

LESSON 3

FIELD TRIP TO THE MISSION AND RIVER



Students will analyze three historic cultures in Tumacacori National Historical Park. They will discover how past and present cultures affect and impact bird habitat and local ecosystems, and how protection of the Santa Cruz river will insure a healthy environment.



LESSON OVERVIEW

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Subjects

Science, Social Studies

Standards

Science in personal and social perspectives.

Objectives

Students will:

1. Listen to traditional stories and songs and discuss how O'odham and Apache people related to their environment.
2. Observe, identify and list local bird species.
3. Complete journal questions and activities.
4. Tour an historical mission, its grounds, and the Santa Cruz River.

Preparation

Divide your students into work groups; make copies of the *Student Journal* found in the *Appendix*; for each student; provide field packs with bird guides, binoculars, journal, pencil and clipboards.

Time

4+ hours.

Vocabulary

bosque, habitat, icon, landscape, mesquite, motif, reverie, riparian.

FIELD TRIP TO THE MISSION AND RIVER

TEACHER BACKGROUND INFORMATION

The Setting

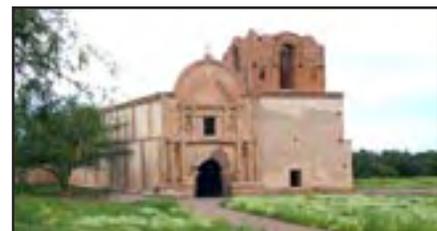
Tumacacori National Historical Park provides a setting to study past and present cultures, their impacts on the Santa Cruz River and its two habitats: mesquite bosque and cottonwood-willow riparian.

Dominating the mesquite bosque landscape is the 310 year old mission site. Archaeological evidence shows the presence of a large mission and Indian population throughout the grounds. An additional 300 acres incorporates the original mission fields and includes over one mile of river and surrounding environment. A visitor center, service buildings, and garden compliment the site. This is surrounded by a mesquite bosque and agricultural fields.

A walking path from the mission leads through a mesquite bosque habitat consisting of Velvet Mesquite, Netleaf Hackberry, Mexican Elder, and Catclaw Acacia. Adjacent to the tree-lined path are

plowed agricultural fields and scrubland. This leads into the Southwest Cottonwood-Willow riparian area about 1/3 mile from the Visitor Center. Here the environment is drastically affected by river flooding, drought and human impacts such as trash, pollution and all-terrain vehicle tracks. Non-native invasive plant species such as Salt Cedar (*Tamarix ramosissima*) conflict with native species. Students are able to really see the naturally changing landscape compared with the effects of human influence.

Arriving at the waters edge of the Santa Cruz students will experience the beautiful cottonwood-willow habitat complete with an abundance of birds, cool shade provided by the towering trees and the music of the flowing river.



Environmental History

The environmental history of the Santa Cruz River Valley is diverse and fascinating. For hundreds of years people have utilized and manipulated the natural environment to their benefit. Each culture in its own way has affected the environment whether Spanish, American, or Indian.

The early Hohokam people settled the area prior to European contact and they mastered survival techniques and utilized natural resources to their benefit. They were sophisticated desert farmers who built elaborate structures and used floodplain farming as well as creating the largest pre-historic irrigation system in present-day Arizona. As gatherers, they collected and cultivated various native plants such as mesquite and prickly pear. An estimated 100,000 agaves may have been roasted in pits in the twelfth and thirteenth centuries. As hunters, they harvested a variety of animals and, according to some archeological evidence, eventually over-hunted the larger animals such as deer and bighorn sheep, causing them to be replaced with smaller rodents and rabbits.

After the disappearance of the Hohokam civilization in the mid to late 1400s, their O'odham successors lived a comparatively simpler lifestyle which Father Kino encountered when he arrived in 1691. Sedentary farmers, hunters and gatherers, they eked out their living along the banks and tributaries of the Santa Cruz River. Like their predecessors, they used floodplain-farming techniques to grow summer crops of corn, squash, beans and cotton, and may have had complex irrigation systems as well. Houses were simple round structures made of willow, mesquite and mud. They utilized trees such as Mexican elder, netleaf hackberry and mesquite for food and medicine. Animals such as rabbit, deer, birds, beaver and bear were harvested to supplement their diet. They lived closely and intimately with nature; at times a rich and romantic lifestyle.

On the other hand, making a living from the land was not easy. Water and resources could be scarce, and freezing temperatures made it impossible to grow year-round crops. As romantic as their culture might seem to us, it was a difficult life.

The Apache people also utilized the Santa Cruz River Valley beginning in the 1600s. Their culture originated in the north, in Canada, and possibly Alaska, along with other cultures having an Athabascan language base. Although some Apaches took to peaceful farming, others took on a lifestyle of nomadic hunters, gatherers and raiders. O'odham villages, and later Spanish settlements and missions, were subject to Apache attacks, loss of crops, and kidnapping of women and children, making life difficult and dangerous for anyone not allied with them. In regards to the environment, however, impact was probably minimal. As nomads and warriors, they were masters at moving through nature with little trace.

