



M A K E
MARANA
2040 • GENERAL PLAN

CHAPTER 4

Resources & Sustainability

Introduction

The natural environment is an integral part of Marana’s identity. The Resources & Sustainability Theme seeks to balance growth and development with the need to protect and conserve natural resources to support a healthy environment for generations to come. This Theme includes five elements (five A.R.S. required elements):

- **Open Space.** A defining characteristic of Marana is the quality and quantity of open space. The Open Space Element balances future development with natural undisturbed open space to protect significant natural areas as Marana continues to grow.
- **Water Resources.** Water is a fundamental resource for human activity, vital to both the existing population and new growth. The Water Resources Element establishes policy guidance for protecting Marana’s sustainable water supplies.
- **Environmental Planning.** Marana has a unique desert environment with diverse natural resources. The Environmental Planning Element provides goals and policies for Marana to continue balancing growth and development with the natural environment.
- **Conservation.** The conservation of Marana's natural and cultural resources helps preserve the Town's heritage. The Conservation Element provides conservation strategies for natural and cultural resources that are significant in Marana as the Town continues to grow and develop.
- **Energy.** Energy is what powers daily lives. The Energy Element encourages energy-efficiency through innovative energy development and conservation strategies to reduce demand on energy sources that are limited.



Open Space Element

Open space contributes to a community's character and quality of life. Marana enjoys vast and scenic open spaces, including river corridors, mountains, and pristine desert landscapes. As the Town continues to grow, it is important to balance development with open space to ensure adequate areas are preserved for the benefit of residents and wildlife. In Marana, open space is categorized in two ways:

- **General Open Space.** Any area maintained for open uses, including recreational lands (i.e., parks, golf courses, desert, floodways, floodplains, greenbelts, common areas), and other unbuilt vegetated areas.



Source: Town of Marana

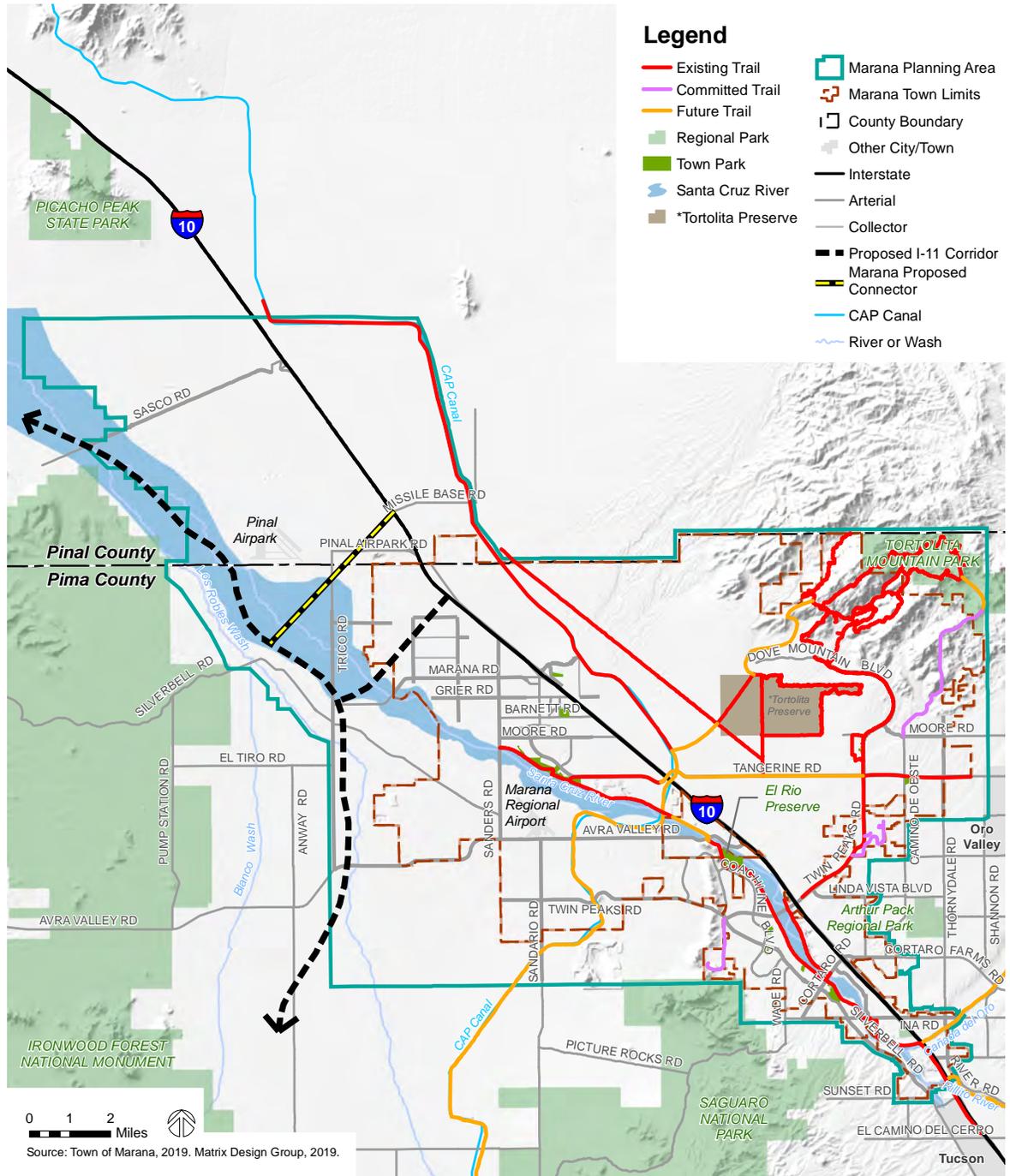
- **Natural Undisturbed Open Space (NUOS).** An area of land with natural vegetation that is unimproved and not occupied by structures or man-made impervious surfaces. NUOS is intended, in the future, for lands that may be set aside, dedicated, and/or purchased and preserved, in perpetuity, as a conservation area.



