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# A Social Analysis of the San Marcos River

**Abstract**

The San Marcos River, located in San Marcos, Texas, has a significant cultural importance to its community today and throughout history. There is a strong local culture of environmental stewardship. Residents described the river as a place with sacred healing qualities and of "ancient" spiritual significance (Price 2020). The local culture around the San Marcos River is in flux between environmental advocacy and recreational use. The latter both degrades and spreads awareness for the environment. The river's condition and social qualities created an interesting case study for how relationships with this urban river foster a sense of community, local identity and environmental stewardship. San Marcos is experiencing rapid growth, and suburban expansion within the Edwards Aquifer recharge zone combined with increasing drought due to climate change is the biggest future threat to this river system. To best protect river ecosystems as these changes take place, we need to understand the local culture impacts environmental advocacy. This reconnaissance study begins to evaluate the spatial organization of recreation and the drivers of spiritual, recreational and social value in San Marcos's river culture.

## Introduction

The city of San Marcos originated around the river and springs. The city is experiencing steady growth that began around 2000 (U.S. Census, 2000). The river is home to several threatened and endangered species that live exclusively in the springs and upper reaches (Figure 1) (U.S. Army Corps of Engineers, 2014). This river and spring were important to ancient civilizations in this region dating back 12,000 years (Figure 2) (Kimmel 2006). Through the mid 20th century, the springs operated as a theme park and resort for nearly 70 years (Figure 3-4) (Weber 2009). A culture of environmental advocacy developed in the 1960s to protect the river. This study investigates the recreational drivers that benefit from and promote restoration, and how the recreational and social value of the river influence culture and local identity.

## Background

The San Marcos River is spring fed from the Edward's Aquifer (Figure 5). From the spring, it runs 4.5 miles through town before converging with the Blanco River, and then 82.5 miles before merging with the Guadalupe River, then drains into the Gulf of Mexico. The 4.5-mile upper reaches of the river make it the most unique. The San Marcos River is the second largest spring system in Texas, it has consistent flow and stable temperatures of 72º F. Numerous specialized species have evolved in this particular habitat (Table 1), and they are sensitive to minor changes in the river. The heavy spring flow keeps the waters clean and free of stagnation, and the cleanliness and steady flow are inviting to recreation (Figure 6) (Kimmel 2006).

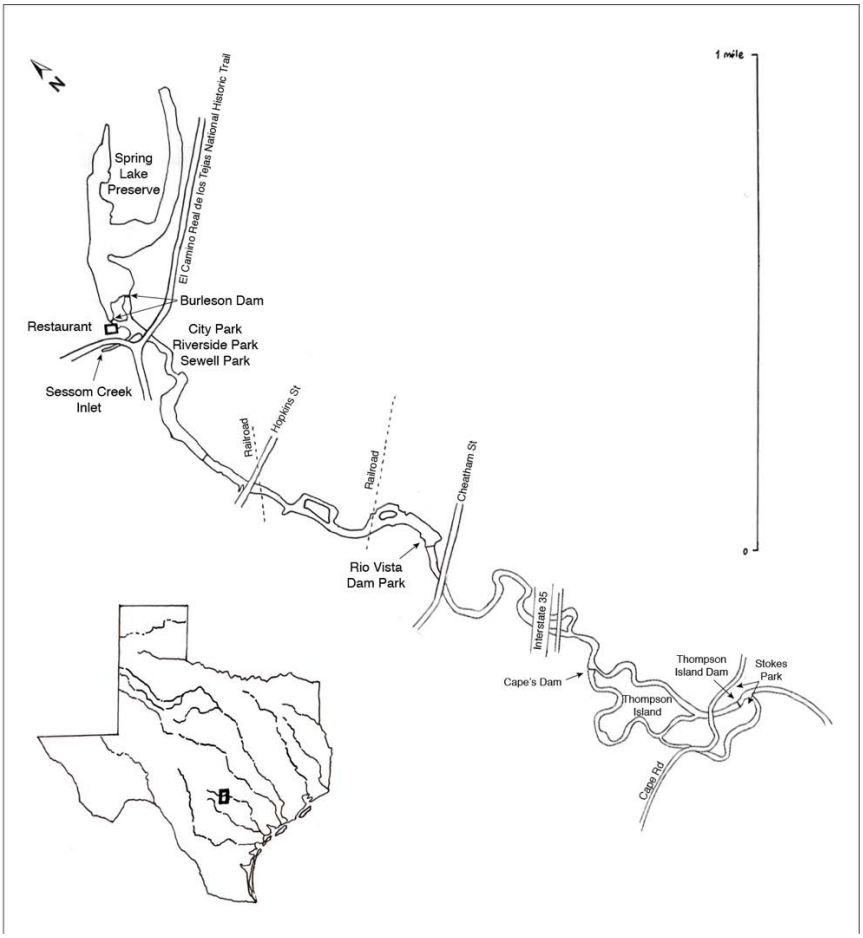


Figure 5: Texas reference map and upper San Marcos River map, by Lilly Byrd.

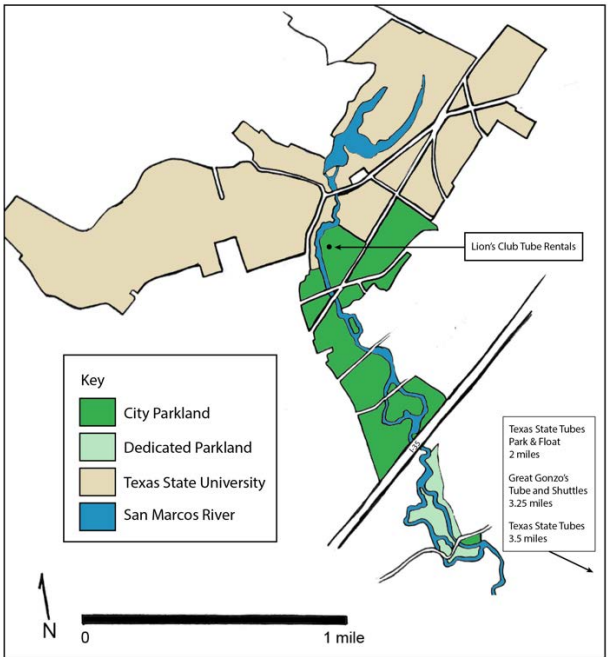


Figure 6: Map of land ownership and use along the San Marcos River.

San Marcos has a large and growing Hispanic population, measuring 42% in 2017. Its diversity beyond this is low, at 5% Black/African American, 2% Asian and 2% other. (2000 and 2010 U.S. Census. 2017 5-year ACS and Root Policy Research). Most of the population are college-aged, 18-24-year-olds at 39%, followed by young adults age 25-35 at 18%, which are growing at the fastest at a rate of 7.9%. The city has a high ratio of renters to homeowners at 75% renters, 25% homeowners in 2017. However, homeownership is rising rapidly at 17% growth from 2000 to 2017 (Appendix A) (U.S. Census, 2000).

COVID-19 has caused a 60% decline in tourism from 2019 to 2020. On June 26, 2020 Governor Abbott ordered the closure of commercial rafting and tubing companies, and these remain closed. The city of San Marcos also closed the many of the river parks and access roads to popular river spots through September (Rash 2020). The city is taking the opportunity to restore Sewell Park during this time.

I reviewed the documents "Rehabilitation of an Existing Channel Dam: Engineering and Environmental Issues; Rio Vista Dam – San Marcos, Texas" (Furlong et al., 2006), "City of San Marcos 2019 EAHCP Work Plan Summary" and the "San Marcos River Section 206 – Aquatic Ecosystem Restoration Project" (U.S. Army Corps of Engineers, 2014). Furlong (et al., 2006) was the plan to repair the damaged Rio Vista Dam in 2006 and reinforce banks into the recreational park space that exists today. The U.S. Army Corps of Engineers (2014) plan covers repairing recreational access structures and bank restoration (Appendix B and C). From these, I chose four park sites for recreational observation: Spring Lake Preserve, Sewell/City Parks, Rio Vista Park and Stokes Park.

The Rio Vista Park restoration from 2006 replaced the older damaged dam with three rows of boulders (Figures 7-8). The boulders create a 3-4 ft drop and two 2 ft drops with the

resemblance to naturalistic rapids with pools in between them. They also restabilized the right bank with limestone retaining walls and terraces above. The restoration document specifies that the project must be finished before the summer recreation activities begin (Furlong et al., 2006).

Figure 7 (left): Photograph of Rio Vista Dam before renovations in 2006.
Figure 8 (right): Photograph of Rio Vista after dam removal and park renovations in 2006. Looking upstream. (Rodriguez 2020)

There is a general eco-recreation and eco-tourism theme throughout the springs in Texas along the Balcones fault zone. Tubing has exploded in San Marcos, and tubers often are rowdy and intoxicated, bring coolers of beer, and leave litter. The influx of people brings in revenue, but that revenue is relatively low because tourists tend to stay in hotels in other cities such as Austin or San Antonio (TXP, Inc. 2017).

**Methods**

My field work focused on observing activities for an hour at four city parks along the river front. I counted the number of people, types of activities, and the number of instances of each activity. I took general notes on frequency of influx and outflux of people, and general demographics such as ethnicity, age groups and family units. I also noted where in relation to the river certain activities were taking place, the weather, and time of day in each location. I took notes on the programming and intended use in the parks' design such as restrooms, terraces,

trash cans, and on impacts on the bank like obvious erosion, unvegetated ground and destabilization.

The four parks I chose were Spring Lake Preserve, Sewell Park, Rio Vista Park and Stokes Park (Figure 9). Spring Lake Preserve was restored into the Texas Rivers Center public park in 1997 (Kimmel 2006). Rio Vista Park was restored in 2006 (Figure 7-8) (Furlong et al. 2006). Sewell/City Park and Stokes Park had their banks and recreational access structures restored in 2014 (Appendix B and C)(U.S. Army Corps of Engineers, 2014).

I spoke to people at random and had extensive interviews with several others. The second half of my field work focused on feedback and suggestions I received from these interviews. Because many of my interviewees mentioned Rio Vista Park, I revisited it to observe the same metrics for the same period of time listed for day one. I added three other sites on the river that were recommended by locals to observe activities; Headwaters, Upper Rio Vista Park and William & Eleanor Crook Park (Figure 10).

