

# Changing Faces, Changing Places

## OUR COTTONWOOD FOREST, THE BOSQUE ECOSYSTEM

The Rio Grande has changed in many ways over the years, but one thing remains the same. Snow melts every spring in the mountains of Colorado and New Mexico. The melted snow runs down the mountain into streams. Streams of melted snow fill the Rio Grande. The Rio Grande flows through Albuquerque. This river provides water to our “bosque.” Bosque is a Spanish word that means wooded place. We are lucky to have this wooded place that runs through the heart of our city.

The trees that make up our bosque are cottonwood trees. In the summer and spring they make a green ribbon of shade through town. In the fall their leaves turn a bright golden color. Cottonwoods have been the most important tree along the river for thousands of years.

Animals and plants living in our bosque depend on the cottonwoods. New Mexico olive trees and coyote willow need the cottonwoods’ shade. Many birds nest high up in the cottonwoods to be safe. Cooper’s hawks hunt from high in the trees where they also nest. In the spring the cottonwoods flower and their green leaves open. That’s when crowds of insects hatch and start eating parts of the cottonwood trees. Just as the insects appear, migrating birds like warblers fly through. They are flying north to their summer nesting grounds. They eat the insects to get energy for their journey. In the winter, porcupines eat the cambium under the cottonwood bark. This is a system that works. The center of it all is the cottonwood tree.



Spring bosque photo by Marie Hughes ES (2015)



Fall bosque photo



Winter bosque photo by Edward Gonzales ES (2015)

## THE COTTONWOOD BOSQUE, MARSHES, AND GRASSLANDS ADAPTED TO SPRING RUNOFF

A long time ago the Rio Grande was a wild river. No one controlled where it flowed. No dams held back the river. In the spring melted snows filled the river. It flooded. These floods changed the path of the river. The new twists and turns of the river created places that were wet and sunny. The cottonwood trees adapted to this changing river.

In the spring, male cottonwood trees grow catkins that produce pollen. Wind carries the pollen to the flowers of female cottonwood trees. The seeds look like fluff. They float from the trees after the spring floods, when the river banks are muddy.



The male cottonwood trees have catkins with pollen.



The female cottonwood trees have flowers with seed ovules.



The cottonwood seeds look like cotton fluff that floats down in the summer.

Most cottonwood seeds will not land in a place they can grow. They need sunlight, clear space. They need soil that stays wet until the roots can grow down to reach the aquifer. They need that underground water to live. Rain is not enough.

Flooding caused our Rio Grande to change its course many times over the years. The changing river created a patchwork of cottonwood groves, grasslands, and marshes. That is why it was called a mosaic landscape.

## **OUR RIO GRANDE IN NEW MEXICO HISTORY**

The Rio Grande helped shape the people in New Mexico. We use the river water to grow food to eat. We use river water to grow food for animals like cows, sheep, and horses. We need the river to bring us clay for pots. We build with adobe. Cottonwood trees can be used to hold up roofs. Trunks and branches can be burned to give heat and light. The river and the bosque have always been important to New Mexicans.

The river has shaped our lives, but we have also shaped the river. History will show us how we have changed the river.

### **Puebloans**

Native Americans have lived in New Mexico for thousands of years. They hunted animals. They gathered wild foods. Then, about three thousand years ago they started growing corn. In the spring they planted their corn. Melted snow from the mountains filled the ditches and rivers. Native Americans planted crops where the spring waters would flow. The waters also brought something else, dead plants. The dead plants make the dirt good for farming. Corn, beans, and squash did not need much extra water. Native Americans may have dug ditches to bring water to their crops. However, they mostly used spring runoff, rain, and smart planning to grow their food.



**Neg** 069107 **Creator**Kaadt, Christian G. **Title**"Jemez Indian Women Making Tortillas", New Mexico **Date** 1895 Courtesy Palace of the Governors New Mexico History Museum, Santa Fe

*Note: Photography was not invented until the mid 1800's, so we have no photos of early puebloans.*

### Spanish Settlers Built Acequias

Spanish settlers came to New Mexico about 400 years ago. The Native Americans here were growing corn, beans, and squash. The settlers brought many new plants to grow. They brought fruit like apples, peaches, and grapes. They brought wheat. These crops need a lot of extra water. The Spanish dug ditches, called acequias, from the river. The river water flowed to their crops.



*Sculpture outside the Albuquerque Museum  
Francisco Vasquez de Coronado came to New Mexico in 1540  
Don Juan de Onate led the first permanent settlers here in 1598*

### Ranchers

By the 1880s there were many sheep and cattle ranchers in New Mexico. Some traveled from Mexico on the Camino Real. Others traveled from the east coast of the United States on the Santa Fe Trail. The sheep and cattle ate many of the plants. When snow melted or rain fell, there were few plants to hold the dirt back. The Rio Grande was choked with dirt. Fields flooded and did not drain. Something had to change.