Source: Town of Marana

While the majority of Marana's MPA is undeveloped and has the appearance of open space, much of this land is privately owned or owned by the Arizona State Land Department (ASLD), who may sell it to private owners for future development. Only lands preserved in perpetuity are classified as NUOS. **Figure 4-1** depicts the land areas in the MPA that are publicly owned and preserved in perpetuity. Also shown on **Figure 4-1** is the Tortolita Preserve, which is 2,399 acres of land owned by the Arizona State Land Department that is leased to the Town of Marana for open space and park purposes, including operation and maintenance of hiking, bicycling, and equestrian trails. The lease has a 99-year term ending in 2099. Future development east of Interstate 10 and north of Tangerine Road, should be sensitively planned and designed to be integrated with the natural environment.

Marana's open space network includes the Santa Cruz River and El Rio Preserve, as well as the various parks and trails throughout the Town and master planned communities that provide active and passive open spaces. Active open space provides recreational opportunities, often found in community parks, whereas passive open space is intended more for its scenic value, like the Santa Cruz River or other NUOS. However, these are not mutually exclusive. Marana also benefits from nearby regional parks and open space that fall outside the MPA, such as the Tortolita Mountain Park, Picacho Peak State Park, Ironwood Forest National Monument, Saguaro National Park, and Coronado National Forest. These assets are further discussed in this Element, along with related goals and policies that intend to enhance their value. For more information on parks and recreation, see Chapter 3, People & Community.



Source: Town of Marana, 2019. Matrix Design Group, 2019.



*Tortolita Preserve is 2399 acres of land owned by the Arizona State Land Department that is leased to the Town of Marana for open space and park purposes, including operation and maintenance of hiking, bicycling, and equestrian trails. The lease has a 99-year term ending in 2099.



The Town of Marana provides this map information "As Is" at the request of the user with the understanding that it is not guaranteed to be accurate, correct or complete and conclusions drawn from such information are the responsibility of the user. In no event shall The Town of Marana become liable to users of these data, or any other party, for any loss or direct, indirect, special, incidental, or consequential damages, including but not limited to time, money, or goodwill, arising from the use or modification of the data.

Map Revised: 1/14/2020

Figure 4-1
Open Space

Santa Cruz River



Source: Town of Marana

One of the most iconic open spaces in Marana is the Santa Cruz River, which flows from the southeast to the northwest through Marana. The River flows 18 miles through the center of Marana, and connects to the Continental Ranch and Gladden Farms neighborhoods, as well as the Marana Regional Airport. Downtown Marana is only approximately one mile north of the River. The proximity of the Santa Cruz River to these communities and destinations provides opportunities for enhanced access and connectivity to and from this natural riparian corridor.

Historically, the Santa Cruz River supported the early cultures of this area dating back 13,000 years ago and people first practiced agriculture along the river at least 3,600 years ago. Many historical sites are still being discovered today. However, now parts of the Santa Cruz are, for most of the year, a dry river bed. This is due to two factors—excessive groundwater pumping and invasive plant species. Groundwater pumping occurs from public and private wells for potable water use in homes and businesses. If more groundwater is pumped out of the aquifer than is replenished, less water flows through the Santa Cruz River on a regular basis. When water does flow through the Santa Cruz River, the water collects and carries seeds from nearby plants, depositing them along the riverbanks. Some of these seeds are from invasive plant species that may require more water than native species, and thus absorb more of the ground water. Managing these invasive species is necessary to preserve the natural balance required for a healthy river and environment.

Most surface water that does flow through the Santa Cruz River is treated effluent discharge from Pima County's Tres Rios Wastewater treatment facility. This reliable source of high-quality reuse water for the Santa Cruz River helps the corridor to maintain a diverse riparian habitat.

In addition to riparian habitat, the Santa Cruz River provides recreational opportunities for residents and visitors, including shared-use paths for walking, biking, horseback riding, and birding. There are also some sand and gravel extraction sites along the River. The Town recognizes that these sites are necessary operations for the active building occurring in Marana. The challenge and goal is to identify future uses for these areas once the operations close. Future uses may include protected wildlife, birding or preserve areas, as well as active recreational areas such as sport fields.

Marana recognizes the significance of the Santa Cruz River to the community, both environmentally and socially. The goals and policies of this Element help guide the Town's efforts, along with similar local and regional efforts, to rehabilitate and enhance the integrity of the river corridor.

El Rio Preserve



Source: *Discover Marana*

Along the Santa Cruz River, the El Rio Preserve is a 104-acre site located between Avra Valley Road and Coachline Boulevard. This area is an old borrow pit, which was used to extract material to construct Interstate 10 in the 1960's. The Town originally purchased this parcel in 2003 for mitigation for the Cactus Ferruginous Pygmy Owl as part of a proposed Habitat Conservation Plan (HCP), which was never adopted due to species delisting. The Town has now identified this 104 acres as a critical connection for wildlife between the Tucson and Tortolita Mountains. The Preserve is one of several protected riparian habitats along the Santa Cruz River that, collectively, provide a network of habitats and feeding area for over 200 species of birds.

The El Rio Preserve is surrounded by a berm to help retain water, but the barrier was breached in 2014 and again in 2016. In 2018, the Town completed engineering and landscaping plans for improvements that will help protect against future flooding, reduce mosquito problems, reduce trash and invasive seed buildup during storm events, facilitate routine maintenance at the site, and provide outdoor learning space for school kids. The Town is also working with Pima County Regional Flood Control District to construct bank protection along the El Rio Preserve. This would replace the existing berm with a more stable material and minimize the amount of flooding during flood events. All features associated with the project will be compatible with the existing natural habitat and its role in the region's open space network.



*Egrets at the El Rio Preserve.
Source: Jennifer Flood*

The Tucson Audubon Society worked with the Town to plant a pollinator garden near the entrance of the Preserve. A pollinator garden is a garden specifically intended for native pollen producing plants that attract pollinating species, such as butterflies, moths, bees, and bats. These species move from one flower to another, transferring pollen and aiding plant reproduction. Many pollinator species are declining in population due to habitat loss and fragmentation, pesticides, climate change, and invasive species. By planting habitat for these species, the Town is helping to ensure their survival.

Many invasive plant species are deposited into the El Rio Preserve from the Santa Cruz River as water flows into the site and settles in the Preserve. Managing the spread of these invasive species is important to mitigate and prevent things like wildfires from occurring in this area. The Town maintains a management plan for the El Rio Preserve that includes Invasive Species Plant and Weed Control measures, but further actions will be necessary to preserve native vegetation as the Town enhances this area as a recreational use.

