

# Rio Nuevo Habitat Restoration Project Cards

## Overbank Flooding

During years with a high winter snowpack there will be lots of water melting and flowing down the watershed in the spring. Much water will be held in reservoirs for irrigation through the summer, but in good years a large flow can be allowed downstream during the normal season for spring runoff. The water managers at the Army Corps of Engineers and Bureau of Reclamation can decide to allow for water amounts to pass through the dams that will spill over the banks of the river and flood some of the floodplain of the Rio Grande. This is called “overbank flooding.” (The goal is to have standing water in wooded areas within the levees. This way the communities outside the levees are protected from flooding.) Overbank flooding promotes the growth of mature cottonwoods and other native riparian plants as well as encouraging the natural cycling of nutrients.

What beneficial changes will there be as the result of this project? What habitat components can we replace on the model now?

- ✓ place ten more cottonwood seedlings on the model; seedlings can be added to sand bars or edges of the river or to places that have been cleared of other vegetation
- ✓ place two more native riparian shrubs on the edges of the Rio Grande; plants such as willows will grow well now
- ✓ remove one upland shrub: wetter areas are no longer attracting upland plants
- ✓ if any homes have been placed within the levees, remove these now: floodplains are a silly place to build anyway
- ✓ remove one snag: with overbank flooding fuels are reduced by faster decomposition and less likely to burn with wetter conditions
- ✓ remove one exotic tree as conditions are not as optimum for some of these plants

## Pole Planting of Cottonwoods

The numbers of cottonwoods are decreasing along the Rio Grande, because for decades flooding has been prevented and natural places for cottonwood establishment are not being created. One way to counteract this is to plant cottonwoods. Cottonwoods have an adaptation that land managers can take advantage of: a long, young branch of a cottonwood tree (here called a “pole”) can be cut and put in the ground where it will send out roots and grow. We can have tall trees immediately, without needing to grow them in a nursery from seed. This usually takes a lot of labor, a giant drill to drill a hole down to the water table (remember cottonwoods need to have their roots in the water to survive), and very long branches of cottonwood, 15 to 20 feet long (and even then, all but a few feet will be buried). The cottonwood pole is slipped in the newly drilled hole and dirt is packed in. This is a way to give some cottonwoods a good start, but it is expensive, especially if you are looking at miles of river needing more cottonwoods.

What beneficial changes will there be as the result of this project? What habitat components can we replace on the model now?

- ✓ add ten more cottonwood saplings to the model, making sure you put them close to the river where the water table is not too deep
- ✓ add one more mature cottonwood tree to symbolize that this project will mean large trees in the future

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## Wetland Construction

The numbers of marshes and wetlands have been reduced over the last decades. Managers can create new ponds and wetlands. Some examples are the ponds at the Rio Grande Nature Center, at the Bosque del Apache National Wildlife Refuge, and southeast of the Alameda bridge over the Rio Grande in Albuquerque. A different wetland is a “constructed wetland” that takes wastewater and sends it through a series of small water pools. Each pool is filled with cattails and other plants that clean the water. Constructed wetlands can be found at Los Padillas Elementary School in Albuquerque and at Los Ranchos de Albuquerque village center.

What beneficial changes will there be as the result of this project? What habitat components can we replace on the model now?

- ✓ place 50 more cattails on the model in groups representing 10 new constructed wetlands
- ✓ add five cottonwood seedlings (although wetlands are not specifically designed to recruit new cottonwoods, they often provide a good site for cottonwoods to reestablish)
- ✓ add one native riparian shrub: conditions are better for native plants such as willows
- ✓ remove one upland shrub: wetter areas are no longer attracting upland plants
- ✓ remove one exotic tree as conditions are not as good for some of these plants