In 1691, the O'odham villagers invited Jesuit missionary Eusebio Francisco Kino to Tumacácori to establish the first mission in present-day southern Arizona. The next day he established Guevavi Mission, which became the cabecera, or head church. Despite his good intentions, however, these sites along with Sonoitac (near present-day Patagonia), Arivaca and San Xavier del Bac all remained visitas until the 1730s with Kino, his successor Father Campos, or other priests visiting infrequently. Cattle, horses, wheat and more were introduced during this period, much of which had an impact on the environment, albeit minimal. As a result of political changes, Guevavi and San Xavier missions began hosting resident priests about 1732. This, with the discovery of silver near to the Arizona ranch (located in Mexico between Nogales and Saric), brought more Spanish settlement, introduced species and environmental impact.

As a result of the short-lived Pima Rebellion in 1751, the military established a Presidio in Tubac and the first formal church was constructed at Tumacácori. Other missions were also renovated at this time and various villages were consolidated into larger settlements. When the Jesuits were expelled in 1767, the Franciscans replaced them, but soon abandoned Guevavi as the cabecera and made Tumacácori the head mission for the area. They eventually added a three-sided convento, created an acequia or canal, to bring in water, and constructed the larger church. During the mission's peak there were an estimated 300 people, up to 6,000 head of stock and possibly hundreds of acres of crops. The impact on the land was substantial in comparison with that of the Indians. The Mexican War of Independence meant that Tumacácori would never see another permanent priest and Apache attacks increased. Finally, a cold winter left the Tumacácori Mission abandoned about 1848.

The northern Pimería Alta which Padre Kino had claimed for God and Spain became a territory of the United States with the Gadsden Purchase of 1853. The Americans were slow in coming, mostly due to Indian hostilities and fierce Apache raids. This all changed in the 1880s. With the coming of the railroad and soon after the surrender of Geronimo, more people settled the area and with them came new technology. Business and exportation became lucrative, and mining and extraction of natural resources increased tremendously as did large-scale cattle operations. Huge mining camps like Bisbee and Morenci brought boomtowns of thousands of people. By the turn of the 20th century, there were an estimated 1.5 million cattle in Arizona.

Environmental impact further increased in the 1930s when a mechanized water pump allowed farmers and ranchers to tap into the aquifer as well as divert surface water. The Santa Cruz Valley soon became a major crop producer, with large farms and ranches lining the banks of the Santa Cruz River

from Nogales to Sahuarita. Historic pictures of Green Valley, for example, reveal solid cotton fields with Mt. Hopkins and Mt. Wrightson in the background. The combined impact of large agricultural operations and an extended drought resulted in the scarcity of cottonwoods along the river and the eventual drying up of surface flow in the river by 1970.

In 1971 the Nogales International Sewage Treatment Plant was installed in Rio Rico. The present-day plant treats up to 17 million gallons daily from both sides of the border and insures a flow of water in the Santa Cruz River. Although the effluent from the plant is estimated to account for only 20% of the river's current, the historically intermittent river now flows year-round at Tumacacori, and sometimes as far as Tubac. As a result, we now have a substantial greenbelt that most likely never occurred before. It is not without problems, however. The water quality of the effluent, although cleaned and monitored at the plant, is questionable from a health standpoint. Monsoon floods bring tons of trash from both sides of the border and litters the riverbanks. This trash might also include dangerous substances, syringes, and possible chemical spills from the Nogales Wash; an area known for high rates of lupus and rare cancer. The river has also become a playground for ATVs (All Terrain Vehicles) causing damage to habitat and wildlife as well as noise pollution.

Despite all the problems, the Santa Cruz River is an oasis in an otherwise harsh environment. It is a beautiful area for recreation and a migratory corridor for neotropical songbirds; a haven for birders. The 4 ½ mile section of the Juan Bautista de Anza National Historical Trail between Tumacácori and Tubac has become an important hiking corridor that is easily accessed by the public. The area also serves as an educational study area for local schools, universities and professional researchers.

LESSON 3 - FIELD TRIP TO THE MISSION AND RIVER

Activity 1

Identifying birds of the Mesquite Bosque

(Meet the garden fountain)

1. Pre-divide students in four groups before arriving at the park. Hand out journals, clipboards, pens, pencils, etc. to each student.
2. Meet students in the garden and review rules of conduct. (see Journal page 9) Distribute binoculars and clipboards.
3. Give brief introductions and demonstrate how to use the binoculars. Further discuss other birding techniques, do's and don'ts.
4. Working in small groups with adult leadership, walk around the grounds of the park and go birding. Identify birds and ask students to record any species observed in their Journal on page 1.
5. Complete the birding activity (30 to 45 minutes) and meet at the O'odham Ki.

Activity 2

Native Americans and their Environment

1. Ask students to enter the *Ki* and imagine what it was like to be a teenage O'odham boy or girl while leaders briefly describe their history and lifestyle.