The El Rio Preserve is a major asset in Marana, with the dual benefit of environmental health and community recreation. The goals and policies in this Chapter support future open spaces that benefit the community environmentally, socially, culturally, and physically.

Regional Open Spaces

Situated in southern Arizona, Marana is surrounded by picturesque mountain ranges and regional open spaces enjoyed by residents and visitors alike. These include locally and regionally protected open spaces, such as Tortolita Mountain Park, Picacho Peak State Park, Ironwood Forest National Monument, Saguaro National Park, Coronado National Forest, and Tucson Mountain Park. It is important that Marana continues to coordinate with the various agencies that manage these open spaces to preserve their ecosystems and scenic value, and ensure they are suitable for continued recreational use.

Tortolita Mountain Park

Tortolita Mountain Park is located in northeast Marana, and includes the Tortolita Mountains. The park is maintained by Pima County, and features hiking trails, equestrian trails, mountain biking, and wildlife viewing.



Source: Discover Marana

Picacho Peak State Park

Picacho Peak State Park is located just north of Marana, along Interstate 10. The park is maintained by the Arizona State Park Foundation, and features hiking trails and camping sites.



Source: Travel2Arizona.com

Ironwood Forest National Monument

The Ironwood Forest National Monument is located west of Marana, and is managed by the Bureau of Land Management (BLM). The national monument features several culturally historical sites, including several that are listed on the National Register of Historic Places.



Source: Bureau of Land Management

Saguaro National Park

Saguaro National Park’s West Unit is located directly south of Marana, and includes the Tucson Mountains. The park is managed by the National Park Service, and features a dense concentration of Saguaro cacti, as well as a variety of hiking trails and wildlife viewing.



Source: Discover Marana

Coronado National Forest

The Coronado National Forest is spread throughout southeastern Arizona and into New Mexico, and is managed by the U.S. Department of Agriculture. The national forest contains 12 different mountain ranges, including the Santa Catalina Mountains east of Marana.



Source: Runrevel.com

Tucson Mountain Park

Tucson Mountain Park comprises 20,000 acres south of Marana. The park is maintained by Pima County and has 62 miles of shared-use trails for hikers, equestrians, and mountain bikers.



Source: Pima County

Trails

Trails generally include off-street paths that provide active recreational opportunities in open spaces, and help connect people to nature. Marana features a growing network of trails, largely concentrated within the Tortolita Mountains and along the Santa Cruz River. In total, residents and visitors enjoy over 60 miles of trails in the Town. These trails are listed in **Table 4-1**.

Table 4-1 Trails in Marana

Trail	Location	Distance	Activities
Alamo Springs Spur Trail	Tortolita Mountains	0.5 miles	<ul style="list-style-type: none"> ■ Hiking ■ Biking
Alamo Springs Trail	Tortolita Mountains	4.1 miles	<ul style="list-style-type: none"> ■ Hiking
Cochie Springs Trail	Tortolita Mountains	7.2 miles	<ul style="list-style-type: none"> ■ Hiking
Hotel Spur Trail	Tortolita Mountains	0.3 miles	<ul style="list-style-type: none"> ■ Hiking
Loop Trail	Tortolita Mountains	1.7 miles	<ul style="list-style-type: none"> ■ Hiking ■ Biking
Lower Javelina Trail	Tortolita Mountains	1.7 miles	<ul style="list-style-type: none"> ■ Hiking
Ridgeline Trail	Tortolita Mountains	3.1 miles	<ul style="list-style-type: none"> ■ Hiking ■ Biking
Shared Use Path	Santa Cruz River	18.9 miles	<ul style="list-style-type: none"> ■ Hiking ■ Biking ■ Equestrian
Tortolita Preserve Trail	Tortolita Foothills	9.7 miles	<ul style="list-style-type: none"> ■ Hiking ■ Biking ■ Equestrian
Upper Javelina Trail	Tortolita Mountains	2.8 miles	<ul style="list-style-type: none"> ■ Hiking ■ Biking
Wild Burro Trail	Tortolita Mountains	6.5 miles	<ul style="list-style-type: none"> ■ Hiking ■ Biking ■ Equestrian
Wild Mustang Trail	Tortolita Mountains	3.8 miles	<ul style="list-style-type: none"> ■ Hiking ■ Biking

The policy guidance in this Theme promotes continued trail development to better connect communities and open spaces as well as policy guidance for limiting trail development impacts on the natural environment.



Source: Town of Marana

Water Resources Element

In a dry, arid environment, water is a limited resource. One of the primary reasons the Town sought incorporation in 1977 was to protect its rights to water resources. Water resources in Arizona are managed by the Arizona Department of Water Resources (ADWR), which divides the state into five Active Management Areas (AMAs). Marana is within the Tucson AMA, and as such, must comply with the Assured Water Supply Program to maintain a 100-year water supply. The Town received a Designation of Assured Water Supply by ADWR in 1997, permitting Marana to pump groundwater to serve its customers.

The Tucson AMA has the goal of maintaining an equal balance between the amount of withdrawn groundwater and the amount of recharged water, either naturally or artificially, deposited back into the groundwater basin. According to Arizona statutes, this goal is expected to be achieved and maintained by 2025, which is within the horizon of this General Plan. Marana contributes to this goal in several ways. One way is through membership in the Central Arizona Groundwater Replenishment District (CAGRDR). The CAGRDR recharges groundwater supplies back into the aquifer, allowing members, such as Marana to have a balanced water resource portfolio necessary to meet local demands.

In addition to groundwater pumping rights and replenishment capacity, Marana's current renewable water portfolio includes 2,336 acre feet per year (AFY) of Municipal and Industrial priority Central Arizona Project (CAP) water. The Town recently completed a major expansion to its water reclamation facility in North Marana. This included the design and construction of an effluent recharge facility where Marana now stores treated effluent to accrue long term storage credits. The expanded water reclamation facility will provide the capacity to support up to 10,000 new homes and the recharge facility places treated water back into the aquifer to further help meet the Tucson's AMA goal.

Marana also receives its proportionate share of long-term storage credits for treated effluent discharged from Pima County Regional Wastewater Reclamation Department's (RWRD's) Tres Rios Water Reclamation Facility and stored in the Lower Santa Cruz River Managed Recharge Project. Marana's share is based on the amount of water provided by Marana Water in areas where RWRD provides sewer service, less reductions for obligations to Pima County, the Department of the Interior (to maintain Tribal water rights), and conservation.

