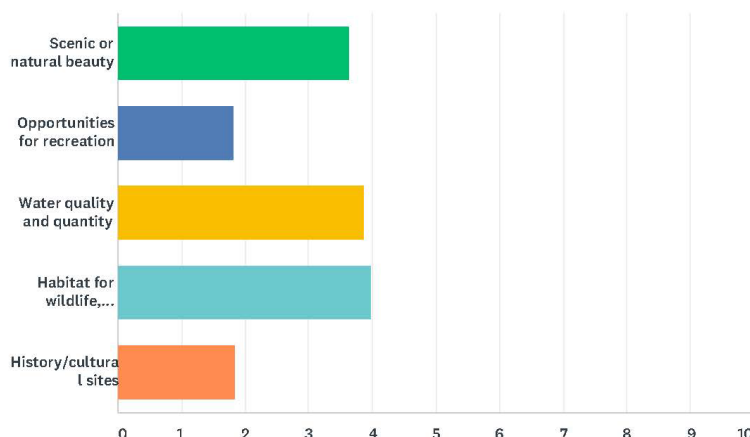
Chicago, Illinois [Chicago River Design Guidelines Checklist](#)

Boise, Idaho [Boise River System Application Submittal Requirements](#)

## Appendix F: Complete Community Survey Results

Q1.1: What do you think are the most important characteristics of the Virgin River in Springdale?  
(rate the options below with 1=the most important)

Answered: 195 Skipped:3



	1	2	3	4	5	TOTAL	SCORE
Scenic or natural beauty	27.27% 48	25.00% 44	34.66% 61	11.93% 21	1.14% 2	176	3.65
Opportunities for recreation	3.37% 6	6.18% 11	11.80% 21	25.84% 46	52.81% 94	178	1.81
Water quality and quantity	32.40% 58	33.52% 60	25.14% 45	6.15% 11	2.79% 5	179	3.87
Habitat for wildlife, birds, and fish	38.71% 72	31.18% 58	19.35% 36	9.68% 18	1.08% 2	186	3.97
History/cultural sites	4.23% 8	2.12% 4	9.52% 18	42.86% 81	41.27% 78	189	1.85

Q1.2 Are there other characteristics not mentioned above that are important to you?

Answered: 115 Skipped: 83

#	RESPONSES	DATE
1	No	1/31/2018 4:56 PM
2	Protection of the riparian areas	1/29/2018 8:05 AM
3	No	1/23/2018 10:14 AM
4	Walking path along river	1/23/2018 8:45 AM
5	Un-dammed, free-flowing, naturally taking its course without man's intervention - truly wild	1/22/2018 5:54 PM
6	no	1/20/2018 10:46 PM
7	I think it would be nice to have a walking path (dirt or paved) along the river leading into Zion.	1/19/2018 10:32 PM
8	No	1/19/2018 8:42 AM
9	Lessening the crowds	1/19/2018 12:44 AM
10	Maintaining or increasing Springdale's ownership of Virgin River water rights.	1/18/2018 9:51 AM
11	Keeping developments away from the water.	1/17/2018 7:24 AM
12	no	1/16/2018 2:31 PM
13	Serenity, peace, and quiet.	1/15/2018 5:39 PM
14	restoration	1/14/2018 9:16 PM

15	Over building	1/14/2018 11:19 AM
16	No	1/14/2018 7:51 AM
17	No	1/13/2018 3:23 PM
18	No	1/13/2018 2:49 PM
19	no	1/13/2018 2:47 PM
20	Accessibility that is limited somewhat so that crowding does not become an issue, such as parking lot limitation. Quiet. Clean.	1/13/2018 2:03 PM
21	Protecting the "Narrows" from overuse. The quiet serenity of nature. Not changing the course.	1/13/2018 12:57 AM
22	No	1/12/2018 4:32 PM
23	Yes....a double emphasis on water quality an quantity. A concern for residents with less emphasis on what might be available for tourism.	1/12/2018 11:37 AM
24	Irrigation	1/12/2018 11:23 AM
25	No	1/12/2018 5:50 AM
26	value	1/11/2018 11:27 PM
27	Public access	1/11/2018 9:13 PM
28	No	1/11/2018 8:37 PM
29	No.	1/11/2018 8:24 PM
30	It's freedom, people can walk along it or in it, and it's an amazing feeling. To stand in the river and feel it's power and beauty it's created around it.	1/11/2018 8:23 PM
31	Access to the river is important to me (for rafting and kayaking, as well as swimming etc). One characteristic that did exist was a huge Heron rookery (along the river behind the Majestic View Lodge). It has recently been destroyed.	1/11/2018 4:59 PM
32	Keeping the river in its natural state and not building up the banks too much. The river often floods and changes course. I think its important to let this happen. Sometimes people lose property and then gain it again. Let it happen. Also stop letting houses hand hotels build so close to the river.	1/11/2018 2:10 PM
33	an area around the river banks of at least 200 ft left in riparian vegetation and removed from development of any kind.	1/11/2018 1:00 PM
34	Maintaining the privacy of the individuals who live on the river and keeping the river banks clean of trash( both from floods and recreational users).	1/11/2018 12:04 PM
35	Not of significance	1/11/2018 11:47 AM
36	no.	1/11/2018 11:40 AM
37	Public access	1/11/2018 11:29 AM
38	NA	1/11/2018 11:14 AM
39	Negative	1/11/2018 11:06 AM
40	Maintaining the Virgin River's "wild and scenic" and undammed character.	1/11/2018 10:49 AM
41	No	1/11/2018 10:28 AM
42	none	1/11/2018 10:27 AM
43	The sound rising up, heard between helicopters and traffic, the lifeblood of the valley, after the WCWCD is done with it, how profoundly it changes from Navajo Lake to Lake Mead.	1/11/2018 10:26 AM
44	Public access. Springdale is a gateway community and we should recognize that opportunity by making the river more accessible to everyone.	1/11/2018 10:23 AM
45	No.	1/11/2018 10:16 AM
46	no	1/11/2018 9:48 AM
47	no	1/11/2018 9:45 AM
48	Not that I can think of at the moment.	1/11/2018 9:40 AM
49	Keeping our community supplied with water in the desert.	1/11/2018 9:33 AM
50	The love seeing the blue heron hang out on the river.	1/11/2018 9:08 AM