**Interview Questions**:

- How often do you choose to swim at the river? Which spots do you usually go to?
- What are your experiences at other Riverside Parks in Texas?
- How engaged are you in the history of the San Marcos River?
- How engaged are you with awareness of endangered or invasive species in the San Marcos River?
- How in your opinion does the river intersect with the local culture as a whole?
- What features of the river do you think should be improved?
- What do you look for in a spot to recreate along the river?

I posted flyers at each of the four parks with a survey posing a different series of questions linked by a QR code, but these did not receive any responses.


Figure 9: Day 1- Map of the San Marcos River marking the parks visited in the first day of observations. Prepared by Lilly Byrd.


Figure 10: Map of the San Marcos River marking the parks visited in the second half of observations. Prepared by Lilly Byrd.

## Results

**Day 1** – Sunny, ~75 degrees F, Sunday Nov. 9, 2020. Observed for 1 hour. (Table 2)

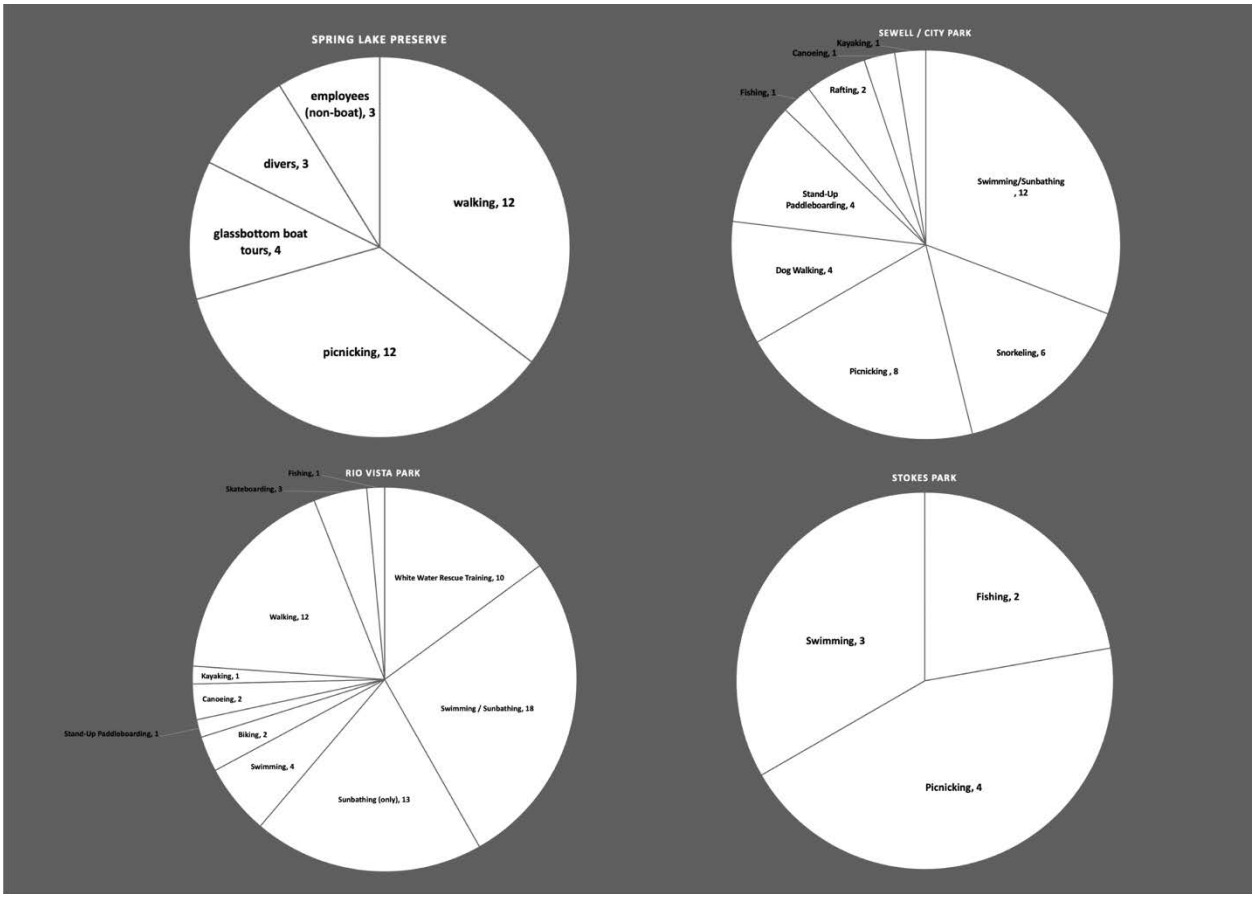


Figure 11: Pie charts at each park location depicting the observed activities at each location, with the number of participants. Prepared by Lilly Byrd (See Tables 1-5)

Figure 12 (left): Spring Lake Preserve's glass-bottom boats on the spring side of the lake, looking south. Photo taken by Lilly Byrd.

Figure 13 (right): Aerial image of Spring Lake. Green dots mark the points where the photos were taken. Observations were made throughout the park.

**Spring Lake Preserve –** owned by Texas State University (Table 3) (Figures 12-13)

I saw few individuals not in groups. One large group of college students and one group of divers were present and appeared to be in groups with kids around age 13 and under, or

couples. Parking is adjacent to the park and requires payment during the week. Boat tours are $10 per person, and the park does not allow swimming. Diving is only allowed to certified specialists for studies or environmental research. The walking trails were largely unoccupied, except for three groups. Extensive educational material is available here about the Springs' history, ecology, and the regional hydrology, most of it in English and Spanish. Ethnic ratio was about 70% Caucasian, 30% Hispanic. Trash and recycling cans were both present, as well as public restrooms.

Figure 14 (left): Recreation at City Park (Sewell next door was fenced off). Looking upstream. Photo taken by Lilly Byrd.

Figure 15 (right): Aerial image of City Park. (Green dot marks where Figure 16 was taken). Source: Google Earth.

**Sewell/City Park** – owned by the City of San Marcos (Table 4) (Figures 14-15)

Sewell Park was fenced off for restoration construction, but both banks were occupied outside of fencing. Unfortunately, these numbers were probably not representative of the normal traffic to this park, due to construction. There were many people swimming, sunbathing and using goggles underwater. Many swimmers were swimming through the patches of Texas wild rice. The parking lot was adjacent to the swimming area. I sited two rangers. Trash and recycling cans were both present, as well as public restrooms. Ethnicity ratios were about 50% Caucasian, 50% Hispanic.

Figure 16 (left): Recreation activities at Rio Vista Park, including white water rescue training team. Looking upstream. Photo taken by Lilly Byrd.

Figure 17 (right): Aerial image of Rio Vista Park. (Green dot marks where Figure 18 was taken).

**Rio Vista Park —** owned by the City of San Marcos (Table 5) (Figures 16-17)

This site had a large grassy terrace space for sunbathing. Many people were swimming and hanging out on boulders in the water spillway. A lot of soil on retaining wall terraces was eroding into the lower levels. Areas planted with grass showed heavy foot traffic and sparse, trodden vegetation leftover. Terraces and beds had erosion-control netting in place. I sited two rangers. There were several ducks. There was a group of rafters practicing river rescue in the manmade rapids. Many people were kayaking and canoeing, and many recreators were wearing helmets. There is no Texas wild rice in the waters in this area. Both trash and recycling cans were present. There were more groups with kids (about 13 and under) than at Sewell.

Figure 18 (left): Recreation at Stokes Park. Photo taken by Lilly Byrd. Looking downstream.

Figure 19 (right): Aerial image of Stokes Park (Green dots marks where Figures 20 and 22 were taken).

**Stokes Park —** owned by the City of San Marcos (Table 6) (Figures 18-19)

This site was less crowded than the others. The riverbanks were eroding, causing trees to lean into the water (Figure 20). There was a lot of graffiti. I sited two rangers near the entrance. Trash and recycling cans were both present. There are no public bathrooms. Ethnicity ratios were about 78% Caucasian, 11% Hispanic, 11% East Asian.

