

## **Beavers, Brews, and Santa Cruz Expert Panel – Panel discussion transcript**

Event Date: 27 September 2019

### **Panelists:**

**Jeff Simms – Bureau of Land Management, Fisheries Biologist**

**Doug Duncan – US Fish and Wildlife Service, Biologist**

**John Windes – AZ Game and Fish Department, Habitat Evaluation and Lands Program Manager**

**Antonio Esquer – Profaua, Biologist, Sonora, Mexico**

**Trevor Hare – Watershed Management Group, River Restoration Biologist**

**Moderator Lisa Shipek – Watershed Management Group, Executive Director,**

At WMG's Beavers, Brews, and Santa Cruz event, we hosted a panel of experts who answered some important questions surrounding the possible reintroduction of beavers into Las Ciénegas National Conservation Area.

*[transcript begins following panelist introductions]*

### **What was the historical range of beavers in this region?**

**Doug:** We've done a lot of digging into the records for beavers in the Santa Cruz. If you look at what is actually a record for a biologist, that's skin, skull, parts, photographs, and beavers leave more obvious evidence, since they have dams and cuttings. There are actually no mammal records of the beaver in the Santa Cruz Watershed. There are anecdotal reports, so I believe they have not occurred in the Santa Cruz Basin during the historical period, which is the last 150 years. They have certainly occurred here in the past and I will say right now I believe they deserve to be back also, as a tool we'll discuss.

**Jeff:** The context of beaver in Arizona and in rivers that connect Arizona to Sonora is kind of fascinating. Early trappers came in the 1800s but before that, when it was New Spain, I think they were trapped, certainly. So, beaver at the beginning of the country were under siege from trappers because they were instant cash: trap the beaver you got food, because you could eat the tail, and hide you could turn into silver or gold so the trapping was heavy and early. The wetlands and rivers responded to that by downcutting and draining when we had floods in the 1890s up through about the 1910s.

We had a series of droughts and floods so our rivers changed forever and our wetlands were lost for the most part. There's remnants left - and that's what we call them - remnants, of wetlands and remnant streams that still have surface water. The loss of that keystone species reverberates in our riparian and wetland communities to this day and to reverse that beavers are a big step in the right direction.

As far as beaver on the Santa Cruz, the Gila was well populated and the San Pedro next door was called Beaver River before San Pedro by the trappers because there were so many. They

do get around, they will move long distances over dry land so the Santa Cruz certainly had beaver and Spaniards probably started trapping. When it was Mexico, they continued to be trapped because there's money in it, and when the white settlers came there was pretty much nothing much left, and then we have some anecdotal information from people that made observations of the last few that were around and that's where we sit, with some uncertainty. If you look at the Gila River system as a whole any place that had water probably had beaver and that's reasonable.

As a keystone species... their removal, we'll never know the devastation to the wildlife and to the wetlands because nobody recorded that or took pictures so what we do have is some very scattered information and a lot of it has to do with finders that kept records, journals, and first explorers like military explorers and biologists later.

**Antonio:** When I started knowing about beavers, I visited the San Manuel area where the Nature Conservancy and other organizations were planning the conservation for the Upper San Pedro in Mexico and Arizona. To have beavers in Mexico sounds like a dream. I live in Hermosillo, and I found a beaver in ironwood and brought it to Los Fresnos [preserve] - there is beaver here, I said, look. 2006 had much precipitation - maybe 18" in one night - so there's a lot of water. In those days, beavers have peers in Los Fresnos, there are some records of the year before with beavers, and that is amazing. Even in Santa Cruz, there are records from years before with beavers there. I mean, walking and moving from watershed to other watersheds.

In the history, I remembered reflecting with Dr. Ray Turner who was talking about restoration because, in those days, 2001, 2002, and 2003, we were very focused on restoring rivers for migratory beaver. We need to protect the riparian corridor and vegetation so we're very focused on using restoration techniques, but in talking with him he made me think with this question: at what age do you want to restore? Riparian corridors come because of us modifying conditions of the stream to permit a corridor, as we know. Before the beavers can come there need to be trees. They're going to make a lot of Ciénegas with trees; that is good for birds because they can move. It's like, can you imagine a river is like a series of Ciénegas with a lot of water infiltration to the aquifer?

