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RIO VISTA NATURAL RESOURCE PARK

MASTER PLAN REPORT

Prepared For:

CITY OF TUCSON
PARKS & RECREATION

Prepared By:

SMITHGROUP

September 2022

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RIO VISTA NATURAL RESOURCE PARK

PROJECT BACKGROUND

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ACKNOWLEDGMENTS

CITY OF TUCSON

MAYOR & COUNCIL AND CITY MANAGER

Regina Romero	Mayor
Lane Santa Cruz	Ward One
Paul Cunningham	Ward Two
Kevin Dahl	Ward Three
Nikki Lee	Ward Four
Richard Fimbres	Ward Five
Steve Kozachik	Ward Six
Michael Ortega	City Manager

TUCSON PARKS AND RECREATION DEPARTMENT

Lara Hamwey	Director
Mike Hayes	Deputy Director
Greg Jackson	Deputy Director
Tom Fisher	Project Manager

A SPECIAL THANKS TO:

Rillito Bend Neighborhood Association

Friends of Rio Vista

All other park advocates

PARK HISTORY

In the early 1900s, the current site of the park was largely untouched by Tucson's rapidly expanding urban development with the exception of a few rural homesteads as well as a nearby horse farm established in the 1950s. The land was a place of solitude and inspiration for nearby residents with its expansive views of the Santa Catalina Mountains to the north and access to the once-lush Rillito River. This natural desert area full of wildlife remained intact for many years, but over time was disturbed by too many random trails and other destructive human activities.

In 1987, the City of Tucson purchased this land within the Rillito Bend Neighborhood with the intent of creating an urban park with modern amenities to serve a growing Tucson population. However, after years of fierce community debate over the park's purpose, it eventually became Rio Vista Natural Resource Park as a compromise with area residents and desert advocates. Dedicated in 2010, it became the first natural resource park in Tucson. Rio Vista's advocates are passionate about preserving the park's rural qualities, natural systems, and wildlife which has resulted in several planning efforts to ensure it remains a natural resource for the long-term.

Today, Rio Vista Natural Resource Park is a 40-acre municipal park located at the north end of Tucson Boulevard where there is access by all modes, including horses. While the west side of the park has been developed with a parking lot, large grass area, restroom, and playground, about 85% of the park land remains natural open space. The park is a popular destination for pedestrians, equestrians, and bicyclists who want to experience that special rural setting just blocks away from busy Tucson streets. Recreational and passive activities at the park include: a children's playground, dog-walking, horseback riding, bicycling, picnicking, birdwatching, and walking and running with connections to the regional bikeway Loop along the Rillito River.

For a more detailed understanding of the park's history, refer to community plans and reports in the appendices.

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MASTER PLAN PURPOSE

Rio Vista Natural Resource Park is one of Tucson's unique desert treasures that is valued by many residents and advocates in the surrounding area. Over the last few decades, there has been extensive dialog, debate, and planning to ensure that the park remains largely preserved and protected as a natural resource for all to enjoy. This latest planning effort is a culmination of activities focused on the park's preservation and protection going into an uncertain future of environmental change.

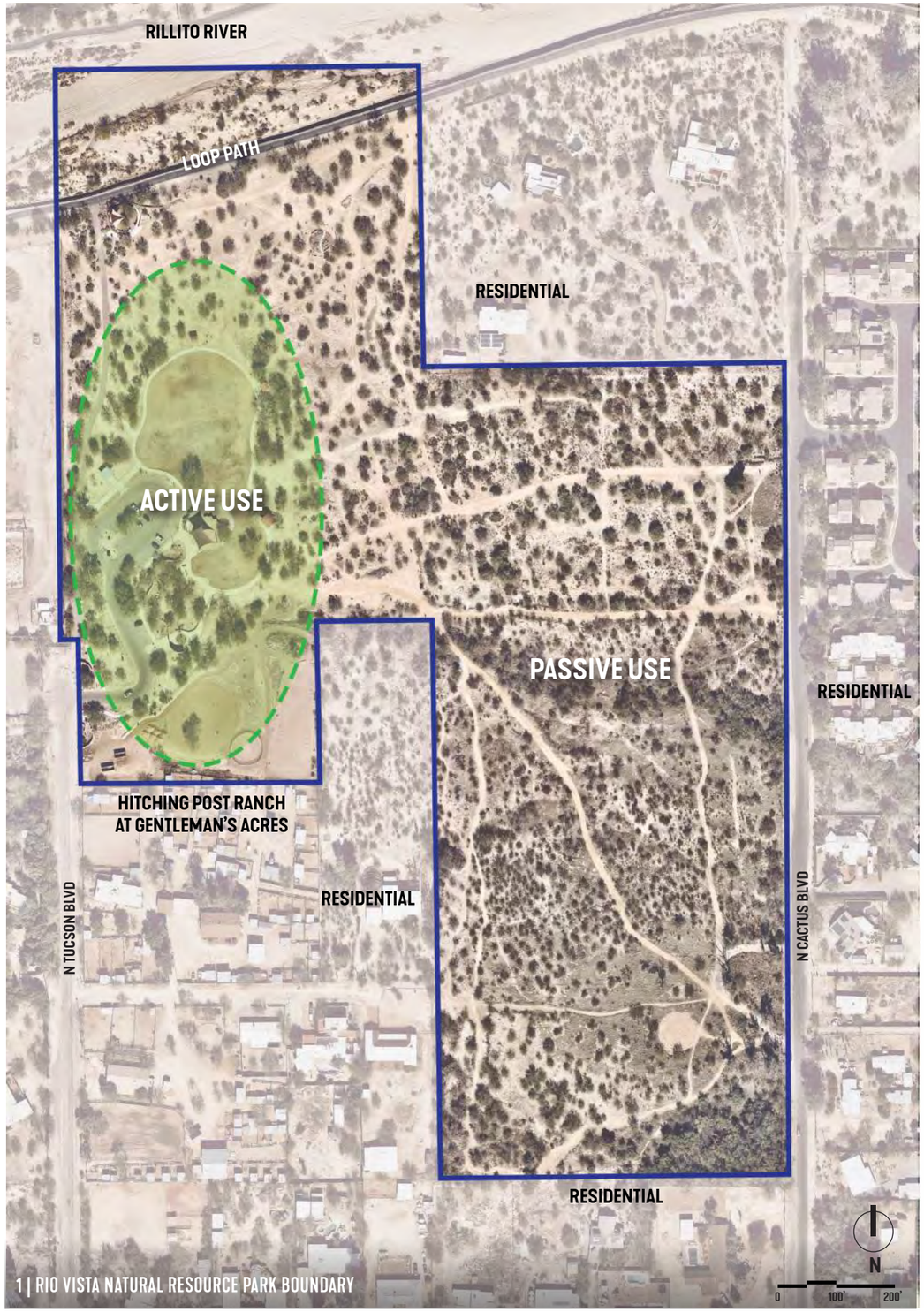
The main purpose of this master plan is to:

- document the park's history, its natural character, and community vision and values
- identify the park's current uses and amenities, as well the overall condition of the park
- establish a public consensus of goals and strategies for the park's future as a natural resource park with an existing developed component
- establish Improvement Priorities for the park to be implemented with available public and private resources

NATURAL RESOURCE PARK

DEFINITION

- Park land comprised of native desert open space that supports delicate ecological systems containing wildlife habitat, water resources, and endangered species.
- The role of the Tucson Parks and Recreation Department is to maintain, preserve, and restore when needed, the natural integrity of a resource park.
- As a guideline, no more than 15% of a designated natural resource park should include developed amenities such as those found at an urban park setting. Rio Vista Natural Resource Park has approximately 12% developed amenity space and 88% natural desert open space.



1 | RIO VISTA NATURAL RESOURCE PARK BOUNDARY

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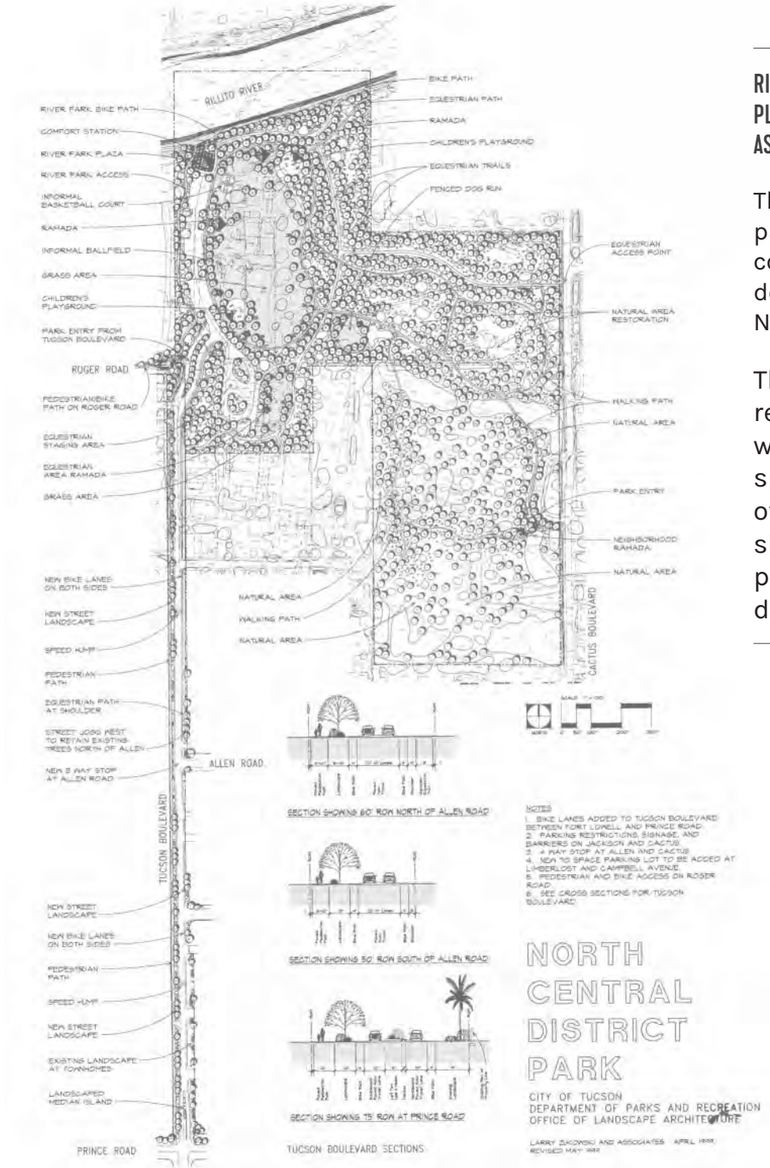
PREVIOUS MASTER PLAN

LARRY ZUKOWSKI AND ASSOCIATES, 1999



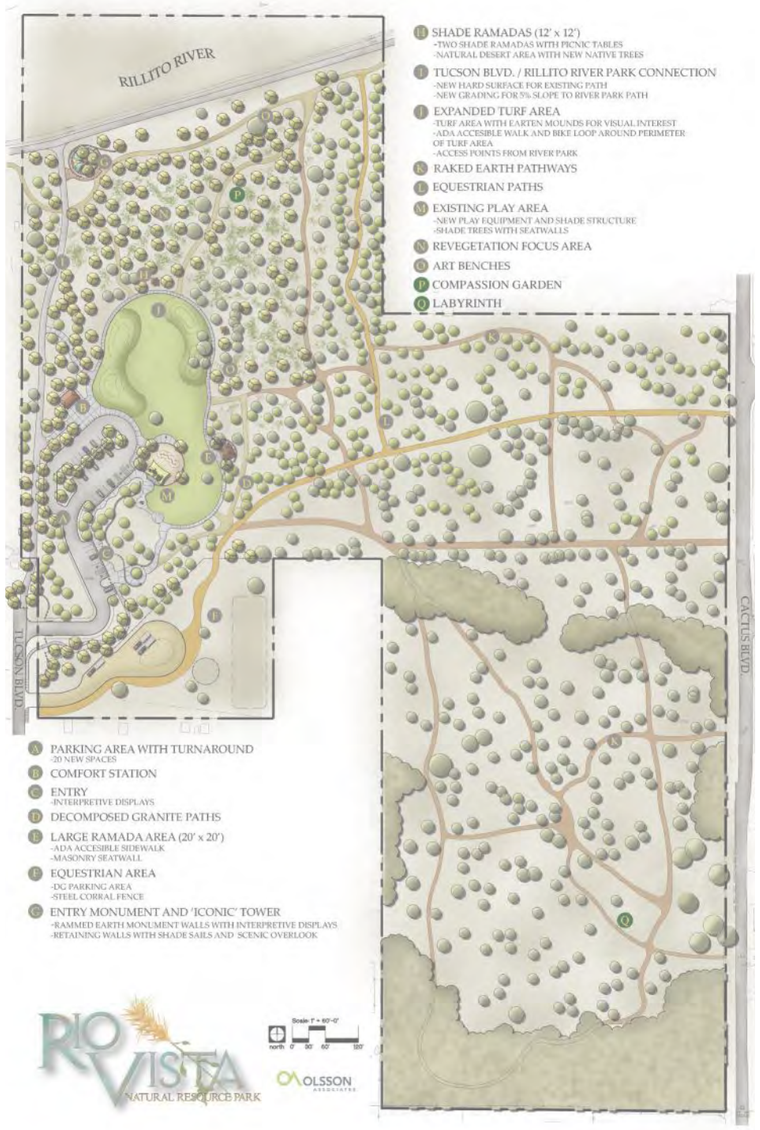
RIO VISTA NORTH CENTRAL MASTER PLAN CONCEPT, LARRY ZUKOWSKI AND ASSOCIATES - APRIL 1999

This master plan is a one-page annotated site plan concept. The concept was not developed as part of Rio Vista Natural Resource Park.

The overall concept was not received well by the public who felt the natural open space and preservation of native desert character should be the highest priority with regard to development.

PREVIOUS MASTER PLAN

OLSSON ASSOCIATES, 2004



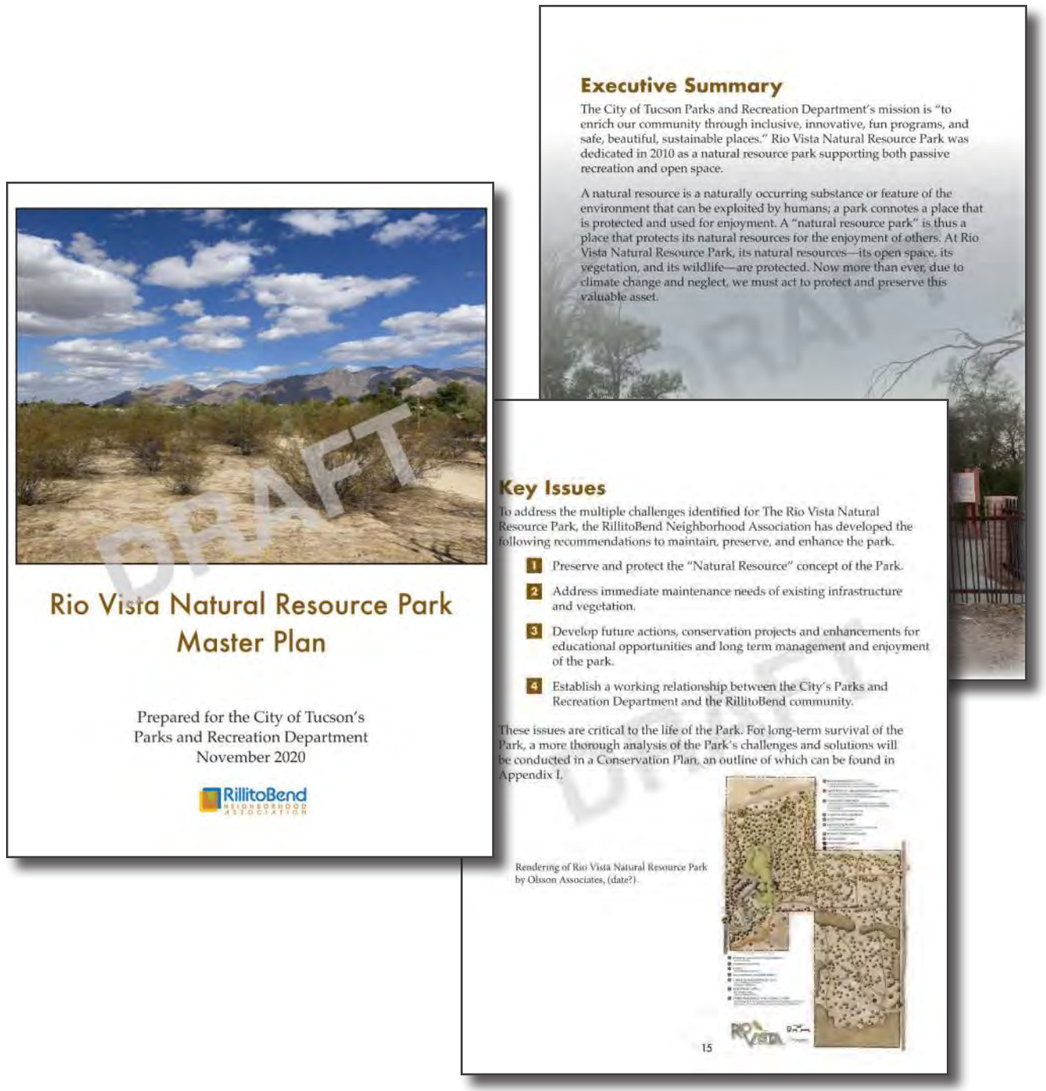
RIO VISTA NATURAL RESOURCE PARK OLSSON ASSOCIATES - 2004

This master plan is one-page annotated site plan that served as the basis of the existing site plan development.

The site plan includes a dedicated active recreational and play area. Parking and supporting amenities are located on the west side. The east side is natural open space with a meandering trail network.

PREVIOUS MASTER PLAN

RILLITO BEND NEIGHBORHOOD ASSOCIATION (RBNA), 2020



MASTER PLAN SUMMARY

RILLITO BEND NEIGHBORHOOD ASSOCIATION (RBNA), 2020

- This master plan was the first neighborhood-backed plan effort
- Vision and Goals
  - Preserve and protect the natural resource concept of the park. City of Tucson (COT) to partner with RBNA with regard to future enhancements of the park in a master planned approach that underscores maintaining the integrity of native desert character of park.
  - Address maintenance needs of existing infrastructure and vegetation. Address irrigation system repairs and expansion to park's south and east areas. Provide prioritized plan to remove invasive plant species within park interior and along perimeter areas. Maintain network of minimal trails, develop signage, and provide physical barriers to prevent off-path use.
  - Develop future enhancements for educational opportunities, long term management, and enjoyment of the park. Develop a long term conservation plan. Incorporate stormwater capture within park areas and mitigate flooding issues. Re-imagine entry plaza, updated signage, and reduce maintenance vehicle impact/access.
  - Explore education opportunities to increase stewardship and investigate funding mechanisms for park improvements.
  - Establish working relationship between Rillito Bend Community and COT Parks and Recreation.
- Park History
  - 44 acres of donated land from neighborhood in late 1980s, public support to create a Resource park and ultimate award of $1.5 million to construct first Natural Resource Park dedicated in 2010.
- Natural Features of Park
  - Soils/Drainage
  - Vegetation
  - Wildlife

Refer to Appendix II for full plan document.

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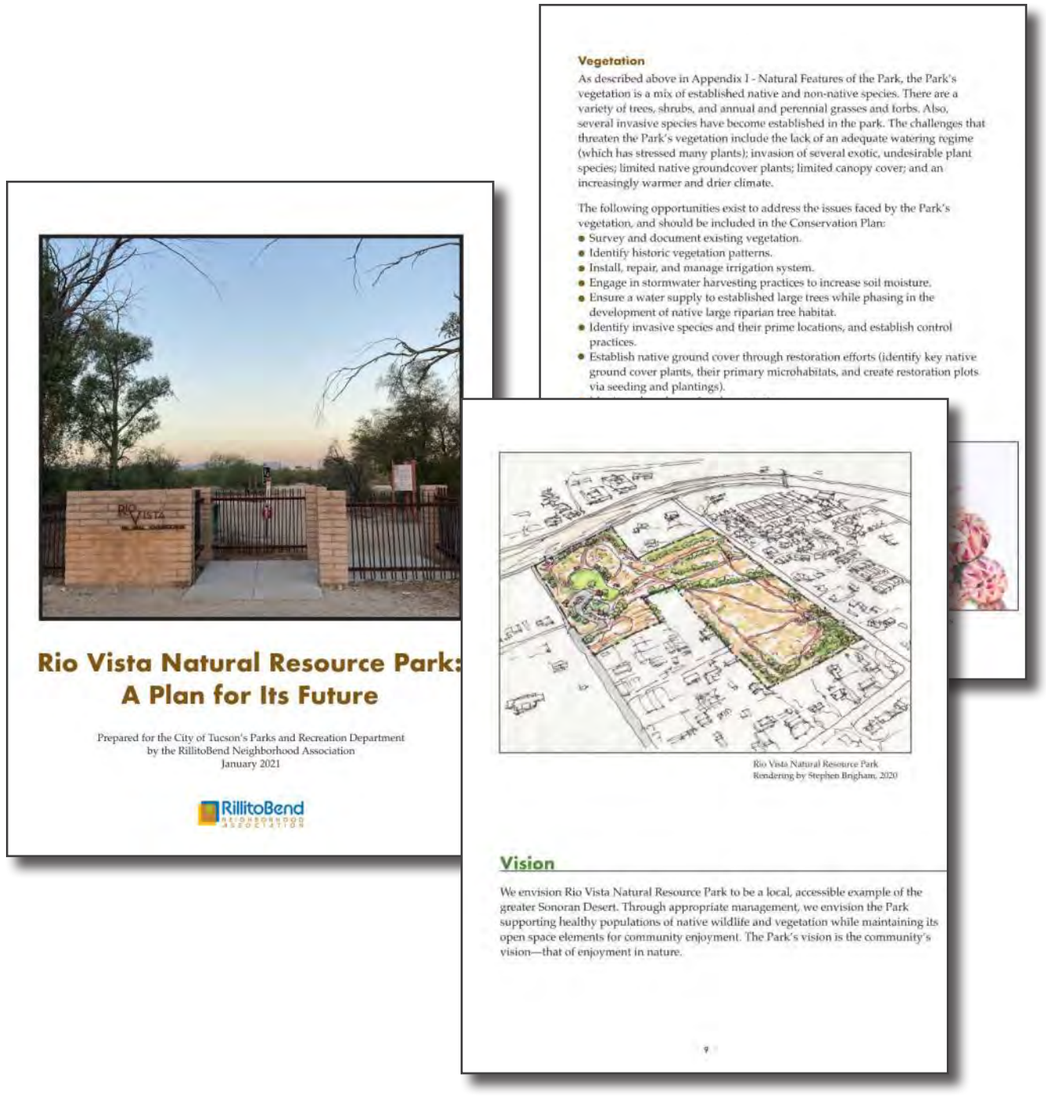
PREVIOUS MASTER PLAN

RILLITO BEND NEIGHBORHOOD ASSOCIATION (RBNA), 2021



MASTER PLAN SUMMARY

RILLITO BEND NEIGHBORHOOD ASSOCIATION (RBNA), 2021

RIO VISTA NATURAL RESOURCE PARK: A PLAN FOR ITS FUTURE
Rillito Bend Neighborhood Association
January 2021

- Similar to November 2020 Plan – Expanded Information in Appendices
- Additional Stakeholder Groups and involvement
- Additional Conservation Plan components focused on:
  - Vegetation
  - Wildlife
  - Open Space
  - Educational Opportunities
  - Equestrians, Artists, Enhancements, etc.
  - Funding Opportunities
  - Priorities

Refer to Appendix III for full plan document.

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PREVIOUS MASTER PLAN

STRATEGIC HABITAT ENHANCEMENTS, 2022

MASTER PLAN SUMMARY

STRATEGIC HABITAT ENHANCEMENTS, 2022

PLAN FOR TRAIL HABITAT ENHANCEMENT AT RIO VISTA NATURAL RESOURCE PARK
Strategic Habitat Enhancements and Friends of Rio Vista
January 2022

Detailed Guide to Park Ecosystem Rehabilitation and Trail Formalization

- Trail System Assessment
- Phased Approach to Trail Rehabilitation
- Vegetation Survey/Recommended Species/Installation Practices
- Maintenance and Monitoring Guidelines
- Funding Opportunities

Refer to Appendix IV for full plan document.

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RIO VISTA NATURAL RESOURCE PARK

EXISTING SITE CONDITIONS

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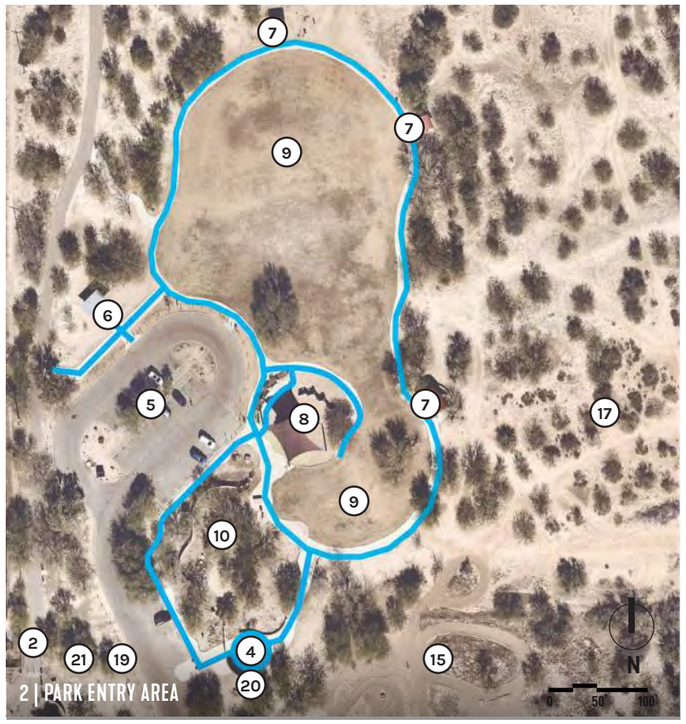
EXISTING SITE CONDITIONS

The following section documents existing site conditions at Rio Vista Natural Resource Park through map locations and images. The park enlargement (Map 2), keyed map (Map 3), and images were used to guide the first public input meeting. Documenting the existing site conditions aided in prioritizing recommendations for park improvements and amenities.

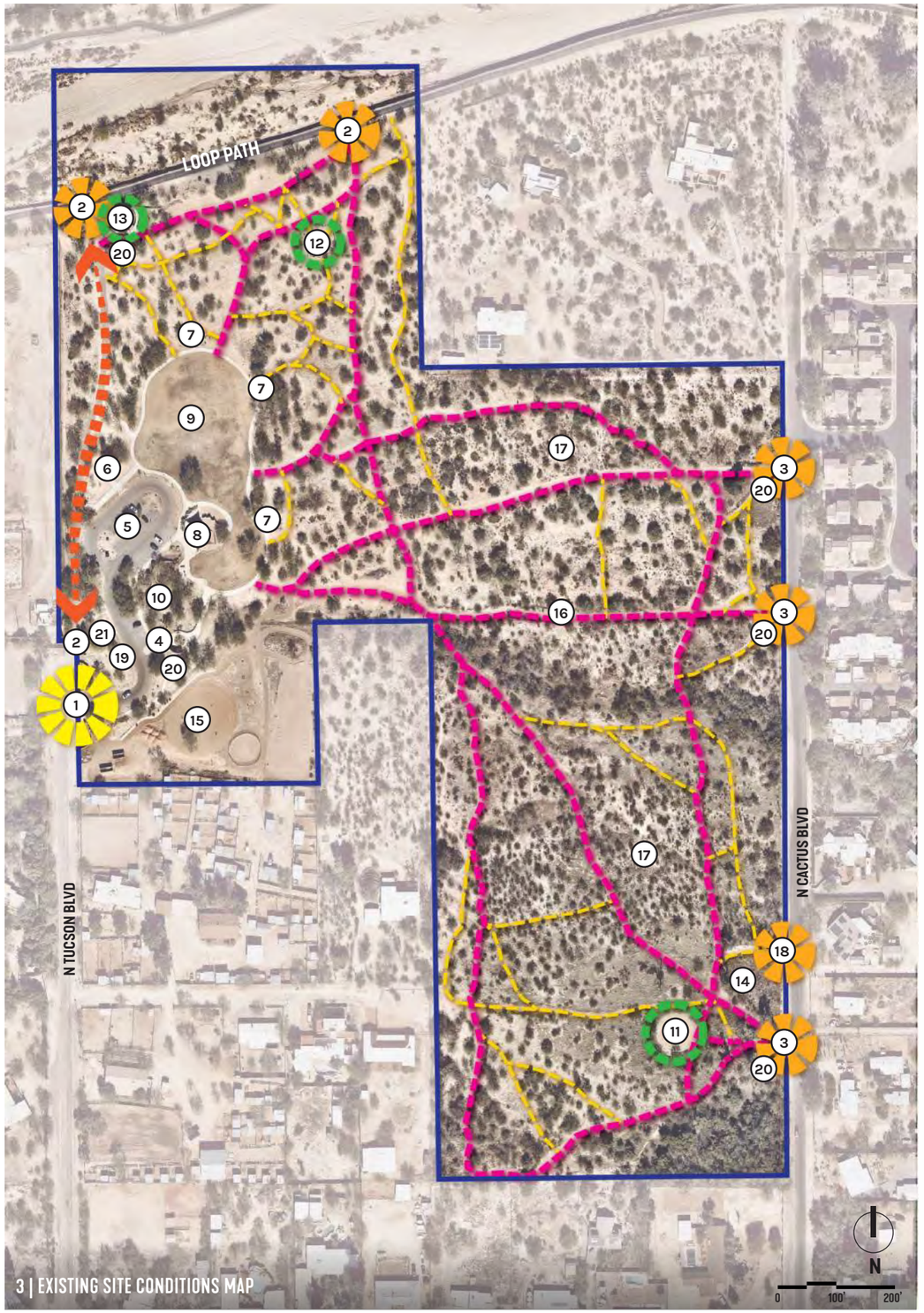


SYMBOL LEGEND

- Park Boundary (Partially Fenced)
- Main Entry
- Secondary Entry
- Primary Trail
- Secondary Trail
- Concrete Loop Path
- Trail Amenity
- Asphalt Path To Loop

KEY

1. Vehicular Entry
2. Pedestrian/ Bike Entry
3. Pedestrian/ Equestrian/ Bike Entry
4. Entry Plaza
5. Parking Lot
6. Restrooms
7. Ramadas (3)
8. Playground Area
9. Open Grass Area
10. Interpretive Garden
11. Labyrinth
12. Compassion Garden
13. Gateway Plaza at Loop
14. Existing Eucalyptus Grove
15. Equestrian Area
16. Trails
17. Native Desert Area
18. Service Entry
19. Art Sculpture
20. Wayfinding Signs
21. Utility Service Connections
    - Irrigation
    - Water
    - Electric



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WEST ENTRY

EXISTING CONDITIONS

MAIN ENTRANCE

The west entry is also the primary visitor entrance into the Rio Vista Natural Resource Park. The entry is located along Tucson Blvd. adjacent to Hitching Post Ranch at Gentleman's Acres. The main access point to the Loop is from the park entrance.