**Day 2** – Sunny, Saturday, Nov. 14, 2020. Observed for 1 hour (except for Headwaters) (See map Figure 10)

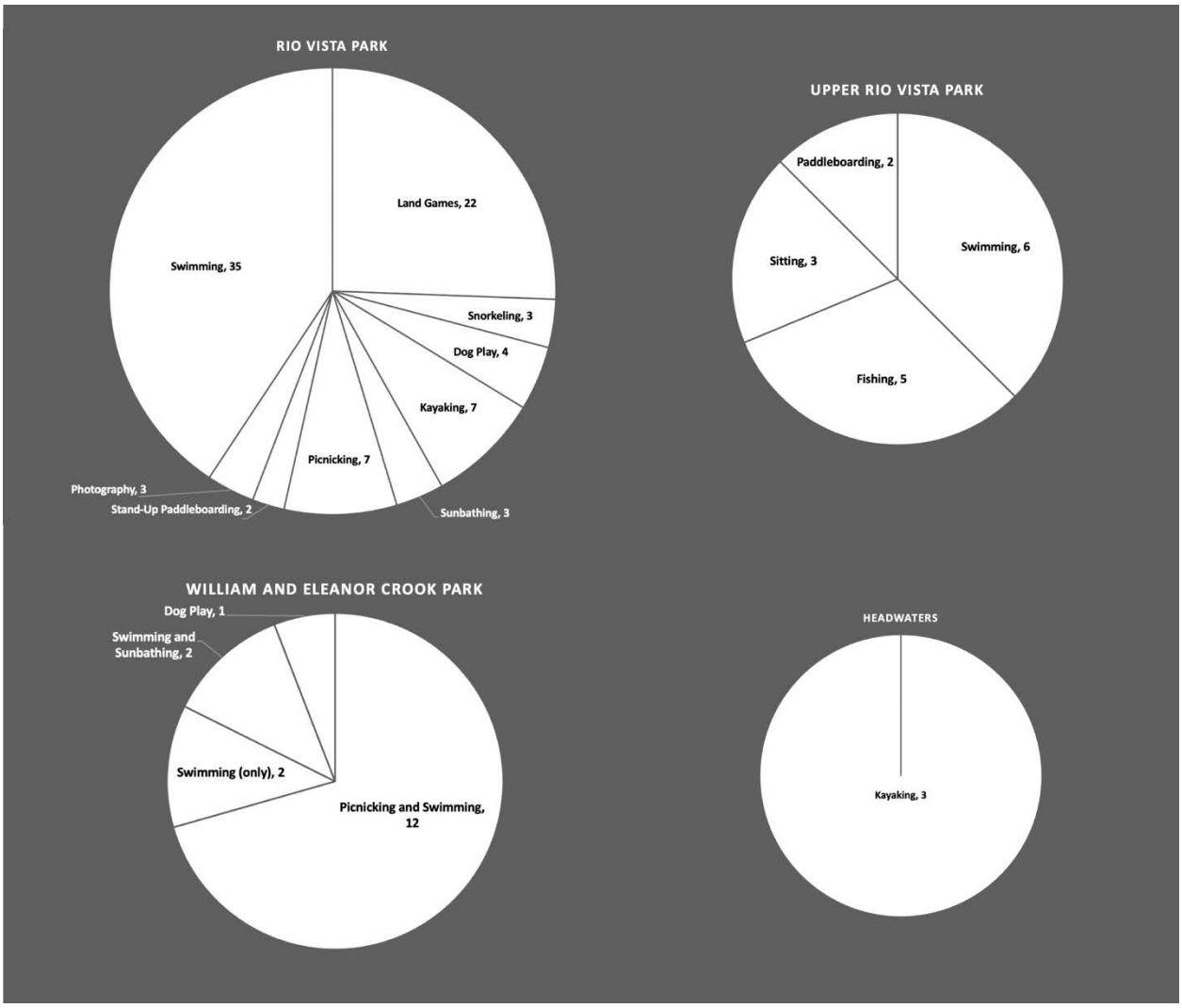


Figure 21: Day 2- Pie charts depicting the number of people doing certain activities in the four locations on the river. Prepared by Lilly Byrd.

Figure 22 (left): Recreation at Rio Vista Park on day two of field observations. Looking downstream. Photo taken by Lilly Byrd.

Figure 23 (right): Aerial image of Rio Vista Park. (Green dot marks where Figure 23 photo was taken).

**Rio Vista Park —** owned by the City of San Marcos (Table 7) (Figures 22-23)

This park was adjacent to the parking lot. I observed that the younger crowds are engaged in more passive activities like swimming and sunbathing, while crowds 35+ tend to dominate the group that is engaging in kayaking, paddle boarding, and fishing; activities requiring more personal gear. All ages were using snorkels and/or using goggles swimming. Ethnic ratios are about 60% white, 40% Hispanic. Sited 5 rangers.

Figure 24 (left): Image at Upper Rio Vista Park. Looking upstream and at island in river. Photo taken by Lilly Byrd.

Figure 25 (right): Aerial image of upper Rio Vista Park area. (Green dot marks where Figures 25 and 27 were taken).

**Upper Rio Vista Park —** owned by the City of San Marcos (Table 8) (Figures 24-25)

This was a quieter access point upstream, three minutes walking from the parking area. A few people were fishing. It was less crowded for groups to set up space on the banks. There are fenced off areas for restoring plants (Figure 26). Ethnic ratios here were about 60% Hispanic, 40% Caucasian. I sited no rangers here. Trashcans, recycling cans and public bathrooms were close by.

**William and Eleanor Crook Park —** owned by the City of San Marcos (Table 9)

This area was a three-minute walk on a dirt path from a parking area. It had a notable college-aged crowd swimming, picnicking, and sunbathing. More groups had stereos to play music, and more groups were covertly drinking alcohol, smoking, and unleashing dogs, all of which are against official park rules throughout the city. Ethnic ratios were about 70% Caucasian, 30% Hispanic. I sited two rangers. Trash and recycling cans were both present. There were no public bathrooms in this area.

Figure 27 (left): Headwaters swimming area where Sessom Creek meets the San Marcos River. Looking downstream on Sessom Creek. Photo taken by Lilly Byrd, Nov. 14, 2020.

Figure 28 (right): Aerial image of the location of Headwaters. (Green dot marks where Figure 28 was taken).

**Headwaters —** owned by the City of San Marcos (Table 10) (Figures 27-28)

A local I interviewed suggested Headwaters, as it was his favorite swimming spot. He gave me specific instructions to enter through a concrete storm drain (about 8 feet wide by 4 feet tall), because the city fenced off the banks to the public. It was about a 10-minute walk from free public parking, and only three other people were there in kayaks. Ethnic ratios 100% Caucasian. No rangers were present. Trash and recycling cans were both present. I did not stay the full two hours because the park was fenced off from the public.

Figure 29: The spillway at Headwaters swimming area below the Burleson Dam. Looking upstream. Photo taken by Lilly Byrd, Nov. 14, 2020.

**Interviews:**

Aside from in-person discussions and field observations, I interviewed three participants, and am awaiting two more, about their experiences with the San Marcos River; Christian Farris, Gary Price and Joe Higgs. Farris is a 30-year old San Marcos resident. Price is a 65-year old Austin resident who is very familiar with San Marcos and the springs of Central Texas. Higgs is a resident of San Antonio with experience in San Marcos and other river cities. The answers I got

were conversational and led to interesting offshoot topics. I spoke briefly with a local man, a tour guide at Spring Lake and a woman who visited Aquarena Springs as a child in 1962.

In an interview with San Marcos resident, Christian Farris, I learned about the locals' relationship to the river. His favorite river activities are swimming with his dog, kayaking, exploring the waters with goggles and playing guitar on the banks. He has a practice of bringing a bag to collect trash whenever he can and mentioned wanting to get a waterproof flashlight to go night-swimming and searching for items on the river floor. A friend of his built two giant mechanical sculptures out of trash he found in the river, one that is an aquatic creature and one that resembles a swimmer or Poseidon-type figure (Figures 35-36).

Figures 30-31: Publicly displayed sculptures in the front yard of San Marcos artist. These sculptures are made entirely of items found on the bottom of the river. It is a hobby for many to go "treasure hunting" with snorkeling gear on the river floor. Photo taken by Lilly Byrd.

Farris didn't know specifics of the river biology, but appreciates the Texas wild rice (*Z. texana*) and likes to swim around it. There are local groups that go spearfishing for invasive fish species in the river, such as suckermouth catfish (*Hypostomus Plecostomus)* or tilapia (*Oreochromis niloticus*). He has never seen a salamander or a threatened or endangered animal species but mentions seeing snapping turtles (*Macrochelys temminckii*) and invasive nutria (*Myocastor coypus*).

**Discussion**

The demographics gathered at points in the river differ at locations and at different times of year. Rio Vista Park and Sewell were the most active parks, with many children, groups and activities. The more remote swimming areas without amenities like bathrooms and close parking were dominated by younger groups, though less populated overall. The ethnic makeup of river users was representative of the city's average demographics. Rangers were prevalent throughout nearly all parks. Higher numbers of rafters and kayakers come to the Rio Vista Park and interact with the rapids built into the dam. I noticed trends of confluences of people around dams and islands. The naturalistic design of the pool and riffle dams seemed embraced by the community, because many people were hanging out in these areas. I noticed that all parks had trash and recycling receptacles which speaks to the culture of care for the river environment.

From my research, observations and interviews, I gathered that since the bulk of river-recreational tourism is in tubing the river, riverside parks and singular swimming "spots" serve a different demographic. Predominantly locals were using the park space I visited, and I did not see any tubers. This study was conducted in November during the COVID-19 pandemic, so this may not reflect the normal conditions, but this was a unique time that put more emphasis on the locals' use.

Public art prominently features the theme of the river in San Marcos. There are public murals, painted mermaid statues around town, and drain covers and installations featuring the San Marcos Salamander (*Eurycea nana*) as almost a mascot or flagship species (Figures 32-34). The city seal of San Marcos even features an image of the river alongside historic buildings and the Texas flag (Figure 35).

The younger locals gravitated towards more secluded and naturalistic areas of the river to swim, as opposed to the major developed parks. In the interview, Christian Farris stated, “I want the river to be as natural feeling as possible.” When asked about the spiritual connection to the river, Farris spoke about his favorite trees on the riverbanks. There was one special, old tree on Thompson Island called the “Pocahontas Tree” that he had a funeral for a pet underneath. There was another tree on the same island, one which I known and remember, and have seen numerous photos and videos of online that people called “Stokes Oak” (Figures 36-37). It fell in 2018 due to bank erosion that destabilized its roots. Locals had nailed planks to the trunk to climb up to the top of this tree and jump from about 20 feet down into the water. Farris mentions he once climbed to the top with some friends and a small charcoal grill and barbequed up in the branches. Thompson’s Island had a slave cabin on it from the 1850s until the 1970s, and when asked about this history Farris replied he did not know many details, but he expressed he can feel a sense of spiritual “heaviness” in the landscape and always tries to be respectful when he is there. (Ball 2013).

Farris was raised in San Antonio but chooses to live in San Marcos, stating that “the San Antonio River is just so polluted that it loses a lot of its naturalistic beauty and social value.” Conversely, San Marcos’ heavy and constant flow prevents these problems, but there is also a cultural mentality of keeping the river clean and appreciating the habitat. He points out a common spiritual relationship with the river in the local culture that encourages stewardship amongst citizens. This may be because San Marcos is a smaller city and the river is in close proximity to many of the residents, making it more integral to their life there. Farris expressed that he chose to live in San Marcos over San Antonio specifically for the river (Farris 2020).

I heard similar comments from other interviewees. Gary Price, when asked about the San Marcos River versus other recreational rivers in Texas, referred to the San Marcos River as "a real river," meaning it feels natural whereas some other urban rivers in Texas don't. Price states "the four big springs in Texas are Barton Springs [in Austin], Comal Springs [in New Braunfels], San Pedro Springs [in San Antonio] and San Marcos Springs. Each of them has its own culture surrounding it. "There has been a really strong local community in San Marcos to protect the river for 40 to 50 years." This local "hippie culture" in the community is also partially the reason that the city preserved so much parkland along the river downtown. Price is a springs afficionado and lent me his collection of vintage postcards of Texas springs and river swimming holes (Figures 38-39).

Figures 38-39: Fifty of the 100 postcards in Gary Price's collection of vintage postcards from Texas Springs and swimming holes.