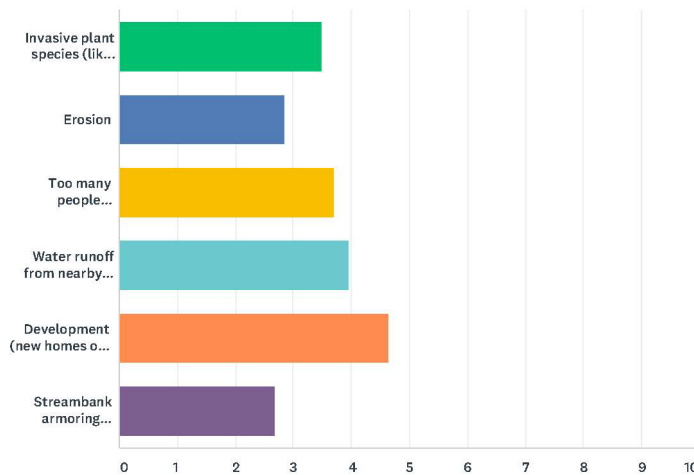
51	The encroachment of hotels to the rivers edge where visitors trash the area and build dams etc.	1/11/2018 9:05 AM
52	Economic? River continues to draw tourism	1/11/2018 8:17 AM
53	no	1/11/2018 8:17 AM
54	No	1/11/2018 8:04 AM
55	Breathing room. There are too many people packed into small areas in/around the river.	1/11/2018 6:17 AM
56	Maintenance of main stream of Virgin River and forks in a contained environment that prevents flooding or overflow from borders and protects sewer points and water used for drinking.	1/11/2018 5:32 AM
57	All of the above are equally important except for recreation	1/11/2018 5:09 AM
58	Overuse and excrement from narrows tourism because the park does not have sanitary facilities for the number of visitors that come.	1/11/2018 5:03 AM
59	Line of sight. No more visible development.	1/11/2018 4:59 AM
60	no	1/11/2018 12:57 AM
61	Flood protection and flood safety. Also, aquifer recharge.	1/11/2018 12:21 AM
62	Conservation and prevention of erosion from heavy tourist use.	1/11/2018 12:05 AM
63	the river and its natural state without rip rap, without structures right to its meandering banks, the river is the lifeblood of this community of people and animals. It is the source.	1/10/2018 10:39 PM
64	limit people	1/10/2018 10:21 PM
65	Natural resources for the canyon	1/10/2018 10:10 PM
66	I think habitat, water quality/quantity, and scenic/natural beauty are all linked and essentially the same issue. You have to address all of these simultaneously to be effective.	1/10/2018 10:02 PM
67	I feel they were well covered in question 1.	1/10/2018 9:51 PM
68	Preservation of the shoreline	1/10/2018 8:51 PM
69	parks	1/10/2018 8:39 PM
70	N/a	1/10/2018 8:19 PM
71	No	1/10/2018 8:18 PM
72	None I can think of	1/10/2018 8:16 PM
73	Natural Beauty & rare rock formations, the spectacular views, a feeling of awe, a very precious gift to protected for always	1/10/2018 8:07 PM
74	The creation of Zion Canyon	1/10/2018 7:55 PM
75	Flood plain and conveyance	1/10/2018 7:55 PM
76	Access. Parks along the river, boating put in/take outs, trails along the river	1/10/2018 7:39 PM
77	Transit. Need trails along the entire length in town.	1/10/2018 7:21 PM
78	No	1/10/2018 7:05 PM
79	Easy access and recreation area for visitors...	1/10/2018 6:25 PM
80	Being able to use the water for farming!	1/10/2018 6:19 PM
81	Natural interaction, solitude, quiet introspection	1/10/2018 6:17 PM
82	The Wild and Scenic River designation!	1/10/2018 5:56 PM
83	No	1/10/2018 5:55 PM
84	not that I can think of	1/10/2018 5:46 PM
85	The sound of running water	1/10/2018 5:32 PM
86	n/a	1/10/2018 5:23 PM
87	Not having the tourists think they can climb out of river, party on the banks, leave trash, use the yards and patio furniture of residents and open gates of private river homes that are fenced and just stroll out and up to Zion Blvd. We also have people who think they can camp in residential yards next to the river, we need signs that state NO RIVER ACCESS on our streets.	1/10/2018 5:19 PM



88	Quality of life for residents. Housing for employees.	1/10/2018 5:14 PM
89	Protection of the resource in the short and long term	1/10/2018 5:10 PM
90	This survey did not leave my choices showing. I rated opportunities for recreation as a 5, and the other 4 questions as a 1. I hope that is what you see.	1/10/2018 5:10 PM
91	No	1/10/2018 5:07 PM
92	The Virgin River provides "WATER" which is the life blood of our existence. We are already over using what is there with the over building of hotels and resorts in our valley.	1/10/2018 4:58 PM
93	No	1/10/2018 4:55 PM
94	Flooding control	1/10/2018 4:55 PM
95	No	1/10/2018 4:54 PM
96	no	1/10/2018 4:46 PM
97	No	1/10/2018 4:43 PM
98	Access to enjoy it.	1/10/2018 4:42 PM
99	that houses aren't built right on the river	1/10/2018 4:40 PM
100	Buffer zone adjacent to river provides natural screen between buildings (hotels, restaurants, residences) and river.	1/10/2018 4:38 PM
101	Free flowing. No concrete or rock dams.	1/10/2018 4:36 PM
102	Public River Access. Multiple locations for puting in and taking out.	1/10/2018 4:34 PM
103	Peace and Quiet for contemplation and wildlife refuge and viewing.	1/10/2018 4:32 PM
104	It should be free flowing without human built or placed structures within.	1/10/2018 4:30 PM
105	Yes, do not open for Development it wouldn't surprise me to see a permit for a hotel on top of the river with some ridiculous reason being that all could enjoy the glass bottom floor . Leave the river alone !	1/10/2018 4:30 PM
106	Access	1/10/2018 4:21 PM
107	open space, conectivity	1/10/2018 4:11 PM
108	It has a natural 100 year flood plain that needs protection.	1/10/2018 4:10 PM
109	No	1/10/2018 4:09 PM
110	N/A	1/10/2018 4:06 PM
111	Access	1/10/2018 4:02 PM
112	no	1/10/2018 4:02 PM
113	water conservation	1/10/2018 4:01 PM
114	Public access when possible	1/10/2018 3:37 PM
115	nope	1/10/2018 3:01 PM

Q2.1: What do you think are the greatest threats to a healthy river corridor? (rate the options below with 1=the biggest threat)

Answered: 195 Skipped: 3



	1	2	3	4	5	6	TOTAL	SCORE
Invasive plant species (like Russian olive, tamarisk, or weeds)	16.20% 29	11.73% 21	20.11% 36	22.35% 40	16.76% 30	12.85% 23	179	3.50
Erosion	5.68% 10	13.64% 24	13.64% 24	17.61% 31	24.43% 43	25.00% 44	176	2.84
Too many people recreating on or next to the river	20.44% 37	16.57% 30	19.89% 36	13.81% 25	15.47% 28	13.81% 25	181	3.71
Water runoff from nearby parking lots, streets, or buildings draining into the river	12.36% 22	29.78% 53	20.79% 37	20.79% 37	10.11% 18	6.18% 11	178	3.95
Development (new homes or businesses along the river corridor)	42.86% 81	21.69% 41	12.17% 23	9.52% 18	8.47% 16	5.29% 10	189	4.65
Streambank armoring (riprap)	7.07% 13	7.61% 14	16.30% 30	15.76% 29	21.20% 39	32.07% 59	184	2.67

Q2.2: Other threats?