SUGGESTED IMPROVEMENTS

- Add new landscaping for aesthetics and celebration of entry
- Install wayfinding signage to plaza entry

EAST ENTRY

EXISTING CONDITIONS

PEDESTRIAN, BIKE, EQUESTRIAN ACCESS

A series of steel step-through trail access points are located along Cactus Blvd. and designate the entries to the park. The width and detailing of each trail entrance is appropriate for allowing pedestrians, bicyclists, and equestrians into the park and trail network while also prohibiting vehicle access.

SERVICE VEHICLE ACCESS

Along Cactus Blvd. and near the Park's southeast boundary is a designated area for vehicular access. The entry into the trail network is locked shut for service and maintenance access only.

SUGGESTED IMPROVEMENTS

- Add new landscaping for aesthetics and celebration of entries
- Capture drainage off south portion of Cactus Blvd.
- Install interpretive signage at entries

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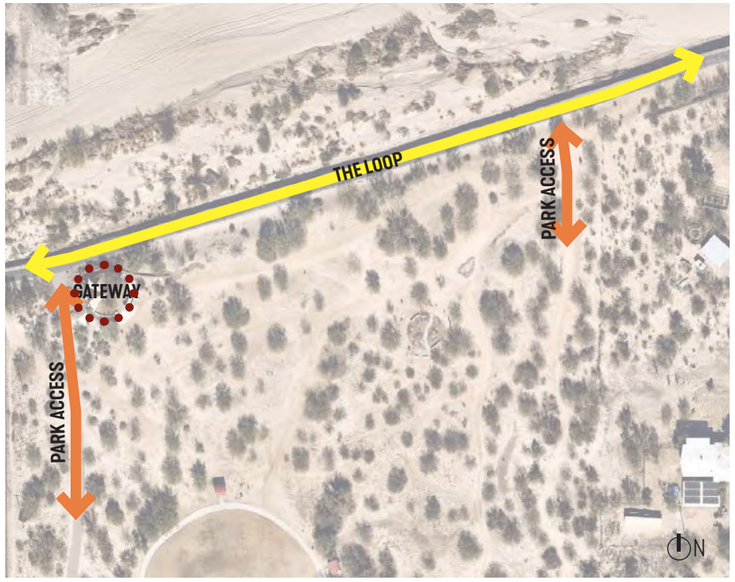
ACCESS TO LOOP REGIONAL BIKEWAY

EXISTING CONDITIONS



ACCESS TO LOOP

Access to Tucson's Loop bikeway network is through the park at various locations. The Loop borders the Rillito River and is located along the park's northern boundary.

SUGGESTED IMPROVEMENTS

- Update Entry/Interpretive signage
- Add new landscape for aesthetics, wayfinding, and celebrating entries

GATEWAY PLAZA AT LOOP

EXISTING CONDITIONS

GATEWAY PLAZA AT LOOP

The plaza is at the northwest entrance to the park from the Loop. Along the perimeter of the plaza there is region appropriate desert landscape that is well established and maintained. The signage into the park does not stand out and needs to be highlighted.

The inner plaza of the Gateway is shaded by a triangular tensile canopy that covers a large, sunken gathering area comprised of stabilized decomposed granite, concrete seatwalls, and shade tree.

The shaded gathering area is accessible by stairs and an ADA ramp.

SUGGESTED IMPROVEMENTS

- Repair and repaint wall as needed.
- Adjust planting for better visibility of entry signage.

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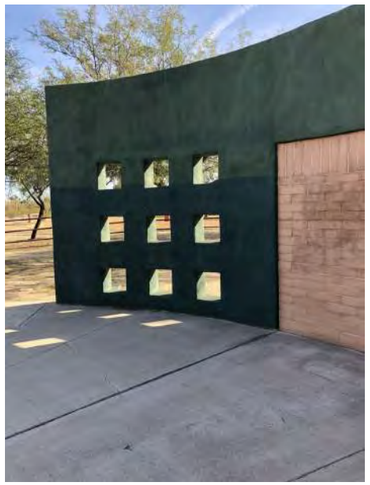
ENTRY PLAZA

EXISTING CONDITIONS



ENTRY PLAZA

The entry plaza is the main pedestrian entrance into the developed portions of the park. It is located on the west side of the property and is accessible from the parking lot entrance on Tucson Blvd. The plaza serves as a gateway to the park areas and includes seatwalls for gathering and is adjacent to the Interpretive Garden. The paint finish on the entry structure is faded and in need of a refresh. The park structure includes park signage that is faded.

SUGGESTED IMPROVEMENTS

- Repair stucco finishes and paint
- Replace/update signage and interpretive graphics
- Update adjacent landscape for aesthetics, wayfinding, and celebrating the entry

INTERPRETIVE GARDEN

EXISTING CONDITIONS

INTERPRETIVE GARDEN

The Interpretive Garden is located north of the plaza and in close proximity to the play area. The garden includes several educational signs attached to the low wall separating the area from the parking lot. The interpretive signs highlight types of wildlife, but are too small in scale and not accessible by a clear path. A small ramada is located in the Interpretive Garden and is a fun interactive piece for children. Landscape in the garden is stressed and does not offer much species variety.

SUGGESTED IMPROVEMENTS

- Update landscaping and interpretive signage
- Provide pedestrian access through planting to signage displays

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SHADE STRUCTURES

EXISTING CONDITIONS

BUILT SHADE STRUCTURES

The park includes (3) ramadas and (2) gathering areas covered by tensile canopies.

The ramadas are located along the perimeter of the open grass area. The tensile canopies cover the play area and the gateway plaza adjacent to The Loop.

RAMADAS

Each ramada includes picnic tables and a trash receptacle. They are easily accessible from the concrete sidewalk that circles the playground and open grass areas. The ramadas appear to be a good condition.

SUGGESTED IMPROVEMENTS

- Refurbish and repaint as needed

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PLAY AREA

EXISTING CONDITIONS

PLAY AREA

The play area is accessible from the parking lot located off of Tucson Blvd. It is adjacent to the open grass area and is shaded by a large tensile shade structure. The area includes a play structure with elements for toddlers and older children. Minimal landscape surrounds the play area other than grass. Seatwalls are located around the edges of the playground area.

SUGGESTED IMPROVEMENTS

- Increase variety of play equipment options for different age groups
- Refresh landscaping with variety of plant species
- Evaluate condition of playground surface and replace as needed

GRASS AREA

EXISTING CONDITIONS

GRASS

The open grass area wraps around the east edge of the play area and is enclosed by a concrete sidewalk that separates active and passive areas of the park. The area is approximately 1.5 acres (67,750sf) and is used by many for recreational activities including fetch with dogs, yoga, and sports. The large area serves as a valuable open space that offers flexible programming for a variety of potential uses for recreation and special events.

As a response to public survey input, two locations have been identified for a potential dog park location. The proposed locations include: 1) north portion of the open grass area; or 2) the area north of the open grass area where there is existing site disturbance and sparse landscape. The proposed dog park is to be roughly 17,000 sf.
See **Park Improvement Recommendations Map** (p. 68-69).

SUGGESTED IMPROVEMENTS

- Enhance active park area by adding a designated fenced area for dogs (Dog Park)
- Restrict vehicular access other than maintenance access with appropriate barriers

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COMPASSION GARDEN

EXISTING CONDITIONS

COMPASSION GARDEN

The Compassion Garden is a passive amenity that is located at the northeast portion of the park within the trail network. The garden includes low walls with designations and donor information. The walls border the round garden area. Five weathered steel pillars and one bench in the Compassion Garden have an artistic component integrated in the elements which describe resources for teens and suicide prevention.

SUGGESTED IMPROVEMENTS

- Add native and desert pollinator landscape species for color and added layer of visual interest and habitat
- Surround passive amenities with pockets of shade trees
- Move or add benches to areas with shade

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LABYRINTH

EXISTING CONDITIONS

LABYRINTH

The Labyrinth is a passive amenity located in the southeastern corner of the park within the trail network. This amenity is used often by the neighborhood residents and includes a few benches around the perimeter with minimal shade.

SUGGESTED IMPROVEMENTS

- Add native/ desert pollinator landscape species for color and added layer of visual interest and habitat
- Surround passive amenities with pockets of shade trees
- Move or add benches to areas with shade

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PARKING LOT

EXISTING CONDITIONS

PARKING LOT

The parking lot is located at the main park entry off Tucson Blvd. and is adjacent to the UA property and access to The Loop. The asphalt parking lot includes shade trees within the landscape median.

SUGGESTED IMPROVEMENTS

- Construct stormwater management features to capture water from parking lot surfaces
- Revegetate landscape area between parking lot and UA property for visual screening

RESTROOMS

EXISTING CONDITIONS

RESTROOMS

The park's restrooms are located just north of the parking lot and west of the open grass area. The restroom structure has (2) separate stalls and includes basic restroom amenities such as toilet, sink, ADA rail, and mirror.

SUGGESTED IMPROVEMENTS

- Repaint interior of restrooms
- Improve routine maintenance schedule for cleanliness and stocking of toilet paper and soap

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LANDSCAPE

EXISTING CONDITIONS

VEGETATION

Apart from the open grass area and the aesthetic plantings at pedestrian entries, the overall feel of the landscape within the park is desert region appropriate and respects a native plant palette. Within the trail network the landscape is naturalistic with some dense, riparian landscape along Shannon Wash and at the southeast corner of the site. There is a patch of Eucalyptus trees at the southeast corner of the site along Cactus Blvd. The Eucalyptus trees are at different stages of life but are home to wildlife. There have been some noted invasive Salt Cedars in the landscape areas.

SUGGESTED IMPROVEMENTS

- Add shade trees at gathering areas and trail nodes
- Remove invasive species where not used by wildlife
- Revegetate open space areas and unwanted trails
- Refer to Appendix II for acceptable revegitation plant list

LANDSCAPE

EXISTING CONDITIONS

INTERPRETIVE GARDEN

The Interpretive Garden landscape does not include a lot of landscape variety such as seasonal color, size, and texture. Aesthetic planting at entries could use an update. Paths to the educational interpretive signage are overgrown with landscape and difficult to determine.

SUGGESTED IMPROVEMENTS

- Refresh garden with region appropriate plants
- Add pollinator landscape species for color and habitat
- Define paths
- Integrate interpretive signage for education

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SHANNON WASH

EXISTING CONDITIONS

SHANNON WASH

Shannon Wash is in the center of Rio Vista Natural Resource Park within the trail network. The landscape surrounding the wash is native riparian vegetation. A portion of the wash closest to the equestrian area has been disturbed and is in need of revegetation.

SUGGESTED IMPROVEMENTS

- Revegetate Shannon Wash with riparian landscape
- Improve stormwater management on site

STORMWATER MANAGEMENT

EXISTING CONDITIONS

STORMWATER MANAGEMENT

Existing site disturbances interfere with stormwater drainage throughout the site and to Shannon Wash.

SUGGESTED IMPROVEMENTS

- Capture stormwater runoff on southeast corner of site to distribute onto park landscape
- Introduce bioswales and micro-basins to parking lot

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IRRIGATION SYSTEM

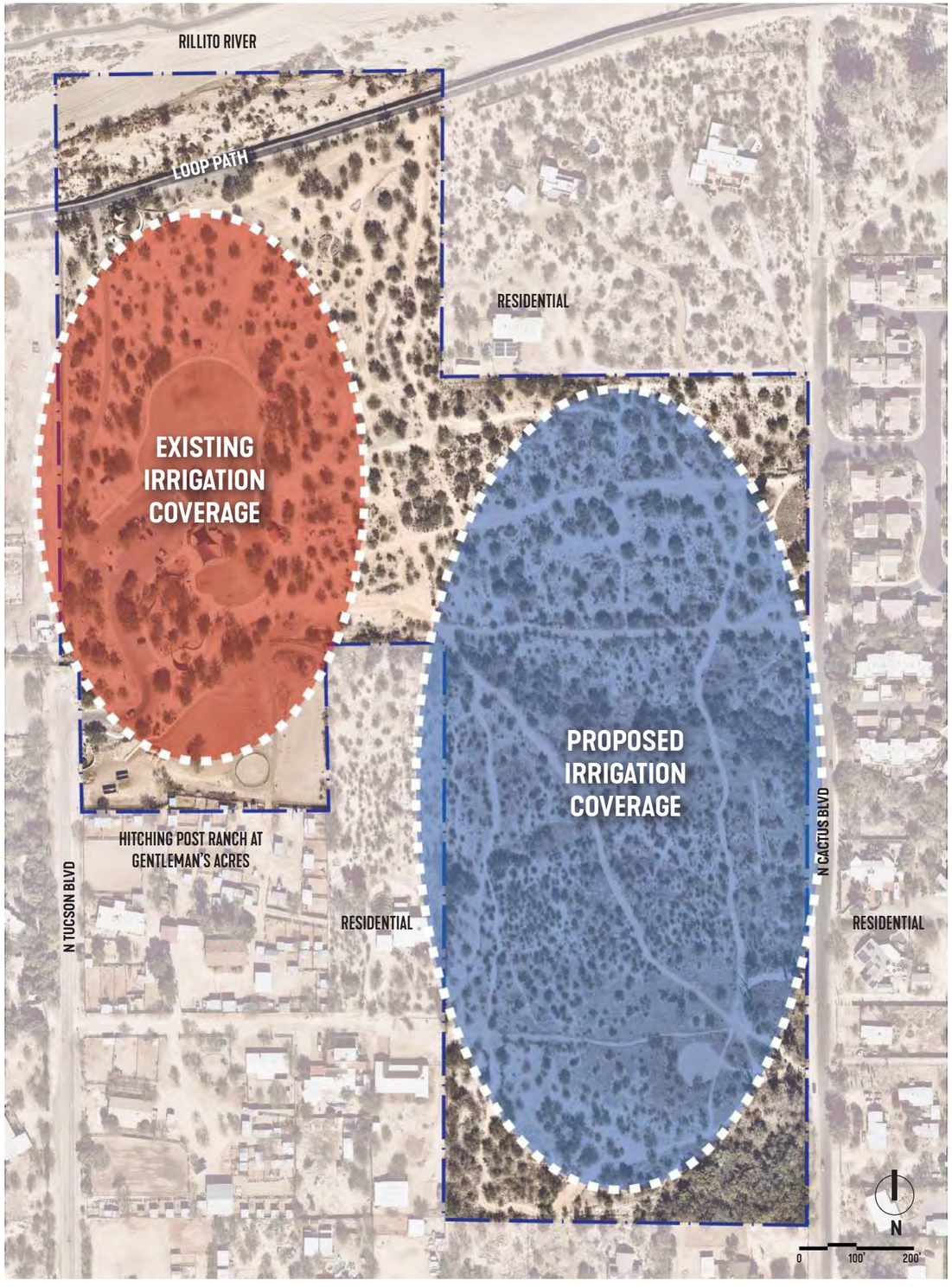
EXISTING CONDITIONS

DESCRIPTIONS

There is an existing irrigation system at the park which needs to be assessed to see if it is functioning properly based on the condition of the plant material throughout the site.

SUGGESTED IMPROVEMENTS

- Establish routine maintenance and repair of irrigation system
- Extend irrigation system through out trail network where revegitation efforts occur



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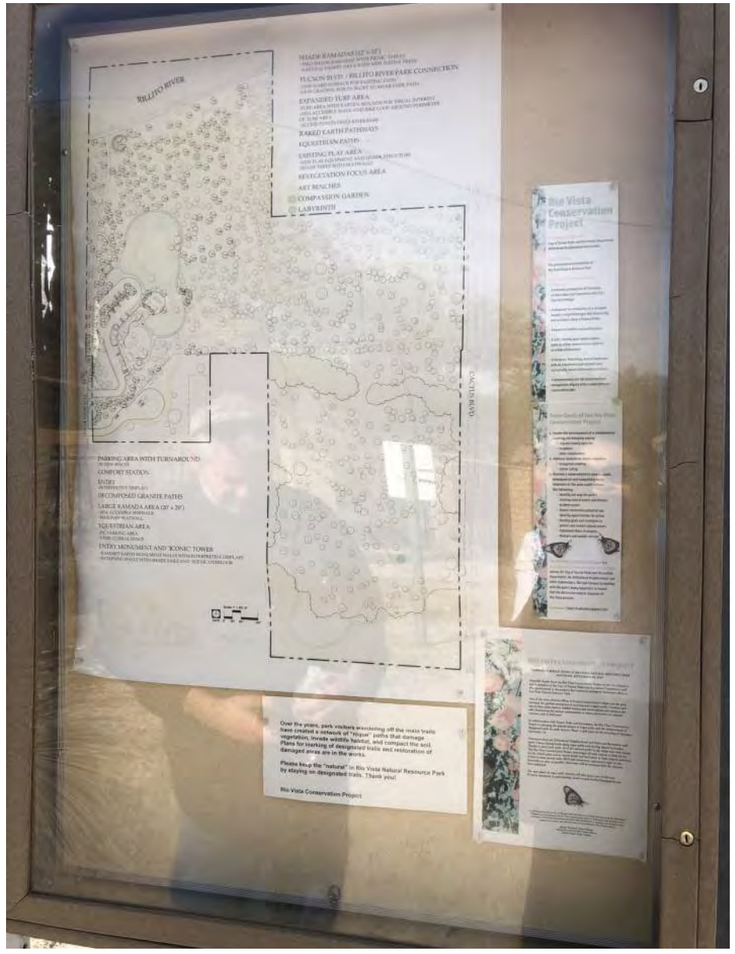
SIGNAGE AND WAYFINDING

EXISTING CONDITIONS



PARK MAPS

Throughout the site there are (5) park map stands.

The map stands are of two different designs:
1) a tri-side tube steel stand with park information on each side;
2) a one-sided steel and acrylic shadow box with map and additional information pinned to the inside. Information can be updated with panel key to unlock shadow box.

The conditions of the maps and information on all panels are faded and difficult to read clearly.

SUGGESTED IMPROVEMENTS

- Replace signage with updated park map
- Include park hours and rules
- Develop new signs to be consistent in design throughout park

INTERPRETIVE SIGNAGE

EXISTING CONDITIONS

INTERPRETIVE SIGNAGE

Interpretive signage that includes educational information about wildlife are focused at the Interpretive Garden and another location in the trail network. The signage at the Interpretive Garden is attached to a perimeter wall. The other design type is a stand-alone stand made of weathered tube steel.

SUGGESTED IMPROVEMENTS

- Install more interpretive signage throughout park
- Interpretive signage can include plant identification, wildlife, and preservation information
- Interpretive signage may include community art

PUBLIC ART

EXISTING CONDITIONS

ART SCULPTURES

The "Red Stallion" art sculpture stands near the main entrance to the park and was dedicated on September 1, 2020. The sculpture was designed and created by sculptor Al Glann and donated by Bill and Roberta Witchger through Sculpture Tucson "Sculpture in the Street" Program.

Sculpture is new and in good condition.

SUGGESTED IMPROVEMENTS

- Interpretive signage may include community art
- Placement of additional sculptures to be approved by City of Tucson and community

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EQUESTRIAN AREA

EXISTING CONDITIONS

EQUESTRIAN AREA

The equestrian area is located on the southwest corner of the park and has direct access to the park's trail network. The perimeter fence separating the park from the equestrian area is currently a steel post fence with a standard step-through feature for the horses.

SUGGESTED IMPROVEMENTS

- Replace step -through access with gate and lock
- Raise height of fence

WILDLIFE HABITAT

EXISTING CONDITIONS

WILDLIFE HABITAT

Trails meander through wildlife habitat and riparian landscape. Shannon Wash is centered within the trail network and spans west to east across the site. There is an existing bird perch area located in the Eucalyptus trees along Cactus Blvd. The secondary paths create disturbance that interfere with the natural habitat.

SUGGESTED IMPROVEMENTS

- Preserve bird perch area
- Enhance Shannon Wash

SEATING

EXISTING CONDITIONS

SEATING

There are numerous bench locations within the trail network. Design type and placement of benches is inconsistent. Existing benches include designs that are: 1) off-the-shelf; 2) concrete art-influenced; 3) and standard concrete with skateboard deterrent and concrete pad.

SUGGESTED IMPROVEMENTS

- Move or add benches to locations in shade along trail nodes
- Bench design to be consistent throughout the park

PERIMETER FENCE

EXISTING CONDITIONS

PARK FENCE

There are currently sections of fence that border the east, south, and west properties; however, there is no fence on the northeast side of the park where it is adjacent to the residential properties. The existing fence is inconsistent in design and condition.

SUGGESTED IMPROVEMENTS

- Add wire fence to missing areas where park borders residential property
- Upgrade equestrian area entry
- Fencing to be consistent in character and design

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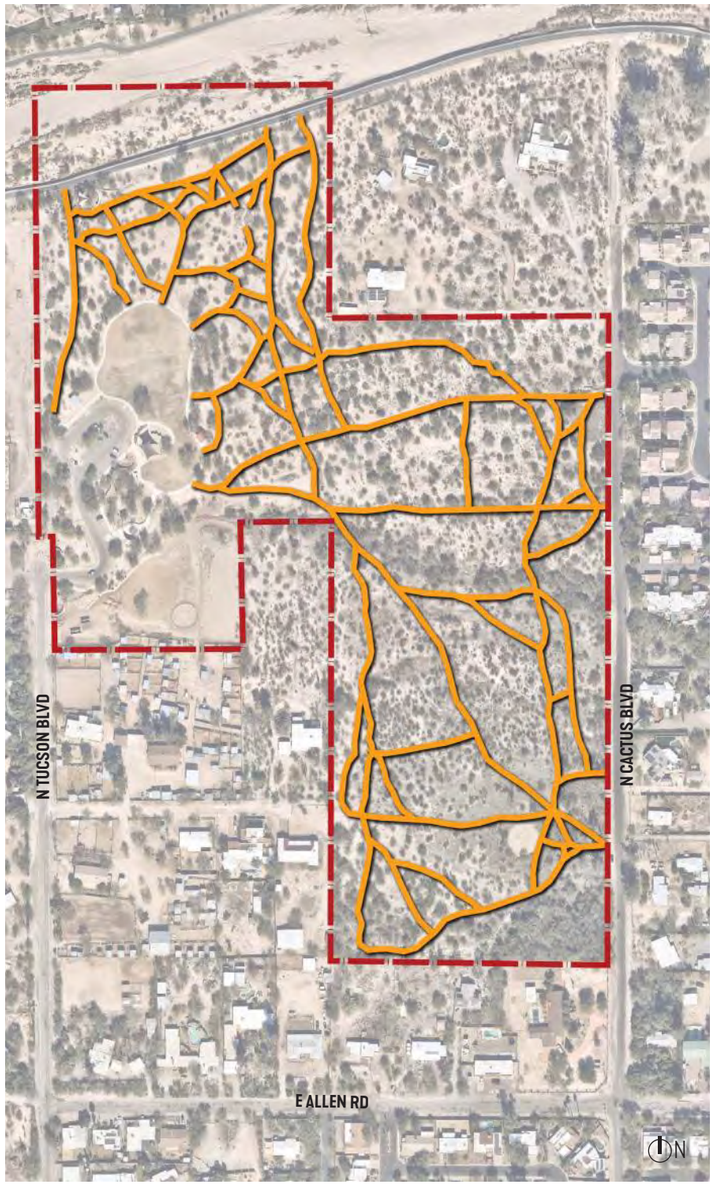
TRAIL NETWORK

EXISTING CONDITIONS



TRAIL NETWORK

The trail network portion of the park is used daily by the neighborhood residents and park visitors. The trails give access to pedestrians, bicyclists, and equestrians. There are several rogue paths that have evolved from the primary trail network and, as a result, have caused disturbance to the natural areas.

TRAIL NETWORK

EXISTING CONDITIONS

TRAIL ROUTE

Disturbance within the trail network makes it difficult to determine the primary trails for walking, biking, and equestrian use. The trails are wider than necessary to accommodate different user types. The Tucson Parks Department service vehicles use some of the wider trails.

SUGGESTED IMPROVEMENTS

- Designate primary trail network and close off rogue trails
- Reduce the width of trails to appropriate widths for specific user types
- Define trails edges with rocks or other appropriate materials

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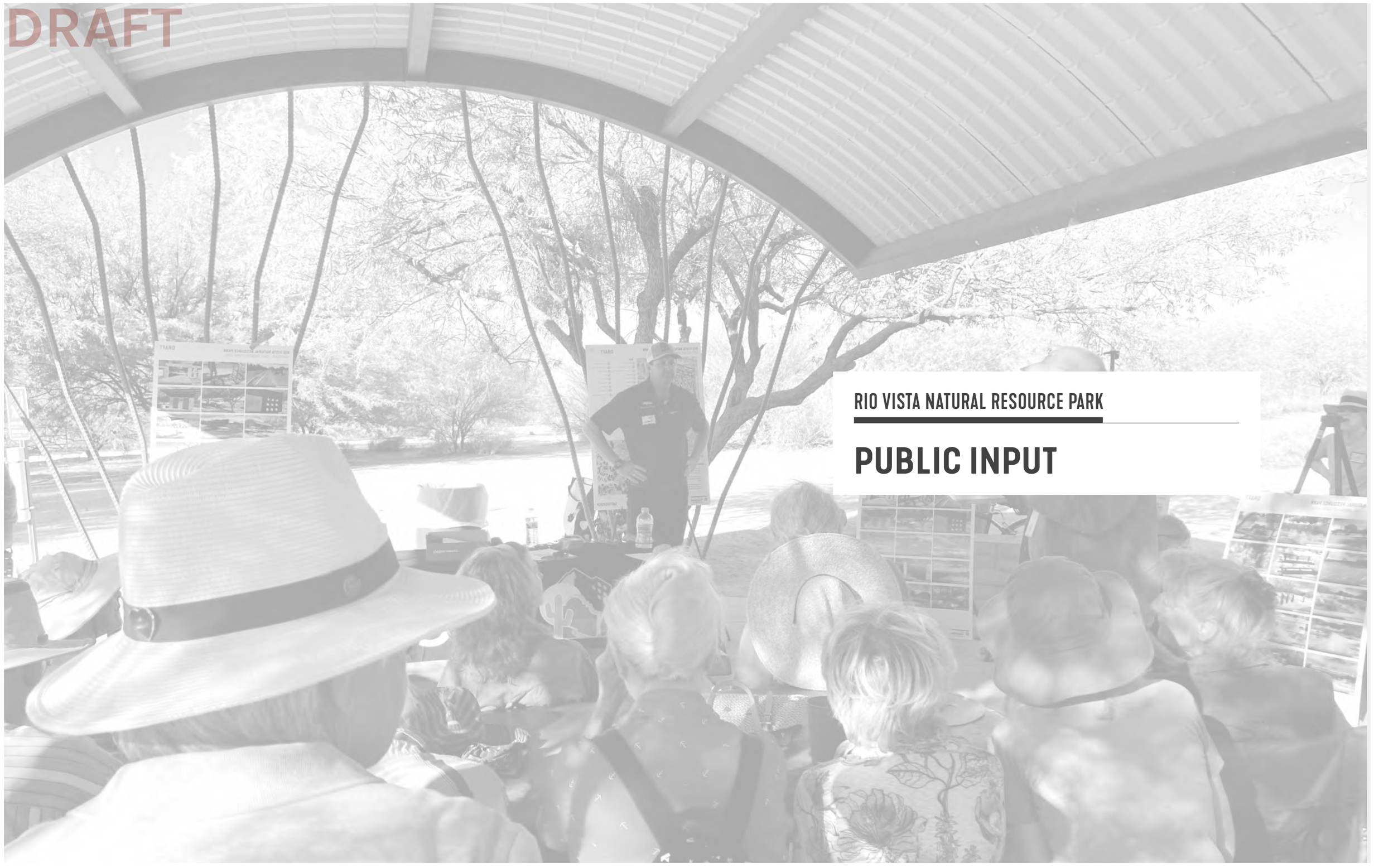

RIO VISTA NATURAL RESOURCE PARK

PUBLIC INPUT

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PUBLIC INPUT

Public input from visitors and nearby residents who utilize Rio Vista Natural Resource Park is crucial to determining and prioritizing improvements for the park. The following outline summarizes key recommendations from local organizations, public surveys, and public meetings.