According to the 2010 Potable Water Master Plan, the Town is expected to need over 60,000 AFY at buildout (as determined in the 2010 Potable Water Master Plan). While some resources, such as effluent and CAGRDR supplies, will continue to increase with growth, other water resources fluctuate. During a drought event, reductions or limitations to water supply may drop below water demand, causing a water shortage. To mitigate fluctuating water resources, Marana should develop a Drought Management Plan that provides strategies to augment water supply through additional water resources, as well as reduce demand through water conservation efforts.

Environmental Planning Element

The natural environment can be unforgiving to poorly planned development. Likewise, poorly planned development can have long-term adverse impacts on the environment. As such, balancing future development with the natural environment is critical for a sustainable future and protecting Marana residents from adverse environmental impacts. The primary environmental considerations for development in Marana are floodplains and the wildland-urban interface.

Floodplains

During storm events, rainwater flows towards surface waters, such as rivers and washes. In the desert environment, rivers and washes are predominately dry. These dry riverbeds can become overwhelmed during storm events and summer monsoon rains, which can lead to flooding. The areas prone to flooding, or those areas that are determined to have a 1% chance each year of flooding according to the Federal Emergency Management Agency (FEMA), are considered within the 100-year floodplain. **Figure 4-2** depicts the 100-year floodplain within Marana, as well as the Santa Cruz River's floodway.

Development and urbanization can exacerbate stormwater issues and flooding and reduces wildlife habitat in xeroriparian areas. Impervious surfaces caused by development restrict stormwater infiltration into the ground. Rather, this water is often discharged into a surface water channel, such as the Santa Cruz River. This not only expedites the rate stormwater flows into the River, but also collects pollutants along the way, such as gasoline, motor oil, bleach, and other household cleaners and deposits them in the River. This stormwater management method can increase flooding issues to nearby developments, erode rivers and washes, and pollute waterways. Since stormwater is so important to keeping water levels at their peak, the Town has implemented an outreach program that lets the public know why stormwater pollution prevention is important. This also helps to bring the citizens together as a community with a common goal.

In addition to the potential adverse impacts caused by development and urbanization within floodplains, agricultural land can adversely impact water quality in waterways, such as the Santa Cruz River. Pesticides and other chemicals used on agricultural land is often washed along with stormwater runoff and into important waterways, reducing the water quality and impacting the riparian habitats.

To help protect surface waterways, such as the Santa Cruz River and other various washes, Marana established an erosion hazard setback to all-natural channels. The setback is a horizontal distance measured from the primary channel bank of an incised channel or from the floodplain limit of a non-incised channel to provide a measure of safety against lateral erosion. Bank protection lines much of the Santa Cruz River between Ina and Avra Valley roads. The Lower Santa Cruz River Levee was constructed by Pima County Regional Flood Control that extends from Avra Valley Road to Sanders Road on the east bank. These flood control structures reduce the flooding risk for areas adjacent to the Santa Cruz River. An additional bank protection project is currently being designed for the protection of the El Rio Preserve on the West bank of the Santa Cruz River, north of the Continental Ranch neighborhood.