After a hard day herding cattle, cowboys head to dinner in this 1897 photo from the Palace of the Governors Photo Archives, Neg. No. 005324.

### Levees and Drainage Ditches

In 1925 levees were built to control the spring floods. Our levees are dirt walls built to keep the river from flooding our town. They also keep the river from changing its course. These levees continue to stand along the river. We also dug ditches to drain the extra water from fields. These ditches are still in use. The dirt wall levee, the river and the ditch all run north to south.



## **Salt Cedar, Russian Olives, and Elms, Oh My!**

Salt cedar, elm trees, and Russian olive trees were brought to the United States from Europe and Asia. By 1930 they were growing in our bosque. These trees and bushes produce many seeds. They do not need floods for their seeds to grow. We now call these invasive plants, because after we brought them in from foreign lands, they “invaded” our Bosque. Cottonwoods and other native plants are dying because they cannot compete with the invasive trees.



Russian Olive Trees grow easily because they do not need spring floods.

## **Levee breaks**

In 1941 the levee broke near where the Nature Center is located today. Cottonwood seeds germinated on land outside the levee. That is when our last grove of cottonwoods began to grow. How many years ago was 1941? How old are these trees? Cottonwood trees grow to be about 100 years old. How much longer will these trees live? What will replace them when they are gone?



Cottonwoods from 1941 levee break

## **Jetty Jacks**

In 1957 jetty jacks were built. These big metal bars help the levees to keep the river running on a straight path. The river runs faster if it doesn't wind from side to side. Some fish like the silvery minnow cannot find slow water to lay their eggs. Jetty jacks protect the levee from floods. The levees will not break like they did in 1941. The river will stay in one place, on one path. Floods in Albuquerque are unlikely.



Jetty jacks behind salt cedar

## Cochiti Dam

In 1975 Cochiti dam was completed. A dam is like a wall across a river. Cochiti Lake forms behind the dam. Melted snow from the mountains is stored in the Lake. We can open the gates of the dam. Water flows into the Rio Grande. We choose when the water flows. All that melted snow from spring runoff is used in a slow, useful flow. It no longer causes floods in Albuquerque. This is a problem for cottonwood seeds that need floods.



Cochiti Dam

The Visitor Center at the Nature Center is modeled after this dam.

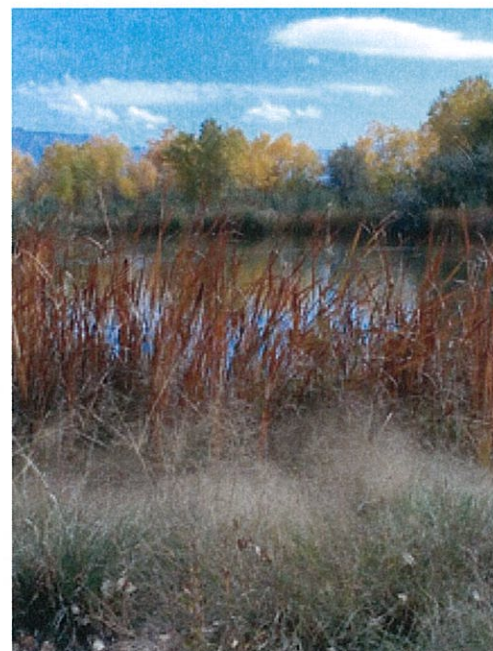
## Conservation Efforts

In the 1990's many groups came together to save the bosque. Here are some of the projects they are working on.

- Some groups are planting cottonwood branches, since the seeds cannot grow. The branch must be long enough to reach the top of the underground water (about 6 feet down). The branch will grow roots and become cottonwood a tree.
- Groups can build ponds like the one at the Nature Center to ensure that pond plants and animals can live near our river.
- Many groups are working to get rid of invasive plants along our river.
- We are removing jetty jacks. They are not needed since we built Cochiti dam.
- Some groups are knocking down the high banks of the Rio Grande in approved places. Extra water is released from the dam to create a controlled flood between the river and the levee. Cottonwoods can germinate and grow there. This is called "overbank flooding."
- Everyone in Albuquerque should conserve water. Replace lawns with desert plants. Turn the water when you brush your teeth. Take short showers or shallow baths.



Overbank flooding of the Rio Grande in 2011



Man-made pond

Sometimes when you solve one problem you create new problems. These are called “opportunity costs.” What new problems did we create when we fixed the flooding problem? What are we doing to fix these problems?

Over time people have used the Rio Grande to meet different needs. We have changed the river to meet those needs. One thing that never changes is the important role that water plays in our lives. It quenches our thirst for drinking water. It is a place in nature, a place of quiet and calm in the middle of our busy city. The river will always need our protection. When you save water, you are helping protect the river.



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