## Fuel-wood Reduction

In earlier years, the overbank flooding that would occur every few years would saturate the branches and leaves that had fallen on the ground in the bosque. By being wet, they would decompose more quickly than they have in recent decades. Microscopic organisms such as bacteria and fungi break down plant material into nutrients that can be used by other plants; this is called nutrient cycling. Prior to the regulation of the river, the cottonwood forest did not burn as hot as it does today—sometimes it was so wet that fuel wood on the ground decomposed fairly quickly. Since the elimination of overbank flooding after large dams were constructed on the river, fuel wood has built up on the floor of the cottonwood forests and everything is much drier. Fires spread very quickly once they get started and generally burn hotter and longer in the same area. Most fires are caused by careless people, and there are many more people living in the valley today. The fires burn far and wide. One way to reduce the destructiveness of fire in the bosque is to clean the area of downed trees and branches—reducing the fuels that create destructive fires. Teams of volunteers can haul away branches and sticks; a shredder can be used to create mulch that will decompose more quickly than large branches.

What beneficial changes will there be as the result of this project? What habitat components can we replace on the model now?

- ✓ remove four snags: as we control the fuel in the forest, fires will be smaller and less severe
- ✓ remove five exotic trees: much of the excess trees removed in these projects are non-natives
- ✓ remove one upland shrub; again we can select to remove shrubs like one-seed juniper
- ✓ add one native riparian shrub; while removing exotic and upland plants we are making room for native riparian shrubs
- ✓ add one grassy meadow: fuel breaks create more grasslands
- ✓ remove one mature cottonwood: sometimes we do need to cut some cottonwood down to make an effective fuel break

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## Creation of Secondary Channels

The river used to have many channels as it flowed down the valley. Some would only have water in them during the spring runoff, but this was enough for cottonwoods to get a good start. In some areas, the easiest way for cottonwoods to get established is for us to help out nature a little. In places where the banks are just too high, managers can take in a bulldozer, lower the bank, and create a small side channel where water will flow some times of the year. Cottonwoods and native shrubs such as willow can get established here. Sediment removed from the banks can be returned to the river, creating new sand bars and improving Rio Grande silvery minnow habitat. An example of this is on the west bank of the river south of Bridge Street in Albuquerque (the Albuquerque Overbank Project). Many young cottonwoods have now reached the sapling stage after their human-encouraged head start.

What beneficial changes will there be as the result of this project? What habitat components can we replace on the model now?

- ✓ add 40 cottonwood seedlings; these projects are prime habitat for germinating cottonwoods
- ✓ add one mature cottonwood tree to represent the future forest
- ✓ add 10 cattails to show more wetlands being developed
- ✓ add two sand bars below the project site, created by sediment added by the earth work
- ✓ add two native riparian shrubs: birds like willow flycatchers need thickets of willows to nest; these thickets have been rare for many years, and now more are being created
- ✓ remove one upland shrub because the habitat no longer provides dry conditions these plants need
- ✓ remove three jetty jacks
- ✓ remove one non-native tree

## Removal of Exotic Species

Many agencies and landowners are involved in reducing the number of introduced species such as saltcedar (also known as tamarisk, *Tamarix chinensis*), Russian olive (*Elaeagnus angustifolia*) and Siberian elm (*Ulmus* sp.) in the bosque. These exotic shrubs and trees are increasing, in general, because human-caused changes in the river valley provide favorable conditions for them to grow. Saltcedar has been thriving, especially in the lower Middle Rio Grande Valley. Saltcedar trees flower and produce seeds throughout the growing season; their reproduction is not restricted to spring/early summer as are native cottonwoods. When bare ground is colonized late in summer by saltcedar, it will not be bare in the spring when cottonwoods are sending out seeds. Both Russian olive and Siberian elm can sprout in shaded areas, under the canopy of the cottonwoods and are becoming very common in the bosque. Entire food chains depend on the cottonwood trees of the bosque. As cottonwoods are crowded out by introduced species such as these, the entire ecosystem is affected and fewer native species thrive.

Large saltcedar removal efforts have been undertaken at the Bosque del Apache National Wildlife Refuge. They have experimented with different procedures to effectively keep the saltcedar from returning. Santa Ana Pueblo has also undertaken major projects to restore the bosque to its previous native-species-only state. The bosque near Tingley Beach in Albuquerque is a showplace contrasting a restored area to the invaded area. This work can range from volunteers cutting down and removing exotic trees to the large equipment of bulldozing and repeated rootplowing, sometimes using herbicides to reduce their reoccurrence.