- City of Tucson Parks Online Survey - April 2022
- City of Tucson On-Site Public Open House - April 2022
- On-site meetings with Rillito Bend Neighborhood Association (RBNA) - May 2022
- On-site meeting with Friends of Rio Vista - May 2022

PUBLIC INPUT

CITY OF TUCSON PARKS ONLINE SURVEY - APRIL 2022

Approximately 300 local residents of Tucson and users of Rio Vista Natural Resource Park participated in an on-line survey asking for input on existing park amenities and usage, safety, priorities for park improvements, and what additional amenities users would like to see. The following outlines the survey questions and the most popular responses. Refer to **Appendix I** for full survey report.

How often do you visit Rio Vista Natural Resource Park?
65% of survey participants use the park on a weekly basis or more frequently.

When do you usually visit Rio Vista Natural Resource Park?
74% of survey participants use the park in the morning and 49% use the park in the evening.

What do you usually do when you visit Rio Vista Natural Resource Park?
Survey participants had the opportunity to select more than one answer.
The most popular activity by 86% of survey participants is to walk, run, or bike the nature trail network. The second most popular answer by 39% of survey participants is to walk the labyrinth. Use of the equestrian area was the least popular amenity with 4% of the survey participants selecting this option.

How safe do you feel when you visit Rio Vista Natural Resource Park?
50% of survey participants feel safe and 39% of participants feel very safe. Less than 3% of participants feel unsafe.

What are your priorities for park improvements?
Survey participants were asked to rank items from highest priority to lowest priority. The priorities for over 152 responses are as follows with the highest priority item listed as number 1:

1. Natural Open Space and Native Plants
2. Walking Trails and Signage
3. Playground and grass area
4. Restrooms
5. Ramadas, Picnic Tables, and Benches
6. Drinking Fountains
7. Parking lot and lighting
8. Equestrian area

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PUBLIC INPUT

CITY OF TUCSON PARKS ONLINE SURVEY - APRIL 2022

Are there any park amenities not at this park that you would like to see?
This survey question was open ended and feedback was received from 99 survey participants. Park users used this opportunity to share what amenities they would like to see at the Park while also highlighting Park issues that should be addressed.

The most common answer across survey participants is to preserve the natural integrity of the Park which includes: fewer developed areas, consolidating the trail network, restoring habitat and vegetation, and incorporating stormwater management.

The survey also gave insight into a Park issue with visitor's exercising their dogs off-leash. Many participants commented on the need for a designated dog park while other participants expressed the need for signage (with enforcement) stating dogs are not allowed off-leash.

Other popular amenities mentioned were overall more shade trees and additional play equipment like swings, monkey bars, toddler-safe play equipment, or outdoor fitness equipment for adults.

Issues with park maintenance were also mentioned Properly functioning irrigation was the most common answer. Monitoring trash receptacles, clean restrooms, the addition of recycling bins, and replacing faded and outdated park signage were other comments mentioned.

What is your age?
Survey participants were predominately in the 61-70 age range (28%) and 71-80 age range (23%).

Which racial and ethnic group do you identify?
Survey participants were able to select more than one answer. The most popular answer was White or Caucasian with 91%.

How far would you need to travel to get to Rio Vista Natural Resource Park?
55% of survey participants travel less than 1 mile to get to the park.

CITY OF TUCSON PARKS ONLINE SURVEY

How would you travel to this park?
61% of survey participants walk to Rio Vista Natural Resource Park.

In addition to the multiple choice questions response section, respondents were offered opportunity to provide additional more detailed comments regarding park use and potential improvements.

Nearly 50% of those surveyed offered additional remarks, the main subject matter of these responses included:

- Preservation of natural, native character of passive areas of park
- Streamlined version of trail network
- Revegetation of disturbed areas
- Irrigation repair and expansion
- Provision of park area for off-leash dog activity

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PUBLIC INPUT

ON-SITE PUBLIC OPEN HOUSE - APRIL 2022

A public open house meeting was held on-site at Rio Vista Natural Resource Park on April 20, 2022. Many comments at the beginning of the meeting were regarding the goal of preserving and maintaining the existing natural space in the park. There is opposition to construction of more urban park amenities like a splash pad.

General Park Use

- The park has lots of daily use, but not an option on the survey. Only Weekly option. Make sure that the City acknowledges all the daily use.
- Quite peaceful park to visit, concerned about increased noise level and traffic that may come from surrounding development.
- Park is a great natural area resource for folks who live outside the immediate area.
- Humans need areas for release, some visit the park twice per day, every day.
- Popular park for birders.
- Neighbors are very supportive of the Parks Department's effort to restore the park. They offered to help with physical labor.
- Many attendees stepped forward to offer assistance from the neighborhood groups. They spoke of projects already completed, and the wealth of knowledge the groups had to offer regarding the park itself as well as their respective backgrounds/career knowledge that could benefit the future park development decisions.

ON-SITE PUBLIC OPEN HOUSE - APRIL 2022

Existing Conditions

- Grant money goes to things no-one wants; The park is great as it is currently but need to protect the biodiversity already there. Wildlife includes bobcats, coyotes, hawks, raptors, and Great-Horned Owls.
- Need recycling bins in additional to trash containers.
- Slow the traffic on the adjacent streets.
- Provide trail signage to keep people on the designated paths.
- Paths need better delineation, repair, and maintenance. Multiple comments. Close some trails to restrict trampling of natural desert areas.
- The Compassion Garden is not used and is not maintained. Should consider removing it or clean it up. Was a project promoted by a previous Mayor.
- Revitalize the former mesquite bosque and natural cienega for a riparian habitat area at east/center area of park.
- Improve conditions to maintain existing bird species and increase/expand list of species that visit park. Preserve taller trees for perches that sit 40' off the ground overseeing the native tree canopies. These are hunting/nesting opportunities for certain species. Look at partnering with Rio Vista Conservation project and Tucson Audubon Society for additional resources.

Stormwater Management

- Need more water harvesting and irrigation system expansion to maintain health of plants, mainly large trees. Fix existing leaks in the irrigation system. Fill in areas where trees died, and empty planting areas are bare. Restore what's here.
- Many opportunities presented to capture stormwater runoff within the park and along the adjacent streets. Potential connection to Christmas Wash. Reduce soil compaction near trees/vegetation from maintenance vehicles throughout park.

Dogs

- Need a dog park. Too many people are letting their dogs off leashes. 2 comments. However, several people oppose a dog park and are advocating for better enforcement to keeps dogs on leashes.
- Off-leash dogs are disruptive and drive wildlife into hiding, especially in more natural areas of the park.

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PUBLIC INPUT

ON-SITE PUBLIC OPEN HOUSE

Park Boundaries

- Fencing is needed on the NE periphery of the park boundaries. People are cutting through private property (3 residential lots).
- The UA property to the west has been planned for development in the past. Talk to the UA about their plans for that property and how it can become part of the park.
- Property owner may be interested in selling her vacant desert parcel as a conversation easement as part of the park. It is located just east of the Gentlemen's Acres horse property.

Equestrian Area

- The adjacent horse property owner (Gentlemen's Acres) uses and manages the publicly-owned park equestrian area by default. There is no formal agreement with the Parks Department in place. He coordinates opening and closing of the gate and maintains the existing mesquite trees and the grounds. The owner also pays the city to haul away horse manure from his horses and others using the equestrian area. A few issues and ideas:
- Horse property owner recommends that some signage be installed on the north perimeter of the equestrian area to restrict pedestrians as some people have entered the area while there are horses around.
- Install an electronic opener on the equestrian area gate to allow for easier in-out access. It should lock automatically per park hours.
- Use horse manure to help fertilize the natural areas in the park.

ON-SITE MEETING WITH RILLITO BEND NEIGHBORHOOD ASSOCIATION - MAY 2022

The Rillito Bend Neighborhood Advocacy Group met with City of Tucson Parks staff on May 20, 2022 at the park to discuss the group's perspective on park improvements.

Comments and Ideas Mainly Related to the Natural Open Space

- Replace barbed-wire fencing with smooth wire fencing where needed. The bottom wire should be a minimum 18-inches above ground to allow for wildlife access. Install new wire fencing around NE perimeter of park adjacent to residential properties.
- Uniform trail wayfinding and rules signage is needed throughout the park at key points: entrances, main trail crossings, by parking lot. But not too much signage to cause clutter. Signage should have the basic features:
    - Full map of park and key features (one sign)
    - Park rules (separate sign) addressing: hours, dogs on leash code, trail etiquette, key points of interest, types of animal habitat
    - Durable signs and posts. Re-use or modify existing kiosks.
- There is a private entry at west side of the park off of the Tucson Blvd. cul-de-sac

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PUBLIC INPUT

ON-SITE MEETING WITH RILLITO BEND NEIGHBORHOOD ASSOCIATION - MAY 2022

ON-SITE MEETING WITH RILLITO BEND NEIGHBORHOOD ASSOCIATION - MAY 2022

- Cactus Boulevard drainage should be captured to flow into SE corner of park as it was before, and to reduce all flow into Shannon Wash to the north. Need rolling dips and channelization for run-off. Will require coordination with Transportation Department.
- Trail Improvements: identification, restoration, narrowing, closure of small trails, ADA access
  - General widths: 8 feet for horse/ped/bike trail, 6 feet for major ped/bike trails, 4 feet for minor ped trails
  - Close most of the minor trail network with barriers and revegetate
  - Identify types of barriers needed to close trails: sawhorses, rocks, logs, post and cable
  - Provide signage to attach to barriers: Area closed for desert preservation. Please use main trails
  - Designate/promote specific trails for equestrian use. Use silty sand or other soft material for horse comfort. Maybe separate trail for horses on side of ped trail.
  - Restore main trails to reduce erosion and flooding. Use rolling dips to channel water. Arizona Conservation Corp does trail restoration.
  - Mark trail edges with some form of natural rock or other natural material. Check out Case Natural Park and County parks (contact county Flood Control).
- Use horse manure to help restore soils, if possible.

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PUBLIC INPUT

ON-SITE MEETING WITH RILLITO BEND NEIGHBORHOOD ASSOCIATION - MAY 2022

ON-SITE MEETING WITH RILLITO BEND NEIGHBORHOOD ASSOCIATION - MAY 2022

Vegetative Restoration

- Provide new vegetation along north side of equestrian arena fence.
- Large trail crossing areas need to be made smaller and revegetated. Too much open dirt area. Install more plants in areas with large open water-harvesting basins.
- Extend irrigation system where needed to accommodate more planting.
- The Compassion Garden is not well maintained and is built on a mound. Re-work some of the area to allow water harvesting to help plants thrive.

Parks maintenance Issues

- Parks truck and trailer drives on main trails and does damage to plants, especially on corners where turning. Trucks tend to speed and create dust. Consider using smaller vehicle or limit driving in some areas
- Some trash cans are located in the middle of the desert area and have to be serviced. Place trash cans only by main park area and near Cactus Road where they can be serviced. Find ways to limit driving in middle of desert area.
- There is a sewer manhole in middle of trail network. Limit trucks to service it.
- Repair irrigation system. Several irrigation emitters not servicing any plants. Dead plants need to be replaced or remove the irrigation line.

Benches

- Provide benches in desert bosque next to main parking lot. This area is shady but under-utilized.
- Limit benches in open desert space. There are some that are randomly placed with concrete pads but no connectivity to anything else. Place donated benches in and around the urban park area.
- Select benches that are more attractive than the concrete ones. Consider using more of the old wood bus benches where needed. Or other bench with natural materials.

Equestrian Issues

- Work with horse owners to identify main horse trails and signage needed
- Vegetate area next to north fence along equestrian area
- Identify strategies to use horse manure for soil restoration
- Per the sale of the park land by the Bagley family, at least 20% must be preserved for equestrian use.

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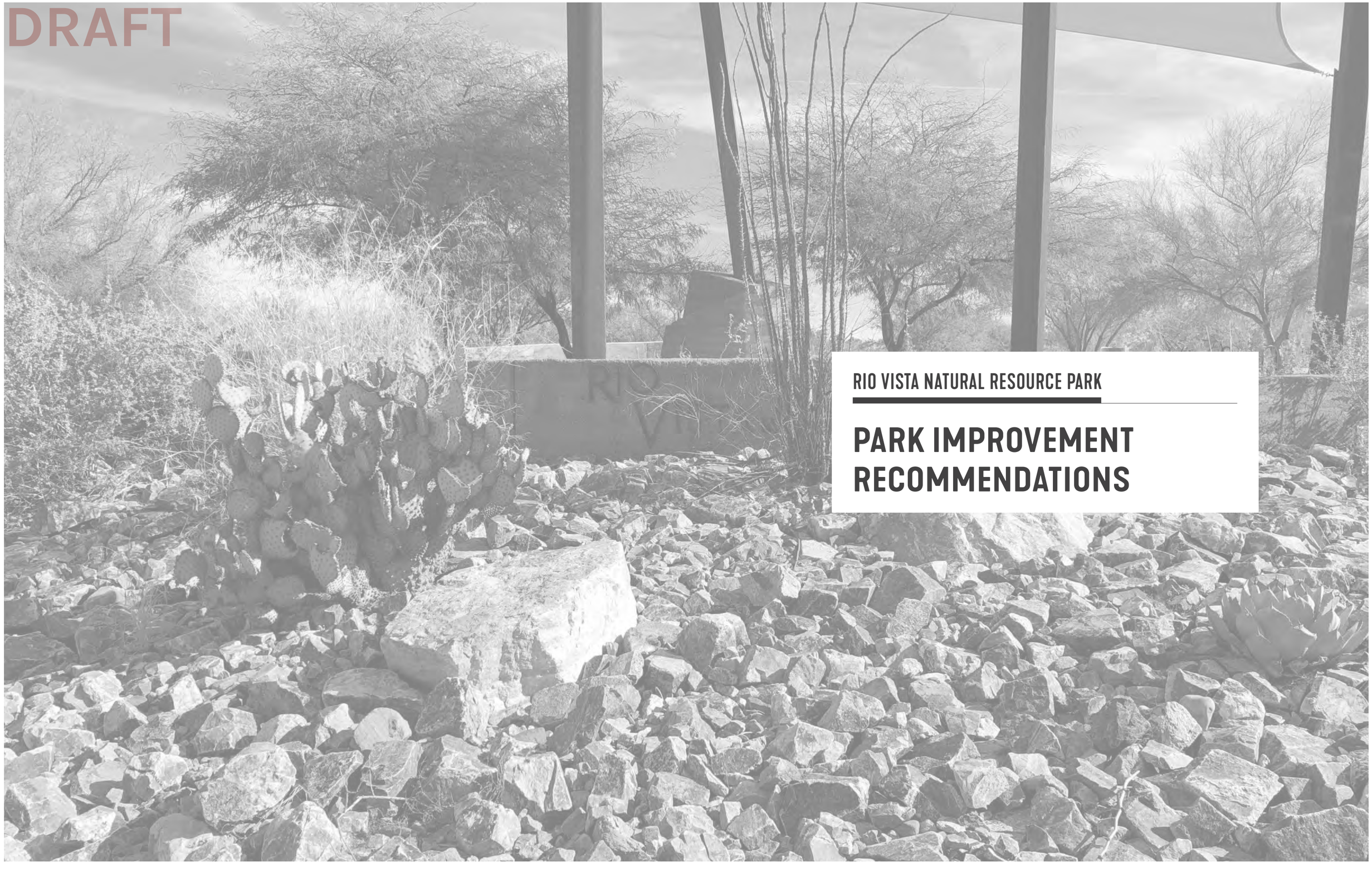

RIO VISTA NATURAL RESOURCE PARK

PARK IMPROVEMENT RECOMMENDATIONS

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PARK IMPROVEMENT RECOMMENDATIONS

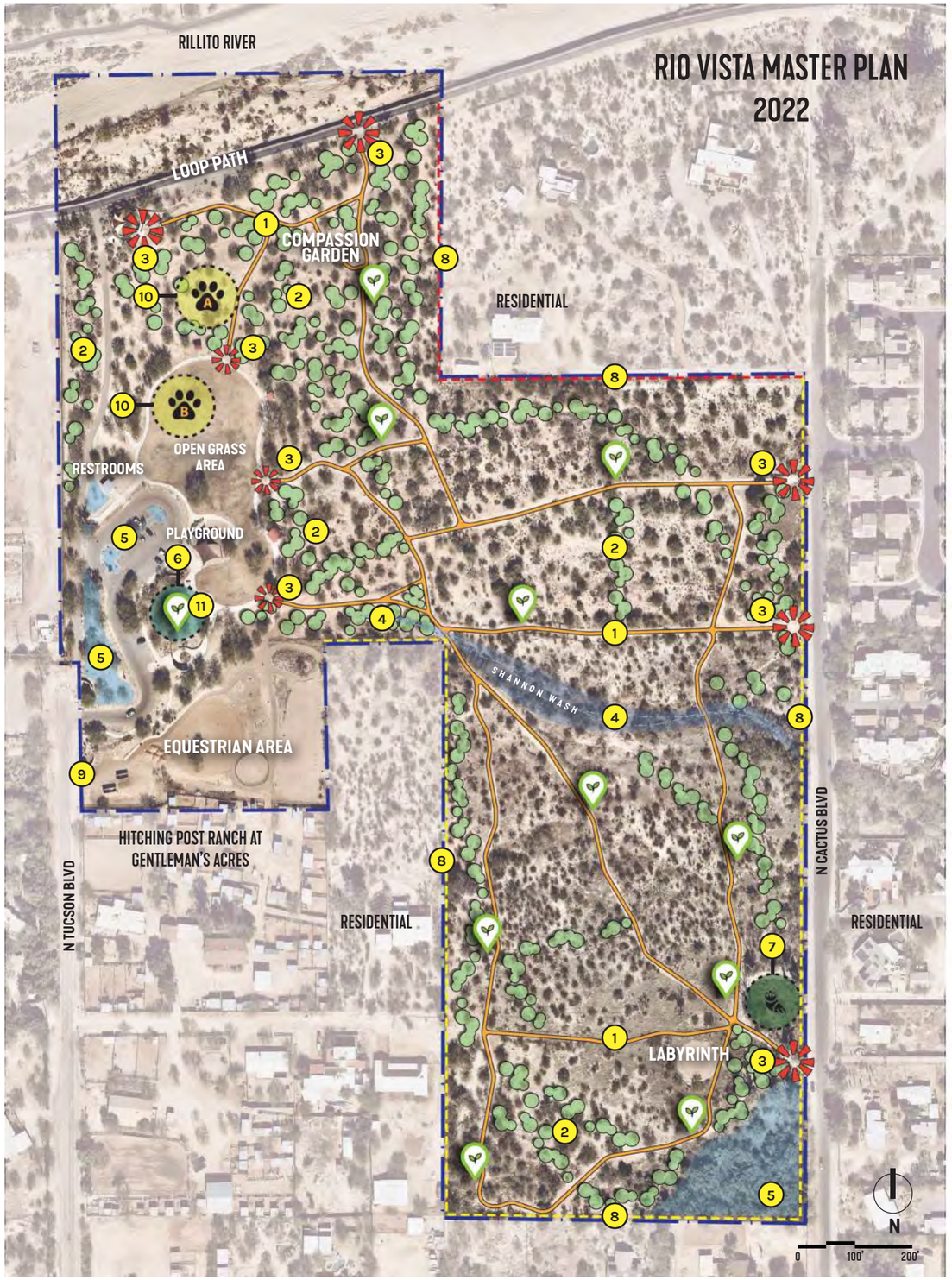
There are many park users, organizations, and neighborhood associations who are passionate about Rio Vista Natural Resource Park. Feedback from the on-line public survey, on-site meetings, and existing master plan documents influenced the following recommendations and priorities for the park. Users of Rio Vista Natural Resource Park emphasized the importance of preserving the natural quality of the park while also enhancing the user experience of the natural environment. It is clear that improvements to the park must align with the community's goals to restore the native landscape, preserve and create habitat for wildlife, improve park maintenance, provide education opportunities, and enhance the visitor's experience to appreciate the natural desert environment.

High Priority Improvements

1. Consolidate Trail Network
   - Close unwanted trails / provide temporary barriers
   - Upgrade primary trails
   - Revegetate disturbed areas
2. Revegetate Disturbed Open Spaces
   - Repair & Expand Irrigation System
3. Upgrade Trail Network Signage
4. Enhance Riparian Area
5. Stormwater Harvesting
6. Enhance Interpretive Garden
7. Preserve Bird Nesting Area
8. Repair and Upgrade Perimeter Fencing
9. Upgrade Main Gate Access at Equestrian Area
10. Potential Dog Park (Location A or B)
11. Install New Benches

Key

- Revegetate areas with native plant material
- Trail Network
- New Perimeter Fence
- Existing Perimeter Fence
- Entry to Trail Network with Signage
- Node with Interpretive Signage



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MAINTENANCE RECOMMENDATIONS

Ongoing maintenance activities for the existing portions of the active and passive areas of the park should be enhanced.

Related efforts include:

- Routine maintenance and repair of site amenities
- Restroom Cleaning
- Trash collection
- Mowing large lawn areas
- Seasonal pruning of landscape shrubs and trees
- Irrigation repair

Additive maintenance for newly developed/restored passive trail systems to the east will require a more frequent maintenance schedule during establishment period of (approximately 12-24 months) then reduce in frequency and become part of routine maintenance program. These efforts will need volunteer support.

Related efforts will include:

- Regular Application of seasonal irrigation to new container planting and seeded areas
- Planned weeding/removal of invasive species and control of over-aggressive native species
- Herbivore plant protection as required
- Trail barricade upkeep and repositioning
- Trail surface repair
- Patrolling storm water basins for debris and erosion control measures
- Monitoring newly planted/seeding areas for species health and successful seed germination

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2022 COST ESTIMATE FOR RECOMMENDED PRIORITIES

Item	Quantity	Unit		Unit Cost		Total Cost
Contract Costs						
General Conditions/Mobilization	1	LS	$	25,000.00	$	25,000.00
Temporary Erosion Control/Maintenance of SWPPP	1	LS	$	10,000.00	$	10,000.00
Site Preparation						
Clear and Grub Landscape Areas/Prune Existing Trees	1	LS	$	7,500.00	$	7,500.00
Consolidate Trails						
Revegetate Disturbed Areas - Plants/DG	100,000	SF	$	0.70	$	70,000.00
Expand/Update Irrigation Coverage	100,000	SF	$	0.40	$	40,000.00
Trail Surface Refresh	50,000	SF	$	0.50	$	25,000.00
Seating	12	EA	$	750.00	$	9,000.00
Upgrade Trail Network Signage						
Larger Directional Signage (Nodes/Entries)	6	EA	$	2,000.00	$	12,000.00
Smaller Interpretive Signage	10	EA	$	1,000.00	$	10,000.00
Stormwater Harvesting						
West Parking Lot/Entry Area	20,000	SF	$	1.00	$	20,000.00
Southeast Corner at Cactus Boulevard	10,000	SF	$	1.00	$	10,000.00
Interpretive Garden Updates						
Signage Allowance	1	LS	$	1,500.00	$	1,500.00
LS Updates/Irrigation/DG	10,000	SF	$	0.50	$	3,000.00
Perimeter Fencing						
New Fencing/Update Existing	5,000	LF	$	15.00	$	75,000.00
Equestrian Gate						
New Gate at North End	1	LS	$	10,000.00	$	10,000.00
Potential Dog Park						
Lawn/Irrigation/Limited LS/Fencing & Gates/Seating	1	LS	$	80,000.00	$	80,000.00
Entry Plaza Updates						
Stucco Repair/Paint walls	1	LS	$	15,000.00	$	15,000.00
Entry Landscape Refresh						
Main Entry at Tucson Boulevard	1	LS			$	7,500.00
East Entries at Cactus Boulevard	1	LS			$	5,000.00
Loop Entry/North Edge Interface	1	LS			$	5,000.00
				Sub Total:	$	440,500.00
				Contingency (10%)	$	44,050.00
				Contractor OH&P (15%)	$	72,682.50
				Sales Tax (6%)	$	33,433.95
				Total	**$**	**590,666.45**

Consolidate Trails

a. Reduce trail widths

b. Define trail edges with rocks

c. New seating

Revegetate Disturbed Areas

a. Repair and expand irrigation system

b. Container planting (Trees & Shrubs)

c. Topdress

d. revegetate abandoned trails

Upgrade Trail Network Signage

a. Replace sign graphics

b. Update signage stands

Stormwater Harvesting

a. Low impact development tools

i. Parking Lot

ii. Southeast corner of site on Cactus Blvd.

Interpretive Garden

a. Container planting (Shrubs)

b. Educational signage graphics

c. Signage stands

d. Define trail edges with rocks

Repair and Upgrade Perimeter Fencing

a. Add perimeter fence to missing areas

b. Upgrade perimeter fence to be consistent throughout

Upgrade Main Gate Access at Equestrian Area

a. Raise fence height

b. Remove step-through fence

c. Add gate and lock

Potential Dog Park Area

a. Perimeter fence/ vestibule

b. Dog drinking fountain

c. Waste & Clean-Up accessories

Entry Plaza Updates

a. Paint and finish touch ups

b. Container planting at park entries

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RIO VISTA NATURAL RESOURCE PARK

APPENDIX I

2022

PUBLIC SURVEY REPORT

Rio Vista Natural Resource Park

May 4, 2022, 2:27 PM

Contents

Rio Vista Natural Resource Park

What improvements do you want to see at Rio Vista Natural Resource Park

Summary Of Responses

As of May 4, 2022, 2:27 PM, this forum had:		**Topic Start**
Attendees:	360	March 8, 2022, 3:55 PM
Responses:	309	
Hours of Public Comment:	15.5	

QUESTION 1

How often do you visit Rio Vista Natural Resource Park?

		%	Count
Weekly		60.8%	188
A few times a month		16.8%	52
Monthly		11.3%	35
A few times a year		9.1%	28
Once a year		1.6%	5
Never		0.3%	1

QUESTION 2

If “Never” why not?

		%	Count
I have never heard of it		100.0%	1

QUESTION 3

When do you usually visit Rio Vista Natural Resource Park?

Rio Vista Natural Resource Park

What improvements do you want to see at Rio Vista Natural Resource Park

		%	Count
Morning		73.7%	227
Afternoon		36.0%	111
Evening		44.5%	137
I do not visit this park		0.3%	1

QUESTION 4

What do you usually do when you visit Rio Vista Natural Resource Park? (Select all that apply)

		%	Count
Special event		10.4%	32
Use the playground		22.7%	70
Use the ramadas		23.1%	71
Walk the Labyrinth		36.0%	111
Visit the Compassion Garden		19.2%	59
Walk, run, or bike the nature trail network		83.1%	256
Exercise-other than walking, running and biking		9.1%	28
Use the equestrian area		3.2%	10
I do not visit this park		0.6%	2
Other		25.0%	77

QUESTION 5

Rio Vista Natural Resource Park

What improvements do you want to see at Rio Vista Natural Resource Park

How safe do you feel when you visit Rio Vista Natural Resource Park?

Level of safety

		%	Count
Very safe		37.0%	114
Safe		51.3%	158
Neutral		8.8%	27
Unsafe		1.9%	6
Very unsafe		0.6%	2
N/A		0.3%	1

QUESTION 6

What are your priorities for park improvements? (place each in order of your highest priority first)

1. Natural Open Space and Native Plants
2. Walking Trails and Signage
3. Playground and grass area
4. Restrooms
5. Ramadas, Picnic Tables and Benches
6. Drinking Fountains
7. Parking Lot and Lighting
8. Equestrian Area

QUESTION 7

Are there any amenities not at this park that you would like to see?

Answered	193
Skipped	116

area areas been benches better bike dog dogs **equipment from** grassy irrigation **leash** like **love** **more** **native** natural **nice** pad

Rio Vista Natural Resource Park

What improvements do you want to see at Rio Vista Natural Resource Park

park people plants playground please **put** **resource** **s** **see** shade signage **signs** so **some** **splash** **swings** **trails** **trees** use **water**

QUESTION 8

What is your age?

		%	Count
15-19		0.3%	1
20-30		3.9%	12
31-40		15.9%	49
41-50		16.5%	51
51-60		16.8%	52
61-70		25.2%	78
71-80		20.1%	62
81 and over		1.3%	4

QUESTION 9

Which racial and ethnic group do you identify? (select all that apply)

		%	Count
American Indian or Alaska Native		1.0%	3
Asian or Asian American		2.9%	9
Black or African American		1.9%	6
Hispanic, Latino or Spanish origin		6.8%	21

Rio Vista Natural Resource Park

What improvements do you want to see at Rio Vista Natural Resource Park

		%	Count
Native Hawaiian or Other Pacific Islander		0.6%	2
White or Caucasian		89.0%	275
Other		3.9%	12

QUESTION 10

How far would you need to travel to get to Rio Vista Natural Resource Park?

		%	Count
Less than 1 mile		52.1%	161
1 - 3 miles		32.4%	100
3 - 5 miles		12.6%	39
Greater than 5 miles		2.9%	9

QUESTION 11

How would you travel to this park?

		%	Count
Public transit/ride share		0.6%	2
Personal vehicle		53.1%	164
Bike		36.6%	113
Walk		62.8%	194

QUESTION 12

Rio Vista Natural Resource Park

What improvements do you want to see at Rio Vista Natural Resource Park

How did you hear about this survey?