2. Read the O'odham story about coyote and quail on Master Page 3.4. Ask the students to listen for clues in the story that describe the habitat and birds of the mesquite bosque.



(Meet at the O'odham House or Ki)

3. Briefly discuss the historical habitat based on the story. Further talk about how the O'odham people related to, and utilized their natural environment.
4. Have students step outside the Ki and sit down under the adjacent ramada to listen to the Apache Eagle song (tape provided, music score on Master Page 3.4).
5. Help students to visualize and imagine life as a teenage Apache. Continue to discuss how the Apache people related to and utilized their natural environment.
5. Using samples from Lesson 1, Master Page 1.5 to 1.8, introduce and discuss ancient rock art.
6. Helping students imagine they are an O'odham or Apache living at the Ki, ask them to work in their journals, answering the questions on Page 1, and to draw at least one example of rock art depicting a bird or other environmental image on Page 3. No copying or tracing! Emphasize student creativity.

Activity 3

The Spanish Mission: Priests and People

(At the mission church and graveyard)

1. Students will follow a guide for a short tour of the church with a focus on Spanish and Mission culture.
2. Kneeling inside the dark, cold church at the altar students will experience first hand a taste of mission life through singing or listening to a traditional Gregorian Chant.
3. Discuss how the mission influenced and affected the Indians and how this may have altered their way of life.
4. Show students the paintings of grape and wheat on the sides of the arch in front of the altar, emphasize how the missionaries related to and utilized their natural environment through construction, planting crops, using water, introducing domestic animals, etc.
5. Ask students to use their binoculars, showing them the bird image painted on the inside front wall of the church, above the door to the left of the window. Use this as to define and discuss religious icons (artwork conveying a religious symbol).
6. Ask the students to use their *Journals*, answering the questions on Page 4, and drawing one or more icons on Page 5. The drawing should not be traced or copied, but a product of their imagination. It should be of bird, or another environmental related image as the mission priests might have done long ago.



Activity 4

The Americans

(A walk through a modern landscape)

1. Students will walk from the mission to Anza Trail stopping at or near the interpretive ramada. Viewing a ranch to the south, students will receive an orientation about the early Americans and how they interacted with the local environment.
2. Ask students to complete the questions on Page 8 in their *Journals*.

Activity 5

1. Following the dirt road to the east and the road will make a 90 degree turn to the left. You will see a water tank in front of you. Do not follow the road, but take the small path on the right which leads through a small gate. At this point, stop in the shade and explain that the river is very dynamic and actually floods to where they are standing.
2. Introduce students to their assignment. Explain that they will each have a place to sit, alone by the river, during which time they are to answer *Journal* Pages 6 and 7. Encourage them to enjoy and explore their personal area.
3. Continue walking east, down the small hill, ask students to use their senses to detect changes in habitats as they walk along. The trail will then drop into the sandy river's floodplane.
4. At the rivers edge, place students individually in comfortable spots located on the river's edge. Continue walking down the trail and doing so until all students have their own special spots.
5. In silence students complete *Journey into the Heart of the Santa Cruz River*.
6. Return to the Visitors Center and home.

The O'odham Legend of Ca Kai Choo and Bun

As passed down to Nathan Allen

Tohono is the home of Ca Kai Choo (quail) and Bun (coyote). Ca Kai Choo often played tricks on Bun. One time they took some of his body fat while he slept. Bun awoke and was angry! He chased the Ca Kai Choo, but they flew to safety, into their little holes along the Akimel (river). Bun went to the first hole and reached in. He grabbed the first Ca Kai Choo and growled, "Are you the one who did this to me?" A tiny peep, "No! try the next hole," was heard. And so Bun went from hole to hole until he came to the last one. "Was it you?" Again a tiny peep, "No! try the next hole." Bun stuck his paw into the next hole full of hanum (cholla)! Bun howled with pain as the Ca Kai Choo ran away with glee and laughter. Again Ca Kai Choo had gotten the best of Bun, their worst enemy!

Eagle Dance Song

The musical score for 'Eagle Dance Song' consists of ten staves of music. Each staff contains a line of lyrics in Ojibwa syllables. The lyrics are:

1. Ma ya ha Yu me ya ma me se ta he yo - o, ha - e - e ya, ya

2. he yo ha he ye ma ha yo - ti He - e - e ya He yo me yo he ya

3. we yo he he - e yo Ya he yo ha he yo ma ha yo - o, he - e - e ya, Ya

4. he yo ma he yo ta ha ye - ti He ga ni ni yo yo he ga shi weh si

5. si yo ma haan neip ai na deuh keth bun naa nevi ah go shi go sho de ya yo

6. she e ah yo me yo ye me yo ya - ah he yo ya - ah he yo

7. ja . he ya me yo ya me yo he ya - ah he ya me yo

8. ya me yo he ya - ah he ya me yo ya me yo ya he he

9. ja - ah he ya ye ya he yo he e he.