The recreationists and conservationists clash politically in San Marcos. Tubers coming in from other parts of the state bring in profit but also take a major toll on the environment, pulling out Texas wild rice (which is artificially reconstituted in restoration efforts), getting intoxicated and leaving trash. Commercial tubing services are mostly designated to the lower reaches of the river where fewer endangered species and critical habitats are. So, the trend follows that the locals and families tend to enjoy the upper river, and tourists enjoy the areas below town. In the

upper river there is abundant parkland, but there are consistently areas fenced off to help reconstitute native plant growth on the banks (Figure 26)(Price 2020).

Many were angered by the Rio Vista Park Renovations in 2006 because of the allocation of funds going only to recreation, but "they saw that [spending money on park maintenance] was the only way to prevent complete destruction" in other areas of the river (Price 2020). I noticed several areas in Rio Vista Park where access was allowed and where access was fenced off, and the differences in soil erosion were significant (Figures 41-42). In my interview with Price, he mentioned the "genius" of the Lamda Park pool in New Braunfels. They diverted spring water from the river into a manmade pool for swimmers to use. While this loses some of the appeal of a naturalistic swimming hole, it helped save the riverbanks from the degradation of excessive foot traffic (Figure 40-41) (Price 2020).

In 2016, the city council passed the removal of the historic Cape's Dam in Stokes Park, but it was met with controversy and postponed. Removing the dam would change flows, displace established wildlife and could lead to the collapse of the historic Thompson's Island. Now they are discussing restoring the dam and millrace into an accessible public park with historic commemoration and a specific emphasis on the natural beauty and environmental function over the recreation-centric tubing culture (Johnson et al. 2019). This plan mirrors the Rio Vista Dam restoration and may make an interesting comparison study moving forward.

There are contradicting factors at play in the river city that both drive and inhibit the health of the river and floodplain habitat. The river is a central force in uniting the community around it, but high involvement and rapid growth mean that politically it is difficult to get much done at the rate needed. San Marcos balances the health of its urban river with steady restoration efforts; some that serve the ecosystems and others that serve the people. Figure 42 shows this

cycle. Beginning at the top, wildlife attracts recreators which over time degrades the conditions. This either prompts wildlife restoration or human-use restoration like parks. Parks will be used by more people, and crowds and overuse end up driving recreators back to other, more natural and secluded areas, thus prompting more restoration. Recreation has its place, especially for the local residents who care about and clean up the river. As the population grows, maintaining the culture will be crucial to maintaining the balance between the wildlife and the people.

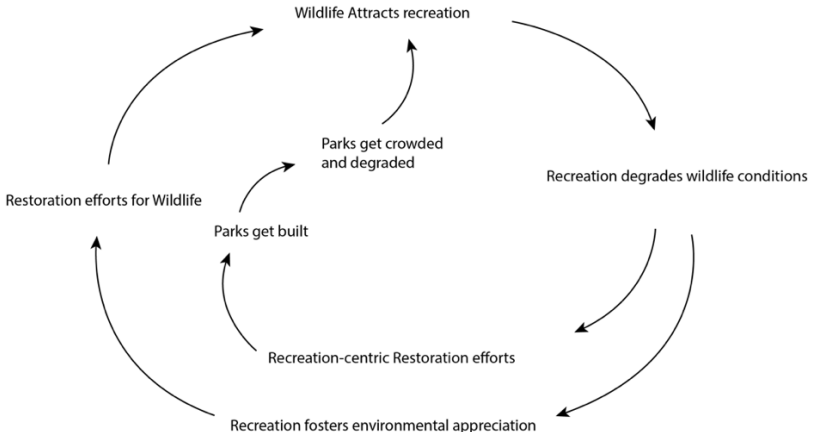


Figure 43: This diagram illustrates the cycle of restoration and recreation observed in my findings. Prepared by Lilly Byrd.

**Conclusion**

There is a sense that the San Marcos River is a "river for the people." The spiritual component the San Marcos residents describe shows the importance of river access. From a municipal perspective, investing in recreation-specific parks with naturalistic design and maintenance can relieve the impact on the natural processes in other, more fragile areas of the river. Historical commemoration, public art and riverside parkland for recreation can be extremely powerful in forming a community's identity around its natural resources. This identity is a key component to creating a culture of environmental stewardship to drive the inevitable need for restoration in a growing, urban river system.

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Pam LeBlanc, "Our Guide to Rope Swings in the Austin Area," *Austin American Statesman*, August 24, 2017.



Rodriguez, "San Marcos River Parks to Close next Thursday Due to COVID-19 Surge."

Figures and Captions

Figure 1: Photograph of a kayaker paddling through the Texas wild rice (*Z. texana*). Looking downstream. Photo taken by Wyatt McSpadden, precise date and location unknown.
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Figure 2: Illustration of the original condition of Spring Lake when it was sacred tribal grounds. By artist Susan Dunis.
Gregg Eckhardt, "San Marcos Springs," The Edwards Aquifer Website, accessed November 14, 2020, https://www.edwardsaquifer.net/sanmarcos.html.

Figure 3 (left): Photograph of the Aquarena Springs theme park underwater theater complex.
Doni Weber, *Aquarena Springs*, Images of America (Charleston, SC; Chicago, IL; Portsmouth, NH; San Francisco, CA: Arcadia Publishing, 2009).

Figure 4 (right): The mermaids of Aquarena Springs theme park performed underwater using oxygen tubes to breathe while audience members watched from the submerged theater.
Doni Weber, *Aquarena Springs*, Images of America (Charleston, SC; Chicago, IL; Portsmouth, NH; San Francisco, CA: Arcadia Publishing, 2009).

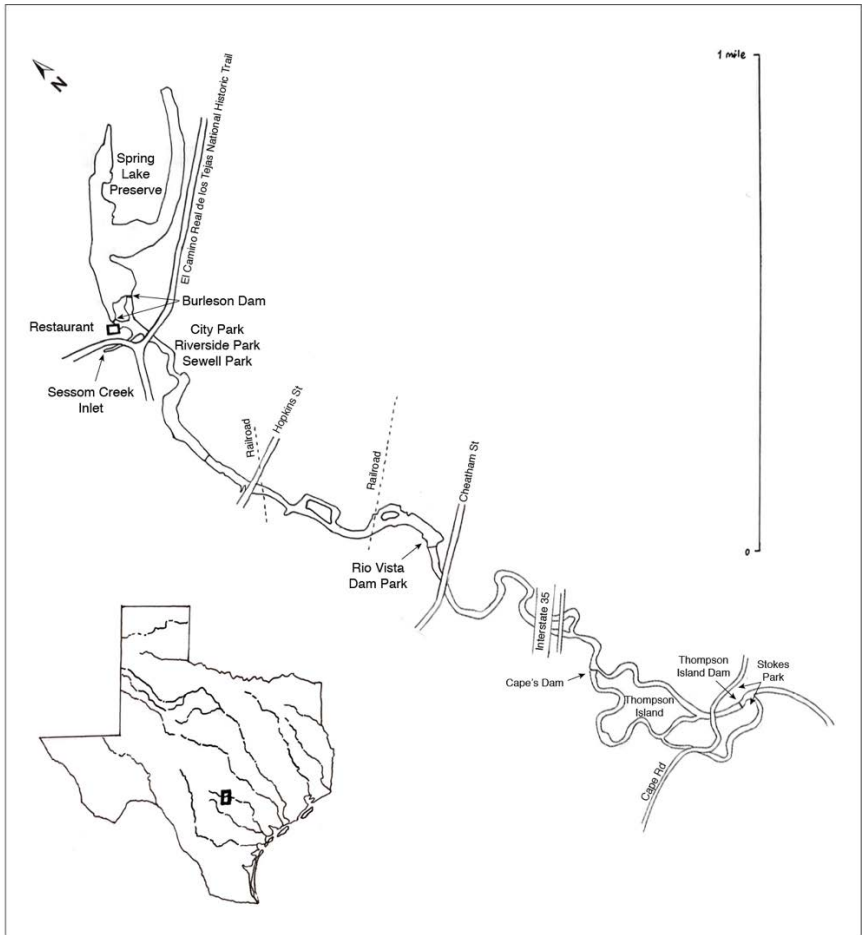


Figure 5: Texas reference map and upper San Marcos River map, by Lilly Byrd.

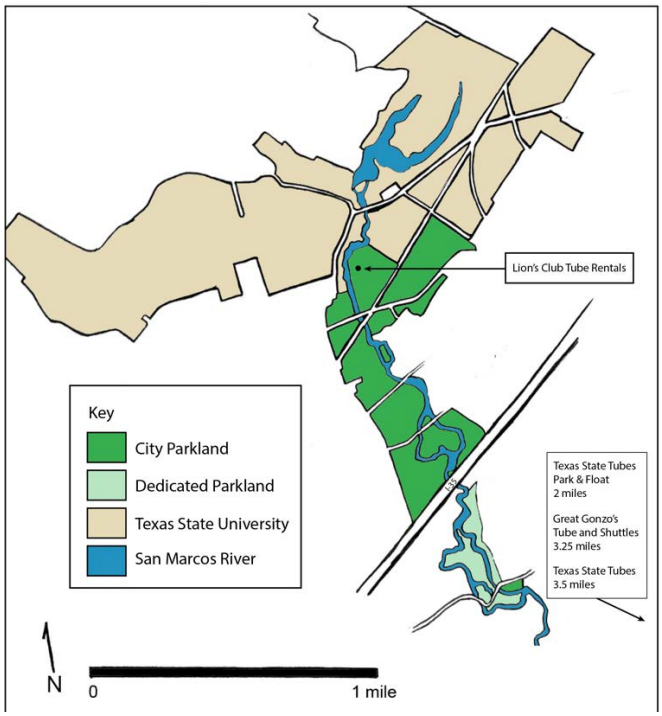


Figure 6: Map of land ownership and use along the San Marcos River. Prepared by Lilly Byrd.

Figure 7 (left): Photograph of Rio Vista Dam before renovations in 2006.
Kimmel, *The San Marcos : A River Story*.

Figure 8 (right): Photograph of Rio Vista after dam removal and park renovations in 2006. Looking upstream.
Rodriguez, "San Marcos River Parks to Close next Thursday Due to COVID-19 Surge."