Answered: 102 Skipped: 96

#	RESPONSES	DATE
1	Chemical runoff--like from farming and salting roads, etc.	2/10/2018 2:08 PM
2	No	1/31/2018 4:56 PM
3	upstream trash from humans - human waste	1/22/2018 5:54 PM
4	no	1/20/2018 10:46 PM
5	No	1/19/2018 10:32 PM
6	No	1/19/2018 8:42 AM
7	Too many people	1/19/2018 12:44 AM
8	Loss of water rights to other, less conscientious government agencies.	1/18/2018 9:51 AM
9	Lack of water due to diversions upstream.	1/17/2018 11:51 PM
10	Human caused pollution	1/17/2018 1:58 PM
11	I'm sure there are.	1/16/2018 2:31 PM
12	global warming, lack of rain	1/15/2018 10:56 AM
13	garbage	1/14/2018 9:16 PM
14	People altering the riverbank up and down canyon, removing all vegetation.	1/14/2018 7:51 AM

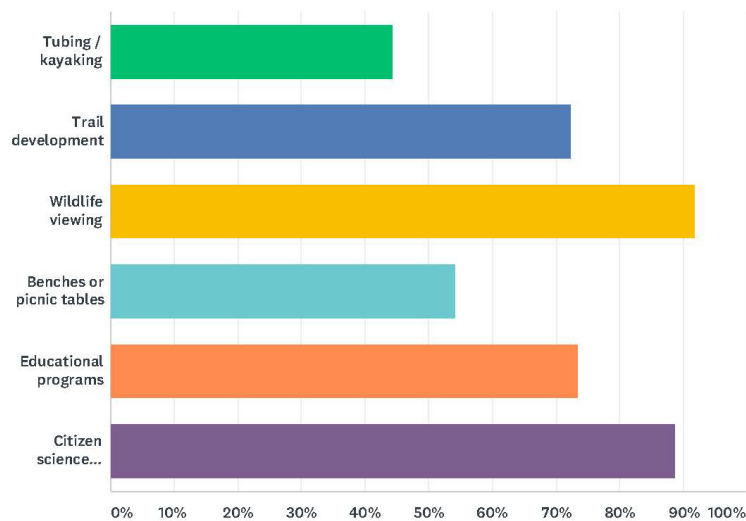
15	dams	1/13/2018 3:23 PM
16	Farming, cow pastures from higher elevations	1/13/2018 2:49 PM
17	n/a	1/13/2018 2:47 PM
18	I would like to see the Virgin be able to flow freely, taking the rip rap out and allowing it to flood as nature intended	1/13/2018 2:03 PM
19	Pollution/littering	1/12/2018 4:56 PM
20	No	1/12/2018 4:32 PM
21	Malicious ignorance. Witness Springdale Spring	1/12/2018 11:37 AM
22	Pollution from fertilizers that leach through fields/lawns and end up in the river.	1/12/2018 11:23 AM
23	water runoff from fertilized lawns	1/12/2018 10:39 AM
24	No	1/12/2018 5:50 AM
25	pollution from too many people in the river	1/11/2018 11:46 PM
26	overallocation	1/11/2018 9:29 PM
27	Human waste from upstream	1/11/2018 9:13 PM
28	Too much use of water to diminish flows downstream.	1/11/2018 8:37 PM
29	No.	1/11/2018 8:24 PM
30	Garbage and trash	1/11/2018 8:23 PM
31	Dams would be a major threat to a healthy river corridor.	1/11/2018 4:59 PM
32	preserving the corridor for wildlife to be able to travel freely.	1/11/2018 2:10 PM
33	bacteria in the water from human use in ZNP and also from beaver use.	1/11/2018 1:00 PM
34	Water diversions above Springdale and the Park.	1/11/2018 12:04 PM
35	NA	1/11/2018 11:14 AM
36	Erosion by my top 3 selections are large threats, also overflow of polluted water from town into the river	1/11/2018 11:06 AM
37	Too many hotels and tourists in the area, trash, human feces, it ruins the ability to enjoy the river as well as the health of it. Cattle upstream.	1/11/2018 10:28 AM
38	People throwing garbage and other waste into the river	1/11/2018 10:27 AM
39	Development is the hugest threat; too much, too many. It's a desert. If you want green, move there.	1/11/2018 10:26 AM
40	Lack of awareness from users, before limiting access we have an obligation to educate better stewardship.	1/11/2018 10:23 AM
41	No.	1/11/2018 10:16 AM
42	no	1/11/2018 9:48 AM
43	pollution	1/11/2018 9:45 AM
44	Animal life. Beavers for example.	1/11/2018 9:40 AM
45	Tuber who throw their garbage in the river.	1/11/2018 9:08 AM
46	unprepared park visitors in the Narrows that pee and poop in the river and on the rivers edge to be carried down stream into town.	1/11/2018 9:05 AM
47	Under too many people recreating the issue of human waste as well as litter must be taken into account Another threat is the grazing of farm animals above the river corridor	1/11/2018 8:29 AM
48	Permanent man-made re-routing of the river will affect the rivers natural course which over the years ebbs and flows - wide flood plains needed	1/11/2018 8:04 AM
49	Families swarming the Diversion Dam. Let's get rid of the sign and plant a few bushes or something along the Parus there.	1/11/2018 6:17 AM
50	Not having proper containment and rip raps.	1/11/2018 5:32 AM
51	It is difficult to rate these in order. They all play into the part of the larger big picture.	1/11/2018 5:09 AM
52	Pollution/ chemical & soil leeching from fertilizers.	1/11/2018 5:03 AM
53	Overmanaging 75% of Springdale's attraction.	1/11/2018 12:57 AM