	%	Count
Post on Facebook	9.7%	30
Email from the neighborhood association	37.9%	117
Notification from the ward office	3.2%	10
A friend, family member, or neighbor	18.4%	57
Post on NextDoor	2.9%	9
Email from Parks and Recreation	1.9%	6
Sign at the park	21.7%	67
Email from Open Town Hall	0.6%	2
Other	3.6%	11

QUESTION 13

Additional Comments:

Answered	138
Skipped	171

all **also** **area** **areas** been **desert** **do** **dog** dogs from **its** **keep** like **love** **more** natural need owners **park** parks people **please** resource **rio** s see so some space thank **they** trails tucson **up** **use** **vista** **walk** was **who** **wildlife**

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RIO VISTA NATURAL RESOURCE PARK

APPENDIX II

2020

“RIO VISTA NATURAL RESOURCE PARK MASTER PLAN”

Rio Vista Natural Resource Park Master Plan

Prepared for the City of Tucson's
Parks and Recreation Department
November 2020

RillitoBend NEIGHBORHOOD ASSOCIATION

Table of Contents

Appendices

Acknowledgements

Mayor and Council

Regina Romero	Mayor
Lane Santa Cruz	Ward 1
Paul Cunningham	Vice Mayor and Ward 2
Paul Durham	Ward 3
Nikki Lee	Ward 4
Richard Fimbres	Ward 5
Steve Kozachik	Ward 6

Michael J. Ortega	P.E., City Manager
Albert Elias	Assistant City Manager
Joyce Garland	CFO/Assistant City Manager

Tucson Parks and Recreation Commission

Willie Blake	Chairperson and Ward 5 Appointee
Norma Coffman	Ward 2 Appointee
Robin McArdle	Ward 3 Appointee
Kendall Kroesen	Ward 4 Appointee
Steve Poe	Ward 6 Appointee
Lucy Porter	Mayor's Appointee

Tucson Parks and Recreation Department

Tim Thomure	Interim Director
Mike Hayes:	Deputy Director, Parks Operations
Greg Jackson	Deputy Director, Capital Planning
Ann Marie Jefferson:	Park Area Supervisor
Richard Langdon:	Parks Maintenance Coordinator
Sierra Boyer	Community Promotions/Marketing Manager
Ismael Galindo	Volunteer Coordinator
Glenna Overstreet	Administrator
Dominic Rullo	Parks Area Supervisor (Irrigation)
Howard Dutt	Landscape Architect
Lisa Lopez	Finance Manager
Iliana Gonzales	Capital Planning, Management Coordinator

Tucson Clean and Beautiful: Adapt-a-Park

Mattress Firm	Jared Sennet, District Manager

Advocacy Groups

RillitoBend Neighborhood Advocacy Group (RNAG)

RNAG is made up of residents of RillitoBend and sponsored by the RillitoBend Neighborhood Association (RBNA).

Stephen Brigham	RBNA President	Trica Oshant Hawkins
Lisa Fabrizio (lead)	RBNA Vice-President	Lindy Brigham
Estelle Stern-Eilers	RBNA Board Member	Sue Ann Breems
Mary Bird	RBNA Board Member	Linda Turner
Catlow Shipek	RBNA Board Member	Burke Beaumont
Sue DeArmond	RBNA Board Member	John Kovacik

Nearby Neighborhood Advocacy Group (NNAG) Representatives

NNAG is made up of residents in the neighborhoods within a 1.5 mile radius of Rio Vista Natural Resource Park.

Cabrini	Donna M. King
Campus Farm	Jim Brooker (Chair)
	Bonnie Poulos, contact
Hedrick Acres	Glenn Perkins (Co-Chair)
	Linda Drew (Co-Sec)
La Madera	Russ Scott
Mountain View	Maria Voris, VP
Richland Heights East	Maureen Pollack
	Sandra L Miller
Richland Heights West	John Mulholland
	Ellen Caldwell
Historic Winterhaven	Jennifer Pershing
Winterhaven Townhomes	Jennifer Treece

Special Thanks

Thanks to all the neighbors, volunteers, and local organizations that support the Park.

Archaeology Southwest	Rio Vista Conservation Project
AZ Native Plant Society	SW Monarchs
Desert Archaeology	Tucson Audubon
Native Seeds Search	Tucson Village Farm
National Phenology Network	Watershed Management Group

Executive Summary

The City of Tucson Parks and Recreation Department's mission is "to enrich our community through inclusive, innovative, fun programs, and safe, beautiful, sustainable places." Rio Vista Natural Resource Park was dedicated in 2010 as a natural resource park supporting both passive recreation and open space.

A natural resource is a naturally occurring substance or feature of the environment that can be exploited by humans; a park connotes a place that is protected and used for enjoyment. A "natural resource park" is thus a place that protects its natural resources for the enjoyment of others. At Rio Vista Natural Resource Park, its natural resources—its open space, its vegetation, and its wildlife—are protected. Now more than ever, due to climate change and neglect, we must act to protect and preserve this valuable asset.

Introduction

Purpose

The purpose of this project is to provide a Master Plan for the City of Tucson's Rio Vista Natural Resource Park, a 44 acre park situated in Tucson's midtown.

Vision

The vision for this Plan is to create a stakeholder-supported "road map" that represents the needs of both the City and the community in protecting and preserving this unique park. As one of the few natural resource parks in Tucson, the current and future state of this park is in crisis. Let's support Rio Vista's original intention and manage its precious resources.

Goals

The goals and objectives of this Master Plan are to:

1. Preserve and protect the "Natural Resource" concept of the Park.
2. Address immediate maintenance needs of existing infrastructure and vegetation.
3. Develop future actions, conservation projects and enhancements for educational opportunities and long term management and enjoyment of the park.
4. Establish a working relationship between the City's Parks and Recreation Department and the RillitoBend community.

This Master Plan is a living document. By working with the City's Department of Parks and Recreation, we of RillitoBend, along with our stakeholders and neighbors, shall provide the trajectory needed to preserve and restore this precious place.

Rio Vista Nattural Resource Park
located in the RillitoBend neighborhood

History of RillitoBend and the Park

A close-knit community of approximately 3,300 residents, RillitoBend has a long history of active engagement in preserving its open land in midtown Tucson. Refer to Appendix II to read about the neighborhood's history of its citizens' efforts to retain its rural qualities and its allure as a haven for artists and nature lovers.

In 1987, the City purchased 44 acres of land in the center of the RillitoBend neighborhood from its residents.

The development of Rio Vista as a Natural Resource Park posed significant challenges. Initially called the North Central District Park, it was envisioned as a built-out amenity like most of Tucson's public parks. Complicating the proposal was the participation of the University which, in exchange for some land swap, wanted to develop a driving range for the UofA golf program. Neighbors rallied to protect the open desert land. The process was contentious and involved many public meetings where most neighbors argued for an open, natural desert park consistent with the history and values of the surrounding neighborhood. Finally, with local newspaper articles and editorials supporting the neighbors' position, the City Council approved what was to become one of Tucson's first natural resource parks. With 2004 General Obligation Bond money of approximately $1.5 million, it "addressed community needs in an area of the County with a shortage of parks as defined by the City of Tucson." (Project No. CPRPRIOVP) The Park was dedicated in 2010.

Rio Vista Park was developed essentially as two parks: a developed section with amenities such as play and picnic areas with restrooms and an undeveloped, natural section. This document's focus is on the natural, undeveloped, natural section.

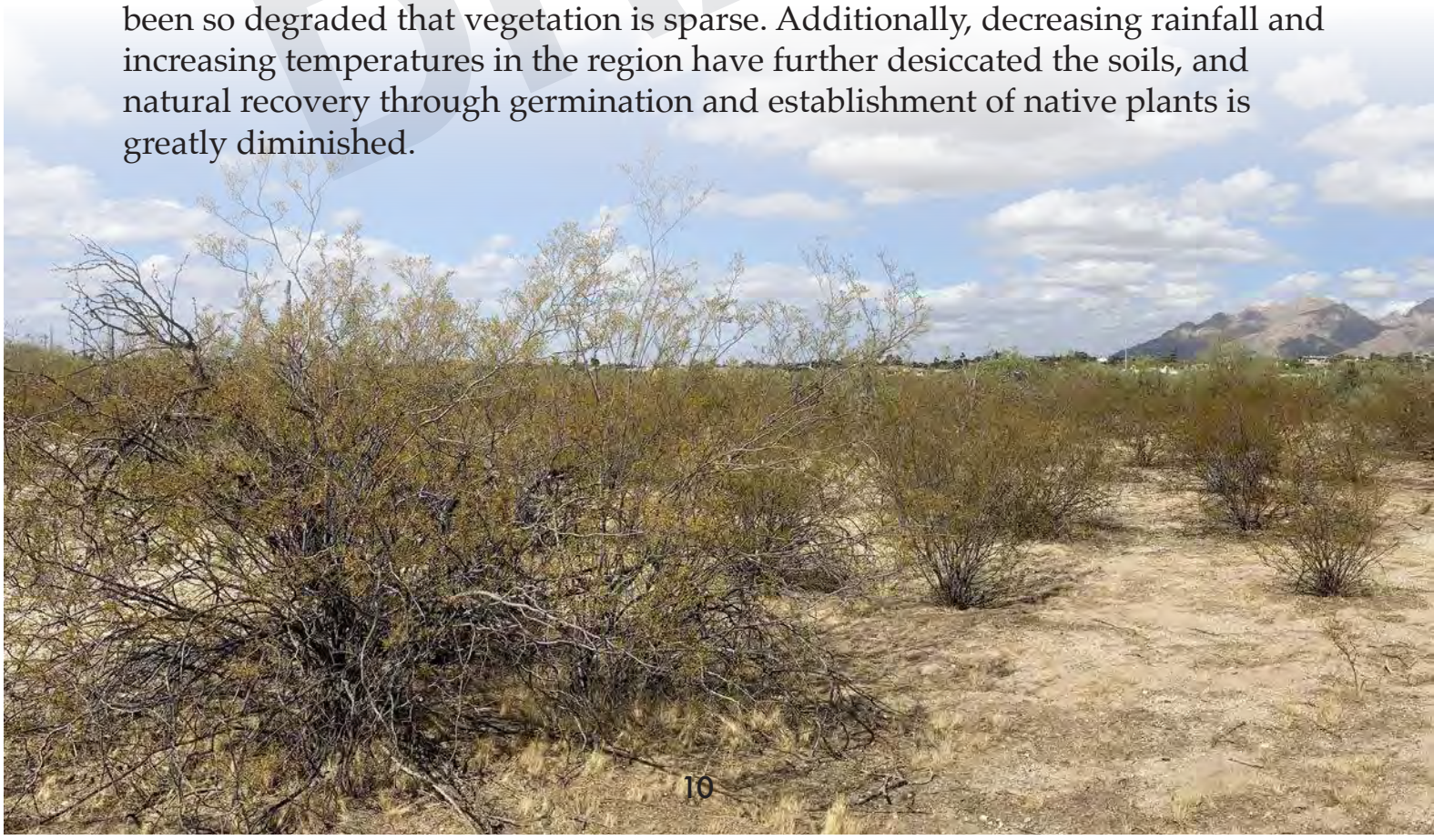
Natural Features of the Park

Rio Vista Natural Resource Park is situated on an alluvial floodplain on the south bank of the Rillito River.

Soils and Drainage

The site is relatively flat, with slopes ranging from 0 to 3 percent. Roughly half of the site's soils are classified as Arizo-Riverwash, composed of gravelly to very gravelly loamy sand. The other half are classified as Glendale silt loam, composed of silt loam at the surface and clay loam slightly deeper.

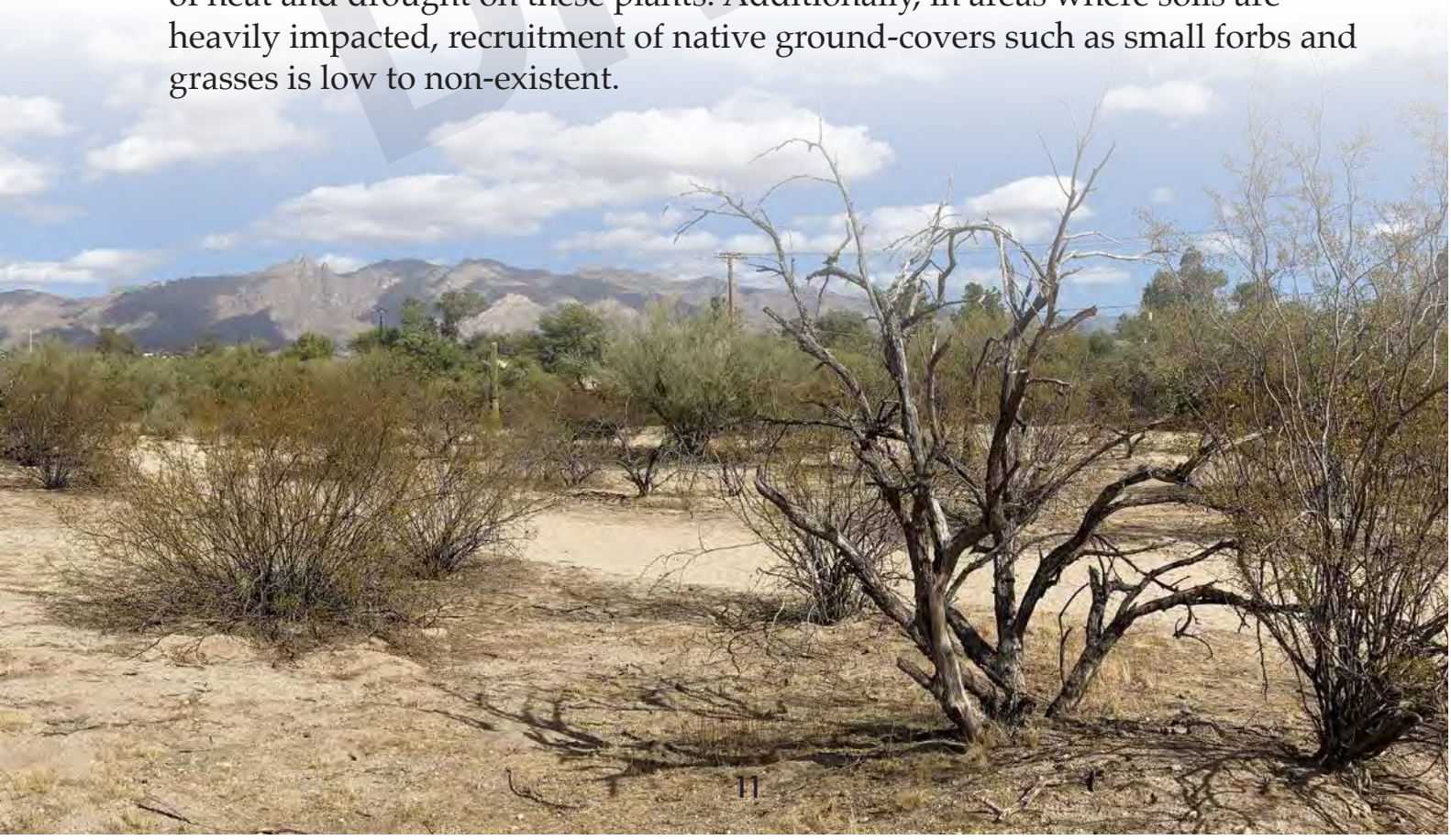
Several small washes cross the park, flowing gradually toward the northwest. Most of the washes have been interrupted or diverted by various park installations (playground, parking area) or other disturbances. Today, rainwater runoff that once ran in the park's washes is channeled northward along Cactus Blvd., entering the park only during extreme events at the lowest spots where washes intersect the road. On-site rainwater seeps into the soil or, in extreme events, sheet flows over the soil surface. Infiltration in the less disturbed areas is good, but in areas of high impact, the ground surface has become nearly impermeable and sheet flow or pooling is common. In these sites, the soil has been so degraded that vegetation is sparse. Additionally, decreasing rainfall and increasing temperatures in the region have further desiccated the soils, and natural recovery through germination and establishment of native plants is greatly diminished.



Vegetation

The majority of plants in the park are native to Arizona and the Sonoran Desert. Being so close to the Rillito, the park was historically riparian woodlands in areas closest to the river, and mesquite bosque as one moves farther from the river to the south. As recently as the 1990's Fremont cottonwood and Goodding's willows lined the river bank here. Over time, with the lowering of the water table, bank stabilization projects, and other habitat impacts, all of the original cottonwoods and willows are gone from the river's bank by the park.

Today, patches of the mesquite bosque still remain, primarily in lower-lying areas along the now mostly defunct washes. In the more open areas, plants such as creosote, desert broom, wolfberry, white thorn and catclaw acacia, and paloverde are common, but sparse. Smaller shrubs and forbs including burrowed, desert senna, and globe mallow are found in most areas of the park. Seasonally, the ground in some areas of the park may be covered with a variety of sunflowers cañaigre, and small, native grasses. These are all plants that have traditionally adapted to our arid, desert environment. Today, there is very little, if any, recruitment of the native shrubs and trees. Some of the older, established plants appear stressed or dying. There is extensive visual evidence of the effects of heat and drought on these plants. Additionally, in areas where soils are heavily impacted, recruitment of native ground-covers such as small forbs and grasses is low to non-existent.



Vegetation, cont'd

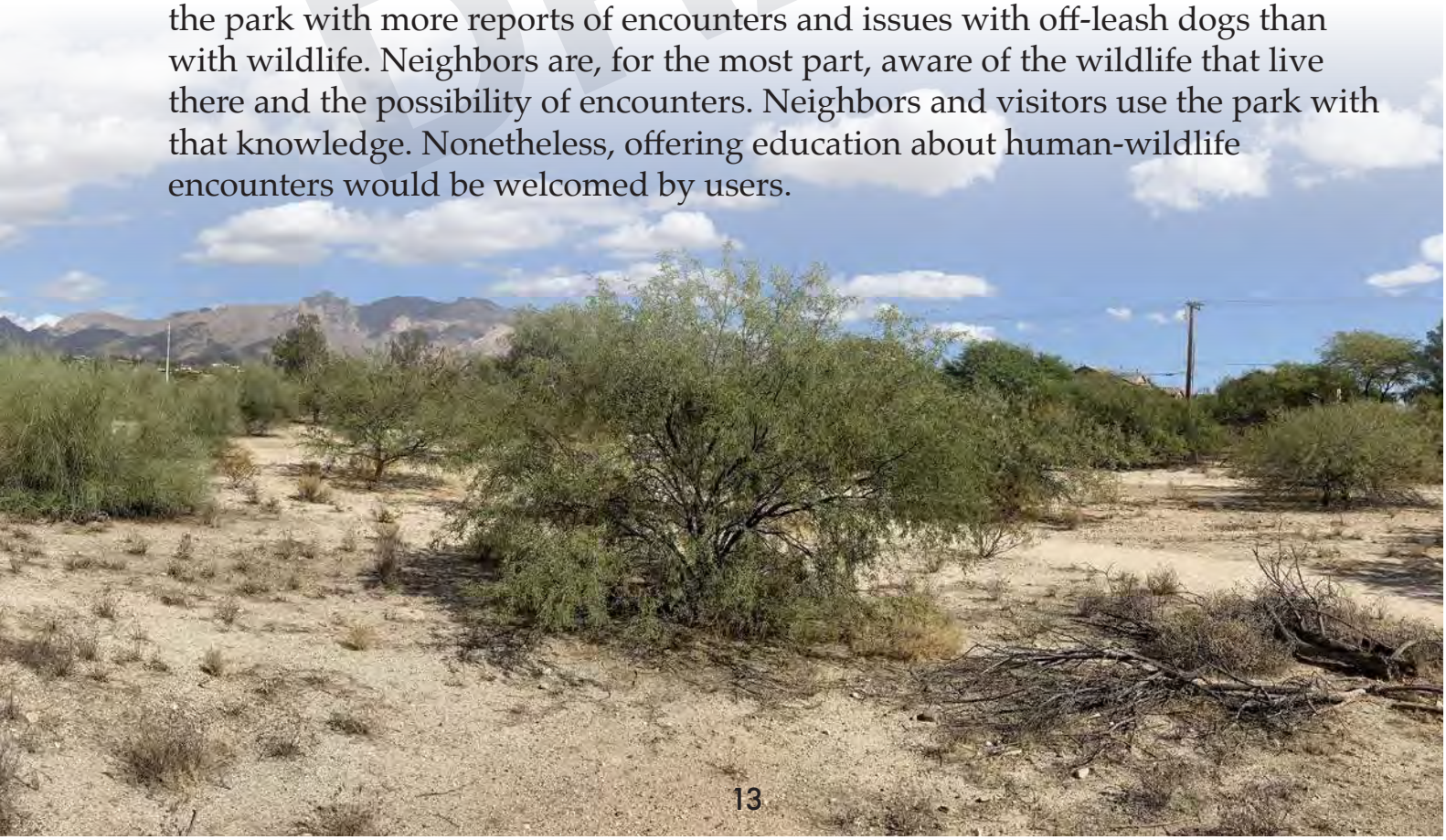
Several non-native species of plants have also become established in the park. Some of these are invasive and threaten native species. These include African sumac, Mediterranean grass, and London rocket, among others. Along the banks of the Rillito River at the north end of the park, buffelgrass has become an issue and several neighborhood-organized removal events have occurred. At the park entrance off Cactus Blvd. there is a stand of old eucalyptus trees, in which both Cooper's hawks and great horned owls have nested. These trees were once watered by the City but more recently have not been receiving supplemental water. Today, they are dead, stressed, or dying.

When the site was established as a Natural Resource Park in the 1990s, the City planted numerous small trees (mostly mesquite) in the more impacted areas at the north end of the park. Irrigation was provided to those saplings. Today, many of the irrigation emitters have been damaged and it is clear that the continued maintenance of these trees and irrigation system is necessary for these trees to become better established.

Wildlife

Given the Park's location proximate to the Rillito River, as well as its inherent native vegetation that provide food and shelter, the park is an important habitat for both native and migratory wildlife species. The park is important as a corridor for native species to move between the Rillito River and local neighborhood washes; it is a year-around home to several species of small mammals and nesting birds (and possibly coyotes); and the park also serves as an important migratory stop for birds during spring and fall migrations. The presence of native wildlife species is one of the elements that make Rio Vista Natural Resource Park unique--because it is managed as a native habitat, one can visit the park and regularly see native animals species. Mammal species that have been seen in the park include coyote, bobcat, desert cottontail rabbit, and javelina. Common native birds living year-around in the park include phainopepla, curved-billed thrasher, Cooper's hawk, great horned owl, Abert's towhee, and red-tailed hawk. Migratory birds that have been documented in the park include Peregrine falcon, western tanager, Lucy's warbler (likely nesting), ash-throated flycatcher (nesting), indigo bunting, and western bluebird.

It is understood that anywhere humans come into contact with wildlife, there is potential for conflict. The incidents of human-wildlife conflicts are rare within the park with more reports of encounters and issues with off-leash dogs than with wildlife. Neighbors are, for the most part, aware of the wildlife that live there and the possibility of encounters. Neighbors and visitors use the park with that knowledge. Nonetheless, offering education about human-wildlife encounters would be welcomed by users.



Even with the impacts to soils and native plants, the park is a welcome respite to the many neighbors and visitors who enjoy passive recreation activities there. From nearly every location in the park, one has a magnificent vista of the Santa Catalina Mountains. Park paths, lined with creosote and mesquite, wind through the site giving walkers the feeling of actually being in nature. This is a very different feeling from recreating in a wide-open grassy field, and one of the reasons so many people visit the park. Some areas of the park are more heavily wooded – remnants of the former mesquite bosque. At these sites, one can truly feel as though they have escaped the hustle and bustle of the city – and yet they are right in town, close to their own residence. It is these natural elements of this Natural Resources Park that make Rio Vista such a gem in the crown of the City of Tucson's park system.

We enjoy birding at the Rio Vista Natural Resources Park. It is an in-town, convenient location to spend time looking for birds and enjoying nature. It's location on the Rillito River riparian corridor is ideal for attracting birds and other wildlife. Over 133 bird species have been reported from Rio Vista to Cornell University's eBird database. It's a great place!

Betty and Peter Bengtson
Tucson Audobon

What a peaceful place, and it is right in town! I hear the owls' hooting at night, and almost everytime I walk past the park, I see a hawk. And if I am lucky, I see a Coopers and a Red Tail the same day!

Mary
RillitoBend

Key Issues

To address the multiple challenges identified for The Rio Vista Natural Resource Park, the RillitoBend Neighborhood Association has developed the following recommendations to maintain, preserve, and enhance the park.

1. Preserve and protect the "Natural Resource" concept of the Park.
2. Address immediate maintenance needs of existing infrastructure and vegetation.
3. Develop future actions, conservation projects and enhancements for educational opportunities and long term management and enjoyment of the park.
4. Establish a working relationship between the City's Parks and Recreation Department and the RillitoBend community.

These issues are critical to the life of the Park. For long-term survival of the Park, a more thorough analysis of the Park's challenges and solutions will be conducted in a Conservation Plan, an outline of which can be found in Appendix I.

Rendering of Rio Vista Natural Resource Park by Olsson Associates, (date?).

1 Preserve and protect the "Natural Resource" concept of the Park.

Background The Rio Vista Natural Resource Park is relatively small given its objective of providing undeveloped natural open space for the unstructured enjoyment and passive recreation of the community. Approximately twenty-five percent of the original Park plan was conceded to development with a large grassy area set aside for a playground, restrooms and picnic ramadas. The remaining seventy-five percent was left as 'natural' (interpreted as untouched) but it still needs to be managed to preserve its integrity as a natural resource park.

In addition, the park has been prone to "embellishments" such as a Compassion Garden, several memorial benches and more recently a push for a large sculpture—all of which is counter to the original concept. RillitoBend and its neighbors would like to protect the park from seemingly random additions such as art sculptures, memorial benches, and miscellaneous built structures, unless they speak to the inherent nature of the park and are approved by the RillitoBend Neighborhood Advocacy Group (RNAG).

Remedies

a. Through this working relationship, include the RillitoBend Neighborhood Advocacy Group (RNAG) in all decisions regarding changes to the Park.

b. Limit ad hoc placement of vegetation and structures in the Park. Consult with the RNAG before any new development is initiated.

2 Address immediate maintenance needs of existing infrastructure and vegetation.

Three critical areas need to be addressed to maintain the existing vegetation: 1) irrigation, 2) invasive species, and 3) paths.

a. Irrigation – existing and extension

Background Maintenance of existing trees and shrubs is critical for the health and survival of the area as a natural resource park. The trees provide a canopy to protect the smaller plants and animals from the intense heat and sun. They create habitat by providing food and shelter for animals like coyote, bobcat, owls, and raptors. Given the ranching history of the Park, much of the soil has become compacted by cattle and horses, and some vegetation has been trampled. Though the Conservation Plan (see Appendix I) will address the restoration of the soil and groundcover plants, the more immediate concern is saving the large, established trees.

The original plan for the park addressed the restoration of the historical mesquite bosque environment. Mesquite saplings were planted north and east of the developed area. These new trees and nearby shrubs are watered through a drip irrigation system, using reclaimed water. Irrigation lines were also installed to support the taller trees to the south. Unfortunately, the irrigation lines have broken or been misdirected and many of the emitters have been damaged, so many of the irrigated plants, including the large trees, are stressed or dying. There is water available for trees on the eastern side of the park, but this has not been recently utilized. Decades ago, however, the large eucalyptus trees on that side of the park did have water. The building of the Riverwood community on the east side of the park, impeded the natural drainage to the park, further stressing the trees and original plantings.

Ongoing drought and climate change have exacerbated the environmental conditions, and it is critical that we preserve the trees and other original plantings.

Remedies

i. Maintain and repair existing irrigation.
ii. Plan for extension of irrigation to original plants.
iii. Resume irrigation with existing water lines of the tall trees that are documented habitat for raptors until an overall conservation plan for the park determines their fate.

b. Invasive Species - removal and management

Background Though most of the Park's plants are native, non-native plants such as oleander, African sumac and olive trees were planted around the homestead during its days as a ranch. In addition, invasive species like cheatgrass, Mediterranean grass, and London rocket have encroached in several areas. The very invasive and fire-prone buffelgrass is taking hold at the edges of the Rillito River and could potentially become an issue in the park if not managed

Remedies

i. Remove the fast growing and spreading invasive species such as cheatgrass before reseeding can occur. Continue to remove buffelgrass in areas proximate to the park.

ii. Consider removal or maintenance of the non-native, established plants but with less urgency. The final Conservation Plan will determine to what extent these non-native plants should be managed or removed.

c. Path Maintenance

Background In recent years the open space, 'natural' areas of the Park have been severely degraded with rogue paths cut across significant parts of the park so much that in some areas it is unclear where designated paths are. These rogue paths are the result of a combination of equestrian, pedestrian and off leash dog use.

Remedies

i. Maintain minimal pathways through the 'natural' areas. This will require closing paths that have been created since the original masterplan and/or revising paths based on an analysis of natural area management given environmental conditions.

ii. Develop and enforce rules for horses and pedestrians.

iii. Post rules (attractive and eye-catching) at all entrances including where horses and pedestrians are entering the park.

iv. Develop low, natural looking physical barriers to discourage off-path use.

3 Develop future actions, conservation projects and enhancements for educational opportunities and long-term management of the Park.

There are significant needs for the Park beyond the immediate needs identified in the above sections. A comprehensive Conservation Plan is critical to ultimately accomplish the restoration of the Park and ensure long-term preservation as envisioned by the original stakeholders.

In addition, future enhancements of existing structures should be considered and educational opportunities pursued, all geared to the long term preservation of the park.

Lastly, funding sources need to be pursued through grants, non-profits and local organizations and individuals.

a. Conservation Plan

Background The original plan for the Rio Vista Natural Resource Park focussed on developing the built areas such as the delineation of grass area, playground, parking lot, and entrance way. The natural areas were outlined, and the 'bosque' area was planted with trees and irrigation, but no detailed conservation planning was undertaken for the majority of the 'natural' areas. Because of our continuing drought, with climate change predicted to bring even warmer and dryer conditions to the Southwest, coupled with the increased usage of the park, it is imperative that a comprehensive Conservation Plan be developed for the Park's natural areas..