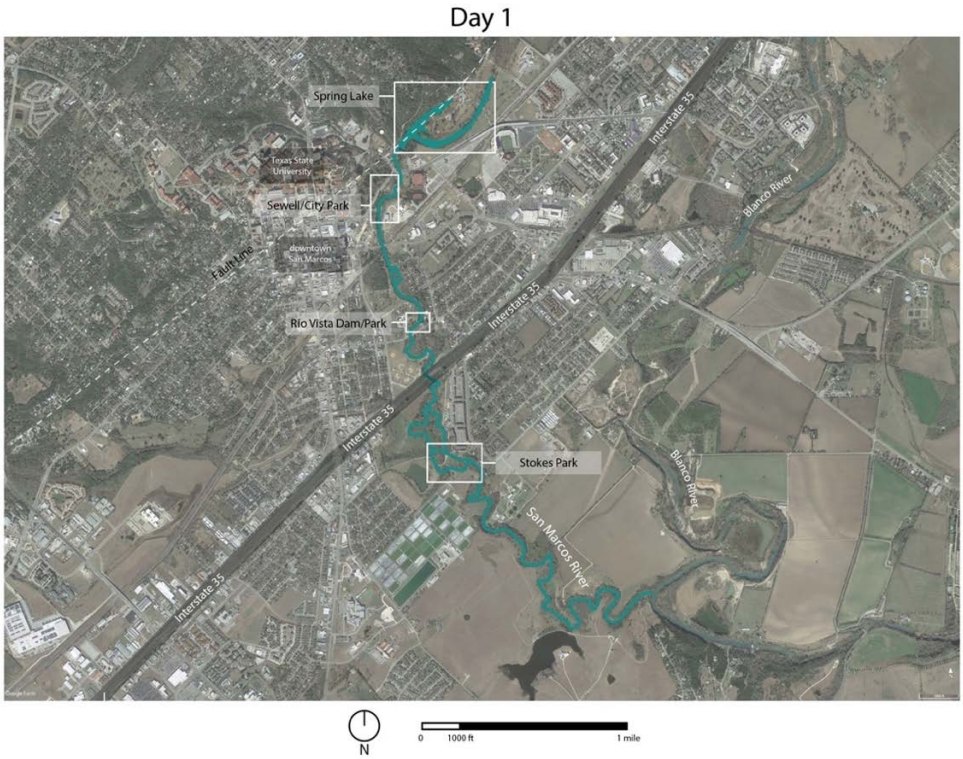


Figure 9: Map of the San Marcos River marking the parks visited in the first half of observations. Prepared by Lilly Byrd.

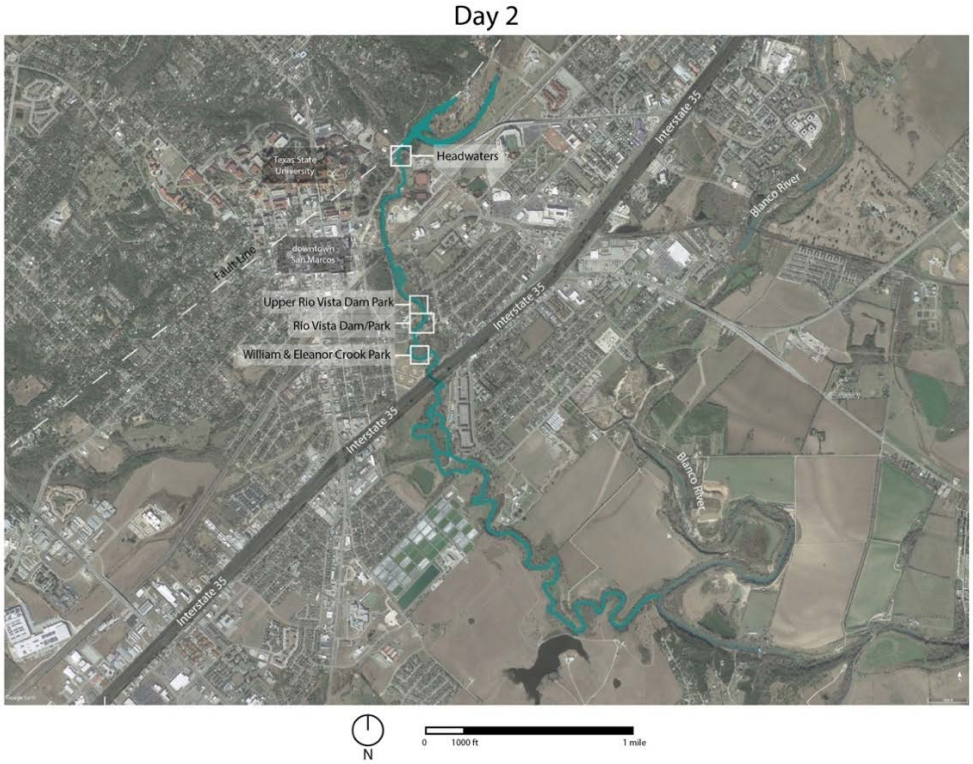


Figure 10: Map of the San Marcos River marking the parks visited in the second half of observations. Prepared by Lilly Byrd.

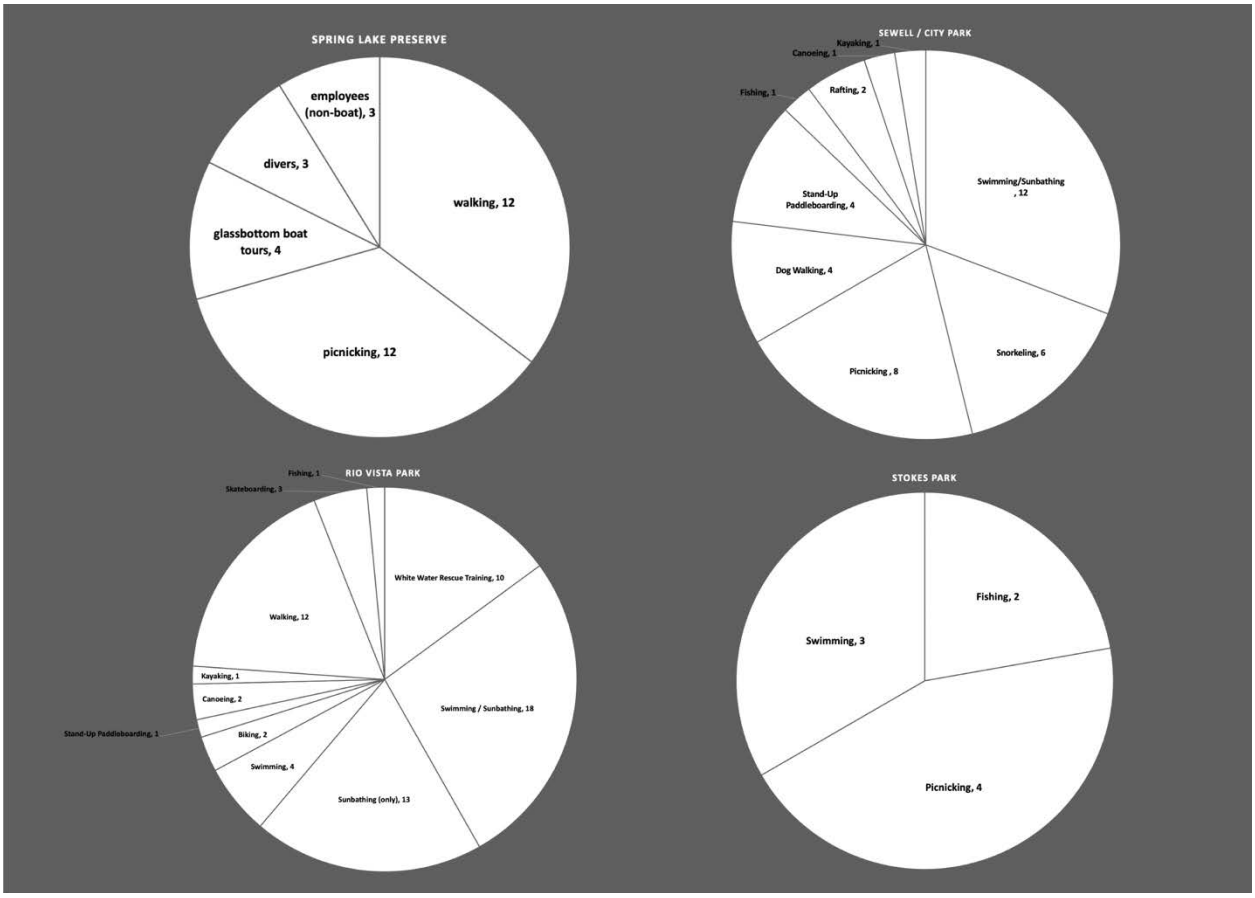


Figure 11: Pie charts at each park location depicting the observed activities at each location, with the number of participants. Prepared by Lilly Byrd. (See Tables 1-5).


Figure 12 (left): Spring Lake Preserve's glass-bottom boats on the spring side of the lake, looking south. Photo taken by Lilly Byrd, November 7, 2020.

Figure 13 (right): Aerial image of Spring Lake. Green dots mark the points where the photos were taken. Observations were made throughout the park.

Figure 14 (left): Recreation at City Park (Sewell next door was fenced off). Looking upstream. Photo taken by Lilly Byrd, November 7, 2020.
Figure 15 (right): Aerial image of City Park. (Green dot marks where Figure 16 was taken). Source: Google Earth.

Figure 16: Figure 16 (left): Recreation activities at Rio Vista Park, including white water rescue training team. Looking upstream. Photo taken by Lilly Byrd, November 7, 2020.
Figure 17: Aerial image of Rio Vista Park. (Green dot marks where Figure 18 was taken).

Figure 18 (left): Recreation at Stokes Park. Photo taken by Lilly Byrd, November 7, 2020. Looking downstream.
Figure 19 (right): Aerial image of Stokes Park (Green dots marks where Figures 20 and 22 were taken).

Figure 20: Tree root exposure on the riverbanks at Stokes Park. Looking northwest. Photo taken by Lilly Byrd, November 7, 2020.