54	Undercutting of landslides.	1/11/2018 12:21 AM
55	NA	1/11/2018 12:05 AM
56	Lack of awareness of all of the above listed threats, by citizens, by town, city, county officials. Lack of enforcement by same of any ordinances that are in place to protect and preserve this one unique scenic and once wild river.	1/10/2018 10:39 PM
57	pollution	1/10/2018 10:21 PM
58	Human waste from the Narrows.	1/10/2018 10:02 PM
59	none off the top of my head	1/10/2018 9:51 PM
60	hotels, and tourist's trash and poop	1/10/2018 8:39 PM
61	Waste from hikers upstream	1/10/2018 8:19 PM
62	No	1/10/2018 8:18 PM
63	Nothing I can think of	1/10/2018 8:16 PM
64	N/A	1/10/2018 7:55 PM
65	Landslides	1/10/2018 7:55 PM
66	Development	1/10/2018 7:39 PM
67	No trespassing signs.	1/10/2018 7:21 PM
68	To many people.	1/10/2018 7:05 PM
69	Not sure of any others...	1/10/2018 6:25 PM
70	Sewage being drained in to it.	1/10/2018 6:19 PM
71	Public access to the river being monopolized by rich people	1/10/2018 5:58 PM
72	Agriculture and overuse of the water.	1/10/2018 5:56 PM
73	Sewage	1/10/2018 5:55 PM
74	no	1/10/2018 5:46 PM
75	Cattle upstream allow access	1/10/2018 5:32 PM
76	Putting a walking path next to the river.	1/10/2018 5:32 PM
77	Rich people who think they can do anything just because they have money.	1/10/2018 5:21 PM
78	People tubing the river, leaving broken beer bottles, cans, trash all over embankments for the locals to clean. Also trying to explain to tourists that our yards are not part of their park experience.	1/10/2018 5:19 PM
79	Encroachment too much development too close	1/10/2018 5:10 PM
80	No	1/10/2018 5:07 PM
81	Hotels filling in our towns namesake!	1/10/2018 5:04 PM
82	Springdale's sewer flowing into the river.	1/10/2018 4:58 PM
83	No	1/10/2018 4:55 PM
84	?	1/10/2018 4:55 PM
85	No	1/10/2018 4:54 PM
86	no	1/10/2018 4:46 PM
87	Overuse of water supply particularly as it relates to the irrigation of thirsty, non native decorative landscaping i.e. grass	1/10/2018 4:43 PM
88	no	1/10/2018 4:42 PM
89	letting developments like the Springhill Suites destroy the natural habitat that once was recognized by the Audubon Society and the natural spring that gave our town its name	1/10/2018 4:40 PM
90	Human waste, including feces and trash.	1/10/2018 4:38 PM
91	Fertilizer runoff. Blockage of natural feeder washes or Springs.	1/10/2018 4:36 PM
92	Access restrictions due to private property	1/10/2018 4:34 PM
93	Toxic pollution from asphalt, fertilizers, soil and clay washed from developed areas.	1/10/2018 4:30 PM

94	Old Sewer Drain Fields	1/10/2018 4:21 PM
95	Too many hotels.	1/10/2018 4:21 PM
96	Army Corp of Engineers	1/10/2018 4:09 PM
97	N/A	1/10/2018 4:06 PM
98	Trash along river being swept in at higher waters	1/10/2018 4:02 PM
99	no	1/10/2018 4:02 PM
100	no	1/10/2018 4:01 PM
101	Human, dog and landscape waste	1/10/2018 3:37 PM
102	You're too late.	1/10/2018 3:01 PM

Q3: What type of uses should the river corridor support? (check all that apply)

Answered: 196 Skipped: 2



ANSWER CHOICES	RESPONSES	
Tubing / kayaking	44.39%	87
Trail development	72.45%	142
Wildlife viewing	91.84%	180
Benches or picnic tables	54.08%	106
Educational programs	73.47%	144
Citizen science opportunities (water quality monitoring, bird counts, etc)	88.78%	174
Total Respondents: 196		



Q4: Do you feel connected to the Virgin River in Springdale - if so, how? What is your connection? (short answer)

Answered: 160 Skipped: 38

#	RESPONSES	DATE
1	It is the lifeblood of all who inhabit the canyon	2/11/2018 6:36 AM
2	Very much so. My jobs exists because of tourism in the Narrows. I recreate in the river. My neighborhood gets water from the Virgin	2/10/2018 2:08 PM
3	I've worked in Zion Ntl Park for a year	1/31/2018 4:56 PM
4	River Park and trail system is really the only easy access.	1/29/2018 8:05 AM
5	Resident	1/23/2018 10:14 AM
6	Absolutely. I've lived along the river's edge. The river needs to be preserved in it's most natural state possible.	1/23/2018 9:05 AM
7	Yes, I walk quite often along the river near the dog park area.	1/23/2018 8:45 AM
8	I run along it several times a week, kayak in the Spring when over 400CFS and out folks to hike the Narrows	1/22/2018 5:54 PM
9	I lived there for 10 years and now visit several times a year.	1/22/2018 2:55 PM
10	We visit every year, multiple times, We were married along side the river.	1/21/2018 9:57 PM
11	It created the canyon which I live in.	1/21/2018 4:24 PM
12	daily walk to the river	1/20/2018 10:46 PM
13	I love going to the river and wish there was a walking path along it so we could enjoy it even more.	1/19/2018 10:32 PM
14	I do. I like to view it from the bridges and kayak it when the flow is high enough.	1/19/2018 8:42 AM
15	It's my church...	1/19/2018 12:44 AM
16	I used to feel more connected before development completed the destruction of the river inside Springdale.	1/18/2018 9:51 AM
17	No, I don't feel connected because the river is surrounded by houses and businesses in many areas, so it doesn't feel like a natural area.	1/17/2018 11:51 PM
18	YES I LIVE HERE WE ARE THE ONLY ONES WHO SEEM TO CARE	1/17/2018 1:58 PM
19	Yes from family memories	1/17/2018 7:24 AM
20	The river supports life - for humans, animals and plants. Without the river none of us would be living here.	1/16/2018 2:31 PM
21	Its a place I love to go and walk to end my day or sit by and read. Its a really beautiful area to play with the dog or relax by.	1/15/2018 5:39 PM
22	water is life	1/15/2018 10:56 AM
23	finding a quiet place to escape the heat after a hot day of guiding or climbing	1/14/2018 9:16 PM
24	Agricultural uses	1/14/2018 11:19 AM
25	Water is life. Protecting it needs to be priority.	1/14/2018 7:51 AM
26	The river is connected to the surroundings and directly reflects the environmental situation in the Park. Have recreated in, around, and above the river, it is a a wonderful giver of life.	1/13/2018 3:23 PM
27	Not a strong connection, but being able to walk the river and experience nature	1/13/2018 2:49 PM
28	it saves us during summer heat	1/13/2018 2:47 PM
29	A very special place that I frequent for serenity	1/13/2018 2:03 PM
30	Very much so. I feel a part of the canyon and the river it created. The peace I feel when I sit quietly nearby. The very life it give us through drinking water and irrigation.	1/13/2018 12:57 AM
31	Absolutely. This town and the park wouldn't be here if it wasn't for the Virgin River. It's the heart of where we live.	1/12/2018 4:32 PM
32	Yes, it is the community's life blood.	1/12/2018 11:37 AM
33	It would be difficult for me to live in such a hot, arid environment without the relief of the river.	1/12/2018 11:23 AM