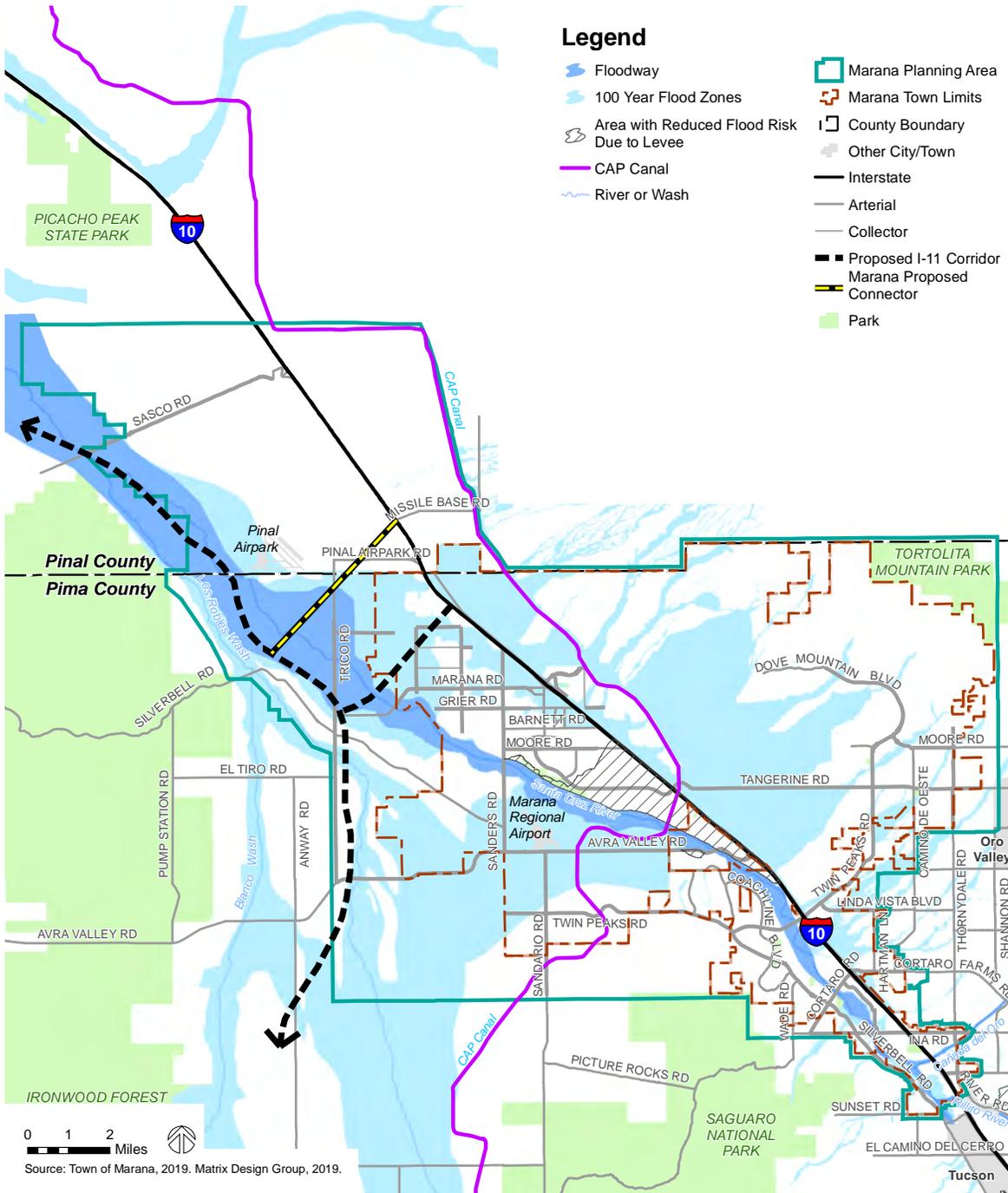


Figure 4-2
Floodway and Floodplains



The Town of Marana provides this map information "As Is" at the request of the user with the understanding that it is not guaranteed to be accurate, correct or complete and conclusions drawn from such information are the responsibility of the user. In no event shall The Town of Marana become liable to users of these data, or any other party, for any loss or direct, indirect, special, incidental, or consequential damages, including but not limited to time, money, or goodwill, arising from the use or modification of the data.

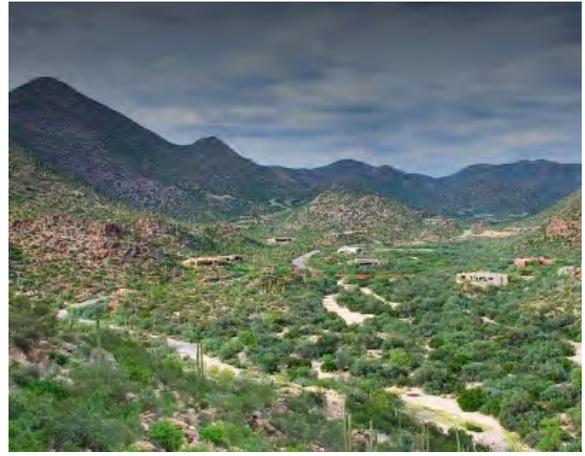
Map Revised: 1/14/2020

Tortolita Fan

Another area of stormwater concern is in the Tortolita Foothills. As stormwater runs off the Tortolita Mountains, water drains downhill through the Foothills towards the Union Pacific Railroad (UPRR) and Interstate 10, creating an alluvial fan, also known as the Tortolita Fan. Many of the culverts under the UPRR are currently undersized, which causes ponding along the UPRR. There are few culverts under Interstate 10, which exacerbates the drainage issue. The Town is currently working on a North Marana Drainage Study in northwest Marana to identify flooding risk and to identify projects that will alleviate this situation.

Wildland-Urban Interface

Wildfires can spread quickly in a dry, arid environment, threatening life and property. As development extends into remote, natural areas, homes become more exposed to potential wildfire threats while moving farther away from safety. The wildland-urban interface consists of natural areas on the edge of urbanization that contain dense scrubland, where wildfires are more likely to occur and cause damage to life and property. Additionally, introduction of non-native, invasive vegetation, such as buffelgrass, creates a condition where wildfires are more likely to occur and spread.



Residential homes in the wild scrubland of the Tortolita Mountains.

Source: Town of Marana

As a growing and expanding community, there are large areas of natural undeveloped land surrounding the Town, particularly in the Tortolita Foothills. The Tortolita Foothills is flush with scrubland due to the stormwater runoff from the mountains. This dense, dry scrubland could potentially add fuel to wildfires, threatening life and property in nearby communities. This General Plan contains policy guidance to help balance future development with potential fire hazards in the wildland-urban interface.

Conservation Element



Sunset over the Sonoran Desert.
Source: Town of Marana

Located in the vast Sonoran Desert, Marana is home to a diverse habitat of plants, animals, and other important natural resources. As development occurs, habitats can become disconnected and fragmented, cutting off migration patterns, reducing genetic diversity, and causing loss of species critical to the natural ecosystem. The Conservation Element promotes the preservation of these important natural resources, and protects the vibrant Sonoran Desert ecosystem through wildlife crossings and invasive species management.

Within the Town's municipal boundary, Marana protects natural resources through the Town Code's *Native Plant Protection Landscape Requirements*. The Town reviews all development for unique environmental features and resources important to the community, such as riparian areas, wildlife corridors, and significant vegetation, and requires conservation measures for these areas where applicable.

Since Marana's planning area is largely undeveloped, there are many opportunities to protect these resources, fostering a healthy ecosystem. Over the years, the Town has completed several documents that are used as guidance, but have not been formally adopted due to the delisting of endangered or threatened species and change in federal and state regulations. Some of these documents include the Draft Habitat Conservation Plan (developed originally for the listing of the Cactus Ferruginous Pygmy Owl and then modified to include 13 species), and the Santa Cruz River Corridor Study. The Town intends to review these documents and combine these efforts into one Open Space and Wildlife Conservation Plan, which will guide future natural resource conservation in the future.