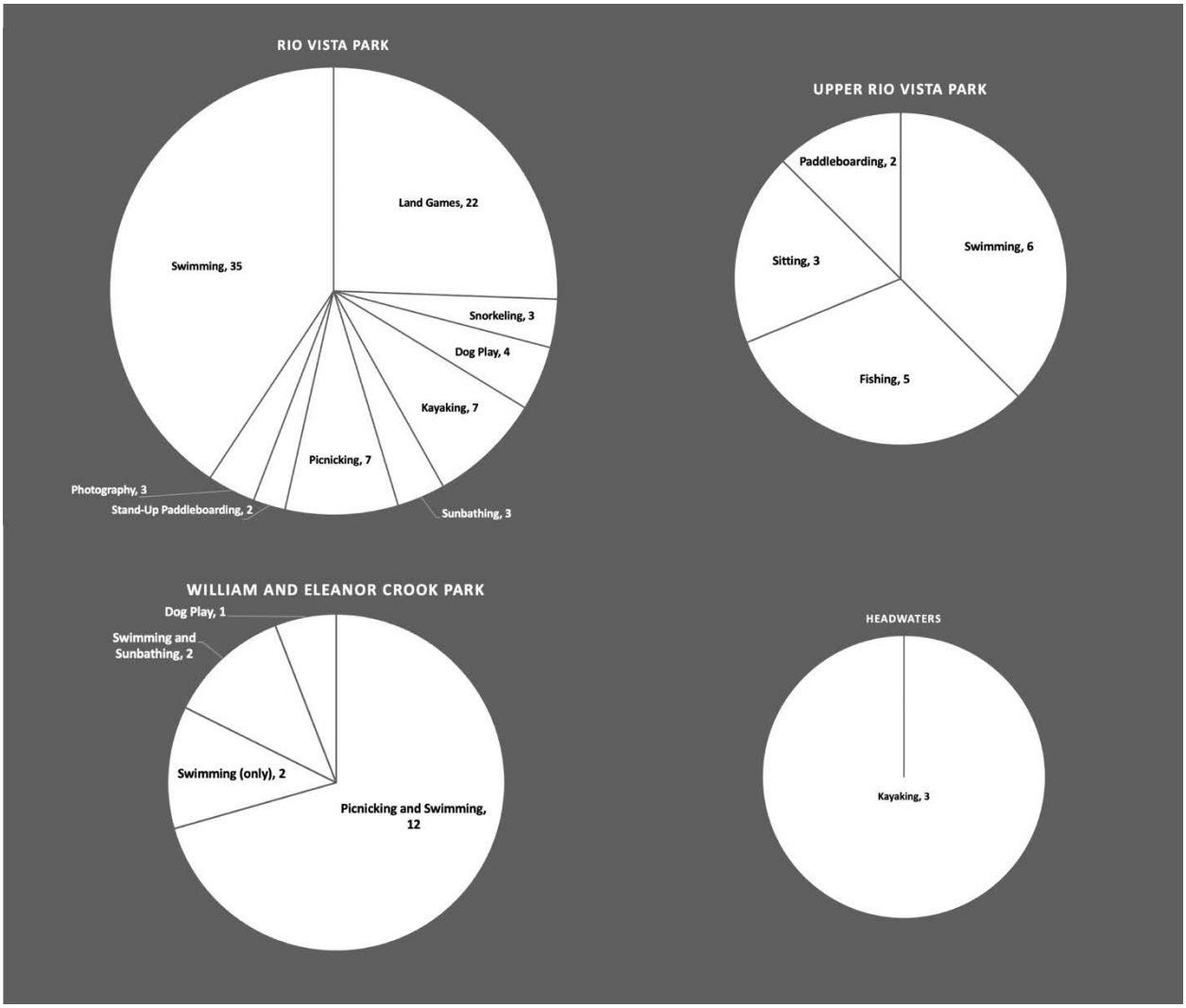


Figure 21: Day Two pie charts depicting the number of people doing certain activities in the four locations on the river. Prepared by Lilly Byrd.


Figure 22 (left): Recreation at Rio Vista Park on day two of field observations. Looking downstream. Photo taken by Lilly Byrd, November 14, 2020.

Figure 23 (right): Aerial image of Rio Vista Park. (Green dot marks where Figure 23 photo was taken).

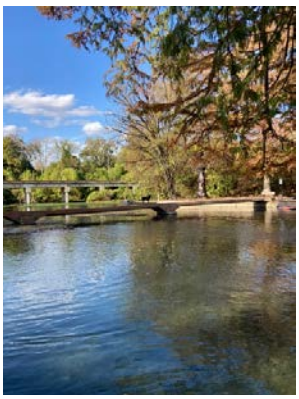

Figure 24 (left): Image at Upper Rio Vista Park. Looking upstream and at island in river. Photo taken by Lilly Byrd, November 14, 2020.

Figure 25 (right): Aerial image of upper Rio Vista Park area. (Green dot marks where Figures 25 and 27 were taken).

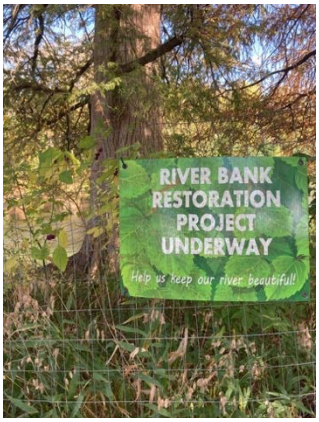


Figure 26: Shows fenced off areas of the shoreline for revegetation at upper Rio Vista Park. Looking northeast. Photo taken by Lilly Byrd, November 14, 2020.

Figure 27 (left): Headwaters swimming area where Sessom Creek meets the San Marcos River. Looking downstream on Sessom Creek. Photo taken by Lilly Byrd, Nov. 14, 2020.

Figure 28 (right): Aerial image of the location of Headwaters. (Green dot marks where Figure 28 was taken).

Figure 29: The spillway at Headwaters swimming area below the Burleson Dam. Looking upstream. Photo taken by Lilly Byrd, Nov. 14, 2020.

Figure 30-31: Publicly displayed sculptures in the front yard of San Marcos artist. These sculptures are made entirely of items found on the bottom of the river. It is a hobby for many to go "treasure hunting" with snorkeling gear on the river floor. Photo taken by Lilly Byrd, November 14, 2020.

Figure 32 (left): Public art installation at a City Park entrance next to the river.

Figure 33 (right): Detail of public art installation in Figure 7. Salamanders in the detail remind the public who the habitat health is serving. Photo taken by Lilly Byrd, November 14, 2020.


Figure 34: The city of San Marcos had a competition for the design of their storm drain covers. This design by Andrea Weissenbuehler featuring the San Marcos Salamander was one of the winners.
Andrea Weissenbuehler and Mabel Lopez, *Storm Drain Covers*, 2014, graphic design, iron, 2014, http://www.andreafeathers.com/ArtAndDesign_SanMarcosStormDrainCovers.html.


Figure 35: The official city seal of San Marcos, featuring the river in the top right quadrant.
"City of San Marcos," December 11, 2020, https://www.sanmarcostx.gov.

Figure 36 (left): A beloved tree and rope swing across the river from the Thompson Island called the "Stokes Oak." It fell in 2018.
Pam LeBlanc, "Our Guide to Rope Swings in the Austin Area," *Austin American Statesman*, August 24, 2017.

Figure 37 (right): A view from the top of the now fallen "Stokes Oak," where residents liked to hang out and jump into the water.
Pam LeBlanc, "Our Guide to Rope Swings in the Austin Area," *Austin American Statesman*, August 24, 2017.

Figures 38-39: Fifty of the 100 postcards in Gary Price's collection of vintage postcards from Texas Springs and swimming holes. Photos taken by Lilly Byrd.

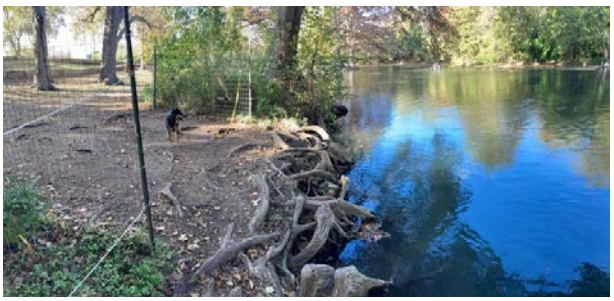

Figure 40 (left): Observational photo of banks among cypress roots (*Taxodium distuchum*). Figures 39 and 40 are taken in the same location, but figure 39 is looking downstream by a fenced off area for revegetation and figure 40 is looking upstream where the bank is accessible to swimmers. These photos show the stark difference in bank erosion among the roots. Photo taken by Lilly Byrd, November 14, 2020.
Figure 41 (right): Demonstrates the difference in soil and bank erosion where the water is accessible versus Figure 39 where it is not. Photo taken by Lilly Byrd, November 14, 2020.

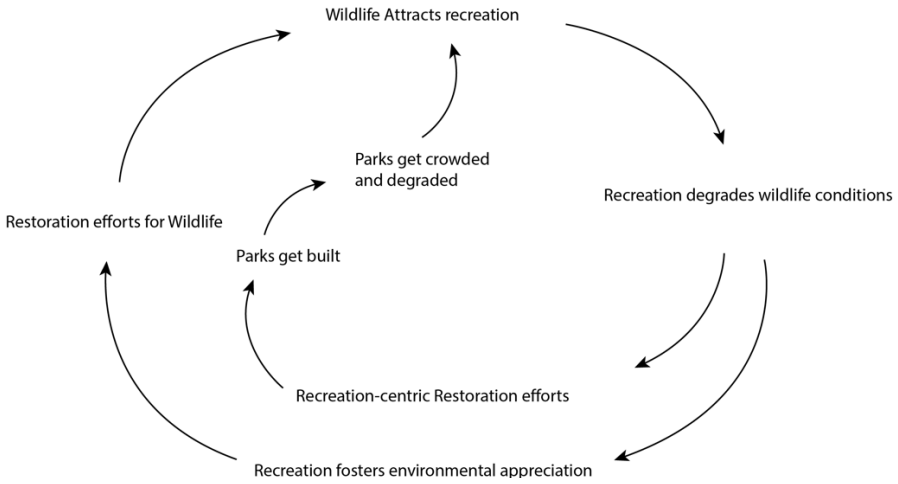


Figure 42: This diagram illustrates the cycle of restoration and recreation observed in my findings. Prepared by Lilly Byrd.