34	I love sitting by and walking along the river for connecting with nature	1/12/2018 10:39 AM
35	Very much so. It is a tributary to the Colorado River, which was literally my front yard growing up as a child. I enjoy walking along the river, sitting along its banks and feeling close to nature. I do know access is limited in places, but I take advantage of the space inside and out of the park, behind the hotels, and along our own property. It feels like a sanctuary there.	1/12/2018 9:08 AM
36	Yes it carved the canyon which is why park and town exist	1/12/2018 5:50 AM
37	Sitting along the river beaches and tubing, (not commercial tubing). Visual monitoring the water flows.	1/11/2018 11:46 PM
38	place of peace	1/11/2018 11:27 PM
39	I love to go to the river for reflection time	1/11/2018 10:46 PM
40	in Rockville	1/11/2018 9:29 PM
41	I don't feel connected to the river because of the overwhelming commercial development alongside it	1/11/2018 9:13 PM
42	Yes, I use the Virgin river for recreation, swimming and relaxing. It's important to me to have access to this river for multi use.	1/11/2018 8:37 PM
43	We live in Virgin Town, work in Zion. My husband grew up in Springdale. We love the river!	1/11/2018 8:25 PM
44	Memories as a child. Hearing stories and seeing pictures from grandmother and grandfather.	1/11/2018 8:24 PM
45	We have always visited every year at least once.	1/11/2018 8:23 PM
46	connectivity of human and natural habitats between the park and Town	1/11/2018 7:06 PM
47	It has been a place of solace for me and my family for 40 plus years. We have recently moved to the area permanently and are committed to being involved in its preservation.	1/11/2018 6:58 PM
48	Best place for me and my dogs to cool off in the summer, listen to its calming sound and view wildlife	1/11/2018 6:01 PM
49	Over many years of living here I have boated and swam in the Virgin River, as well as hiked and recreated nearby the river. It is part of my life and soul.	1/11/2018 4:59 PM
50	I live in Springdale and recreate within Zion every week. The Virgin River is a key component of a healthy ecosystem in Zion, provides beautiful scenery, is in large part what makes Zion the place it is. My work also entails sending people up into the Narrows, which is bitter sweet in that you want people to experience beautiful places in hopes that they are more inclined to preserve them but not at the sake of loving it to death.	1/11/2018 3:21 PM
51	I live near the river. Keeping it clean and healthy is the most important connection. Its sad to see so much trash floating downstream and along the banks	1/11/2018 2:10 PM
52	We take our dogs for walks at the Springdale Park	1/11/2018 1:14 PM
53	yes, solace my drinking water, riparian ecosystem	1/11/2018 1:00 PM
54	Water for my home.	1/11/2018 12:04 PM
55	Working in outdoor recreation makes a direct connection	1/11/2018 11:47 AM
56	Yes! It is the life blood of this canyon, the reason why this national park exists. The river offers "shelter" from the harsh desert environment in the unrelenting summer.	1/11/2018 11:40 AM
57	Yes, especially through kayaking during spring runoff.	1/11/2018 11:14 AM
58	I do, it's the source of life to this town. Without the river there would be no park, which would mean no town. More realistically, if we didn't have a river flowing through town it would be very hard to support our tourism industry without piping it in	1/11/2018 11:06 AM
59	Yes.	1/11/2018 10:56 AM
60	I grew up on that stretch of river. It is a source of comfort and pleasure.	1/11/2018 10:49 AM
61	The river created this canyon, and is the most important factor effecting quality of life in Springdale.	1/11/2018 10:45 AM
62	Yes. I've always loved the refuge of the river in the desert. I use to swim in it regularly but have lost many of my swimming holes because more and more hotels are being built right on the river and it is being polluted by too many tourists.	1/11/2018 10:28 AM
63	Yes. I kayak through Zion N.P. and Springdale whenever I can. It creates a lovely illusion as everything else disappears and it's just you, the river and the canyon.	1/11/2018 10:26 AM
64	Yes, this is an important part of the town and communities landscape. We should do our best to keep this river public, everyone should have access whether or not they can afford a river front property. Besides the spring that gave Springdale its name were unfairly drained, all we have left is the river.	1/11/2018 10:23 AM

65	My Sister and Brother in Law own a house in this beautiful place and I love to visit there when I can	1/11/2018 10:20 AM
66	It is a beautiful, peaceful place to find refuge from the heat and from the craziness of Springdale crowds. Plus, it is an essential link to the park, and an essential reminder of our connected ecosystems.	1/11/2018 10:16 AM
67	I look at it every day. It is the author of the canyon.	1/11/2018 9:49 AM
68	I enjoyed hiking it with my family and friends. The awe inspiring and beauty is mind blowing	1/11/2018 9:48 AM
69	Yes - Taking kids and dogs to play in it on warm days.	1/11/2018 9:45 AM
70	Yes. It is a place where this area thrives. It brings life not only to the natural world, but gives me a way to rejuvenate.	1/11/2018 9:40 AM
71	Not so much in Springdale, but further down where there is more public access.	1/11/2018 9:33 AM
72	I love viewing the natural beauty of the Virgin River, including the wildlife that may be there. And I love taking photos of it.	1/11/2018 9:13 AM
73	Yes I do feel a deep connection. The river runs right by our house . It is the lifeblood of this town.	1/11/2018 9:08 AM
74	Yes. I walk by the river at least once and mostly twice a day. I notice when it's higher, has more silt, colors, sounds, birds..it's a very important part of life in the desert as a break from the heat. The artery that flows through a breaking heart town of Springdale.	1/11/2018 9:05 AM
75	My kids and I enjoy playing in the river	1/11/2018 9:02 AM
76	Yes.....birding and enjoying the quiet of nature that the river offers	1/11/2018 8:29 AM
77	Because of the congestion in Springdale we don't go there often, and we don't personally use the river there much. We relate the the river on a daily basis in Virgin, where we live, and river health upstream is always a concern -- to us personally, but also in the vital importance of a healthy watershed, period.	1/11/2018 8:24 AM
78	Yes. Source of life for all species, unique to this system and strong component of Zion national park experience.	1/11/2018 8:17 AM
79	This river represents life itself. It is not being shown proper respect or protection.	1/11/2018 8:17 AM
80	I live and have property next to flood plain down river, in Virgin. Whatever affects the Virgin river in Springdale ultimately affects us. The river has moved approx 150 ft back and forth in the 10 years we have lived here.	1/11/2018 8:04 AM
81	Well, it created Zion Canyon. And it's a beast when it rains. And it's gorgeous. And it's the reason life flourishes in the area. Yeah, I guess I'm pretty attached to it. :)	1/11/2018 6:17 AM
82	No. Existing Businesses, private property and other obstacles such as fences, create a lack of access and trails along the river currently thwart or prevent use and enjoyment of the river.	1/11/2018 5:32 AM
83	It is part of the beautiful natural landscape of the canyon providing "life".	1/11/2018 5:09 AM
84	It sustains my life....if there is no water there is no me. How many toilet flushes times 4.6 million tourists a year does the river support. How many chemicals are poured into the sewage water to make it drinkable?	1/11/2018 5:03 AM
85	Family history. Personal memories.	1/11/2018 4:59 AM
86	I spend nearly every summer day in the river. I am in relationship with the river and the life it supports, including me.	1/11/2018 1:01 AM
87	Very connected. It borders the backyard of our house.	1/11/2018 12:21 AM
88	It is a wonderful asset to the Town and adds so much beauty while offering a respite from the heat and a serene wonderland in winter, but if it is not protected, the overuse and erosion of the banks will put it at risk for both water and recreation.	1/11/2018 12:05 AM
89	Of Course! can you flush your toilet with out thinking of that connection. When it rains do you not go to the river to see what level, what color it is?	1/10/2018 10:39 PM
90	The river is relatively separate from my typical experience while in Springdale, with only a few exceptions, like crossing the park bridge, or seeking it out at other parks or bridges.	1/10/2018 10:27 PM
91	Yes. Absorbing nature	1/10/2018 10:26 PM
92	NATURE'S LOVE	1/10/2018 10:21 PM
93	Yes, I am a white water Kayaker and one that works towards keeping the headwaters clean and free flowing.	1/10/2018 10:16 PM
94	Virgin River & Water is the most important resource of Springdale life.	1/10/2018 10:10 PM



