



The Middle Rio Grande Bosque: Restoring the Mosaic

Friday, October 25, 2013 Site Visits to Tingly Pond and the Albuquerque Overbank Project with special thanks to the U.S Army Corps of Engineers, the Bureau of Reclamation, and Natural Heritage New Mexico

The purpose of this time is to discuss the overarching question **“How do we actively restore the bosque mosaic in the face of climate change, anticipating restrictions of water use and increased risk of fire?”**

Components of the question include (BLACK = spoken comments during meeting; GREEN = written comments from participants):

How do we handle large stands of dying cottonwoods (or stands that are likely to die in the near future)?

- Middle Rio Grande Conservancy District (MRGCD) has experience rehabilitating from fires but doesn't always know where the dying cottonwoods are. Some kind of partnership effort utilizing aerial photography when leaves are out would be helpful and combined with wildfire risk abatement planning.
- ABQ Open Space mentioned the need for habitat assessment. Not all stands have the same ecological value. “Not all dying trees are created equal.” Utilize arborists' point of view.
- Know depth to water to help figure out how to handle dying vegetation and what to replace it with
- Once you have a dead stand, maybe lowering the bank for flooding can be used to promote natural regeneration
- Why are the cottonwoods dying? We need to understand that first before deciding what to do/plant next.
- At the Nature Center, many people want dead and dying trees removed because they are perceived as a hazard or a fire threat. Others want them to remain for bird habitat. There is a lot of liability related to dead and dying trees.
- Can any of the wood be thrown in the river to act as large debris snags and force the river to meander and shift silt deposition and erosion?
- The whole system seems to be contracting. Ecosystems should be designed in a sustainable way to accept that contraction. The hydraulics of the system are less.
- Restoration seems to focus on the species and what makes the community. Restoration should focus on the process. If cottonwoods are dying, there is a process that has been disrupted. Cottonwoods haven't reproduced for quite a long time.
- Albuquerque Overbank Project (AOP) shows that you can bring the process back inside the levees – it is a much smaller system than it was. Introducing terraces, lowering banks, installing a flow through channel(s) introduces disturbance.
- Lowering the bankline, to reconnect the river to the floodplain (by removing feet of earth), is expensive but can be very effective in reestablishing vegetation and increasing plant diversity naturally.
- Swales that aren't necessarily connected to the river can still encourage growth of seedlings and plant diversity.

- We haven't seen good recovery of vegetation after reduction or weed abatement – that's where we have introduced swales and seen good effects.
- Willow swales must take into account maximum depth to groundwater. 2.5-3 feet depth to groundwater (rather than 5-6 ft) can help to change the ecosystem function.
- Santa Ana swales did well for 5 years but all the willows in the swale died. BUT surrounding the swale up on top, the willows are thriving. That swale was originally dug out too deep and refilled.
- Landscape architecture engineering vs. process engineering – the snag at AOP did a lot of work that wasn't planned. There's a lot to learn about how to make the process work for us. Randomness can lead to opportunities.
- The wet meadow at the BioPark Wetlands also did the same thing by just letting the water run into that area and watched what happened.
- Use aerial photography as management tool –there are already some entities taking aerial photos but they are usually taken when the leaves are off the trees
- MRGCD - no money for on-the-ground surveying; dozers usually take wood to levees; limited staff to oversee community removing wood; need for community partners
- Santa Ana – Bureau of Indian Affairs usually allocates \$200/acre for Fuels Reduction - there is not funding for ecosystem restoration; low costs leads to use of masticator and leaving fuels on the ground; cottonwoods are dangerous to cut by hand; leaving mulch layer on ground more than 1/2 inch causes microbes to pull nitrogen out of the soil which can kill surrounding vegetation
- Santa Ana - large stand of dying cottonwoods; fire people want to remove all fuel. Cannot do prescribed burns. Need for health assessment of trees by arborists then look at replanting opportunities based on depth to water
- Plan for removal/replacement of cottonwood and look at options for other habitat types to fit mosaic
- Bank lowering – what is the seed source?
- What do we do with dead biomass
- Need to identify critical areas of concern and develop plan to address fire/fuel danger. Tree clearing is being done, but not to the degree needed at specific large dead areas. Restoration needs to be done alongside fuel reduction. Difficult to remove dead wood and transport wood to where public can access.
- Some dead wood is harvested for fuel wood. Some are left in place as habitat. Some are dropped and left in place as habitat for small mammals, reptiles, amphibians, arthropods.
- Need to construct engineered channels to provide supplemental flows to the cottonwood stands. Supplemental flows also encourage germination.
- Need to thin cottonwoods so surviving trees have access to water.