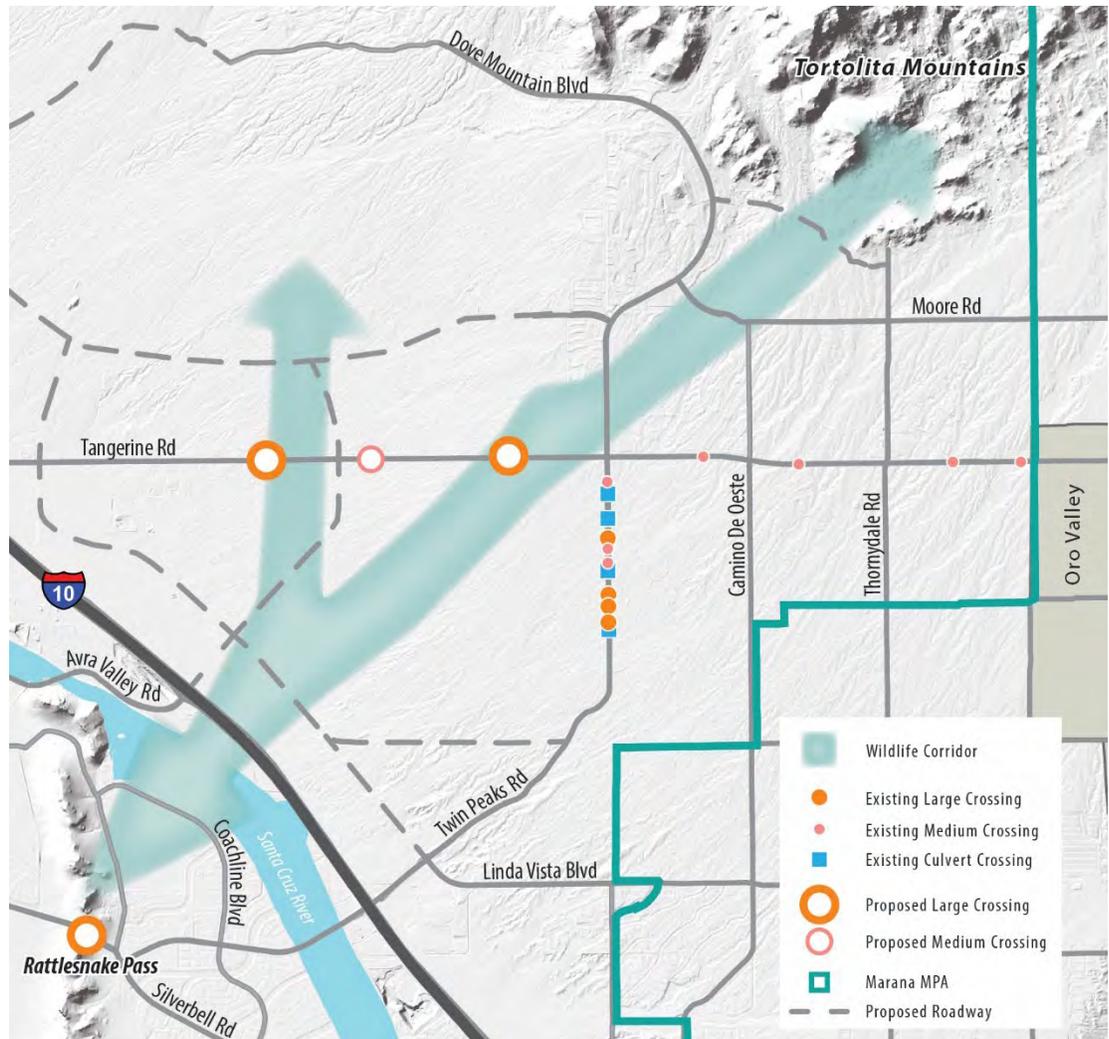
Wildlife Crossings

As mentioned in the Open Space Element, Marana is surrounded by several major preserves that foster robust plant and wildlife habitats. Marana’s location between these natural open spaces makes the Town a crossroads for many wildlife traversing between these nature preserves. **Figure 4-3** broadly illustrates the wildlife corridors across Marana, which generally follow the wash corridors between the Tortolita Mountains and Santa Cruz River. Also shown on **Figure 4-3** are the existing and proposed wildlife crossings at Twin Peaks Road and Tangerine Road. The Town is committed to supporting wildlife corridors across Marana, and should continue to incorporate wildlife crossing best practices where appropriate.



Wildlife Crossing at Twin Peaks Road
Source: Arizona Game and Fish Department

Figure 4-3 Wildlife Corridors



Invasive Species

Invasive species, or plant and animal species not native to a particular ecosystem, can be detrimental to the natural ecology. Invasive species can outcompete native species for water and nutrients, allowing the invasive species to thrive at the expense of native species.

One invasive species in particular that threatens the natural Sonoran Desert ecology is Buffelgrass. Buffelgrass not only outcompetes native plants for water, but also spreads quickly and easily. This grass species is highly flammable, increasing the frequency and severity of wildfires, which further threatens the natural ecosystem, as well as life and property. Further exacerbating the issue, Buffelgrass may be spread through fire, whereas native species are destroyed.

Buffelgrass, as well as other invasive species, require continuous monitoring and management to minimize their impacts on the pristine Sonoran Desert ecosystem.

Energy Element

Energy is an essential resource that powers most aspects of our daily lives. The average U.S. household consumes approximately 10,400 kilowatt hours (kWh) annually, compared to an average Arizona household that consumes approximately 12,400 kWh annually.

The two energy providers in Marana are Tucson Electric Power and Trico Electric Cooperative. These suppliers provide power from coal, nuclear generators, natural gas, solar photovoltaic, wind, and hydroelectric power plants.

Energy Efficiency

With electricity costs increasing, energy efficiency is becoming increasingly necessary, and renewable alternative energy is becoming a more attractive and profitable solution. As such, Marana is dedicated to energy efficiency and conservation. In 2017, the Town Council approved a resolution to review all options for the use of alternative energy throughout Marana. This resolution came in response to increasing costs of electricity and decreasing costs of solar energy systems. It is estimated that the Town currently spends \$1.1 million annually on electricity. This resolution resulted in the development of 9,600 square feet of solar panels being installed above two basketball courts at Crossroads at Silverbell District Park in 2018. These solar panels are expected to reduce power costs by approximately 25% and save Marana \$473,772 over the next 20 years.



*Solar Panels in Crossroads at Silverbell District Park
Source: SOLON Corporation*



Solar Panels in the Policy Facility Parking Lot
 Source: SOLON Corporation

The Town also constructed solar panels over the employee parking lot and the secured Police Facility parking lot at the Marana Municipal Complex. These panels are anticipated to provide enough energy to power the Marana Municipal Complex and the new Police Facility. Additionally, these solar panels provide shade for parked cars and some protection for the Town’s fleet vehicles. The Town conducts energy audits at regular intervals to determine the Town’s largest energy users. This audit determines if

retrofits to existing facilities or operations can save Marana money, or significantly reduce energy consumption.

In addition to the Town’s dedication to energy efficiency, residential homes are increasingly installing solar panels to reduce energy costs. Between 2016 and 2018, the number of residential homes in Marana with rooftop solar panels increased by nearly 50%.