95	I feel very connected to the river. I live directly next to the river. I recreate in the river, I watch birds and other wildlife interact with the river from my house. I also pick up trash along my little stretch of the river. I feel like the river is part of what makes this area special. If we didn't have the river, we wouldn't have Mukuntuweap, and we wouldn't have Springdale.	1/10/2018 10:02 PM
96	Extremely connected. I grew up swimming and boating in the river and do so today with my family. There is property in my family along the river and that place has a special place in my heart for many reasons.	1/10/2018 9:51 PM
97	Lifeblood....	1/10/2018 9:50 PM
98	Yes. Water is life!	1/10/2018 8:53 PM
99	It's our water source! I don't want fecal contaminated drinking water	1/10/2018 8:51 PM
100	Yes. The river is the reason why we can all live here. I love walking along the river. Taking a dip when it's hot. Bringing dogs to the river. And hanging out by the river. Water is life.	1/10/2018 8:39 PM
101	First actual river I ever got to sit by. :)	1/10/2018 8:28 PM
102	Yes. I'm from Virgin and have spent most summers enjoying the river (not necessarily in Springdale though).	1/10/2018 8:19 PM
103	The sound of the river flowing is calming.	1/10/2018 8:18 PM
104	I just love the area. Zion is my favorite spot on the planet!!! We are loving it to death! But Zion and the town of Springdale are very special, for their unimaginable beauty! ♥	1/10/2018 8:16 PM
105	We are all connected	1/10/2018 8:07 PM
106	The river is my church	1/10/2018 8:03 PM
107	Views and sounds	1/10/2018 7:55 PM
108	The river forms the canyon.	1/10/2018 7:55 PM
109	Kayaking	1/10/2018 7:39 PM
110	Yes, the river is the creator of the canyon and I am reminded of this every time I look around.	1/10/2018 7:32 PM
111	Love the park/dog park. I feel frustrated by the lack of access.	1/10/2018 7:21 PM
112	yes - spiritual & wildlife viewing	1/10/2018 6:37 PM
113	I live within 100 yards of it	1/10/2018 6:36 PM
114	Absolutely. Being able to hear the river from my yard is one of my great joys here in the canyon.	1/10/2018 6:25 PM
115	No I feel that the fecal contamination coming from the "park" is disgusting	1/10/2018 6:17 PM
116	Wildlife	1/10/2018 6:14 PM
117	I like walking by it in the evenings (by illegally walking in the Canyon Springs neighborhood)	1/10/2018 5:58 PM
118	I have swam in the river at the park.	1/10/2018 5:56 PM
119	The river is my best friend. Quality alone time with the river.	1/10/2018 5:46 PM
120	Yes. The Virgin River provides a relaxing beautiful environment. It is also a very important water source to animals and people and our community. It has been around for years and we need to protect this important resource.	1/10/2018 5:40 PM
121	Yes, calming to hear and walk by water	1/10/2018 5:32 PM
122	It is beautiful to see her flowly thru town.	1/10/2018 5:32 PM
123	Yes. I literally grew up along the Virgin River, my family has property in Rockville. The river has always been an incredibly special place to my heart, and it breaks every time i visit the Canyon and see the chamfers made, especially by rich people who come and build monstrosities along the river and then complain when their homes get flooded. Then in selfishness, put in stream bank armoring for their home protection. It's not right.	1/10/2018 5:21 PM
124	Live 6 houses away from river, don't want to visit the river always have swarms of tourists, screaming, drinking and making it impossible to enjoy the river.	1/10/2018 5:19 PM
125	yes. i go swimming... if it's not gross	1/10/2018 5:16 PM
126	Yes, I live downstream and depend on its water. I enjoy waking along the virgin river and I think having a diversity of wildlife and vegetation is very important in increasing the resiliency of the river as it faces increased pressure from visitor use and development.	1/10/2018 5:16 PM
127	I live here. The river supplies our water.	1/10/2018 5:14 PM