What beneficial changes will there be as the result of this project? What habitat components can we replace on the model now?

- ✓ remove 10 exotic trees
- ✓ remove one upland shrub in the flood plain (we can select to remove shrubs like one-seed juniper during these projects)
- ✓ add two grassy meadows: removing exotic species provides space for more grasslands
- ✓ add one mature cottonwood: as exotic species are removed there is room for our native trees

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## Water Conservation

The amount of water that is used by people along the river has an impact on the health of the bosque and river life. Pumping more water than is replenished through infiltration each year causes the water table to drop; plants that depend on ground water can no longer reach their roots to that depth and die. When the water table is lowered, more river water will soak down into the ground, leaving less flow on the surface—less water for all of the users who need water. Some New Mexico communities use river water for their household water supply. The more water taken from the river, the less is available for the plants and animals that have evolved to depend on that water. Though some water will be returned to the river after passing through a sewage treatment facility, much is used, evaporates or returns to ground water. The City of Albuquerque had used only ground water for its water supply for many decades, though they owned the rights to Rio Grande water, referred to as surface water. As the population increases and water use increases, the City plans to remove and clean Rio Grande water and include it in its water supply. Water will be returned, but the flow level in the Rio Grande will be reduced—affecting life below the pull-out area. We can lessen the need to lower the flow of the Rio Grande by reducing the water we use: plant low-water using landscaping, install low-flow toilets, turn off the water while brushing your teeth, take shorter showers, etc.

What changes will there be as a result of this water conservation project? What habitat components can we replace on the model now?

- ✓ add five cottonwood seedlings: with more water in the river, more places can flood and start new trees, and seedlings can be added to sand bars or edges of the river
- ✓ add five cattails: more water in the river means more wetlands

## Jetty Jack Removal

The Kellner jetty jacks were placed up and down the river, starting in the 1950s, to straighten the river and protect the levees. The jacks slow the flow of water so that sediment drops out and builds up and eventually plants can grow. This helps keep the bank of the river in one place. As a result, the straighter and more narrow channel helps make the water flow downstream more quickly. The jacks also help to protect the levees. Today, the river banks and levees are quite stable, and the jacks are seen as eyesores. Several management agencies are removing jacks from the bosque. In addition, managers now realize that a stable river bank is not desirable in terms of benefitting the bosque—the banks need to be able to move again. In addition to removing the jacks, managers can destabilize and lower the river bank in certain places to promote flooding and to restore sediment to the river. All of these may improve habitat for silvery minnows and other species.

What beneficial changes will there be as a result of this project? What habitat components can we replace on the model now?

- ✓ remove five jetty jacks from the model
- ✓ remove three mature cottonwood trees as trees sometimes are removed in the process
- ✓ add five cottonwood seedlings as the river can meander more and create new sites for cottonwood regeneration
- ✓ add three cattails as the river can be more braided and provide more wetlands
- ✓ add two sand bars below the jetty jack removal project
- ✓ remove one exotic tree (exotic trees like Russian olive often grow within the jetty jacks and are removed with them)

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### Monitoring

An important part of managing the bosque is to understand what is happening to the plants, animals, water table, and other ecological functions in the bosque. The process of collecting, compiling, and analyzing information is called “monitoring.” Monitoring is an essential tool for land managers to understand if their actions are making any changes (good or bad) in the ecosystem. Many agencies responsible for caring for the river and the bosque collect data on a regular basis. Some schools also help collect important data. In addition to measuring the water table, weather factors, and soil factors, students also collect information about plants and animals.

Why is it important to collect information about the bosque over the long term? How can this information be used to help manage the bosque?

- ✓ add six monitoring plots to the model. Carefully choose places you wish to monitor. You may want some sites that have not been disturbed by recent activities. You might also want some sites where you have done projects.

*Note: The monitoring icon is an image of a Bosque Ecosystem Monitoring Program (BEMP) plot. These sites are scattered throughout the Middle Rio Grande Valley and are generally monitored by students from Grades 2-12.*