Other entities expanding solar development include the Marana Health Center and Marana Unified School District, both of which have installed solar shade structures over surface parking lots. Providing solar panels over dedicated surface parking lots serves a dual purpose of energy collection and generation, as well as shade for parked cars. Trico Electric Cooperative and Torch Clean Energy also partnered to construct an 80-acre solar photovoltaic array in Marana located along Avra Valley Road and west of Sanders Road. This facility has the capacity to generate approximately 30,000 megawatt hours of electricity, which is enough to power over 3,000 homes annually.



80-acre Solar Array along Avra Valley Road
 Source: Town of Marana

The goals and policies in this Theme support the Town’s dedication to energy efficiency and continued cost-effective alternative energy development to reduce Marana’s reliance on nonrenewable energy. This is completed through education and partnerships, as well as other opportunities for private investment in alternative energy.

Goals and Policies

Open Space

Goal RS-1. Marana’s dedication to preserving the Sonoran Desert environment contributes to the Town’s aesthetic character.

- Policy RS 1-1. Where possible, encourage developers to maintain open space, view corridors, and wildlife connectivity to ensure that development does not block wildlife crossings and their connecting corridors.
- Policy RS 1-2. Establish guidelines for buffering natural open spaces from development.
- Policy RS 1-3. Coordinate with regional agencies and neighboring jurisdictions to establish and manage open space and incorporate conservation measures into future long-range planning efforts.
- Policy RS 1-4. Work with the Arizona State Land Department to protect significant open space in the Tortolita Foothills as the area is developed.
- Policy RS 1-5. Advocate that the Arizona State Land Department preserve high-quality natural undisturbed open space and maintain wildlife corridors.

Goal RS-2. Residents enjoy the vast open spaces within and surrounding Marana through an expansive regional trail network and passive recreational opportunities accessible to all community members.

- Policy RS 2-1. Identify an integrated system of trails through open spaces that connects to Marana’s on-street bike and pedestrian network in the Parks and Recreation Master Plan.
- Policy RS 2-2. Adopt trail requirements in the Town Code, in accordance with the adopted Parks and Recreation Master Plan, for future residential developments.
- Policy RS 2-3. Coordinate with the Bureau of Land Management and National Park Service to connect future trail extensions to current and future trailheads at the Ironwood Forest National Monument and Saguaro National Park.

- Policy RS 2-4. Coordinate trail extensions with surrounding jurisdictions, including Pima County, Pinal County, the City of Tucson, and the Town of Oro Valley for regional connectivity.
- Policy RS 2-5. Adopt design and construction standards in the Town Code for future trails that minimize impacts to the natural environment.
- Policy RS 2-6. Consider educational kiosks along trails in preserved open space that inform and educate trail users on the Sonoran Desert and other interesting local facts.

Goal RS-3. The Santa Cruz River is an iconic open space spine through Marana.

- Policy RS 3-1. Work with the Pima County Regional Flood Control District to establish the Santa Cruz River Corridor as an active and passive open space area.
- Policy RS 3-2. Connect regional active and passive recreational sites along the Santa Cruz River Corridor.
- Policy RS 3-3. Encourage low-impact development standards along the Santa Cruz River Corridor that include habitat protection, flood control, and recreation.
- Policy RS 3-4. Continue to connect shared-use paths along the Santa Cruz River, and in the community, that ultimately achieve connectivity to Downtown Marana.

Water Resources

Goal RS-4. Marana is dedicated to conserving and optimizing the use of water resources to ensure long-term supplies.

- Policy RS 4-1. Develop a Drought Management Plan consistent with the Arizona Drought Preparedness Plan that prepares Marana and its residents in the event of water shortages and limitations.
- Policy RS 4-2. Actively promote the use of non-potable sources other than treated effluent, as appropriate, as a sustainable water source for non-potable uses, such as irrigation, in current and future developments.

- Policy RS 4-3. Identify best practices for water conservation programs that can be implemented throughout the community, such as stormwater harvesting or conservation-oriented tap fees.
- Policy RS 4-4. Identify code updates, policies, and practices for the reduction of water usage.
- Policy RS 4-5. Review development proposals to evaluate impacts that development may have on the Town's water supply.
- Policy RS 4-6. Encourage the use of native desert vegetation and low water use vegetation for landscaping on public and private development.
- Policy RS 4-7. Develop a community-wide water conservation awareness campaign.
- Policy RS 4-8. Encourage agriculture and other large industrial and commercial users to transition to the use of renewable water supplies.
- Policy RS 4-9. Continue to install low flow/drip/best practices irrigation systems for common area landscaping for all public spaces.

Goal RS-5. Marana maintains an assured water supply to accommodate future growth.

- Policy RS 5-1. Continue to study population projections and land use trends to determine future water demand.
- Policy RS 5-2. Assess the cumulative impacts of development on water resources within the Town and the region as a whole.
- Policy RS 5-3. Obtain all possible contractual allocations of Central Arizona Project (CAP) water available.
- Policy RS 5-4. Regularly update the Marana Potable Water Master Plan to ensure that water resource needs are being met.

- Policy RS 5-5. Coordinate with other local and regional partners for regional water planning.
- Policy RS 5-6. Participate on water resource management committees for legislation regarding water planning issues.
- Policy RS 5-7. Maximize recharge of treated effluent to meet water resource obligations for current and future customers.

Goal RS-6. Marana provides high-quality potable water for consumer consumption.

- Policy RS 6-1. Continue to ensure that potable water meets or exceeds federal and state standards.
- Policy RS 6-2. Regularly monitor water quality and aquifers for contaminants.
- Policy RS 6-3. Update the Marana Potable Water Master Plan to reflect current water quality needs.
- Policy RS 6-4. Coordinate water availability, distribution, pressure, and quantity requirements for area fire districts and other water providers.

Environmental Planning

Goal RS-7. New developments are constructed in a manner that minimizes flooding.

- Policy RS 7-1. Encourage and incentivize the use of Low Impact Development techniques, such as rain water harvesting, as a tool for reducing post-development runoff.
- Policy RS 7-2. Study and seek funding for flood control projects that reduce the extent of the 100-year floodplain in a sustainable manner.
- Policy RS 7-3. Work with developers to incorporate drainage facilities within their proposed development.
- Policy RS 7-4. Seek to obtain grant funding to implement regional drainage facilities.
- Policy RS 7-5. Use detention basins for multiple purposes (recreation, landscape bufferyard, etc.) where practical and feasible.