The Conservation Plan will be a comprehensive study of the underlying threats to the health of the park: its soil, water management, human usage, etc. This approach will be strategic and targeted.

Of critical concern for the Conservation Plan is restoration of the soils. As a working cattle ranch, and now with the continued impact of horses, the soil is compacted and in many places devoid of the desert crust so critical to the survival of vegetation long term.

a. Conservation Plan, cont'd

Wash restoration and water harvesting: (discussion of Shannon Wash as example?) A current issue for residents surrounding the park is flooding during rainstorms. Washes in the area --- (I think I'm going to get Catlow to contribute to this!!!!!) For example, address the blockage from the nearby River Wood development. This blockage affects a major water source for the park during a rain.

Over the years, interested neighbors have noted the state of the park and started to work on remedies for problems that have been identified. We can build on the efforts already undertaken. See the draft Conservation Plan in Appendix I.

b. Future Enhancements of Existing Structures and Practices

The entrance portal on Tucson Boulevard is currently a structure without much function and has been neglected. Past graffiti abatement was poorly done, overall paint has long since faded, and the entire structure reflects poorly on the Park. Rethinking the purpose of the structure and re-imagining its design to include educational opportunities would be a welcome start.

Wherever possible, additional resources should be put to enhancing the community participation and educational (see below) amenities of the park. Existing signs in the park need a facelift: their graphics are faded, and the structures a bit shabby.. The signs should be redone to be more engaging, durable and informative.

The ongoing use of large Parks and Rec maintenance trucks continues to degrade the Park itself. Their traversing the Park further compacts the soil and prevents any vegetative growth. One solution would be to erect a small shed to house a quad with trailer and maintenance tools. Maintenance crews would then be able to access the Park with a smaller, lighter, and more nimble vehicle, allowing vegetation to survive.

c. Educational Opportunities

Engaging and educating the public about the Park and its natural resources has obvious benefits for the visitor. They become more reverent and knowledgeable about its plants and animals. And in return, the Park becomes the ultimate beneficiary. The more people know that this Park and its biodiversity, the better off the Park will be.

The Park is used by people with many different intellectual backgrounds and interests including birding, research, plant identification, and many as yet unknown pursuits. Examples of educational opportunities include providing bird, animal, and plant lists for people interested in the natural aspects of the park. A 'nature trail' could be established to guide people through the various aspects of the Park. An online phenology trail could be created for interested citizen scientists. The entrance could be enhanced to include plaques, information distribution kiosks, tables for natural groups such as Audubon and the Arizona Native Plant Society to provide literature and expertise for their educational outreach efforts.

d. Funding Opportunities

Understanding that the City has limited funding for many, if not most of the issues outlined in this Plan, the Rillitobend Neighborhood Advocacy Group will lead the effort to enlist support from various sources both local, state, and national agencies.

Many of the educational opportunities can be solicited from the various organizations that regularly use the park (see Appendix IV). Most of these organizations, especially if they are non-profits (501©3s) have a requirement to educate. The University of Arizona Extension Center is in the neighborhood and is in the business of education. Collaboration with many of these organizations would benefit both the visitors to the Park and the organizations.

Local, State and Federal Agencies have grant opportunities that will be pursued as well as the Pima County Bond Program. The RBNA has voiced concern over the plan to use Proposition 407 monies to install a 'splash pad' in the Park. This money would go a long way to implementing many of the current and future needs of the Park.

4 Establish a working relationship between the City's Parks and Recreation Department and the RillitoBend community.

Elements of a working relationship are based on inclusion, trust, and open communication among the stakeholders agreeing to mutually beneficial goals.

The RillitoBend Neighborhood Advocacy Group (RNAG)—supported by the Board of Directors of The RillitoBend Neighborhood Association (RBNA)—will represent the community (which includes 24 Homeowners Associations). The Nearby Neighborhood Advocacy Group (NNAG), made of representatives from the eight surrounding Neighborhood Associations located within a 1.5 mile distance from the Park, has collaborated with RNAG to create one voice, led by RNAG, to partner with the City of Tucson's Parks and Recreation Department in representing the needs of Rio Vista Natural Resource Park.

This document will help to establish a more formal relationship between the City's Parks and Recreation Department and the RillitoBend community.

DRAFT

RIO VISTA NATURAL RESOURCE PARK

APPENDIX III

2021

"RIO VISTA NATURAL RESOURCE PARK: A PLAN FOR ITS FUTURE"

Rio Vista Natural Resource Park: A Plan for Its Future

Prepared for the City of Tucson's Parks and Recreation Department
by the RillitoBend Neighborhood Association
January 2021

RillitoBend
NEIGHBORHOOD
ASSOCIATION

Cover: Morning view of one of Rio Vista Natural Resource Park's entrances on Cactus Blvd

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Appendices

Supporting Groups

Various supporting groups are working with the RillitoBend Neighborhood Association (RBNA) to protect, enhance, and manage the unique natural and cultural resources of this Park.

RillitoBend Neighborhood Association (RBNA) Board

RBNA is spearheading the effort to preserve the Park.

Stephen Brigham (President)
Linda Agen
Mary Bird
Terry DeCarolis
Lisa Fabrizio
Shirley Foerster
Nancy Fung
Wallace Kinkade
John Kovacik
John O'Hare
Cass Peel
Catlow Shipek
Estelle Stern-Eilers
Murray/Sue DeArmond (Advisors)

RillitoBend Neighborhood Advocacy Group (RNAG)

RNAG is made up of the RBNA Board (above) and the following residents of RillitoBend who are passionate about the Park and care about its future. Sponsored by the RillitoBend Neighborhood Association (RBNA).

Burke Beaumont
Sue Ann Breems
Lindy Brigham
Melanie Campbell-Carter
Trica Oshant Hawkins
Mary Alice Keller
Kay Matthews
Vicky Stromee
David Tiers
Justin/Linda Turner
Sandy Young

RillitoBend NEIGHBORHOOD ASSOCIATION

www.rillitobendna.org

Nearby Neighborhoods Group (NNG)

NNG is made up of residents of the neighborhoods within a 1.5 mile radius of the Rio Vista Natural Resource Park, who have a vested interest in the Park's future, and who are consulted by the City when major changes are considered.

Cabrini	Donna M. King
Campus Farm	Jim Brooker (Chair)
	Bonnie Poulos, contact
Hedrick Acres	Glenn Perkins (Co-Chair)
	Linda Drew (Co-Sec)
La Madera	Russ Scott
Mountain View	Maria Voris, VP
Richland Heights East	Maureen Pollack
	Sandra L Miller
Richland Heights West	John Mulholland
	Ellen Caldwell
Historic Winterhaven	Jennifer Pershing
Townhomes at Winterhaven	Jennifer Treece

Special Thanks

Thanks to all the neighbors, volunteers, and local organizations that support the Park.

Archaeology Southwest
AZ Native Plant Society
Desert Archaeology
HawkWatch International
Hitching Post Ranch at Gentleman's Acres
Mattress Firm (Tucson Clean and Beautiful)
Native Seeds/SEARCH
National Phenology Network
Rio Vista Conservation Project
SW Monarchs
Tucson Audubon
Tucson Village Farm
Watershed Management Group

And to

the City of Tucson's Ward 3 Office and
the Parks and Recreation Department for their guidance and support.

What is a Natural Resource Park?

A natural resource is a naturally occurring substance or feature of the environment. Natural resources can be, and often are, exploited by humans. A park connotes a place that is protected and used for enjoyment. A "natural resource park" is thus a place that protects the health of its natural resources including the vegetation, wildlife, and landscape as well as its inherent hydrologic and ecologic functions, for the enjoyment of others. At Rio Vista Natural Resource Park, its natural resources—its open space, its vegetation, and its wildlife—are protected, while also being enjoyed by visitors through passive recreation. The Natural Features of the Park can be found in Appendix I.

Introduction

Rio Vista Natural Resource Park, a 40-acre City Park in the RillitoBend neighborhood in midtown Tucson, is a welcome respite to the many visitors who enjoy its open space and passive recreational activities. Studies have shown the positive effects on mental health from being in nature, and the Park's undeveloped section offers just that: nature. Situated on an alluvial plain of the Rillito River, Rio Vista retains remnants of its original mesquite bosque, supporting a diverse array of native and migratory wildlife. Park paths, lined with creosote and mesquite, with views of the Santa Catalinas beyond, wind through the site giving walkers the sense of actually being in nature. This is a very different feeling from that of an open grassy field, and one of the reasons so many people visit the Park. One can truly feel as though they have escaped the city, and yet they are right in town. These natural elements of this Park are what make Rio Vista such a gem, and they are in jeopardy.

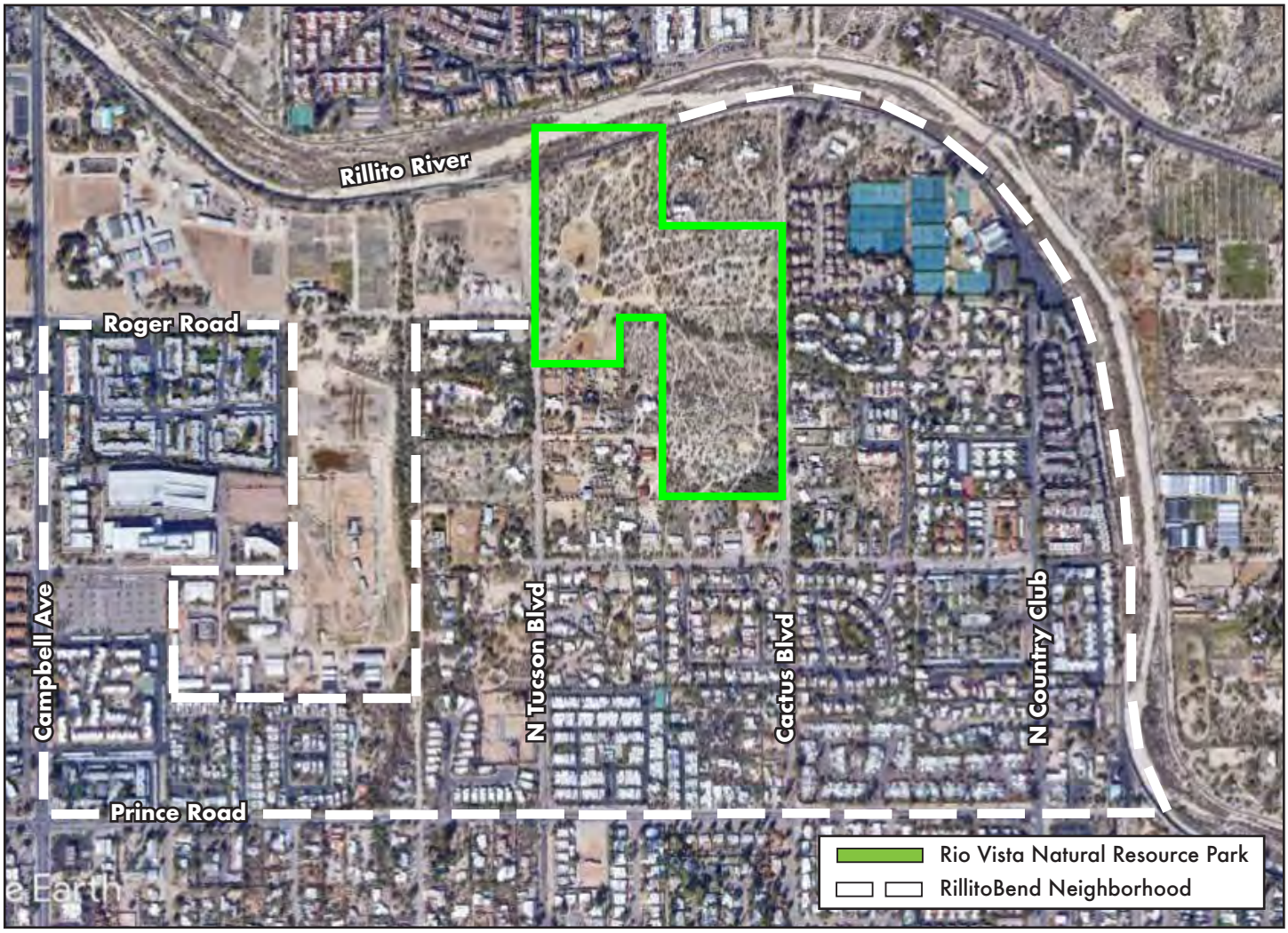
While most parks have standard procedures of care for their fields and facilities, Rio Vista, which is mostly undeveloped open space, requires different management procedures. Increased usage, long-term drought, neglect, and changing community concerns over the past 20+ years require reevaluating the management of the Park.

The main issues that threaten the future of the Park are:

1. encroachment of the Park's natural areas from "built" and "placed" human-made structures;
2. loss of natural stormwater flows from neighboring areas to support riparian habitat within the park due to drainage modifications and reduction in infiltration capacity to replenish soil moisture and shallow groundwater;
3. recent expansion of "social" or "rogue" trail networks which have led to the degradation of soil health and native vegetative cover;
4. maintenance of park infrastructure including supplemental irrigation systems associated with native mesquite tree plantings, presence of invasive and non-native plant species, and formal trail networks; and
5. legacy impacts from historic land use and management limiting resilience to drought and climate change.

These issues are critical to the life of the Park. For its long-term survival, a more thorough analysis of the Park's challenges and solutions will be conducted in a Conservation Plan, an outline of which can be found in Appendix III. The challenges of the watershed can be found in Appendix II.

Now more than ever, we must act to protect and preserve this valuable asset.



Rio Vista Natural Resource Park is located in the RillitoBend neighborhood of Tucson, AZ.

History of RillitoBend and the Park

A close-knit community of approximately 3,300 residents, RillitoBend has a long history of active engagement in preserving its open land in midtown Tucson.

In 1987, the City purchased approximately 40 acres of land in the center of the Rillito-Bend neighborhood from its residents with the intent to provide a park for the residents.

The development of Rio Vista as a Natural Resource Park posed significant challenges. Initially called the North Central District Park, it was envisioned as a built-out amenity like most of Tucson's public parks. Neighbors rallied to protect the open desert land. The process was contentious and involved many public meetings where most neighbors argued for an open, natural desert park consistent with the history and values of the surrounding neighborhood. Finally, with testimony from numerous neighbors, local

newspaper articles, and editorials supporting the neighbors' position, the City Council approved what was to become one of Tucson's first natural resource parks. The initial plan was implemented in 1999 and represented both built-out and natural areas within the Park, a compromise between the City and the residents.

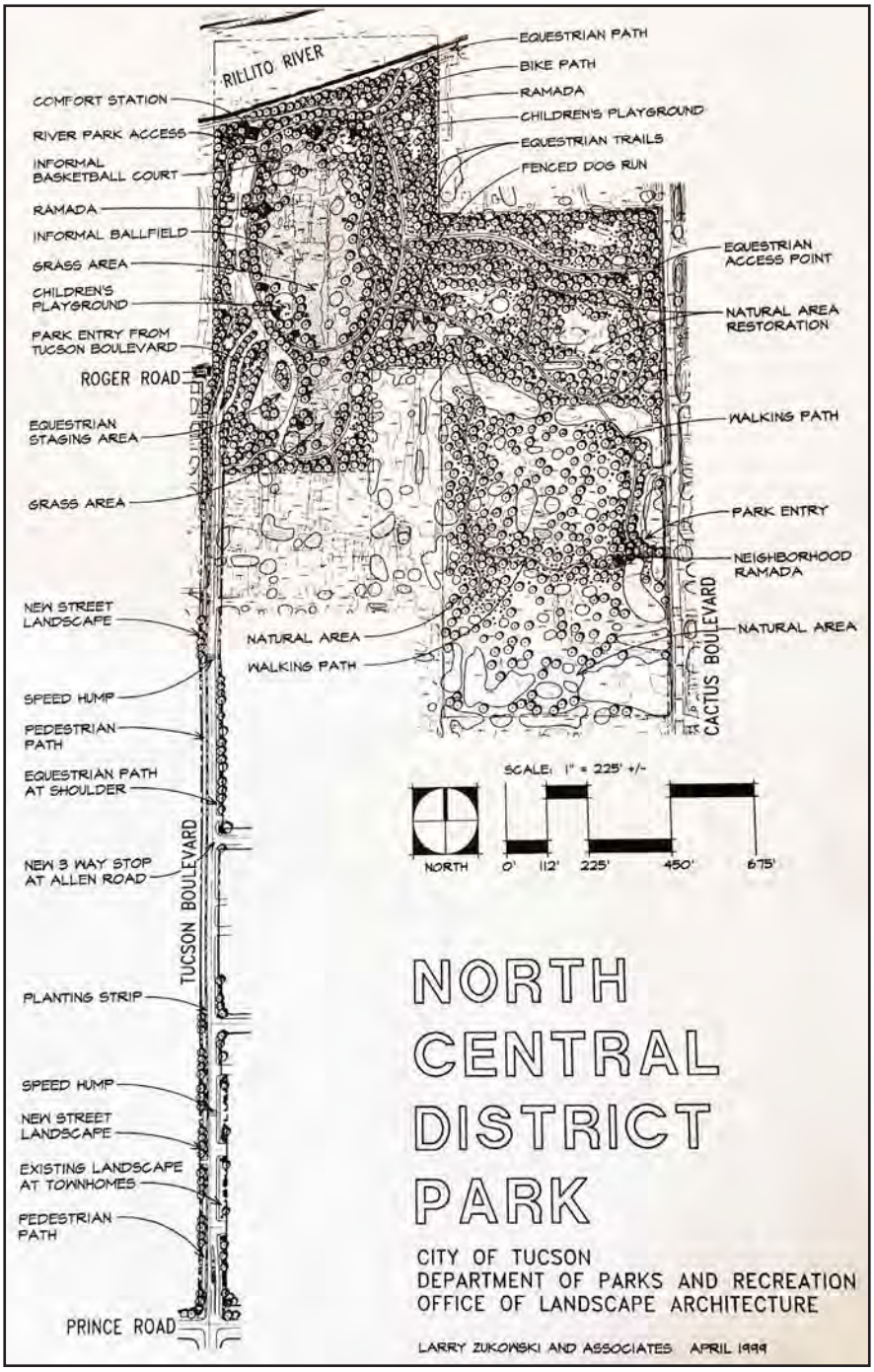
In 2008, Pima County's General Obligation Bond money of approximately $1.5 million was used to enlarge the grassy area, install restrooms and shade structures, plant/irrigate trees, and improve the egress to the River Park Loop Trail. The Park was dedicated in 2010.

Today, roughly a quarter of the Park has built-out amenities: a playground, picnic tables, grassy field, benches, drinking fountains, a bike rack, and restrooms. The remaining three quarters of the Park are undeveloped: walking paths among mesquite, creosote, and large eucalyptus trees.

Recently, the Park has become prone to "embellishments" such as a Compassion Garden, several memorial benches and more recently a large sculpture—all of which is counter to the original concept. RillitoBend and its neighbors would like to protect the Park from seemingly random additions and miscellaneous built structures unless they speak to the inherent nature of the Park.

Refer to Appendix V for more information about the Park's history and the neighborhood's efforts to retain its rural qualities and its allure as a haven for artists and nature lovers.

The Park's dedication in 2010 brought out dignitaries from the City and County.



An early Landscape Plan of the North Central District Park
(aka Rio Vista Natural Resource Park) showing the developed
and undeveloped areas
by Larry Zukowski and Associates, 1999

Rio Vista Natural Resource Park
Rendering by Stephen Brigham, 2020

Vision

We envision Rio Vista Natural Resource Park to be a local, accessible example of the greater Sonoran Desert. Through appropriate management, we envision the Park supporting healthy populations of native wildlife and vegetation while maintaining its open space elements for community enjoyment. The Park's vision is the community's vision—that of enjoyment in nature.

Purpose

The purpose of this document is to provide the City of Tucson's Parks and Recreation Department with an overview of the important issues that concern RillitoBend and the neighborhoods surrounding the Rio Vista Natural Resource Park. With this document, the Parks and Recreation Department, slated to start its Master Planning process in the 2nd quarter of 2021, will be better equipped and informed to execute its Master Plan in a timely manner.

By creating a stakeholder-supported "road map" that represents the needs of both the City and the community, we can protect and preserve this unique Park. As one of the few natural resource parks in Tucson, the current and future state of this Park is in crisis. This Plan supports Rio Vista's original intention and offers an informed overview of the Park's current conditions along with suggested guidelines for managing its precious resources.

We enjoy birding at the Rio Vista Natural Resource Park. It is an in-town, convenient location to spend time looking for birds and enjoying nature. Its location on the Rillito River riparian corridor is ideal for attracting birds and other wildlife. Over 133 bird species have been reported from Rio Vista to Cornell University's eBird database. It's a great place!

Betty and Peter Bengtson
Tucson Audobon

It has been joyful to experience its undeveloped open space in such close proximity to our neighborhood and the river. We have walked together (or with dogs), run, or contemplated Rio Vista in silence a couple times daily during these 2+ decades. And as we proceeded to significantly enhance the natural resource character of our own property over the years, we have always dreamed of what Rio Vista too could become. Of course, it would be simpler in natural scope within each of its many more acres; however its very size allows for countless resources to be conserved, enhanced and frankly nurtured from scratch.

John Kovacik & Leslie Eldenburg
Nearby residents of the Park

My husband and I live in midtown Tucson so we relish the expansive views and proximity of the Catalina Mountains from Rio Vista Park by the Rillito River. It's spectacular any time of day, but it is especially delighting at sunset.

There is a large grassy area near the park entrance which tends to be heavily populated since it has a well equipped playground, shade trees and picnic tables. It also attracts dog walkers.

We prefer the more solitary natural desert paths to the east although they appear to be especially fragile and vulnerable to overuse. There we may see an occasional horseback rider from the nearby stables, and we have encountered a variety of wildlife as well.

When we stumbled upon the labyrinth constructed from local rocks for the first time. It was a marvelous surprise, and we now try to incorporate it during most of our walks.

We realize it is a real challenge to oversee such a varied park of this size, but it is obviously enjoyed by residents and visitors to Tucson alike. We do hope it will be intensively maintained as a natural resource for generations to come.

Marcia Spark
Long-term Tucson resident
U of A Extension Master Gardener

Goal

The stated goal of this Plan is to preserve and protect the "Natural Resource" concept of the Park in line with the above vision statement.

Objectives

To achieve this goal the following objectives will address the issues that threaten the Park:

1. Address immediate maintenance needs of existing infrastructure and vegetation.
2. Implement an action plan that will enhance the native riparian habitat, restore the health of the natural open space, support educational opportunities, and foster long-term stewardship and enjoyment of the Park.
3. Establish a working, collaborative relationship between the City's Parks and Recreation Department and the RillitoBend community.

Recommendations to Achieve Our Shared Goal to Preserve and Protect the "Natural Resource" Concept of the Park

The Rio Vista Natural Resource Park is relatively small given its stated objective to provide undeveloped natural open space for the unstructured enjoyment and passive recreation of the community. Approximately twenty-five percent of the original Park plan was devoted to development with a large grassy area set aside for a playground, restrooms, and picnic ramadas. The remaining seventy-five percent was left as 'natural' (interpreted as untouched) but it still needs to be managed to preserve its integrity as a natural resource.

The objectives stated as follows include recommended actions to help us achieve the goal of preserving and protecting Rio Vista as a Natural Resource Park for generations to come.

1 Objective: Address immediate maintenance needs of existing infrastructure and vegetation

Three critical areas need to be addressed to maintain the existing vegetation: a) irrigation, b) invasive species, and c) paths.

A view north to the Catalina Mountains from Rio Vista Natural Resource Park, where the land is relatively flat and soil compacted in areas.

a. Irrigation: Existing and Extension

Background: Re-establishing native trees and shrubs is critical for the long-term health of the natural areas within the Park. The native trees provide a canopy to protect the smaller plants and animals from the intense heat and sun. They create habitat by providing food and shelter for animals like coyotes, bobcats, owls, and raptors. A Conservation Plan (see Appendix III), will address the restoration of the soil and ground cover plants, but the more immediate concern at this time of record drought paired with record high temperatures is preserving the native trees.

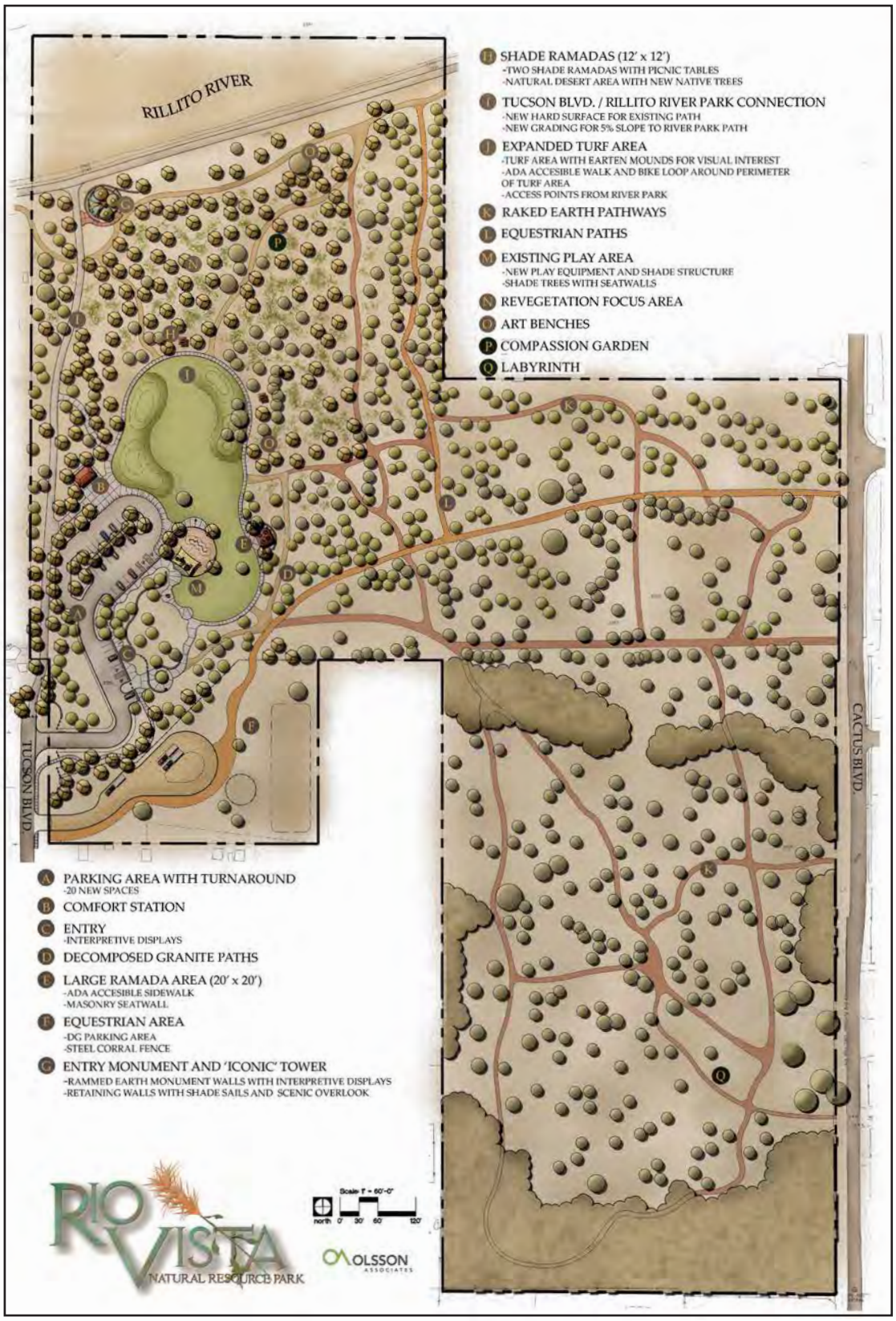
The original plan for the Park addressed the restoration of the historical mesquite bosque environment. Mesquite saplings were planted north and east of the developed area. These newer trees and nearby shrubs are watered through a drip irrigation system using reclaimed water. The irrigation to these trees is in disrepair. In addition, many of these trees need their original tree stakes removed.

A cluster of non-native trees (olives and eucalyptus) associated with the historic ranch house in the southeastern portion of the Park are in crisis. The historic irrigation lines have broken or been misdirected, and emitters damaged, resulting in many of these non-native trees becoming stressed or dying.

Changes in the natural drainages which fed the Park resulting from surrounding residential developments and road conveyance and grading has further stressed the native and non-native plants throughout the Park. Ongoing drought and climate change have exacerbated the environmental conditions. Until comprehensive restoration actions are initiated to enhance stormwater infiltration and promote native habitat, it is imperative that the following remedies be implemented.

Specific Recommendations

- Maintain and repair existing irrigation to support native trees and the few remnant non-native "tall" trees which provide critical raptor perches.
- Plan for extension of irrigation to future restoration areas to support establish ment of new plantings.



Map of Rio Vista Natural Resource Park
Rendering by Olsson Associates, 2009

b. Invasive Species: Removal and Management

Background: Though most of the Park's plants are native, non-native plants such as oleander and olive trees were planted around the original homestead off Cactus Blvd. In addition, invasive species like African sumac (*Rhus lancea*), stinknet (*Oncosiphon pilulifer*), cheatgrass, Mediterranean grass, and London rocket have encroached in several areas. The very invasive and fire-prone buffelgrass is taking hold at the edges of the Rillito River and could potentially become an issue in the Park if not managed.