How do we cultivate "cushion zones" in higher water table areas?

- Diversity in the plant mosaic contributes to a diversity in habitat.
- We need to treat the bosque "in patches"
- Cottonwood without understory – MRGCD is trying to replace mid-story habitat and creating meadows and wetlands.
- In existing areas, need to maintain invasives and noxious weeds; there has been an increase in invasives that have moved from levees to bosque
- Need for mapping of existing plant communities – Fish and Wildlife Service might do this mapping?
- Need for maps showing depth to groundwater
- Can create "pot hole habitats" utilizing seepage flooding
- Use storm water from city to water bosque areas throughout stretch of AIS reach - create more wetlands

- Need to define appropriate areas for cushion zones. Need plan to thin/choke out weeds. Cottonwoods need to have connectivity to river or other water source. Need to measure depth to groundwater and see what species would work there.

Where do we leave existing stands of native cottonwoods and exotics?

- A plan to help the system is key rather than clearing exotics which allows other exotics to take over.
- Working with multiple partners requires a follow-up component of re-treatment/intervention and should include observation of how the site is doing. Many programs require re-vegetation.
- Mesilla Valley Bosque State Park – water may become salinized. BEMP site had 33 acres of saltcedar. Surface was disturbed – many native grasses and shrubs emerged through seed in less than a year.
- Look at what is emerging after removals/disturbances to change plans to reflect what is happening
- Within ABQ Reach, there are two arroyos that reach the river in their historic locations. Native seeds (and animals) are unable to reach river. We need to better manage storm water inputs to river rather than sending water to river as fast as possible. Why not introduce meanders in storm water channels? Why not use a bio-swale below storm water treatment? Let's let water meander.
- AMAFCA has water quality mandates that would allow us to help water to meander. They are looking to do more such projects.
- Millions of dollars of work and man hours have occurred in the bosque. On September 13 the high rainfalls that occurred – the river was not allowed to flood or restore but was re-channeled.
- If they are healthy, leave them. Leave Russian olives where there are high amounts of diversity but need a plan to replace nonnatives with natives. Phasing in very important - 5 year recovery time.
- Analyze based upon types of adjacent stands (leave next to open areas, etc.)

How and where do we support bank lowering?

- Wherever possible – very expensive
- AOP \$5,000/acre in 1998 – but how much is an acre of land in Los Ranchos? The value of the land along the river is very high. It comes to political will. It is possible to realize economies of scale to reduce restoration costs. The cost/benefit analysis still has to be worked through taking a long-term view.
- There are questions about water rights and depletions and where the removed fill should be relocated.
- We have a public that is very engaged and invested in the bosque. Their aesthetic sense of it may not include the “mosaic” concept. There needs to be more public education about contractions and environmental impacts that are pending and what a healthy bosque looks like while still providing water for irrigators and municipal users and a diversity of species.
- People think the bosque is “natural;” they aren't aware that it is “man-made.”
- Santa Ana and Sandia are experiencing dead zones which is likely to happen in ABQ as well.
- Use the river to lower banks (it migrated back and forth in the past) between the levees. Introduce snags to force the river to move, move sediment, build a bar, allow vegetation to reseed.
- swales, lower bank and reconnect where possible
- there is some randomness in system
- creative use of flood control/storm water quality mandates
- wherever possible and safe

- where feasible

Other areas of importance that should be on this list?

- Understand who owns the land and who owns the water. Cochiti to Elephant Butte - understand what has been done and assess where opportunities are.
- importance of maintenance and monitoring needs
- How do you "scale up" idea of mosaic?
- How can we get manpower needed for the effort?