Table 2

Day 1 – Sunny, ~75 degrees F, Sunday Nov. 9, 2020. Observations for 1 hour

| Site | Family groups | Groups (non-family) | Total people at site over 1 hr | Time of day |
|---|---|---|---|---|
| Spring Lake Preserve | 5 | 2 | 34 | 12:00-1:00 pm 80 °F |
| Sewell/City Park | 5 | 9 | 29 | 1:30-2:30 pm 80 °F |
| Rio Vista Park | 6 | 6 | 67 | 2:45-3:45 pm 77 °F |
| Stokes Park | 1 | 3 | 9 | 4:05-5:05 pm 74 °F |

Table 3

Spring Lake Preserve

| Activity | Number of participants |
|---|---|
| Walking | 12 |
| Picnicking | 12 |
| Glass Bottom Boat Tours | 4 |
| Divers | 3 |
| Employees (non-boat) | 3 |

Table 4

Sewell/City Park

| Activity | Number of participants |
|---|---|
| Swimming/sunbathing | 12 |
| Snorkeling | 6 |
| Picnicking | 8 |
| Dog walking | 4 |
| Stand Up Paddle Boarding | 4 |
| Fishing | 1 |
| Rafting | 2 |
| Canoeing | 1 |
| Kayaking | 1 |

Table 5

Rio Vista Park

| Activity | Number of participants |
|---|---|
| Whitewater rescue training | 10 |
| Swimming | 18 |
| Sunbathing | 13 |
| Sitting | 4 |
| Biking | 2 |
| Stand Up Paddle boarding | 1 |
| Canoeing | 2 |
| Kayaking | 1 |
| Walking | 12 |
| Skateboarding | 3 |
| Fishing (net) | 1 |

Table 6

Stokes Park

| Activity | Number of participants |
|---|---|
| Fishing | 2 |
| Picnicking | 4 |
| Swimming | 3 |

Table 7
Day 2 – Sunny, Saturday, Nov. 14, 2020. Observations for 1 hour (except for Headwaters)

| **Site** | **Family groups** | **Groups (non-family)** | **Total people at site over 1 hr** | **Time, Temperature** |
|---|---|---|---|---|
| Rio Vista Park | 5 | 4 | 95 | 12:45-1:45 pm 85 °F |
| Upper Rio Vista Park | 2 | 2 | 26 | 1:50-2:50 pm 85 °F |
| William and Eleanor Crook Park | 0 | 3 | 17 | 3:10-4:10 pm 85 °F |
| Headwaters | 0 | 1 | 3 | 4:45-5:00 pm 83 °F |

Table 8
Rio Vista Park

| **Activity** | **Number of participants** |
|---|---|
| Snorkeling | 3 |
| Playing [land] games | 22 (one group) |
| Swimming [general] | 35 |
| Kayaking | 7 |
| Sunbathing | 3 |
| Picnicking | 7 |
| Stand-up paddle boarding | 2 |
| Photography | 3 |
| Dog play | 4 |

Table 9
Upper Rio Vista Park

| **Activity** | **Number of participants** |
|---|---|
| Swimming | 6 |
| Sitting | 5 |
| fishing | 3 |
| Paddle boarding | 2 |

Table 10
William and Eleanor Crook Park

| **Activity** | **Number of participants** |
|---|---|
| Picnicking and Swimming | 12 |
| Swimming only | 2 |
| Swimming and sunbathing | 2 |
| Dog Play | 1 |

| LOCATION | % persons below poverty estimate | Unemployment Rate estimate | Per capita income estimate, 2014-2018 ACS | % persons with no high school diploma (age 25+) estimate | % persons aged 65 and older estimate, 2014-2018 ACS | % persons aged 17 and younger estimate, 2014-2018 ACS | % civilian noninstitutionalized population with a disability estimate, 2014-2018 ACS | % single parent households with children under 18 estimate, 2014-2018 ACS | % minority (all persons except white, nonHispanic) estimate, 2014-2018 ACS | % persons (age 5+) who speak English "less than well" estimate, 2014-2018 ACS | % housing in structures with 10 or more units estimate | % mobile homes estimate | % occupied housing units with more people than rooms estimate | % households with no vehicle available estimate | % persons in institutionalized group quarters estimate, 2014-2018 ACS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Census Tract 9605, Caldwell County, Texas | 27.3 | 2.1 | 22239.0 | 20.5 | 9.8 | 20.5 | 14.5 | 7.0 | 62.9 | 4.7 | 1.6 | 38.5 | 7.8 | 1.9 | 24.5 |
| Census Tract 2105.05, Guadalupe County, Texas | 20.2 | 1.6 | 18548.0 | 36.9 | 8.5 | 25.9 | 13.9 | 10.7 | 85.8 | 8.8 | 1.7 | 49.9 | 9.1 | 2.8 | 0.6 |
| Census Tract 101, Hays County, Texas | 33.3 | 6.3 | 37619.0 | 7.0 | 14.5 | 10.8 | 6.7 | 2.5 | 34.4 | 1.3 | 27.7 | 0.0 | 0.0 | 6.3 | 5.3 |
| Census Tract 102, Hays County, Texas | 58.2 | 24.8 | 7425.0 | 1.8 | 1.5 | 1.6 | 5.9 | 2.6 | 49.4 | 0.1 | 44.2 | 3.2 | 3.6 | 12.0 | 74.2 |
| Census Tract 103.02, Hays County, Texas | 23.7 | 4.9 | 19479.0 | 22.1 | 5.6 | 23.8 | 8.6 | 16.5 | 68.1 | 11.8 | 18.1 | 13.1 | 7.0 | 5.0 | 0.1 |
| Census Tract 103.03, Hays County, Texas | 38.4 | 8.9 | 15699.0 | 10.8 | 2.0 | 14.2 | 10.9 | 10.2 | 52.2 | 1.3 | 52.5 | 9.9 | 2.9 | 5.3 | 5.7 |
| Census Tract 103.04, Hays County, Texas | 53.2 | 10.9 | 14230.0 | 13.9 | 1.0 | 15.7 | 12.0 | 7.2 | 56.8 | 4.5 | 49.3 | 7.7 | 6.4 | 8.4 | 9.2 |
| Census Tract 104, Hays County, Texas | 25.5 | 7.2 | 22453.0 | 18.3 | 12.9 | 21.0 | 12.3 | 8.7 | 60.1 | 4.8 | 25.2 | 4.1 | 6.6 | 6.4 | 1.9 |
| Census Tract 105, Hays County, Texas | 27.0 | 3.7 | 22811.0 | 13.8 | 8.7 | 23.8 | 10.9 | 16.7 | 61.7 | 3.2 | 34.0 | 4.0 | 7.0 | 13.0 | 0.0 |
| Census Tract 106, Hays County, Texas | 16.3 | 3.8 | 31116.0 | 8.8 | 15.0 | 12.3 | 9.0 | 3.4 | 37.0 | 3.4 | 6.2 | 1.8 | 0.7 | 3.8 | 0.4 |
| Census Tract 107.01, Hays County, Texas | 32.3 | 3.7 | 22573.0 | 8.0 | 9.0 | 13.2 | 8.4 | 2.1 | 41.7 | 0.0 | 35.6 | 6.9 | 2.8 | 6.6 | 2.7 |
| Census Tract 107.02, Hays County, Texas | 33.3 | 11.1 | 22776.0 | 9.1 | 13.8 | 12.4 | 9.4 | 5.1 | 24.8 | 3.8 | 24.0 | 26.9 | 2.6 | 5.9 | 1.8 |
| Census Tract 109.05, Hays County, Texas | 4.9 | 4.0 | 34221.0 | 8.2 | 13.6 | 24.1 | 14.6 | 3.4 | 44.4 | 1.1 | 3.3 | 11.4 | 4.6 | 1.4 | 0.0 |
| | Flag - % persons in poverty is in the 90th percentile | Flag - % civilian unemployed is in the 90th percentile | Flag - per capita income is in the 90th percentile | | | | | | | | Flag - % households in multi - unit housing is in the 90th percentile | Flag - % mobile homes is in the 90th percentile | | | Flag - % persons in institutionalized group quarters is in the 90th percentile |

| Social Vulnerability Index Category |
|---|
| Socioeconomic |
| Household Composition/Disability |
| Minority Status/Language |
| Housing Type/Transportation |

Source: CDC Social Vulnerability Index https://svi.cdc.gov/Documents/Data/2018_SVI_Data/SVI2018Documentation.pdf

**Figure I-6.**
**Race and Ethnicity, San Marcos, 2000, 2010, and 2017**

| | 2000 Num. | 2000 Pct. | 2017 Num. | 2017 Pct. | 2017 Num. | 2017 Pct. | Trend |
|---|---|---|---|---|---|---|---|
| **Total Population** | **34,005** | **100%** | **44,894** | **100%** | **59,935** | **100%** | |
| Non-Hispanic White | 18,886 | 56% | 24,098 | 54% | 29,217 | 49% | ↓ |
| Hispanic | 12,379 | 36% | 16,967 | 38% | 25,075 | 42% | ↑ |
| Black or African American | 1,794 | 5% | 2,465 | 5% | 3,275 | 5% | = |
| Asian | 353 | 1% | 697 | 2% | 1240 | 2% | ≈ |
| Native American | 248 | 1% | 383 | 1% | 111 | 0% | ≈ |
| Other, non-Hispanic minority | 608 | 2% | 785 | 2% | 1284 | 2% | = |

Note: Black or African American, Asian, and Native American residents may include residents that also identified as Hispanic.
Source: 2000 and 2010 U.S. Census, 2017 5-year ACS, and Root Policy Research.

**Figure II-5.**
**Comparative Housing Type, San Marcos and Comparison Cities, 2017**

| | San Marcos | Georgetown | Denton | Waco | College Station | Austin MSA | San Antonio MSA |
|---|---|---|---|---|---|---|---|
| Single family detached | 34% | 79% | 57% | 60% | 46% | 61% | 69% |
| Condos/townhomes | 5% | 4% | 2% | 3% | 6% | 3% | 2% |
| Duplexes/triplexes/fourplexes | 11% | 7% | 9% | 12% | 18% | 6% | 5% |
| Apartments (5-49 units) | 38% | 6% | 23% | 19% | 23% | 17% | 15% |
| Apartments (50+ units) | 8% | 3% | 4% | 4% | 6% | 7% | 3% |
| Mobile homes | 4% | 1% | 4% | 1% | 1% | 5% | 6% |
| Total | 100% | 100% | 100% | 100% | 100% | 100% | 100% |

Source: 2017 5-year ACS.