Specific Recommendations

- Remove the fast growing and spreading invasive species such as African sumac before reseeding can occur. Continue to remove buffelgrass in areas proximate to the Park.
- Consider removal or maintenance of the non-native "tall" trees as part of a comprehensive phased mesquite bosque riparian restoration approach in concert with the Park's Conservation Plan.

c. Path Development

Background: In recent years the open space, 'natural' areas of the Park have been severely degraded with rogue paths cut across significant parts of the Park so much that in some areas it is unclear where designated paths are. These rogue paths are the result of a combination of equestrian, pedestrian, and off-leash dog use.

The formal path network also needs attention. The lack of stormwater diversion strategies has resulted in many trails capturing and conveying stormwater which promotes trail surface erosion, areas of ponding, and the widening of trails as users navigate poor trail conditions. Additionally, the use of heavy trucks on trails has led to trail widening and compaction of adjacent soils supporting native plants.

Specific Recommendations

- Develop a new pathway system with minimal pathways through the 'natural' areas. This will require closing paths and/or revising paths based on an analysis of natural area management given environmental conditions and include stormwater harvesting practices.
- Develop and enforce rules for horses and pedestrians.
- Post rules (attractive and eye-catching) at all entrances about staying on the paths and keeping dogs on leash.
- Develop low, natural looking physical barriers to discourage off-path use.
- Minimize use of maintenance vehicles in the natural areas.

Mesquite bosque on the north side of the Park, remnants of a riparian woodland.

2 Objective: Implement an action plan that will enhance the native riparian habitat, restore the health of the natural open space, support educational opportunities, and foster long-term stewardship and enjoyment of the Park

There are significant needs for the Park beyond the immediate needs identified in the above sections. A comprehensive Conservation Plan is critical to accomplish the restoration and long-term health of the Park.

In addition, future enhancements of existing structures should be considered and educational opportunities pursued, all geared to the enjoyment and awareness of the Park by its visitors, ensuring long-term preservation of the Park.

For all the considered improvements and enhancements to the Park, any changes should always consider the area surrounding the Park. Other City entities have projects in the vicinity of the Park such as the "Treat Avenue Bicycle Boulevard" which will run north down Cactus Boulevard to the Rillito River Park. The RillitoBend Neighborhood Association has developed a vision for the Neighborhood with enhancements to Cactus Blvd. that should be considered when making changes to the Park in addition to the watershed issues. (See Appendix VII - RillitoBend Neighborhood Vision and Opportunities.)

a. Conservation Plan

Background: The original plan for the Rio Vista Natural Resource Park focused on developing the built areas such as the delineation of the turf grass area, playground, parking lot, and entrance way. The natural areas were outlined, and the 'bosque' area was planted with trees and irrigation, but no detailed conservation planning was undertaken for the majority of the 'natural' areas. Because of our continuing drought, with climate change predicted to bring even warmer and drier conditions to the Southwest, coupled with the increased usage of the Park, it is imperative that a comprehensive Conservation Plan be developed for the Park's natural areas.

The Conservation Plan will be a comprehensive study of the underlying threats to the ecological health of the Park: its soil, water management, human usage, etc. This approach will be strategic and targeted.

Of critical concern for the Conservation Plan is restoration of the soils. As a working horse farm, and with the continued impact of horses, the soil is compacted and, in many places, devoid of the desert crust so critical to the long-term survival of vegetation.

A current issue for residents surrounding the park is flooding during rainstorms. Arroyos and drainages have been heavily modified by surrounding residential developments and road alignments. Opportunities exist to expand and/or create additional stormwater entry points along Cactus Blvd. to flow into the Park. Within the Park there is the opportunity to receive and distribute this stormwater to increase retention and infiltration to diminish downstream flooding and support native plants.

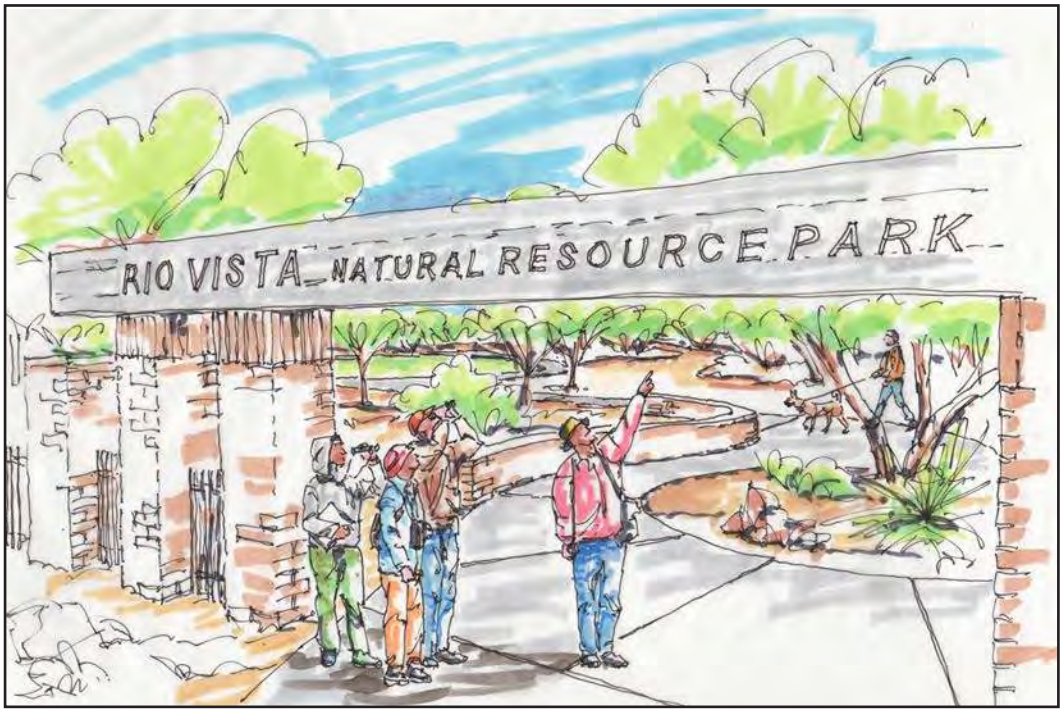
Over the years, interested neighbors have noted the state of the Park and started to work on remedies for problems that have been identified. We can build on the efforts already undertaken. See the outline of the Conservation Plan in Appendix III.

b. Future Enhancements of Existing Structures and Practices

The entrance portal on Tucson Boulevard has been neglected and could offer welcoming and educational opportunities. Past graffiti abatement was poorly done, overall paint has faded, and its introductory welcome sign is outdated and in disrepair. Rethinking the purpose of the structure and re-imagining its design to include educational opportunities and current information would be a welcome start.

Wherever possible, additional resources should be put toward enhancing the community participation and educational amenities of the Park. Existing signs in the Park need a facelift. Their graphics are faded and the structures have been neglected. The signs should be redone to be more engaging, durable, and informative.

The ongoing use of the Parks and Recreation's large maintenance trucks within the Park continues to degrade Park trails and vegetation. The use of these heavy vehicles to traverse the Park further compacts the soil, reduces infiltration, and prevents any vegetative growth. A few suggested solutions include, A) locate garbage canisters where maintenance staff can easily access them from exterior park roads without the need to traverse interior Park trails; or B) to erect a small shed to house a quad, trailer, and maintenance tools. Maintenance crews would then be able to access the Park with a smaller, lighter, and more nimble vehicle, allowing vegetation to survive and being less obtrusive to park users.

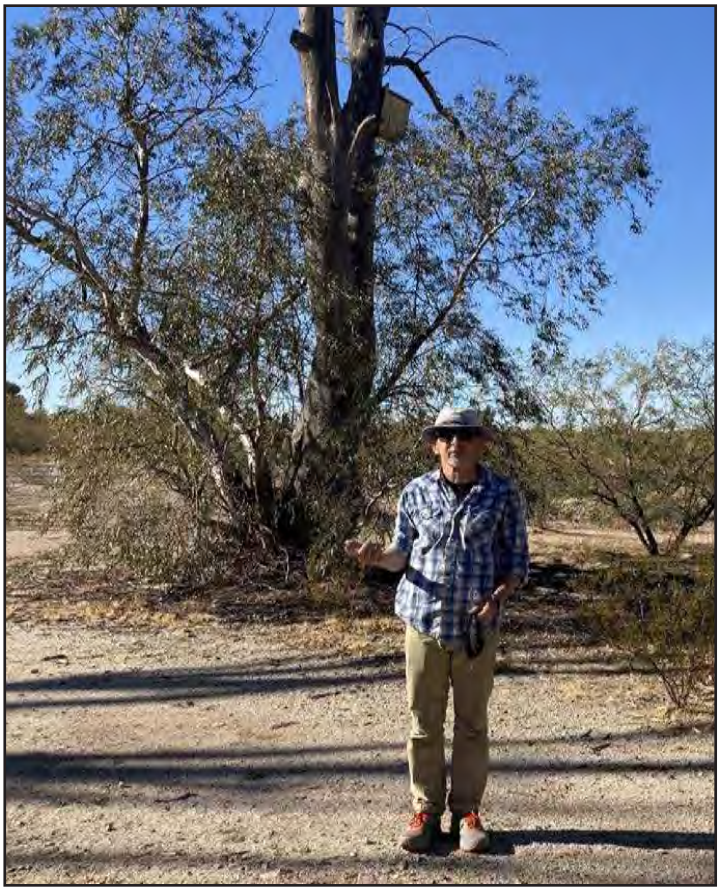


Rendering by Stephen Brigham, 2020

c. Educational Opportunities

Engaging and educating the public about the Park and its natural resources has obvious benefits for the visitor. They become more reverent and knowledgeable about its plants and animals. And in return, the Park becomes the ultimate beneficiary. The more people know about this Park and its biodiversity, the better the Park will be supported in years to come.

The Park is used by people with many different intellectual backgrounds and interests including birding, research, plant identification, and many as yet unknown pursuits. Examples of educational opportunities include providing bird, animal, and plant lists for people interested in the natural aspects of the Park. A signed interpretive nature trail could be established to guide people through the various aspects of the Park. A phenology trail could be created for interested citizen scientists. Bird boxes could be installed and monitored by community science volunteers. The entrance could be enhanced to include plaques, information distribution kiosks, tables for natural groups such as Audubon, HawkWatch International, and the Arizona Native Plant Society to provide literature and expertise for their educational outreach efforts.



Mike Shaw of HawkWatch International with American Kestrel nesting box in tall eucalyptus tree.

d. Funding Opportunities

Understanding that the City has limited funding for many, if not most, of the issues outlined in this Plan, the RillitoBend Neighborhood Advocacy Group will lead the effort to enlist support from various sources at local, state, and national levels.

Many of the educational opportunities can be solicited from the various organizations that regularly use the Park (see Appendix IV). Most of these organizations, especially if they are non-profits (501(c)(3)s), have a requirement to educate. The University of Arizona Extension Center is in the neighborhood and is in the business of education. Collaboration with many of these organizations would benefit both the visitors to the Park and the organizations. A list of priority needs and funding opportunities can be found in Appendix VI.

Many of these non-profit partners may be able to leverage additional grant funding to complement City funding for Park restoration actions.

Local, State and Federal Agencies have grant opportunities that will be pursued as well as the Pima County Bond Program. The RBNA has voiced concern over the plan to use Proposition 407 monies to install a 'splash pad' in the Park. This money would go a long way to implementing many of the current and future needs of the Park's natural resource assets and supporting infrastructure.

3 Objective: Establish a working relationship between the City's Parks and Recreation Department and the RillitoBend community

Elements of a working relationship are based on inclusion, trust, and open communication among the participants. Stakeholders are involved early, and goals are mutually agreed upon.

The RillitoBend Neighborhood Advocacy Group (RNAG), comprised of the RillitoBend Neighborhood Association (RBNA) Board and residents of RillitoBend, will represent the community. The Nearby Neighborhoods Group (NNG), made of representatives from the surrounding Neighborhood Associations located within a 1.5 mile distance from the Park, is collaborating with RNAG to create one voice in representing the needs of Rio Vista Natural Resource Park.

Specific Recommendations

- All new projects and all decisions regarding changes to the Park should include consultation with RNAG, the official representatives of the neighbor hood's interests.
- End the ad hoc placement of vegetation and structures in the Park moving forward.

We look forward to working with the City of Tucson Parks and Recreation Department to preserve and enhance our Park for future generations.

Respectively submitted by
the Master Plan team of RNAG:

Mary Bird (co-lead)
Lindy Brigham (co-lead)
Sue DeArmond
Trica Oshant Hawkins
Catlow Shipek
Estelle Stern-Eilers

RillitoBend NEIGHBORHOOD ASSOCIATION

Notes

l to r: *Cylindropuntia leptocaulis*, Christmas Cholla; *Streptanthus carinatus* ssp. *arizonicus*, Arizona Silverbell; and *Caesalpinia pulcherrima*, Mexican Bird of Paradise

Appendix I
Natural Features of the Park

Soils and Drainage

Rio Vista Natural Resource Park is situated on an alluvial floodplain on the south bank of the Rillito River. The site is relatively flat, with slopes ranging from 0 to 3 percent. Roughly half of the site's soils are classified as Arizo-Riverwash, composed of gravelly to very gravelly loamy sand. The other half are classified as Glendale silt loam, composed of silt loam at the surface and clay loam slightly deeper.

Several small washes cross the Park, flowing gradually toward the northwest. Most of the washes have been interrupted or diverted by various park installations (playground, parking area) or other disturbances. Today, stormwater that once ran in the Park's washes is channeled northward along Cactus Blvd, entering the Park only during extreme events at the lowest spots where washes intersect the road. On-site stormwater seeps into the soil or, in extreme events, sheet flows over the soil surface. Infiltration in the less disturbed areas is good, but in areas of high impact, the ground surface has become nearly impermeable and sheet flow or pooling is common. In these sites, the soil has been so degraded that vegetation is sparse. Additionally, decreasing rainfall and increasing temperatures in the region have further desiccated the soils, and natural recovery through germination and establishment of native plants is greatly diminished.

The site is relatively flat and the soil, mostly gravely sand and silt, is compacted and degraded by horses, vehicles, pets, and pedestrians.

Vegetation

The majority of plants in the Park are native to Arizona and the Sonoran Desert. Being so close to the Rillito River, the Park was historically riparian woodlands in areas closest to the river, and mesquite bosque as one moves farther from the river to the south. As recently as the 1990s Fremont cottonwood and Goodding's willows lined the river bank here. Over time, with the lowering of the water table, bank stabilization projects, and other habitat impacts, all of the original cottonwoods and willows are gone from the river's bank by the Park.

Today, patches of the mesquite bosque still remain, primarily in lower-lying areas along the now mostly defunct washes. In the more open areas, plants such as creosote, desert broom, wolfberry, white thorn and catclaw acacia, and paloverde are common, but sparse. Smaller shrubs and forbs including burroweed, desert senna, and globe mallow are commonly found in the Park. Seasonally, the ground in some areas of the Park may be covered with a variety of sunflowers cañaigre, and small, native grasses. These are all plants that have traditionally adapted to our arid, desert environment. Today, there is very little, if any, recruitment of the native shrubs and trees. Some of the older, established plants appear stressed or dying. There is extensive visual evidence of the effects of heat and drought on these plants. Additionally, in areas where soils are heavily impacted, recruitment of native ground-covers such as small forbs and grasses is low to non-existent.

Several non-native species of plants have also become established in the Park. Some of these are invasive and threaten native species. These include African sumac, Mediterranean grass, and London rocket, among others. Along the banks of the Rillito River at the north end of the Park, buffelgrass has become an issue and several neighborhood-organized removal events have occurred. At the Park entrance off Cactus Blvd. there is a stand of old eucalyptus trees, in which both Cooper's hawks and great horned owls have nested. These trees were once watered by the City but more recently, have not been receiving supplemental water. Today, they are dead, stressed, or dying.

When the site was established as a Natural Resource Park in the 1990s, the City planted numerous small trees (mostly mesquite) in the more impacted areas at the north end of the Park. Irrigation was provided to those saplings.

Native grasses and trees of Rio Vista Park

A Harris' hawk perches on a eucalyptus tree watching...

Wildlife

The Park's location proximate to the Rillito River, as well as its inherent diverse native vegetation that provide food and shelter, make it an important habitat for both native and migratory wildlife species. The Park is important as a corridor for native species to move between the Rillito River and local neighborhood washes; it is a year-around home toseveral species of small mammals and nesting birds (and possibly coyotes); and the Park also serves as an important migratory stop for birds during spring and fall migrations. The presence of native wildlife species is one of the elements that make Rio Vista Natural Resource Park unique; because it is managed as a native habitat, one can visit the Park and regularly see native animals species. Mammal species that have been seen in the Park include coyote, bobcat, desert cottontail rabbit, and javelina. Common native birds living year-around in the Park include phainopepla, Gambel's quail, curved-billed thrasher, Cooper's hawk, great horned owl, Abert's towhee, and red-tailed hawk. Migratory birds that have been documented in the park include Peregrine falcon, western tanager, Lucy's warbler (likely nesting), ash-throated flycatcher (nesting), indigo bunting, and western bluebird.

It is understood that anywhere humans come into contact with wildlife, there is potential for conflict. The incidents of human-wildlife conflicts are rare within the Park with more reports of encounters and issues with off-leash dogs than with wildlife. Neighbors are, for the most part, aware of the wildlife that live there and the possibility of encounters. Neighbors and visitors use the Park with that knowledge. Nonetheless, offering education about human-wildlife encounters would be welcomed by users.

Appendix II
Watershed Context

Rio Vista Natural Resource Park is within the urbanized Christmas Wash watershed. Midtown Tucson contributes stormwater to Christmas Wash originating in the south at the El Con Mall and drains largely north outletting at the Rillito River within the RillitoBend Neighborhood. Neighborhoods throughout the Christmas Wash watershed experience chronic flooding as many of the older midtown neighborhoods lack sufficient stormwater infrastructure.

Upon request by the City of Tucson, Pima County Regional Flood Control District, in partnership with the City of Tucson's Department of Transportation and Mobility initiated in 2018 the Christmas Wash Study (see: study info here) to assess flood concerns and identify stormwater solutions. Several projects within the Palo Verde Neighborhood (between Speedway to Grant and Alvernon to Country Club) have been completed to mitigate flooding within the neighborhood. As the neighborhoods within Christmas Wash have been largely developed with few open space opportunities remaining, the City and County are increasingly turning to green stormwater infrastructure (GSI) solutions to alleviate flooding.

Rio Vista Natural Resource Park, located lower in the Christmas Wash watershed, has two significant channels which convey neighborhood generated stormwater through to Christmas Wash. Park enhancements using GSI practices typically provide a strong return on investment. Chronic flooding downstream of the Park, near the end of Tucson Blvd., may be partially mitigated by enhancing the Park's ability to retain and infiltrate stormwater.

Rio Vista Natural Resource Park, within the 500 year flood zone of the Rillito River, is located along a historic flood terrace and a meander of the Rillito River. This historic floodplain soil is predominantly a sandy or silt loam with high infiltration rates. The soil and drainage context of the Park lends itself to being complementary for implementing GSI, stormwater harvesting practices, to mitigate downstream flooding by retaining and infiltrating stormwater.

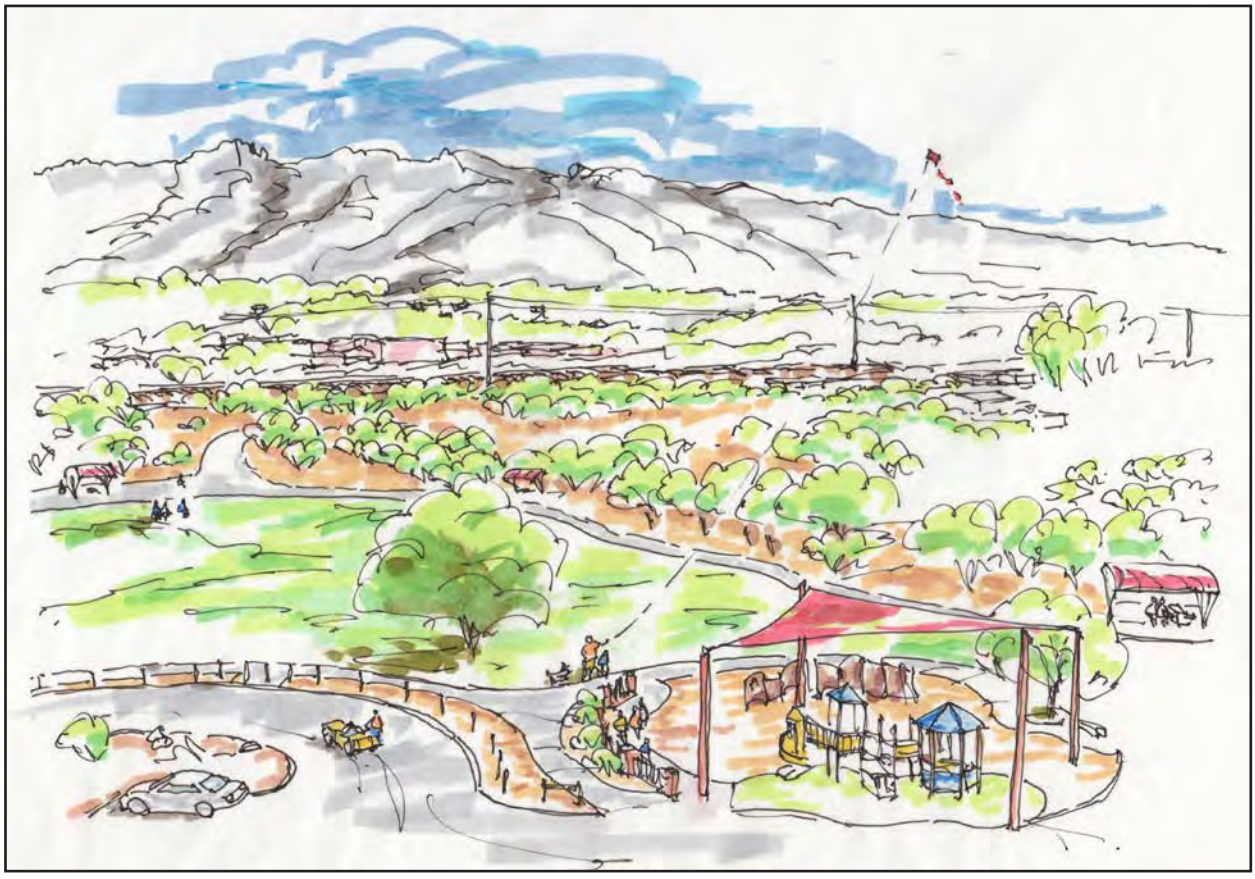
Additionally, by infiltrating stormwater within the Park there is a strong likelihood of recharging the underlying groundwater aquifer where historic groundwater levels along this reach of the Rillito were likely within 40-50 feet of the ground surface (Little River, 2004).

Appendix III
Conservation Plan Overview

The Conservation Plan Overview serves as a focused distillation of a more in-depth Conservation Plan yet to be developed. It includes the Vision for the Park—what we see and hope for the future. Most importantly, the Conservation Plan Overview identifies the resources that are imperiled and the threats to those resources. Various opportunities are presented to reduce or remove those threats.

Vision for Rio Vista Natural Resource Park

We envision Rio Vista Natural Resource Park to be a local, accessible example of the greater Sonoran Desert. Through appropriate management, we envision the Park supporting healthy populations of native wildlife and vegetation while maintaining its open space elements for community enjoyment. The Park's vision is the community's vision—that of enjoyment in nature. A Conservation Plan for the Park will serve as a guide to ensure that the Park continues to exist in that capacity in perpetuity.



Rio Vista Natural Resource Park
Rendering by Stephen Brigham, 2020

Vegetation

As described above in Appendix I - Natural Features of the Park, the Park's vegetation is a mix of established native and non-native species. There are a variety of trees, shrubs, and annual and perennial grasses and forbs. Also, several invasive species have become established in the park. The challenges that threaten the Park's vegetation include the lack of an adequate watering regime (which has stressed many plants); invasion of several exotic, undesirable plant species; limited native groundcover plants; limited canopy cover; and an increasingly warmer and drier climate.

The following opportunities exist to address the issues faced by the Park's vegetation, and should be included in the Conservation Plan:

- Survey and document existing vegetation.
- Identify historic vegetation patterns.
- Install, repair, and manage irrigation system.
- Engage in stormwater harvesting practices to increase soil moisture.
- Ensure a water supply to established large trees while phasing in the development of native large riparian tree habitat.
- Identify invasive species and their prime locations, and establish control practices.
- Establish native ground cover through restoration efforts (identify key native ground cover plants, their primary microhabitats, and create restoration plots via seeding and plantings).
- Monitor phenology of park vegetation.

Caesalpinia gilliesii, Yellow Bird of Paradise

Ferocactus wislizeni, Fishhook Barrel Cactus

Wildlife

As described above in Appendix I - Natural Features of the Park, there are a variety of wildlife that use the Park as their home habitat, or as a movement and migration corridor. Numerous bird, reptile, insect, and mammal species have been observed and documented in the Park. While the Park is one of the few natural habitats in the area, these wildlife are confronted with a variety of challenges that threaten their existence there. These challenges include the lack of quality habitat due to lack of adequate watering regime; habitat loss due to neglect, human impacts, and drought; and a lack of concrete knowledge about which specific species use the park and how they use it (information that would help guide Park management to support wildlife). Finally, there is the challenge of human-wildlife conflicts, as well as off-leash dogs encountering wildlife.

The challenges that wildlife face and/or present can be addressed through the following opportunities, which should be included in the Conservation Plan:

- Survey and document wildlife species including migratory species.
- Establish habitat restoration projects as described above with native vegetation.
- Establish wildlife observation and monitoring projects.
- Educate public/Park users about urban wildlife.
- Install structures to attract & support wildlife (e.g., bird boxes, bat houses & native bee homes).

Open Space Elements

In addition to the Park's vegetation and wildlife, the beauty of the park, and its attraction to Park visitors, are the natural, open space elements of its existence. As described in Appendix I – Natural Features of the Park, these include the soil, drainage, potential for water catchment and infiltration, the walking paths through the park, and its stunning vistas and overall visual quality. However, these very foundational open space elements also face numerous challenges which should be addressed in the Conservation Plan. These challenges include soil compaction from years of neglect and non-management (which limits stormwater infiltration and inhibits plant recruitment); soil quality (limited organic matter and increased parching due to climate change); disturbance of natural runoff channels; decreased visual quality with habitat degradation; widening of paths due to misuse; off-leash dogs; and an accumulation of pet waste.

Numerous opportunities exist to address these challenges to the Park's open space elements and these should be included in the Conservation Plan:

- Restore natural drainage channels (Shannon Wash).
- Increase soil permeability.
- Create passive water harvesting elements to capture and keep rainwater onsite.
- Create visually appealing educational signage about park paths.
- Create visually appealing educational art installations.
- Install visually appealing dog poop receptacles with educational messages.
- Adjust maintenance needs to eliminate need for large maintenance vehicles to use walking paths.
- Educate public/Park users about urban wildlife.
- Install structures to attract & support wildlife (e.g., bird boxes, bat houses & native bee homes).

Appendix IV
Educational Opportunities

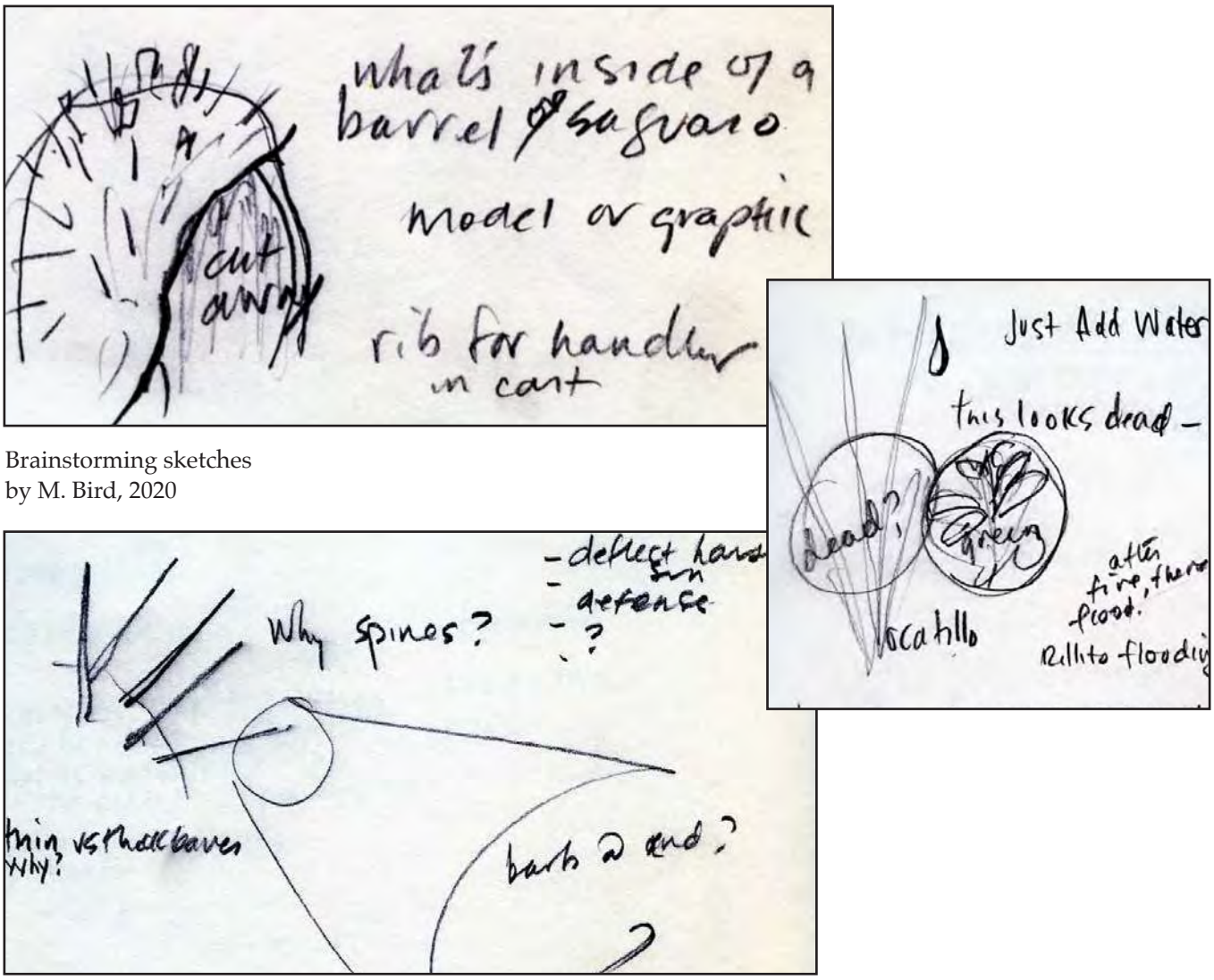
Engaging and educating the public about the Park and its natural resources has obvious benefits for the visitor as well as for the Park. With a better understanding of the Park's plants and animals, ecosystem, and habitats, the visitor respects and values what the Park offers. And in return, the Park becomes the ultimate beneficiary. Raising awareness makes the Park a better place.