Goal RS-8. Stormwater is efficiently and sustainably managed in a way that reduces flood risks and respects water quality.

- Policy RS 8-1. Review, assess, and update the Stormwater Master Plan to comply with Arizona Department of Environmental Quality standards.
- Policy RS 8-2. Preserve and protect primary natural drainage systems.
- Policy RS 8-3. Consider establishing sustainable stormwater methods, such as green infrastructure and pervious pavements, in new development.

Goal RS-9. Marana protects its major water corridors from erosion.

- Policy RS 9-1. Protect the Santa Cruz River from erosion and flooding.
- Policy RS 9-2. Identify options for expanding bank protection improvements along the north and south bank of the Santa Cruz River.

Goal RS-10. Marana proactively addresses wildfire hazards in the wildland-urban interface.

- Policy RS 10-1. Continue to support the implementation of the Pima County Community Wildfire Protection Plan.
- Policy RS 10-2. Identify wildfire hazard areas in Marana, and adopt associated buffer standards.
- Policy RS 10-3. Proactively manage wildland vegetation in developed areas to reduce the amount of fire fuels, including Buffelgrass.
- Policy RS 10-4. Produce and promote fire-safety educational materials for the community.
- Policy RS 10-5. Encourage ignition-resistant materials and construction techniques.

Conservation

Goal RS-11. Marana promotes the protection, conservation, and long-term sustainability of its distinct natural environment.

Policy RS 11-1. Work with regional entities to develop and adopt an Open Space and Wildlife Conservation Master Plan that establishes a vision of open space throughout the Town.

Policy RS 11-2. Through an Open Space and Wildlife Conservation Plan, identify open spaces that are development sensitive.

Policy RS 11-3. Seek innovative methods for acquiring and preserving important natural resources.

Policy RS 11-4. Continue to work with Arizona State Land Department and other local and regional stakeholders to adequately buffer and preserve wash corridors throughout Marana.

Policy RS 11-5. Establish invasive species prevention measures and regulations to continuously monitor, manage, and remove invasive species.

Policy RS 11-6. Ensure that development has collective natural undisturbed open spaces and that they are maintained and managed properly by homeowners' associations or other entities.

Policy RS 11-7. Promote habitat creation and species introduction and protection at water recharge facilities.

Goal RS-12. Development is integrated and compatible with sensitive Sonoran Desert landscape.

Policy RS 12-1. Work with developers and others to conserve natural resources within new developments.

Policy RS 12-2. Review and assess Town Code standards for preservation of natural undisturbed open space.

Policy RS 12-3. Update the hillside development regulations to limit development impacts on steep slopes.

Policy RS 12-4. Consider creating land development guidance that recognizes development sensitive areas, such as washes, floodplains, and steep slopes.

Policy RS 12-5. Explore conservation development strategies that maintain density and permit lot size reductions administratively in exchange for a parallel increase in conserving natural undisturbed open space.

Policy RS 12-6. Consider adopting cluster development standards in the Town Code that allow density in exchange for protecting development sensitive natural resources and open spaces in Marana, using methods such as conservation easements.

Goal RS-13. Marana fosters wildlife movement across the community, connecting wildlife to surrounding natural areas.

Policy RS 13-1. Through an Open Space and Wildlife Conservation Master Plan, identify wildlife habitats and linkages.

Policy RS 13-2. Work with developers and regional agencies to incorporate designated natural washes and drainageways within development to accommodate wildlife movement.

Policy RS 13-3. Explore partnerships with Pima County, the Regional Transit Authority and other regional stakeholders to seek opportunities for preserving wildlife movement by linking major regional open spaces.

Policy RS 13-4. Regularly research best practices for preserving natural undisturbed open spaces to maintain wildlife connectivity, in a manner that is compatible with future growth.

Goal RS-14. The Santa Cruz River is a world-class restored riparian habitat.

Policy RS 14-1. While allowing for active and passive recreational activities within the corridor, identify and protect, from human activity, distinct habitat areas such as sandy bottom and low-flow water areas.

Policy RS 14-2. Work with private property owners to protect and buffer important riparian habitat areas from existing and future development, as well as existing and future aggregate mining operations to avoid incompatible land uses.

Policy RS 14-3. Aggregate mining owners and or operators, shall notify the Town of Marana of any proposed new and or expanded operations within the Marana Municipal Planning Area. Any notice and or transmittal submitted per A.R.S. Title 27, shall be provided to the Town within fifteen (15) days of submitting to the state mine inspector, including but not limited to reclamation plans and financial assurance mechanisms.

Energy

Goal RS-15. Marana encourages energy conservation to reduce energy demand.

Policy RS 15-1. Develop a strategic plan to ensure coordination between the Town of Marana and power utility companies for future growth capacity needs.

Policy RS 15-2. Work with Tucson Electric Power and Trico Electric Cooperative to develop educational material for energy conservation and energy-saving tips that can be distributed to the community.

Policy RS 15-3. Encourage developers to use native vegetation or shade structures for buildings to increase cooling and reduce the amount of energy that is used for cooling.

Policy RS 15-4. Promote energy-efficient home design and materials in future residential construction.

Goal RS-16. Marana explores and encourages innovative renewable energy practices to help power future growth.

Policy RS 16-1. Use State and Federal energy grants to meet the Town’s renewable energy objectives.

Policy RS 16-2. Continue to implement incentive programs for sustainable development, such as the Marana Job Creation Incentive Program.

Policy RS 16-3. Invest in programs that enable the Town to achieve reductions in energy demand, improvements in energy efficiency, and the continued transition to renewable energy sources.

Policy RS 16-4. Continue to enforce the International Energy Conservation Code and consider adopting additional energy regulations as new energy conservation methods or standards emerge.

Goal RS-17. Marana integrates energy efficiency into its municipal operations.

Policy RS 17-1. Continue to develop innovative methods for incorporating renewable energy into Town facilities, such as solar panels that double as shade structures.

Policy RS 17-2. Identify municipal facilities that have the capacity to incorporate renewable energy technologies.

Policy RS 17-3. When possible, design and orient municipal buildings and structures to maximize alternative energy technologies.

Policy RS 17-4. Continue to be involved in community events that are centered on sustainability.

Page left intentionally blank.