**Figure I-3.**
**Age Trends, San Marcos, 2000, 2010, and 2017**

| | 2000 Num. | 2000 Pct. | 2010 Num. | 2010 Pct. | 2017 Num. | 2017 Pct. | Annual Growth Rate 2010-2017 |
|---|---|---|---|---|---|---|---|
| Infants and toddlers (0 to 4) | 1,718 | 5% | 1,948 | 4% | 2,742 | 5% | 5.0% |
| School aged children (5 to 17) | 3,627 | 10% | 4,804 | 11% | 6,101 | 10% | 3.5% |
| College aged adults (18 to 24) | 14,553 | 42% | 19,131 | 44% | 23,594 | 39% | 3.0% |
| Young adults (25 to 34) | 5,567 | 16% | 6,406 | 15% | 10,900 | 18% | 7.9% |
| Middle adults (35 to 44) | 3,040 | 9% | 3,289 | 8% | 4,807 | 8% | 5.6% |
| Baby boomers (45 to 64) | 3,721 | 11% | 4,933 | 11% | 7,490 | 12% | 6.1% |
| Seniors (65 and olders) | 2,507 | 7% | 2,813 | 6% | 4,301 | 7% | 6.3% |
| Total | 34,733 | 100% | 43,324 | 100% | 59,935 | 100% | 4.7% |

Source: 2010 U.S. Census, 2017 5-year ACS, and Root Policy Research.

**Figure I-9.**
**Income Trends for Owners and Renters, San Marcos, 2000 and 2017**

Source:
2000 U.S. Census, 2017 5-year ACS, Root Policy Research.

| | 2000 | 2017 | Percentage Point Change | Numerical Change |
|---|---|---|---|---|
| **Owners** | | | | |
| Less than $25,000 | 24% | 15% | -9% | 22 |
| $25,000-$50,000 | 32% | 22% | -10% | 156 |
| $50,000-$75,000 | 25% | 23% | -2% | 451 |
| $75,000-$100,000 | 10% | 15% | 5% | 533 |
| $100,000+ | 9% | 25% | 17% | 1,248 |
| **Total** | **100%** | **100%** | | **2,410** |
| **Renters** | | | | |
| Less than $25,000 | 60% | 46% | -14% | 2,232 |
| $25,000-$50,000 | 29% | 31% | 2% | 2,455 |
| $50,000-$75,000 | 8% | 12% | 4% | 1,304 |
| $75,000-$100,000 | 2% | 6% | 4% | 755 |
| $100,000+ | 1% | 5% | 4% | 688 |
| **Total** | **100%** | **100%** | | **7,434** |

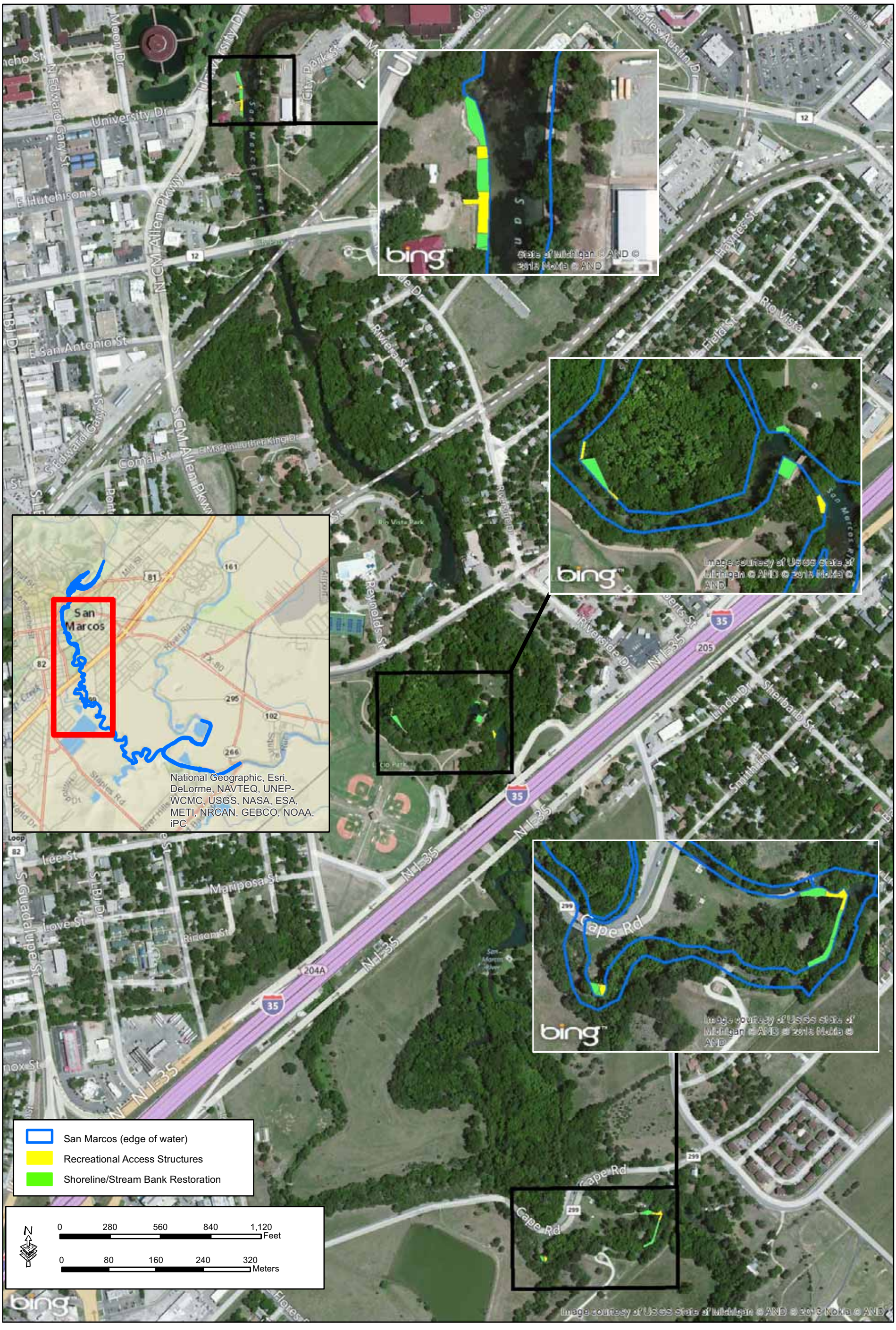


Figure 4-7. Shoreline Restoration (SHORE1)



October 2013

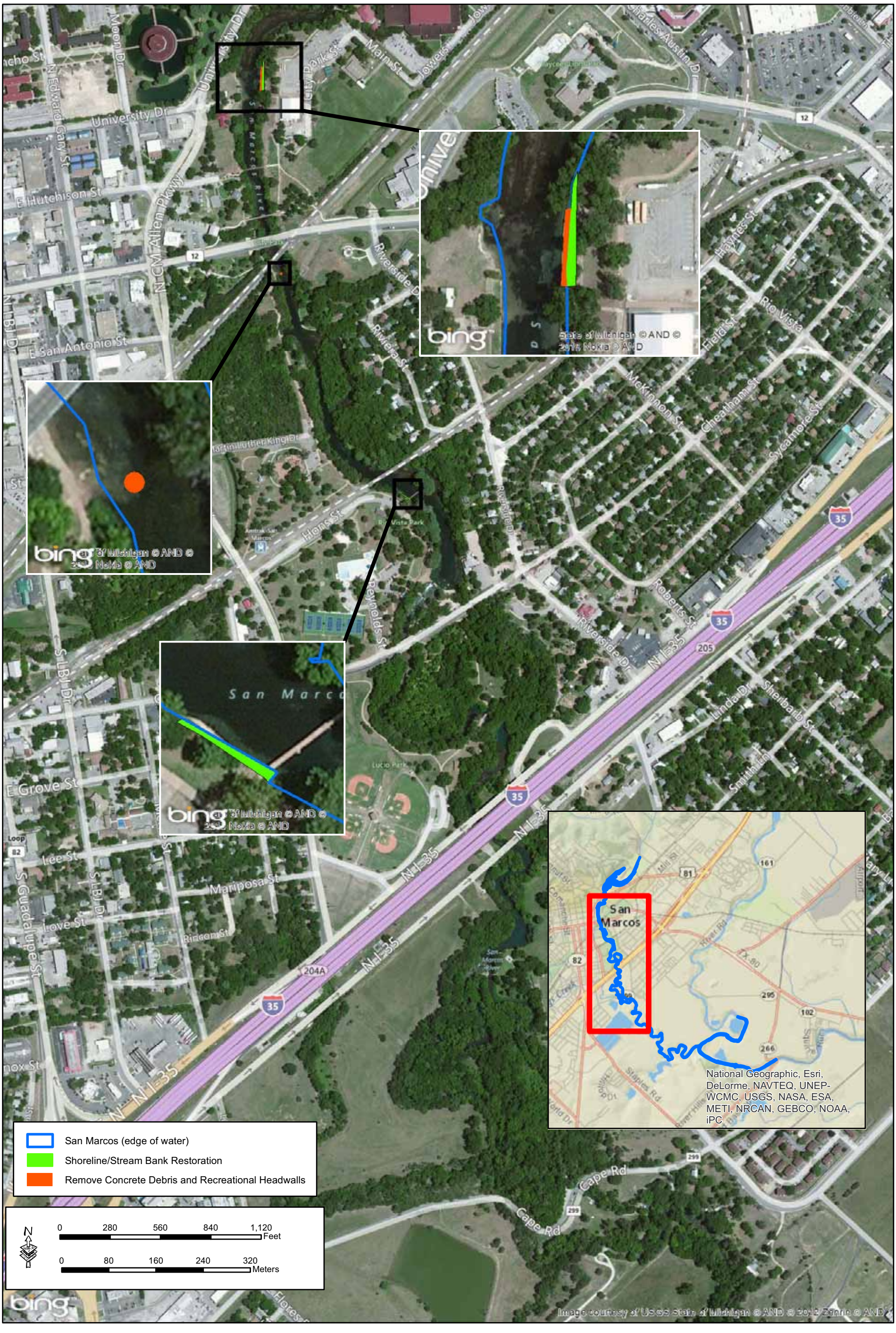


Figure 4-10. Shoreline Restoration on Impervious Improved Lands with Natural Shoreline (SHORE2)

GSRC

October 2013