The following educational strategies/activities can serve to increase one's appreciation of the Park's vegetation, wildlife, and open space. Some strategies may need further development and design, and funding and prioritizing may be necessary. The community is a willing partner in many of these activities, as demonstrated by programs and projects previously accomplished through community action.

Educational program at Rio Vista Natural Resource Park
Rendering by Stephen Brigham, 2020

Strategies/activities to address vegetation opportunities

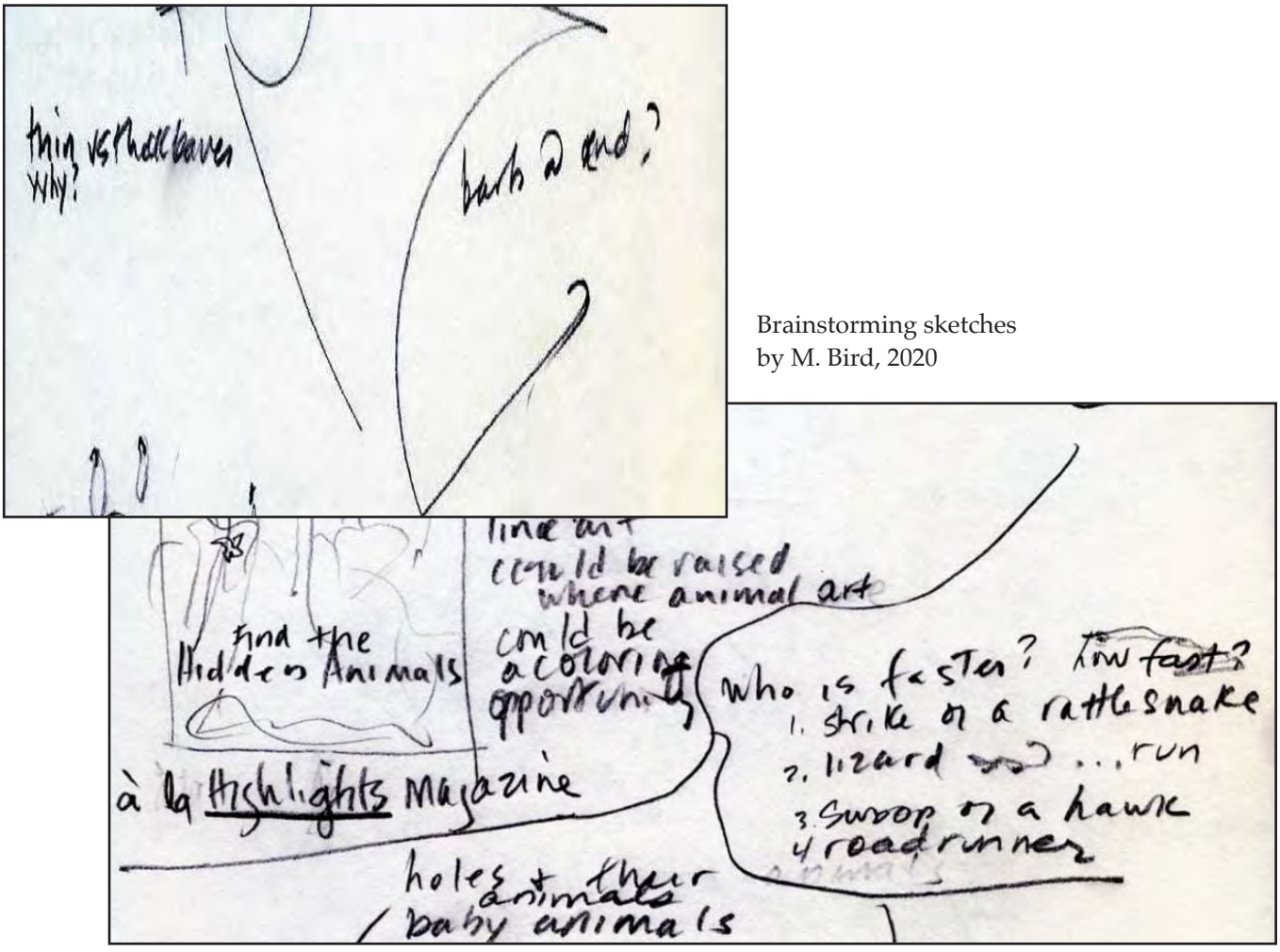
- Conduct a series of educational watershed management workshops with an action project component (e.g., creating passive rainwater harvesting elements).
- Increase public awareness about park vegetation.
- Create trail map/brochure with info corresponding to specific plants on path (downloadable online, laminated/reusable located at park entrance/exit points, app, QR points).
- Install signage at select individual plants with natural history info.
- Create Rio Vista Phenology Trail and recruit and train park walkers to participate.
- Host a series of guided nature walks through the park (recruit via PRs, Nextdoor, social media, etc.).
- Conduct a Park "BioBlitz" to identify and record park vegetation.



Brainstorming sketches
by M. Bird, 2020

Strategies/activities to address wildlife opportunities

- Conduct group project events to build and install wildlife structures.
- Conduct group project events to improve habitat (e.g., projects to improve vegetation and soil).
- Increase public awareness about park wildlife.
- Install signage about wildlife at key habitat areas.
- Host a series of guided nature walks through the park (recruit via PRs, Nextdoor, social media, etc.).
- Create activity book about park elements.
- Create a Rio Vista Park "Quest" (treasure hunt-type educational adventure).
- Conduct public program about urban wildlife (threats and coping strategies).
- Create Rio Vista Phenology Trail and recruit and train park walkers to participate.
- Conduct a Park "BioBlitz" to identify and record park wildlife.
- Partner with local schools to offer park as outdoor classroom (provide activity book and/or guided nature walks and activities).



Brainstorming sketches
by M. Bird, 2020

Strategies/activities to address open space opportunities

- Conduct a series of educational watershed management workshops with specific park action projects components (e.g., creating passive rainwater harvesting elements, rechanneling & restoring drainages, diverting stormwater from park paths, etc.).
- Hold a competition for decorating dog poop receptacles – winner's design is used for new installations (could be a painting workshop onsite).
- Create a Rio Vista Park "Quest" (treasure hunt-type educational adventure).
- Include information about park open space elements in all educational materials and programs.

Rio Vista Natural Resource Park
Rendering by Stephen Brigham, 2020

Appendix V
RillitoBend: Past, Present, and Future

Residents Value Open Space

The RillitoBend neighborhood is a desert "oasis" tucked in the bend of the Rillito River north of Prince Road and east of Campbell Avenue. It is an enclave of open space with scattered single-story homes set amidst undisturbed desert land.

From early days, residents valued the neighborhood's natural swath of desert, becoming the last holdout of County land south of the Rillito River. Annexed with the city in the mid-1970s, its residents have remained true to the original vision "to protect and maintain the existing rural residential character" (Neighborhood Association document, 1960s). Their long-standing efforts to protect the character and integrity of the neighborhood from developers, City transportation planners, and encroaching suburbia are well documented.

RillitoBend Neighborhood Mural
by Sue Ann Breems, 2020

RillitoBend's Equestrian Tradition Continues

Horses have long been part of the community's history. Colonel Cedric Fauntleroy, an ace pilot in WW I and successful businessman, moved to Tucson in 1951 and started a horse farm, Gentleman's Acres, to breed and raise thoroughbred and quarter horses for racing. Mostly pasture land, the property extended to the Rillito River and included a race track. Charles and Jean Bagley purchased the farm in 1965 and began building stalls and runs for their "pets" (burros and horses). In 1987 the City bought 13 acres from the Bagleys as part of the 40 acres that has become Rio Vista Natural Resource Park. Today, Hitching Post Ranch at Gentleman's Acres continues the equestrian tradition offering boarding, specialized clinics, etc.

RillitoBend's Attraction for Artists

Artists were drawn to the beauty and rural character of the neighborhood. Maynard Dixon (1875-1946), an artist known for his portrayal of the American West, lived and worked in the neighborhood. His painting *Home of Tucson*, 1945, shows the familiar scene of the Catalinas from his home off Prince Road—a scene largely unchanged today. (The painting can be found at Tucson's Museum of Art.) George Phar Legler (1885-1982) created a fantasy land called "The Valley of the Moon," which in 2015 was designated a Historic Landmark by the Tucson Historic Preservation Foundation. He bred frogs and rabbits and had a refuge for lost and wounded wildlife for a time. He was a tinkerer and his magical creations can be seen as visionary art. The "Moon's" wondrous world of landforms and characters continue to capture the imagination of many young Tucsonans.

Linda Ronstadt, the pop singer and Tucson's most famous artist, grew up on her parents' 10-acre property in the neighborhood. Her whole family sang, and we have been blessed with their singing. They sang at the Park's dedication in 2010.

Today the neighborhood continues to attract artists and those who value the beauty and rural feel. A large and recently installed mural—made of 1000s of hand-painted mosaic tile showing the flora and fauna of the area—is an example of a resident artist's vision of the neighborhood.

Enhancing the Neighborhood for the Future

The RillitoBend Neighborhood Association (RBNA) has continued to enhance the neighborhood for the benefit of all residents. Within the park, volunteer neighbors created a labyrinth located on the degraded, abandoned Wanamaker homestead site. They installed two benches, castoffs from the City, nearby so visitors would have a place to rest and enjoy the open view of the Catalina Mountains. They have conducted plant surveys and birding walks. They have worked on Park projects to pull invasive species, create barriers to block rogue paths, and weed. RBNA has also worked with neighbors in establishing several linear gardens nearby: along Cactus Blvd outside the wall of Winterhaven Village Townhouses and, more recently, along Allen Road, outside the wall of Meadowview. Neighbors designed, purchased the plants, installed, and maintained these gardens. In addition, a successful grant by RBNA led to the planting of trees along the north side of Prince Road between Country Club Road and Cactus Blvd.

RBNA has recently partnered with Mattress Firm (Tucson's Clean and Beautiful's Adopt-A-Park partner). RBNA will train and educate Mattress Firm staff about the Park's vegetation and habitats while Mattress Firm will provide hands-on support in weeding and clearing.

Neighbors cleaning, weeding, and planting along Cactus Blvd at the Park entrance

Neighbors planting new linear garden outside Meadowview on Allen Road, Fall 2020

Neighbors weeding linear garden outside Winterhaven Village Townhouses on Cactus Blvd, Spring 2020

Sue Ann Breems and friends installing tile RillitoBend Neighborhood Mural, Spring 2020

Appendix VI
Priority Needs, Funding Opportunities, and Partners

Understanding that the City has limited funding for many, if not most of the issues outlined in this Plan, the Rillitobend Neighborhood Advocacy Group (RNAG) suggests targeting priority needs first, and will lead the effort to enlist support from various local, state, and national agencies. It is also important to note that there are many volunteer organizations that use the Park and are willing and able to provide in-kind services such as work crews and educational platforms.

Priority Needs

1. Irrigation

- a. Fix current system.
- b. Extend irrigation to existing trees.
- c. Reestablish watering of tall trees at Cactus entrance until able to phase in native riparian restoration projects depending on Conservation Plan.

2. Develop and begin to implement Conservation Plan

3. Redevelop and formalize path system with the following considerations

- a. Close rogue paths.
- b. Maintain and formalize current path system.
- c. Manage stormwater to reduce path erosion and ponding in coordination with overall stormwater harvesting plan.
- d. Develop educational trails such a phenology (using current paths).

4. Develop alternative plan for Park maintenance and equipment

- a. Use of smaller vehicles
- b. Adjust location of garbage receptacles to reduce frequency or eliminate vehicle access needs.
- c. Use of volunteers for some routine maintenance

5. Develop stormwater flow plan to enhance and distribute stormwater flow inlet points into the Park and enhance retention and infiltration within the Park to support native habitat

- a. Enhance existing and create additional stormwater inlets to divert stormwater draining along Cactus Blvd into the Park.
- b. Address erosion and ponding along Park pathways through the use of stormwater harvesting practices.

Map of Rio Vista Natural Resource Park showing top priorities to address current challenges

1. Irrigation
2. Develop and begin to implement Conservation Plan.
3. Develop stormwater flow plan to reestablish historical flows and supplement current irrigation.
4. Refurbish entrances to capture educational opportunities (see Appendix IV).
5. Redevelop path system.
6. Develop alternative plan for Park maintenance and equipment.

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Priority Needs, cont'd

6. Refurbish entrances to capture educational opportunities (see Appendix IV)

- a. Main entrance
  - i. Act on deferred maintenance needs.
  - ii. Create areas for education displays and events.
- b. Three Cactus entrances
  - i. Update Park directory information.
  - ii. Post Park rules.
  - iii. Develop educational and conservation displays.
  - iv. Provide gathering areas.
  - v. Incorporate Cactus Blvd development plans.

Funding Opportunities

These are some examples of funding sources.

More research will be done for funding of specific projects.

1. Federal

- a. Grants.gov
- b. Partners for Fish and Wildlife (will fund City projects)

2. State of Arizona - Department of Forestry and Fire Management

- a. Urban and Community Forestry Grants
- b. Invasive Plant Program Grant

3. Pima County

- a. County bonds
- b. Neighborhood Reinvestment Program – for streets and parks

4. City of Tucson

- a. Mayor's tree planting program
- b. Slow Streets program
- c. Green Stormwater Infrastructure Program

5. Utilities (*Most major utilities have community investment arms.*)

- a. Tucson Electric Power
  - i. Environmental Stewardship
  - ii. Raptor Protection Program

6. Volunteers

7. Tucson Parks Foundation

8. Volunteer Organizations and Partners

AZ Native Plant Society
Desert Archaeology
HawkWatch International
Hitching Post Ranch at Gentleman's Acres
Mattress Firm (Tucson Clean and Beautiful)
Native Seeds/SEARCH
National Phenology Network
Rio Vista Conservation Project
SW Monarchs
Tucson Audubon
Tucson Village Farm
Watershed Management Group

A Gneiss Bench to Sit On, 2009
Installation by Chris Tanz; at Rio Vista Natural Resource Park
Rendering by Stephen Brigham, 2020

Appendix VII
RillitoBend Neighborhood Vision and Opportunities

RillitoBend's vision document, *Neighborhood - Vision and Opportunities*, portrays a community that values open desert land.

To view the full document, go to rillitobendna.org/documents.

RillitoBend NEIGHBORHOOD

Neighborhood - *Vision & Opportunities*

....to protect and enhance our special Tucson neighborhood with its rich *artistic heritage* and unique *riparian environment*.

Ronstadt Home at Prin

Vision themes

These interconnected themes are intended to help prioritize neighborhood projects.

1. Enhance the ***livability of our streets***

2. Manage our precious ***watershed resources***

3. Restore our ***riparian tall tree environment***

4. Showcase our unique ***artistic heritage and spirit***

5. Support our ***recreational and cultural destinations***

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RIO VISTA NATURAL RESOURCE PARK

APPENDIX IV

2022

"A PLAN FOR TRAIL HABITAT ENHANCEMENT AT RIO VISTA NATURAL RESOURCE PARK"

Plan for Trail Habitat Enhancement at Rio Vista Natural Resource Park

Report RVCP-21-01
January 2022

Prepared by: Strategic Habitat Enhancements, LLC, Tucson, Arizona * www.strategichabitats.com

Prepared for: Rio Vista Conservation Project, Friends of Rio Vista, Tucson, Arizona

Submitted to: City of Tucson Department of Parks and Recreation, Tucson, Arizona

Strategic
HABITAT ENHANCEMENTS

Table of Contents

Project Goals and Report Overview

Rio Vista Natural Resource Park (Rio Vista) is a 35.6-acre park managed by the City of Tucson Department of Parks and Recreation (Tucson Parks and Recreation). It is located along the south bank of the Rillito in midtown Tucson, with easy access to the Rillito River Park. It is a hub for many recreational activities, including children's play, dog-walking, picnicking, cycling, horseback riding, birding, botanizing, and simple immersion in the restorative power of nature. Rio Vista is anchored on its west side with a formal parking lot, playground equipment, and turfgrass. The rest of the park is left in its natural condition with mostly native vegetation and an informal trail system.

As a natural resource park, management should be generally focused on preservation and responsible stewardship of the ecosystem, balanced with the recreational needs of the community. At Rio Vista, there has been increased visitation in recent years, and the trail system is showing damage from unnecessary compaction, duplicative trails and unnecessary cut-throughs, widening, and general habitat degradation.

The Rio Vista Conservation Project began in early 2019 as an independent initiative dedicated to the protection and restoration of Rio Vista. The project collaborated directly with Tucson Parks and Recreation. In 2020, Friends of Rio Vista was incorporated as a 501(c)(3) nonprofit organization. Its mission is to support Tucson Parks and Recreation and the Rio Vista Conservation Project in protecting and enhancing the ecological values of the park.

This plan is intended to guide the process of ecosystem rehabilitation and trail formalization to increase the habitat value and improve visitor experience at Rio Vista. It builds on recent work by the Rio Vista Conservation Project and Friends of Rio Vista to begin trail closure activities as well as a collaboration with the Tucson Chapter of the Arizona Native Plant Society (AZNPS) to conduct a floristic inventory[1]. The plan is based on the premise that habitat enhancement will take place in phases that can be carried out simultaneously or in sequence and that can be modified through lessons learned.

Existing Conditions

Natural vegetation on the site is characteristic of the expected vegetation communities along the Rillito. Representative species by vegetation layer include

- **TREES:** velvet mesquite (*Prosopis velutina*), catclaw acacia (*Senegalia greggii*), blue paloverde (*Parkinsonia florida*), and foothills paloverde (*Parkinsonia microphylla*).

- **LARGE SHRUBS:** creosote bush (*Larrea tridentata*), wolfberry (*Lycium sp.*), graythorn (*Zizyphus obtusifolia*), white-thorn acacia (*Vachellia constricta*), desert broom (*Baccharis sarothroides*), and singlewhorl burrobrush (*Hymenoclea monogyra*).

- **SMALLER SHRUBS and SUBSHRUBS:** burroweed (*Isocoma tenuisecta*), desert senna (*Senna covesii*), and globemallow (*Sphaeralcea ambigua*).

[1] Arizona Native Plant Society (AZNPS) 2021. Plant Survey of Rio Vista Natural Resource Park, Tucson, Arizona. Submitted to the Rio Vista Conservation Project and City of Tucson Department of Parks and Recreation. 25 pp.

Areas of denser vegetation are found along drainages/washes and along fence lines. Additional native species are present in landscaped areas of the park as well. See AZNPS (2021) for the recent full inventory. Note that the survey was completed during an exceptionally dry period and may not reflect the full spectrum of species at Rio Vista; however, it is well suited to guide a restoration planning process where hardy, drought-tolerant species are preferred.

There is an extensive trail system throughout the natural area of Rio Vista, but a lack of a defined trail system has led to the formation of redundant/duplicative trails, shortcuts, and widening in areas to the detriment of native vegetation, wildlife, and watershed health. A map of the current trails was created by the Rio Vista Conservation Project in 2019 (Figure 1).

Trail System Assessment

The Rio Vista Conservation Project used the map of existing trails (see Figure 1) to create a plan for which segments to close. Figure 2 shows the trails identified to remain and areas identified for initial phases of trail closure. This report will assume that this plan, approved by the City of Tucson, remains valid, with the caveat that additional outreach and feedback from public stakeholders/user-groups may be necessary.

The Rio Vista Conservation Project and Tucson Parks and Recreation started the work of trail closure and rehabilitation activities with 2 volunteer events (September 28, 2019, and January 9, 2020). These volunteer events focused on passive means of restoration, such as placement of signed barriers to block entrances to trails and use of brush and woody debris to define trails and rehabilitate widened areas (Photos 1 and 2). The central and southern initial priority areas shown in Figure 2 were treated before the Covid-19 pandemic interrupted the ability to host additional workdays with groups of volunteers. Note that the base map for Figure 2 is identical to Figure 1.

Initially trails were blocked with traffic barricades that would have held up to the elements better; however, the reflective barricades spooked horses and created a hazard for their riders. Sawhorses were proposed by the parks area supervisor as a horse-safe replacement, and the concerned equestrians approved the replacement. Sawhorses were built and provided by Tucson Parks and Recreation; the Rio Vista Conservation Project, with volunteers, made the replacement. Signage that would require ground disturbance was not allowed; the trail barriers were intended to be temporary.

Figure 1. Map of existing trails completed by the Rio Vista Conservation Project in 2019.

Figure 2. Map showing trails planned to be permanent (green), vehicle access routes (yellow), and initial areas for trail closure (blue and gray polygons).

Photo 1. Trail closure signage on sawhorse. This sawhorse is in need of repair and the signage is faded and illegible.

Photo 2. Example of use of wood brush material to define trails and arrest widening.

Individual volunteers have been repairing sawhorses, replacing signs, and attempting to keep them in their intended locations. As part of this restoration planning effort, an inventory of current sawhorse sign locations was made and is presented in Figure 3. Please note that these were the sawhorse locations at the time of the fieldwork for this report; sawhorses are often moved by project participants as well as other park visitors. Occasionally this has resulted in closure signage at the wrong locations, creating confusion, ecological damage, and hazards for horses and their riders.

The current state of the sawhorse signage varies. Many are not holding up well under the elements; many of the signs are faded and illegible and some of the sawhorses are not structurally stable. As noted above, some sawhorses have been moved from their intended locations. As a result, some of the trail closures have been more successful than others, and many trail junctures that are identified as candidates for closure are not signed. Photographs were taken at each of these locations and are available upon request.

Recommendations

- Create a more formal trail closure signage solution that will convey to users that trail closures are for the benefit of the park's natural resources. More formal signs convey a sense of legitimacy to the restoration effort.
    - Consider using new trail closure signage that would be less likely to be moved/removed. Options could include carsonite signs, or traditional signs on posts. These signs would not require additional maintenance and would be able to be removed eventually. Any new signage would have to be approved by Tucson Parks and Recreation.
    - If a new signage style is not preferable, the sawhorse signs could be rehabilitated to look more official. They should all be in good repair and signs should be non-faded and legible. Painting the sawhorses would convey care and stewardship to users.
- Ensure all trail junctures identified for closure have signage. Start with the areas previously signed, and then move through the other closure areas systematically (but not necessarily sequentially).

Photo 3. Example of carsonite signage often used on public lands.

Photo 4. Example of aluminum sign that can be attached to a post.

Figure 3. Orange icons indicate the locations of signed sawhorses at the time of fieldwork for this report. They are concentrated in the central and southern priority closure polygons identified in Figure 2.

Phased Approach to Trail Rehabilitation

Initial Trail Rehabilitation Areas were identified by the Rio Vista Conservation Project in 2019 (see Figure 2); for this report, additional Proposed Trail Rehabilitation Areas have been organized to coordinate with the AZNPS plant survey areas.

Continued trail rehabilitation activities can be implemented in phases, according to resources available. This approach allows for the development of restoration plant palettes that matched the survey areas as closely as possible. Implementation does not need to follow the numbering of the Proposed Trail Rehabilitation Areas, and areas can be implemented simultaneously.

Proposed Trail Rehabilitation Areas are shown in Figure 4 at right.

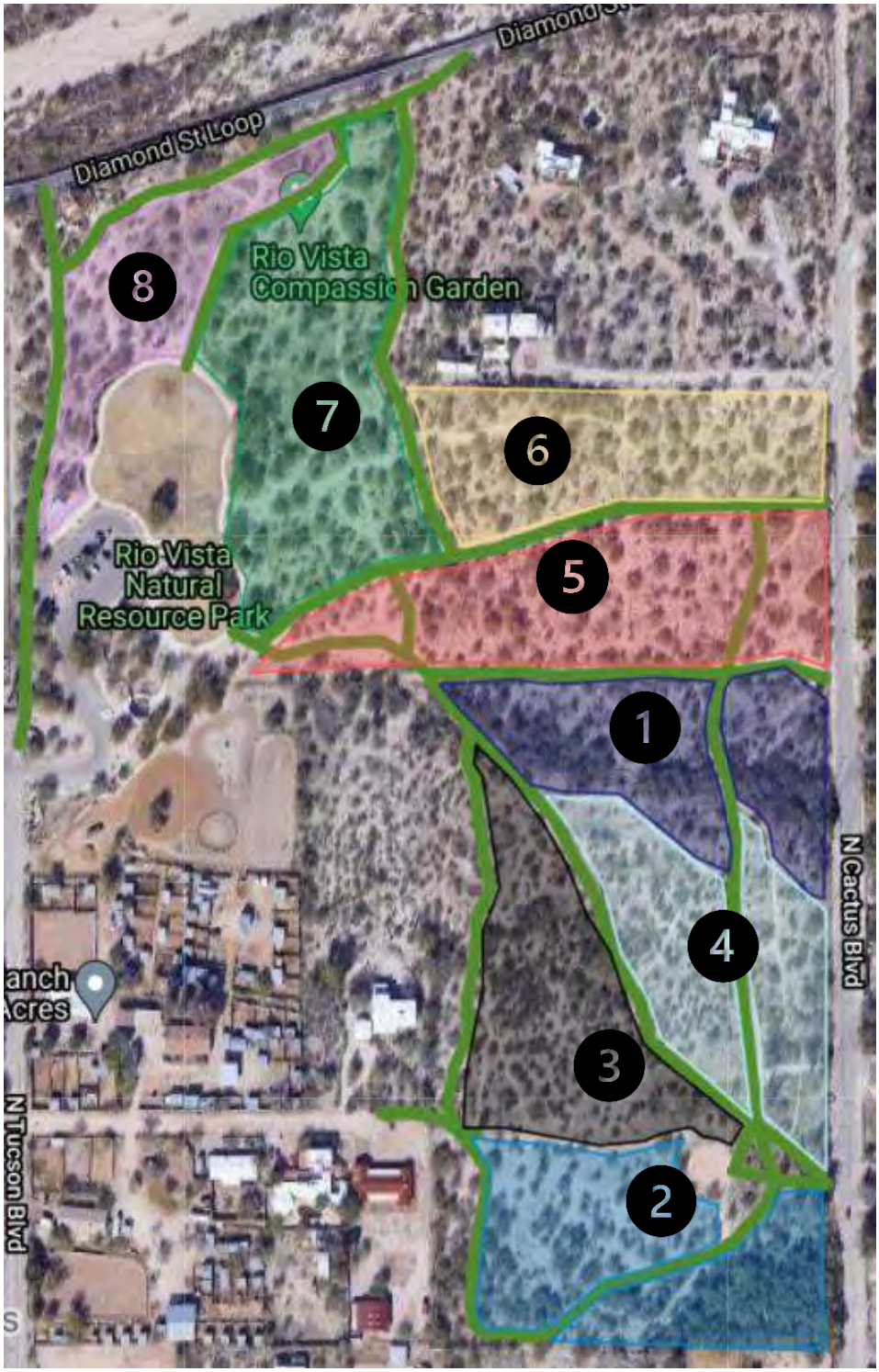

Figure 4. Proposed Trail Rehabilitation Areas.

Site Preparation

Decompaction

Many of the trails that are slated for closure have very compacted soils. Plants will be able to establish more readily with decompaction prior to seeding and container planting. Even in instances where a passive restoration approach is taken, decompaction will help to allow natural recruitment of seeds that are in the system by creating favorable germination sites.

Decompaction can be accomplished with handtools, including rock bars, McLeods, or pickaxes. Quick strokes to break the surface of the soil and create divots are the goal, so that there are spots where seeds and water will be captured. Because decompaction can help with germination of both desirable natives and weed species, it is important to monitor these areas for non-native invasives and to remove them swiftly. For this reason, it is also not recommended that all trail segments be closed; rather, closures should focus on strategic areas where plants need to be established quickly to obscure trails. Focus decompaction actions in these types of areas:

- At junctures where there is signage
- Along the edges of trails where narrowing is the goal

Water Harvesting

Plant materials should be installed in planting basins—either smaller basins for individual plants or larger basins for multiple plants. Basins should be thought of as "puddles" as opposed to "bathtubs"—i.e., no complete ringed rim around them. When natural precipitation occurs, we want water to puddle at the roots of the new plantings. If there is a slope at all, a small berm on the downhill side can also catch runoff and increase infiltration at planting locations. Basins can be gentle and inconspicuous—even one inch of depression can make a difference.