128	Yes understanding that the river is what created the canyon	1/10/2018 5:10 PM
129	Live on the river	1/10/2018 5:10 PM
130	No comment	1/10/2018 5:07 PM
131	Yes! That river is the lifeblood of this community. we need to protect our water and the wildlife that needs it to survive	1/10/2018 5:04 PM
132	I grew up along the river in Springdale. We played, swam, fished and enjoyed the wildlife.	1/10/2018 4:58 PM
133	The park with trails and access is nice connection. Seeing the birds and wildlife that is attracted and lives near river is refreshing to see.	1/10/2018 4:55 PM
134	Irrigation water. Natural beauty.	1/10/2018 4:55 PM
135	Grew up playing in this river	1/10/2018 4:54 PM
136	I stand by the river every day just to enjoy the sounds, the wildlife and the sight of running water.	1/10/2018 4:49 PM
137	Yes, It is a beautiful place to be.	1/10/2018 4:46 PM
138	Yes. As a life source. Also, in a truly historical sense the river is the force by which Zion was created- which in turn has birthed the community in which we now live.	1/10/2018 4:43 PM
139	I have lived in Springdale since 1974.	1/10/2018 4:42 PM
140	Yes, its wild beauty and history	1/10/2018 4:40 PM
141	Not really, due to the very limited accessibility. The only connection I have are brief glances from the roadway as I drive into town.	1/10/2018 4:38 PM
142	Walking place, occasional wading, tubing and cooling off place. Dramatic visual, auditory and olfactory effects of our dramatic canyon floods.	1/10/2018 4:36 PM
143	I have kayaked/rafted/tubed the river for over 20 years.	1/10/2018 4:34 PM
144	I own the bottom of much of the stream bed and many feet of the river bank on both sides.	1/10/2018 4:32 PM
145	The river used to be ours to use a cherish. In the past few years it has become overrun by tourist at times. It was a place you could take your dog and swim, listen to the water, and observe the wildlife. Even tubing in solitude.	1/10/2018 4:30 PM
146	Home owner	1/10/2018 4:30 PM
147	We were here for the 100 year flood, so monitoring and safeguarding it!	1/10/2018 4:21 PM
148	One of the things that drew me to Springdale was the river. However, there seem to be fewer and fewer places in town available to access the river.	1/10/2018 4:21 PM
149	I live next to the river	1/10/2018 4:13 PM
150	habitat and connection to broader community	1/10/2018 4:11 PM
151	Yes, we have a house that is next to the river.	1/10/2018 4:10 PM
152	Been enjoying the River for 60+ years.	1/10/2018 4:09 PM
153	Love the contrast it adds to the red rock	1/10/2018 4:08 PM
154	Love to walk in River and sit riverside and listen to nature. Serene beauty.	1/10/2018 4:06 PM
155	I love it	1/10/2018 4:06 PM
156	My connection is emotional. The river feels healing and life-giving to me. It is the place I go when I have a lot of stress. That's why seeing it not taken care of makes me frustrated...especially when the damage is easy to prevent with a little care and less focus on money.	1/10/2018 4:02 PM
157	i like the easy access to enjoy swimming or hiking along. i also like being able to take my dogs to play.	1/10/2018 4:02 PM
158	I am a native of Washington County and have spent close to 50 years visiting the area on a monthly basis. It is part of my home base.	1/10/2018 4:01 PM
159	Long time Springdale resident.	1/10/2018 3:51 PM
160	Yes! The river is the best place for hiking, swimming and relaxing.	1/10/2018 3:37 PM



## Q4: Any other comments about the Virgin River in Springdale? (short answer)

Answered: 104 Skipped:94

#	RESPONSES	DATE
1	While there are tough decisions to make about river use, finding a way to manage, rather than eliminate, human recreational use is a priority in my mind	2/10/2018 2:08 PM
2	No	1/31/2018 4:56 PM
3	Visitors to clean up after themselves. Trash	1/23/2018 10:14 AM
4	Human pollution is our greatest threat. Other than invasive species, left alone, the river and wildlife will manage its self.	1/23/2018 9:05 AM
5	A complete pathway along the river needs to be developed.	1/23/2018 8:45 AM
6	Buildings should be further away and not to be allowed in the flood plain, not to protect as many humans, but to keep human developments and pollutants from entering the water corridor.	1/22/2018 5:54 PM
7	Please keep the watershed safe and preserve it as close to wilderness as possible.	1/21/2018 9:57 PM
8	no	1/20/2018 10:46 PM
9	No	1/19/2018 10:32 PM
10	Protect it!!!	1/19/2018 12:44 AM
11	Like the button below: "I'm done."	1/18/2018 9:51 AM
12	Keep it natura	1/17/2018 7:24 AM
13	The river needs our protection.	1/16/2018 2:31 PM
14	keep it clean	1/14/2018 9:16 PM
15	Too many people impacting the entire area	1/14/2018 11:19 AM
16	Thank you for doing everything you can to make this river healthy.	1/14/2018 7:51 AM
17	n/a	1/13/2018 3:23 PM
18	No	1/13/2018 2:49 PM
19	it's very valuable	1/13/2018 2:47 PM
20	There shouldn't be any more planned formal access to the river bank. Tubing should be prohibited.	1/13/2018 12:57 AM
21	No.	1/12/2018 4:32 PM
22	More care for the river, less care for its recreational possibilities is called for NOW!	1/12/2018 11:37 AM
23	Set backs should be developed to prevent development immediate adjacent to the river corridor.	1/12/2018 11:23 AM
24	I think it's preservation is as important as many aspects of the National Park. In addition, it is part of our watershed and a provider of liquid gold not only to humans but to wildlife.	1/12/2018 9:08 AM
25	No	1/12/2018 5:50 AM
26	There are several large cottonwoods that have fallen into the river. I would like to see these removed for safety and aesthetics.	1/11/2018 11:46 PM
27	Please don't turn it over to development. Keep it as God intended.	1/11/2018 11:27 PM
28	Its an evolving thing	1/11/2018 10:46 PM
29	Protect it from degradation	1/11/2018 9:29 PM
30	No.	1/11/2018 8:24 PM
31	It is beautiful	1/11/2018 8:23 PM
32	protection of the riparian habitat along the river corridor is essential to maintaining water quality, wildlife habitat, recreational values	1/11/2018 7:06 PM
33	I love and appreciate the Virgin River and all that it does for our community (as well as other communities). I will always respect it and each time I enjoy it I leave it cleaner than when I arrived. Which everyone should do.	1/11/2018 4:59 PM

34	With Zion's popularity skyrocketing, it is hard to watch the park get trampled. A huge part of conservation and protecting the Virgin River is educating those who choose to recreate in it or next to it. I realize education only goes so far when you have hundreds upon hundreds of people heading up the river in a single day, a balance is certainly needed. I do place importance on protecting ecosystems and environmental health but I do think people should be able to experience it in a responsible manner too - it's just finding the right balance I think that is the challenge.	1/11/2018 3:21 PM
35	Since we have to treat and drink the water, we should not let all the people walk up the river in the Narrows where there are no bathrooms. Everyone who walks up the river should have to have a permit and it should be a limited amount. We also need to stop runoff from parking lots to get to the river	1/11/2018 2:10 PM
36	The river and its river banks and adjacent area are not seen as an ecosystem. development near the river is increasing in an alarming rate. Heron nests, water quality fish and bird habitat are all being ignored by town of Springdale Planning commission and Town Council.	1/11/2018 1:00 PM
37	Please take away the tubing. People are too destructive, too much biological waste and other garbage.	1/11/2018 12:29 PM
38	I think it is underutilized by both residents and visitors.	1/11/2018 12:04 PM
39	Managing for a riparian corridor is logical and ethical along a nationally designated wild and scenic river. However population density and current usage will present substantial problems to work around. Good luck!	1/11/2018 11:47 AM
40	Access is a challenge as private land is developed and closed to the public.	1/11/2018 11:14 AM
41	Tubing companies using the virgin river should be held to a higher level of education, stewardship and responsibility when it comes to customer relations	1/11/2018 11:06 AM
42	One of the main reasons for the creation of the River Park was to provide public access to the river for town citizens. As it is now, locals can't even use the park because it is full of visitor cars and visitors use all of the available picnic sites and beaches almost constantly.	1/11/2018 10:49 AM
43	We need to do a much better job of protecting it.	1/11/2018 10:45 AM
44	Tourists are destroying it by the sheer number of them. Utah needs to stop advertising the area and put a limit on the number of hotels building built. The town is becoming a place the locals no longer want to live. The river and town is being destroyed.	1/11/2018 10:28 AM
45	Needs to be protected from idiot developers who ruined the mini-ecosystem by the Switchback, and idiot private citizens trying to re-direct the course of the river.	1/11/2018 10:26 AM
46	The river is an important part of Springdale, both for recreating and connecting with the landscape. Resources like this should be preserved for the enjoyment of all (including visitors) and not dolled out to only those who can afford it...	1/11/2018 10:23 AM
47	I would one day love to live in your great town.	1/11/2018 10:20 AM
48	Let's not over-manage it.	1/11/2018 9:49 AM
49	Let's keep it clean, people.	1/11/2018 9:33 AM
50	If this river was not here, this town would not be here. It is so important and I feel it is being neglected. Building every more hotels that encroach on this evolving river and life blood life of this area.	1/11/2018 9:05 AM
51	Stop tubing....	1/11/2018 8:29 AM
52	She's important.	1/11/2018 8:17 AM
53	The river is NOT a playground for the hordes of visitors who have no respect for this river at all-nor for those who wish to glean \$ from it.	1/11/2018 8:17 AM
54	Not allow building in the flood plain or very close to the river would help.	1/11/2018 8:04 AM
55	Every now and then I think about how much e. coli is in the river. Then I don't, because it's gross and I want to go swimming.	1/11/2018 6:17 AM
56	Foot bridges crossing the river in several places, particularly at the top and bottom of a Town would help foster access and integrate the river into visitors and locals experience of the Canyon.	1/11/2018 5:32 AM
57	Keep it clean	1/11/2018 5:09 AM
58	Water quality and wildlife habitat are the most important issues in the West. It is sad....	1/11/2018 5:03 AM
59	Much of Zion exists because of the river; its canyons formed by its movements, moving sediment and performing important geologic functions. It supports wildlife and plant species that form a larger ecosystem beyond its banks. It should be protected and preserved.	1/11/2018 1:01 AM

60	The river is a huge part of the attraction of Springdale. Use it.	1/11/2018 12:57 AM
61	Keep it healthy and free of development!	1/11/2018 12:21 AM
62	Let's protect it while making it enjoyable.	1/11/2018 12:05 AM
63	Preserve and protect and reduce development with in spitting distance to its flow. But hey the horse is out of the barn so do your best.	1/10/2018 10:39 PM
64	Get the trail along side so people can enjoy it.	1/10/2018 10:26 PM
65	It should be cared for by the community members. If you commercially use it there should be mediatory up keep. This includes the Narrows.	1/10/2018 10:16 PM
66	Hotels consume most of river water so limit the hotel rooms.	1/10/2018 10:10 PM
67	The tubing industry and the recreational use up river is causing too much litter in the river.	1/10/2018 9:51 PM
68	To much human fecal matter and garbage.	1/10/2018 8:53 PM
69	Too many people recreating in it is ruining it! Please no tubing!!!!	1/10/2018 8:51 PM
70	It needs our protection from development, over use. It well marked trails and areas for access and areas where access is more restricted if they are wildlife corridors etc.	1/10/2018 8:39 PM
71	N/a	1/10/2018 8:19 PM
72	It would be great if the Holiday Inn Express would be remove the dead tree in the Virgin River for safety issues. The tree fell off the side of the Holiday Inn Express property into the Virgin River 08/03/2017 during the heavy flash flooding.	1/10/2018 8:18 PM
73	No	1/10/2018 8:16 PM
74	Protect	1/10/2018 8:07 PM
75	Worry that too many transient housing using too water	1/10/2018 7:55 PM
76	Prevent development from being too close to the river.	1/10/2018 7:55 PM
77	The river supports all the wildlife in the area!	1/10/2018 6:25 PM
78	A walking path by the river and away from the road would be really nice	1/10/2018 5:58 PM
79	no	1/10/2018 5:46 PM
80	Limit the amount of people who go into the Narrows. Otherwise this area will get ruined. Make sure the beauty of the Virgin River is still around for people to see, but also maintain the water quality for wildlife and our community.	1/10/2018 5:40 PM
81	Leave it untouched by humans.	1/10/2018 5:32 PM
82	Please protect.	1/10/2018 5:32 PM
83	Keep the tubers out, please!	1/10/2018 5:19 PM
84	yes, people are a huge impact... but so is everything else (see my answers to #3)	1/10/2018 5:16 PM
85	More public access would help connect the locals and possibly inspire more protection of the river	1/10/2018 5:10 PM
86	No	1/10/2018 5:07 PM
87	Please look beyond yourself and making money, help protect our river!	1/10/2018 5:04 PM
88	It's considered a "wild and scenic river" because it is. That's what I love about it.	1/10/2018 4:58 PM
89	It would be nice to limit the tubing use of it as that is disruptive to wildlife and also people who appreciate nature in a more quiet manner. The tubing does nothing positive for the river.	1/10/2018 4:55 PM
90	Nope	1/10/2018 4:55 PM
91	No	1/10/2018 4:54 PM
92	The river needs to be protected from pollution and over consumption, but this can be balanced with recreational opportunities. I think that certain areas within the town would benefit greatly from a riverside pedestrian and bike path as a transportation corridor, as well as an enjoyable, scenic, (hopefully even ADA approved) walking trail.	1/10/2018 4:43 PM
93	no	1/10/2018 4:42 PM
94	Trash cleanup along the banks of the river in town would be a great service project/volunteer day.	1/10/2018 4:38 PM
95	Should be number one priority in protecting our area from overuse or commercial exploitation. The lifeline of our canyon.	1/10/2018 4:36 PM



96	No restrictions on river tubing even when it is next to impossible to float without having to get off & drag the tube for a long way through the stream bed which is trespassing on private property.	1/10/2018 4:32 PM
97	Private homeowners should not be allowed to block access to what was once all of ours. No structure should be built in or along the river.	1/10/2018 4:30 PM
98	Development and developers are ruining what was ( * WAS ) a quaint beautiful little city that has now become an overrun mess . Thank you !	1/10/2018 4:30 PM
99	It serves a lot people, safeguard that asset.	1/10/2018 4:21 PM
100	If we are to preserve Springdale and the river the growth associated with large hotels needs to stop.	1/10/2018 4:21 PM
101	I'm concerned about the growth of Springdale and the likelihood of water shortages from climatic events.	1/10/2018 4:10 PM
102	Lets protect it and enhance the experience with it.	1/10/2018 4:06 PM
103	It is literally the only reason we can live here and sustain ourselves and visitors...especially during high-temp months. Seems in our best interest to be forward-thinking in the preservation of the river's health and aesthetic if we want that to stay true.	1/10/2018 4:02 PM
104	Better public access and uniform trail along the river would REALLY make springdale shine! Especially as the main sidewalks in town are so busy.	1/10/2018 3:37 PM