Vertical Mulching

Vertical mulching is a drylands restoration practice that can assist in establishment of native plants by catching seeds and creating microclimate conditions that help plants to passively establish. It can also be used to visually obscure trails or roads that are being closed, because it instantly looks more natural. This can include "planting" brush or dead shrubs—actions that will help fill in the spaces and carry one's eye past the disturbed area, but also help to catch seeds. This type of mulching can also improve microhabitats for lizards and other small animals.

Plant Materials

This restoration plan benefits greatly from a floristic survey of Rio Vista conducted by the Tucson Chapter of the AZNPS from May 2020 through April 2021, at the request of the Rio Vista Conservation Project. During the survey, 101 species were documented in the park, including 17 non-natives. This survey was conducted during an exceptionally hot and dry period; it is expected that there may be additional species to observe during more moderate periods. Following the active monsoon season of July and August 2021, an additional survey was conducted in October 2021, resulting in the addition of 20 more species to the inventory.

The AZNPS inventory was used to determine species appropriate for this project. That list was further filtered to include those that would achieve the project goals with the least amount of maintenance required, and those that are both available and budget conscious (Table 1). Native species that appeared

to be used only for landscaping were excluded from the list. Please note that additional native plants naturally present at Rio Vista could be used in restoration efforts. The list includes the best type of plant material to use by species, as well as sourcing information.

Type of Plant Material

Plants can be introduced into a project in different forms (seeds, containers, cuttings), and there are many factors to consider when choosing the most strategic type(s) given a particular species and project.

Seeds

Seeds can be an economical way to get certain species established, with the following considerations: 1) seed should be applied in the correct season for the species; 2) some species may take several seasons to experience the weather patterns favorable for germination; 3) annual species are best applied by seed. Strategic application of seeds in areas of downed brush, areas with natural catchment, or in the vertical mulch structures can encourage germination. The summer of 2021 was one with record rainfall that has resulted in a copious crop of seed at Rio Vista. In October of 2021 permission was granted by the City of Tucson for seeds to be collected and stored for this project. Strategic Habitat Enhancements (SHE) collected the species listed in Table 1, which will be available for propagation or direct seeding.

Table 1. Native Plant Seeds Collected for the Project in October 2021.

		TYPE OF MATERIAL	
Common Name	**Latin Name**	**Seed**	**Container**
four-wing saltbush	*Atriplex canescens*	x	x
sacred datura	*Datura wrightii*		x
hoary tansyaster	*Dieteria canescens*	x	
burroweed	*Isocoma tenuisecta*	x	
creosote bush	*Larrea tridentata*	x	x
devil's claw	*Proboscidea parviflora*	x	
desert senna	*Senna covesii*	x	
golden crownbeard	*Verbesina encelioides*	x	

Container plants

Although seeds can be the most economical way to get plants established, there are instances where container plants are preferred for immediate results (e.g., when blocking a trail entrance for closure or screening adjacent development). Container sizes can also be considered strategically based on attributes of the species, site goal, and budget considerations.

- **Traditional containers.** These are the familiar 1-gallon, 5-gallon, and 15-gallon sized pots that are most often encountered at nurseries. The smaller pots are less expensive, and a good choice for smaller species (subshrubs, small perennials, vines, grasses) or those that will grow very quickly. Investing in larger sizes makes sense for species that are slower-growing and/or when a larger-sized plant is needed more immediately.
- **Tallpots/Treepots.** Containers that are taller than wide can be a good choice for restoration as they encourage plants to develop roots lower in the soil profile where soil moisture remains longer, and helps those desert plants with primary taproots develop a little bit more naturally.

These containers can be a good choice for plants that will need to survive without an automatic irrigation system.

Sourcing

To provide the best wildlife habitat possible, purchasing the plants described in this report from local growers that do not use systemic pesticides in the production of their plants is recommended. It is best for the plant materials to be grown completely organically if possible. Preferred local wholesale suppliers include:

- **Pima County Native Plant Nursery (PCNPN).** The primary focus of this nursery is to provide quality native plants for Pima County projects. However, they are also able to provide plants to other entities as long as the purchasing party is a non-profit, government, or educational agency.
- **Nighthawk Natives (NN).** High-quality plants grown in Avra Valley.
- **Wildlands Restoration (WR).** Supplier of native seeds.
- **Gila Native Plant Nursery.** Based in Safford, Arizona, this nursery is run by the non-profit Gila Watershed Partnership, leaders in producing native plants for restoration.
- **Civano Growers.** This wholesale nursery is located in Sahuarita and is able to deliver plants for a modest fee. Because they supply many retail nurseries and garden centers throughout the greater Southwest region, it is important to ensure straight species are being ordered, not cultivars that would be inappropriate in a restoration setting.

Plant availability may vary throughout the year. In addition, these nurseries would be capable of doing a contract-grow, particularly if seeds from onsite were provided. This requires a bit of planning ahead (up to 2–3 years) but including plant materials with local genetics can be very successful. With this option, it is possible to specify the container type and timing, which can be advantageous.

Another important source of materials is to collect directly onsite. Due to the exceptionally wet summer of 2021, local native plants had copious amounts of seed that were collected this October (see Table 1). Collected seed can be used for direct seeding (annuals and perennials) as well as to grow plants specifically for the project (shrubs and trees) via a contract with a local nursery, such as the PCNPN or NN. Cuttings from cholla cane also be used in the restoration effort.

Please note that although neighbors and volunteers may be very excited to contribute to this effort, it is not ecologically appropriate to accept donations of plant materials of species that do not grow naturally at Rio Vista.

Table 2. Native Plants Observed at Rio Vista Appropriate for Restoration, Type of Material(s) to Use, and Local Sourcing Information. Please note that the PCNPN is likely to have additional species available; this table included only the perennial species with seeds collected that could be used for grow-out.

		TYPE OF MATERIAL			LOCAL SOURCE				
Common Name	**Latin Name**	**Seed**	**Container**	**Cutting**	**Pima County Native Plant Nursery***	**Nighthawk Natives / Wildlands Restoration**	**Gila Native Plant Nursery**	**Civano Growers**	**onsite**
triangle leaf bursage	*Ambrosia deltoidea*	x	x			x			
desert honeysuckle	*Anisacanthus thurberi*		x			x			
purple three awn	*Aristida purpurea*	x							
four-wing saltbush	*Atriplex canescens*	x			x				
desert saltbush	*Atriplex polycarpa*	x							
desert marigold	*Baileya multiradiata*	x							
desert hackberry	*Celtis pallida*		x				x	x	
netleaf hackberry	*Celtis reticulata*		x					x	
Drummond's clematis	*Clematis drummondii*		x				x		
cholla	*Cylindropuntia sp.*			x					
cane cholla	*Cylindropuntia spinosior*			x					
fluffgrass	*Dasyochloa pulchella*	x							
sacred datura	*Datura wrightii*		x		x		x		
hoary tansyaster	*Dieteria canescens*	x							x
hopbush	*Dodonaea viscosa*		x					x	
brittlebush	*Encelia farinosa*	x						x	
longleaf jointfir	*Ephedra trifurca*		x						
turpentine bush	*Ericameria laricifolia*	x	x			x			
climbing milkweed	*Funastrum cynanchoides*		x						
burroweed	*Isocoma tenuisecta*	x			x				
creosote bush	*Larrea tridentata*	x	x		x	x			
wolfberry	*Lycium sp.*		x						
pale desert thorn	*Lycium pallidum*		x				x		
wait a minute bush	*Mimosa aculeaticarpa var.*								
blue paloverde	*Parkinsonia florida*		x			x	x	x	
foothills paloverde	*Parkinsonia microphylla*		x			x	x	x	
devil's claw	*Proboscidea parviflora*	x							x
velvet mesquite	*Prosopis velutina*		x			x	x	x	
catclaw acacia	*Senegalia greggii*		x			x	x	x	
desert senna	*Senna covesii*	x							x
desert globemallow	*Sphaeralcea ambigua*	x				x	x		
dogweed	*Thymophylla sp*	x							x
white-thorn acacia	*Vachellia constricta*		x			x	x	x	
golden crownbeard	*Verbesina encelioides*	x							x
graythorn	*Ziziphus obtusifolia*		x						

Specific Materials for Proposed Trail Rehabilitation Areas

The AZNPS plant survey data were collected in sections that roughly correspond to the Proposed Trail Rehabilitation Areas identified in Figure 4, and specific restoration planting palettes are presented for each area in the following tables.

Table 3. Restoration Planting Palette for Trail Rehabilitation Area 1.

		TYPE OF MATERIAL		
Common Name	**Latin Name**	**Seed**	**Container**	**Cutting**
triangle leaf bursage	*Ambrosia deltoidea*	x	x	
purple three awn	*Aristida purpurea*	x		
desert hackberry	*Celtis pallida*		x	
netleaf hackberry	*Celtis reticulata*		x	
Drummond's clematis	*Clematis drummondii*		x	
fluffgrass	*Dasyochloa pulchella*	x		
longleaf jointfir	*Ephedra trifurca*		x	
climbing milkweed	*Funastrum cynanchoides*		x	
burroweed	*Isocoma tenuisecta*	x		
creosote bush	*Larrea tridentata*	x	x	
wolfberry	*Lycium sp.*		x	
blue paloverde	*Parkinsonia florida*		x	
velvet mesquite	*Prosopis velutina*		x	
catclaw acacia	*Senegalia greggii*		x	
desert senna	*Senna covesii*	x		
desert globemallow	*Sphaeralcea ambigua*	x		
graythorn	*Ziziphus obtusifolia*		x	

Table 4. Restoration Planting Palette for Trail Rehabilitation Area 2.

		TYPE OF MATERIAL		
Common Name	**Latin Name**	**Seed**	**Container**	**Cutting**
Drummond's clematis	*Clematis drummondii*		x	
cholla	*Cylindropuntia sp.*			x
sacred datura	*Datura wrightii*		x	
hopbush	*Dodonaea viscosa*		x	
longleaf jointfir	*Ephedra trifurca*		x	
climbing milkweed	*Funastrum cynanchoides*		x	
creosote bush	*Larrea tridentata*	x	x	
wolfberry	*Lycium sp.*		x	
blue paloverde	*Parkinsonia florida*		x	
foothills paloverde	*Parkinsonia microphylla*		x	
devil's claw	*Proboscidea parviflora*	x		
velvet mesquite	*Prosopis velutina*		x	
catclaw acacia	*Senegalia greggii*		x	
dogweed	*Thymophylla sp*	x		
golden crownbeard	*Verbesina encelioides*	x		
graythorn	*Ziziphus obtusifolia*		x	

Table 5. Restoration Planting Palette for Trail Rehabilitation Area 3.

		TYPE OF MATERIAL		
Common Name	**Latin Name**	**Seed**	**Container**	**Cutting**
desert marigold	*Baileya multiradiata*	x		
longleaf jointfir	*Ephedra trifurca*		x	
climbing milkweed	*Funastrum cynanchoides*		x	
burroweed	*Isocoma tenuisecta*	x		
creosote bush	*Larrea tridentata*	x	x	
wolfberry	*Lycium sp.*		x	
blue paloverde	*Parkinsonia florida*		x	
foothills paloverde	*Parkinsonia microphylla*		x	
velvet mesquite	*Prosopis velutina*		x	
catclaw acacia	*Senegalia greggii*		x	
desert senna	*Senna covesii*	x		
desert globemallow	*Sphaeralcea ambigua*	x		
graythorn	*Ziziphus obtusifolia*		x	

Table 6. Restoration Planting Palette for Trail Rehabilitation Area 4.

		TYPE OF MATERIAL		
Common Name	**Latin Name**	**Seed**	**Container**	**Cutting**
triangle leaf bursage	*Ambrosia deltoidea*	x	x	
desert honeysuckle	*Anisacanthus thurberi*		x	
purple three awn	*Aristida purpurea*	x		
four-wing saltbush	*Atriplex canescens*	x	x	
desert saltbush	*Atriplex polycarpa*	x	x	
desert marigold	*Baileya multiradiata*	x		
desert hackberry	*Celtis pallida*		x	
netleaf hackberry	*Celtis reticulata*		x	
Drummond's clematis	*Clematis drummondii*		x	
cholla	*Cylindropuntia sp.*			x
cane cholla	*Cylindropuntia spinosior*			x
fluffgrass	*Dasyochloa pulchella*	x		
sacred datura	*Datura wrightii*		x	
hoary tansyaster	*Dieteria canescens*	x		
hopbush	*Dodonaea viscosa*		x	
brittlebush	*Encelia farinosa*	x		
longleaf jointfir	*Ephedra trifurca*		x	
turpentine bush	*Ericameria laricifolia*	x	x	
climbing milkweed	*Funastrum cynanchoides*		x	
burroweed	*Isocoma tenuisecta*	x		
creosote bush	*Larrea tridentata*	x	x	
wolfberry	*Lycium sp.*		x	
wait a minute bush	*Mimosa aculeaticarpa var. biuncifera*			
blue paloverde	*Parkinsonia florida*		x	
foothills paloverde	*Parkinsonia microphylla*		x	
devil's claw	*Proboscidea parviflora*	x		
velvet mesquite	*Prosopis velutina*		x	
catclaw acacia	*Senegalia greggii*		x	
desert senna	*Senna covesii*	x		
desert globemallow	*Sphaeralcea ambigua*	x		
dogweed	*Thymophylla sp*	x		
white-thorn acacia	*Vachellia constricta*		x	
golden crownbeard	*Verbesina encelioides*	x		
graythorn	*Ziziphus obtusifolia*		x	

Table 7. Restoration Planting Palette for Trail Rehabilitation Areas 5 + 6.

		TYPE OF MATERIAL		
Common Name	**Latin Name**	**Seed**	**Container**	**Cutting**
triangle leaf bursage	*Ambrosia deltoidea*	x	x	
desert honeysuckle	*Anisacanthus thurberi*		x	
purple three awn	*Aristida purpurea*	x		
four-wing saltbush	*Atriplex canescens*	x	x	
desert saltbush	*Atriplex polycarpa*	x	x	
desert marigold	*Baileya multiradiata*	x		
desert hackberry	*Celtis pallida*		x	
netleaf hackberry	*Celtis reticulata*		x	
Drummond's clematis	*Clematis drummondii*		x	
cholla	*Cylindropuntia sp.*			x
cane cholla	*Cylindropuntia spinosior*			x
fluffgrass	*Dasyochloa pulchella*	x		
sacred datura	*Datura wrightii*		x	
hoary tansyaster	*Dieteria canescens*	x		
hopbush	*Dodonaea viscosa*		x	
brittlebush	*Encelia farinosa*	x		
longleaf jointfir	*Ephedra trifurca*		x	
turpentine bush	*Ericameria laricifolia*	x	x	
climbing milkweed	*Funastrum cynanchoides*		x	
burroweed	*Isocoma tenuisecta*	x		
creosote bush	*Larrea tridentata*	x	x	
wolfberry	*Lycium sp.*		x	
wait a minute bush	*Mimosa aculeaticarpa var. biuncifera*			
blue paloverde	*Parkinsonia florida*		x	
foothills paloverde	*Parkinsonia microphylla*		x	
devil's claw	*Proboscidea parviflora*	x		
velvet mesquite	*Prosopis velutina*		x	
catclaw acacia	*Senegalia greggii*		x	
desert senna	*Senna covesii*	x		
desert globemallow	*Sphaeralcea ambigua*	x		
dogweed	*Thymophylla sp*	x		
white-thorn acacia	*Vachellia constricta*		x	
golden crownbeard	*Verbesina encelioides*	x		
graythorn	*Ziziphus obtusifolia*		x	

Table 8. Restoration Planting Palette for Trail Rehabilitation Area 7.

		TYPE OF MATERIAL		
Common Name	**Latin Name**	**Seed**	**Container**	**Cutting**
triangle leaf bursage	*Ambrosia deltoidea*	x	x	
desert honeysuckle	*Anisacanthus thurberi*		x	
purple three awn	*Aristida purpurea*	x		
four-wing saltbush	*Atriplex canescens*	x	x	
desert saltbush	*Atriplex polycarpa*	x	x	
desert marigold	*Baileya multiradiata*	x		
desert hackberry	*Celtis pallida*		x	
netleaf hackberry	*Celtis reticulata*		x	
Drummond's clematis	*Clematis drummondii*		x	
cholla	*Cylindropuntia sp.*			x
cane cholla	*Cylindropuntia spinosior*			x
fluffgrass	*Dasyochloa pulchella*	x		
sacred datura	*Datura wrightii*		x	
hoary tansyaster	*Dieteria canescens*	x		
hopbush	*Dodonaea viscosa*		x	
brittlebush	*Encelia farinosa*	x		
longleaf jointfir	*Ephedra trifurca*		x	
turpentine bush	*Ericameria laricifolia*	x	x	
climbing milkweed	*Funastrum cynanchoides*		x	
burroweed	*Isocoma tenuisecta*	x		
creosote bush	*Larrea tridentata*	x	x	
wolfberry	*Lycium sp.*		x	
wait a minute bush	*Mimosa aculeaticarpa var. biuncifera*			
blue paloverde	*Parkinsonia florida*		x	
foothills paloverde	*Parkinsonia microphylla*		x	
devil's claw	*Proboscidea parviflora*	x		
velvet mesquite	*Prosopis velutina*		x	
catclaw acacia	*Senegalia greggii*		x	
desert senna	*Senna covesii*	x		
desert globemallow	*Sphaeralcea ambigua*	x		
dogweed	*Thymophylla sp*	x		
white-thorn acacia	*Vachellia constricta*		x	
golden crownbeard	*Verbesina encelioides*	x		
graythorn	*Ziziphus obtusifolia*		x	

Table 9. Restoration Planting Palette for Trail Rehabilitation Area 8.

		TYPE OF MATERIAL		
Common Name	**Latin Name**	**Seed**	**Container**	**Cutting**
triangle leaf bursage	*Ambrosia deltoidea*	x	x	
desert honeysuckle	*Anisacanthus thurberi*		x	
purple three awn	*Aristida purpurea*	x		
four-wing saltbush	*Atriplex canescens*	x	x	
desert saltbush	*Atriplex polycarpa*	x		
desert marigold	*Baileya multiradiata*	x		
desert hackberry	*Celtis pallida*		x	
netleaf hackberry	*Celtis reticulata*		x	
Drummond's clematis	*Clematis drummondii*		x	
cane cholla	*Cylindropuntia spinosior*			x
fluffgrass	*Dasyochloa pulchella*	x		
sacred datura	*Datura wrightii*		x	
hoary tansyaster	*Dieteria canescens*	x		
hopbush	*Dodonaea viscosa*		x	
brittlebush	*Encelia farinosa*	x		
longleaf jointfir	*Ephedra trifurca*		x	
turpentine bush	*Ericameria laricifolia*	x	x	
climbing milkweed	*Funastrum cynanchoides*		x	
burroweed	*Isocoma tenuisecta*	x		
creosote bush	*Larrea tridentata*	x	x	
wolfberry	*Lycium sp.*		x	
wait a minute bush	*Mimosa aculeaticarpa var. biuncifera*			
blue paloverde	*Parkinsonia florida*		x	
foothills paloverde	*Parkinsonia microphylla*		x	
devil's claw	*Proboscidea parviflora*	x		
velvet mesquite	*Prosopis velutina*		x	
catclaw acacia	*Senegalia greggii*		x	
desert senna	*Senna covesii*	x		
desert globemallow	*Sphaeralcea ambigua*	x		
dogweed	*Thymophylla sp*	x		
white-thorn acacia	*Vachellia constricta*		x	
golden crownbeard	*Verbesina encelioides*	x		
graythorn	*Ziziphus obtusifolia*		x	

Installation of Plant Materials

In a restoration setting, it is not only important to use the right plant materials, but also to install them correctly. Ideal months for plant installation are September (or as early as late July/August if there is a good monsoon season) through January. Spring installation of container plants should be avoided as it does not leave much time for plants' roots to become established enough to withstand the hottest, driest time of the year. Although planting can be the aspect of a public-facing restoration project that the community is most excited about, it is best not to rush this phase or to install plants at inopportune times.

Some additional tips for successful plant installation:

- Plants should be installed in individual mulched water harvesting basins to increase the benefits of precipitation events and to provide the capacity for hand-watering. Mulch can be gathered onsite. Plants can also be grouped together in slightly larger water harvesting basins – just keep the mature size of each plant in mind.
- Basins for trees should be at least 3 ft in radius.
- Planting holes should be the depth of the plant container (not deeper) and wider. Pour a gallon or so of water into the hole and let it drain completely before installing the plant. Once the soil is back in the hole, tamp and shape the final harvesting basin. Place wood mulch around the base of the plant to retain soil moisture.
- The level of the soil in the plant container should match the level of the soil (of the water harvesting basin, not the surrounding soil) once installed. Exception: often, trees are planted too deeply in their pots; the "root flare" should be above the ground for effective gas exchange and tree health.
- For trees, keep wood mulch 3–5 inches from the base of the trunk to prevent rotting.

The locations of each installed plant should be recorded with GPS so that planting areas can be mapped for effective maintenance and monitoring.

Herbivory Protection

Container plants are a significant investment that can be vulnerable to herbivory by native wildlife, including rabbits, ground squirrels, and javelina. Protect vulnerable plants with round cages made of ¼" hardware cloth (Photo 5). Hardware cloth is preferable to chicken wire to avoid harm to horned lizards, snakes, and other small animals that can get trapped in the larger openings of chicken wire. Cages should be at least 24" tall and constructed from 5' lengths of material for individual plants – larger for groups; trenched into the ground 2" if possible; and secured with 8" landscape staples (3 per cage). Cages should be removed once the plants reach sufficient size to be resistant to herbivory.

Photo 5. Protective plant cage made of hardware cloth. Shown here secured with rebar stakes which are not a good choice in areas with heavy equestrian use; landscape staples are preferred.

Other ancillary benefits of caging plant materials include:

- Improved visibility of the plants and restoration sites for effective maintenance and monitoring;

- Protection from trampling by human park visitors; and
- Shading for plants by the hardware cloth but also a good surface to place brush and debris against for additional shade.

Placement of wildlife drinkers near planting areas can also reduce herbivory pressure, particularly during extended dry periods.

Seed Application

Seeding should occur after planting activities if possible to avoid trampling, particularly if seeds are already germinating. There are two methods of seed application suggested for Rio Vista, and a combination of these strategies is recommended. Seeds may be applied as a single species or in a mix, regardless of method(s) used.

- **Hand-broadcast of seeds** requires a light raking of the soil surface before and after seeds are applied. This method works best if employed just before germinating rains in order to reduce the amount of seed that might be eaten by wildlife before it has a chance to germinate.
- **Seedballs** are another method for applying seeds to a restoration site. In this method, seeds are combined with clay, organic compost/manure, and water to form balls that are dried. See Appendix A for detailed instructions from the University of Arizona Cooperative Extension. Seedballs can contain a single species or a mix; if more than one species is used they should be grouped by general germination season. Seedballs can be deployed immediately or at a later time. This method may relieve some of the pressure around getting the timing exactly right, as they will sit on the surface of the soil until it rains. Seedballs can be made well in advance of when they are used, as long as they are stored in a cool, dry location. Another bonus of using this strategy is that it is a wonderful way to involve community members in the project. Seedball-making workshops are fun for all ages and abilities.

  As this is a method of seed application that is still being refined and developed by restoration practitioners, it is not recommended as the primary means of distributing seeds across the site, but rather as a supplemental method that provides a way to involve the community. With that in mind, the seeds used in this method should be from species that are common and widespread (e.g., creosote bush, burroweed) as opposed to more specialized species. The deployment of seedballs for this project could also present a unique opportunity for the Gornish Lab at the University of Arizona School of Natural Resources & the Environment (https://www.gornishlab.com/) to conduct studies to further refine the technique.

Maintenance

Irrigation

All container plants will need to be irrigated to become established. For this project it is expected that plants will be hand-watered by volunteers using water available onsite. Water may be delivered with hoses or buckets, and should be done gently, at the base of the plant. Water basins should be filled at least twice at each watering event. General schedule:

- At installation: Drench watering hole before planting, allow to drain. Install plant and fill basin at least twice.
- New plantings: Water every other day for 2 weeks, then according to the seasonal schedule.

- Spring: 1x/week
- Arid Foresummer: 2x/week
- Monsoon: 1x/week, adjusting for rain events
- Fall: 1x/week, adjusting for rain events
- Winter: 2x/month, adjusting for rain events

This schedule should be in effect for the first year and extended if there is drought. It may need adjustment depending on how plants are responding and weather patterns. Although we have as-built plans for the park irrigation system, we will need information from Tucson Parks and Recreation on current availability and locations of water sources (e.g., hose bibs and quick couplers) before planting.

Water Basins

Water basins may need occasional maintenance if erosion occurs and they fill, and also as plants grow and need more capacity.

Weeds

Invasive species may appear in restoration sites and it is important to recognize them and remove them as soon as possible. There should be no tolerance of invasives within the herbivory cages of newly installed plants as they will directly compete for resources.

In addition to non-native invasives, native annuals can be weedy. Although this is generally a desirable restoration outcome across the project as a whole, there may be instances where native annuals are threatening to out-compete newly installed perennial container plants that are not yet established. Removal of natives from planting basins should be considered on a case-by-case basis; SHE is available to provide guidance via digital photos/email if necessary.

Implementation Schedule

Restoration activities can occur year-round. Table 10 presents guidance about which activities are appropriate by season.

Table 10. Generalized Schedule for Implementation Activities. Seasons with colored cells indicate when an activity can or should occur; gray cells indicate when an activity should not be planned.

Restoration Activities	Winter (Dec - Feb)	Spring (Feb - April)	Arid Foresummer (May - June)	Summer Monsoon (July - Sept)	Fall (Oct - Nov)
Repair / Replace Signage	As-Needed				
Collect Native Seeds					
Make Seedballs	As-Needed				
Apply Seeds (species dependent)					
Install Native Plants					
Decompaction	As-Needed				
Vertical Mulch	As-Needed				
Water Plants	2x/month	1x/week	2x/week	1x/week	1x/week
Repair Water Basins	As-Needed				
Remove Weeds	As-Needed				

Monitoring

Monitoring restoration responses is an important piece to increasing successful outcomes.

Activity Monitoring

A simple form should be provided to volunteers to record activities and locations for each visit. This can be done electronically via a google form that volunteers can fill out while in the field on their phones. The advantage of this system as opposed to a paper system is that the information is captured immediately in an exportable format for easy synthesis. It also eliminates the hassle of tracking down volunteers for paper datasheets and data entry. A successful online datasheet is not overly complicated and is quick to fill out. It is also possible to collect data on paper datasheets if that is a better solution for the group.

Success Monitoring

- **Photo Points.** Prior to work at each restoration site, create a photo point that is easily reproducible (i.e., has landmarks that can be matched when retaken). Consider conducting photo monitoring each spring and fall to document progress.
- **Plant Locations.** GPS all installed plants (and indicate species) so that they can be easily relocated for maintenance and monitoring.

Cost Information

The total investment to implement this plan depends on many factors; some guidance is presented below to assist with planning.

Plant Materials

Plant materials will be a considerable budget item, and also one that can be scaled/phased according to the budget available. In addition to the prices listed below, SHE is often able to negotiate additional discounts for non-profit projects, including free plant materials, from large wholesale nurseries like Civano Growers.

Table 11. Current Wholesale Pricing for Native Plants by Size.

Supplier	1-gal	5-gal / 15" treepots	15-gal
Pima County Native Plant Nursery	$ 6.00	$ 12.00	$ 40.00
Nighthawk Natives	$ 8.50	-	-
Gila Native Plant Nursery	$ 5.00	$ 10.00	$ 25.00

Other Materials

- The example sign shown in Photo 4 is Available from https://www.campgroundsigns.com/ for $18.95 each.
- Plant Cages (approximately $5 each)
    - Hardware cloth is available in 100-ft rolls; the 4' length ranges in price from $186 (Lowes) to $219 (Tractor Supply). This size will yield 40 cages (5-ft lengths, 24-in tall).
    - Landscape staples. A pack of 100 8-in staples is approximately $20. Each cage needs 3.

Potential Funding Opportunities

There are many grant programs that would be a good fit to fund a comprehensive restoration project at Rio Vista, including:

- **Arizona State Parks Non-Motorized Recreational Trails Program**
  - https://gn.ecivis.com/GO/gn_redir/T/n5tx743zda2j
  - Due May 1, 2022, funding available Jan 2023
  - Requests up to $150,000
  - Reimbursable grant
- **Arizona State Parks Recreational Trails Program, Safety and Environmental Education**
  - https://gn.ecivis.com/GO/gn_redir/T/1rk56mchxi8l9
  - Due May 1, 2022, funding available Jan 2023
  - Applicable to signage
  - Requests up to $10,000
  - Reimbursable grant
- **National Fish and Wildlife Five Star and Urban Waters Restoration Grant**
  - https://www.nfwf.org/programs/five-star-and-urban-waters-restoration-grant-program/five-star-and-urban-waters-restoration-grant-program-2022-request-proposals
  - Due January 25, 2022
  - Requests $20,000 - $50,000
- **Summit Hut Banff Grant Challenge**
  - Contact store directly for information
  - $2,000

Acknowledgements

Strategic Habitat Enhancements and Friends of Rio Vista are grateful to the City of Tucson Department of Parks and Recreation for their support of the Rio Vista Conservation Project and for their permission to prepare this plan for enhancement of trail habitat at Rio Vista Natural Resource Park. We also sincerely thank Jonathan Horst, Kari Hackney, Jennie MacFarland, and Olya Phillips of Tucson Audubon Society for their insightful comments on the draft plan, which benefited greatly from their observations.