In restoration, we use tools, equipment, and machinery. As we say in Spanish, "Mejor castores que tractores" something like "there is no better tractor than a beaver". Once beavers are established they move around, we know there is another area in the Rio Bravo, Chihuahua, so the range is very wide. When beavers start to come, the people start to talk in hills and in the rural areas. We are proposing to restore the riparian corridor, so when beavers appear they are cutting the trees, so they think they are a threat for the riparian corridor. When beavers appear, they kill them in some areas. So two years ago, when it appeared in Santa Cruz in Mexico they crossed into San Lazaro town and the kids and others killed the beavers because they think they are bad for the riparian corridor. We need to educate people to teach that beavers are important to the corridor.

## **What were the lessons learned from the reintroduction of beavers into the San Pedro River?**

**Jeff:** Well, in 2000 there were about 15 beaver that were reintroduced by the Game and Fish Department. They were dropped off, they went to town, felled trees, built dams, had families. At their height, there were over 100 maybe 160 in the San Pedro Riparian National Conservation area. Since then, they have been on the decline and we haven't seen a beaver or beaver dam in three years on the San Pedro. But where they went and their fate is unknown. Some emigrated to other areas - and we've heard about that, they've gone other places - but there are mortality factors associated with any animal and, you know, things like mortality from predators, problems with habitat stability, disease, hunting or trapping could be an issue so we're not quite sure why they disappeared. Unfortunately they sort of winked out on the San Pedro Riparian National Conservation area, but they've spread out and may have set up populations elsewhere from the core group. It is difficult it people are exterminating them as they show up in Mexico and other places; I didn't realize that was such an issue. So, that's kind of in a nutshell what's going on with the beaver here.

I'm a fish biologist so I was out there looking at the implications of having beaver on the fish community. Basically, what beaver were doing for the most part, was setting up dams where they already had a plug of sediment coming in from a tributary that dammed up water and made a big pool. They would enhance that. You know busy as a beaver, work hard like a beaver? They weren't working hard. Some of the beaver did expand out between tributaries and built dams and created pools and some of those beaver ponds were  $\frac{1}{4}$  of a mile long, which is significant.

Hydrologically, the USGS was looking at the relationship between groundwater and riparian vegetation. Well, if a beaver set up on one of their transects all of a sudden their groundwater situation changed and you had an increase in the elevation of groundwater. It messed with their analysis because they wanted a site that behaved without the activity of beaver and the changes in the water table because of the beaver. They wanted comparable cross-sections and comparable reaches, but what they did learn is that beaver make a dramatic difference in recharge and groundwater elevations

**Trevor:** As we pointed out, they make giant ponds and those giant ponds can be very attractive to our non-native species in the area; specifically non-native fish and the non-native Eastern U.S. bullfrog that is a voracious predator of native frogs, fish, turtles, birds, bats, anything they can get their mouths around. Jeff is going to hear a lot about this when he publishes his EA [environmental assessment], everyone is going to be saying...

The difference on the San Pedro to Las Ciénegas is that Las Ciénegas is pretty clean of these nasty, non-native, invasive species. There's a frog project that's been going on going on for about ten years that Dennis Caldwell, who is standing right over there, helped lead to help get rid of the bullfrogs in the Sonoita Valley. There's not a lot of non-native fish except in people's house pounds.

Working with the community is very important for us at Watershed Management Group; we need to set the stage over the next 50, 40, 30 years. In case beavers do make it into the Tucson basin, we need high quality riparian habitat that is free of those non-native species so we can welcome beavers with open arms and there are none of those issues other areas have experienced.

### **What issues are there over the potential reintroduction into Cienega Creek?**

**Jeff:** Well first I'd like to just talk about the bullfrogs. The frog and fish restoration and outreach group worked very diligently for years to eliminate the bullfrog in and in the valley surrounding Ciénega Creek and that is a huge achievement which has set the stage for keeping biological integrity along Ciénega Creek. Like it was mentioned, they'll eat pretty much anything and they're really hell on native leopard frogs and native snakes, especially at the smaller sizes. So, I just want to start off by saying that we've done tremendous work. BLM is quite thankful; we provided the funding and encouragement but really the work was done by biologists.

Given that, let's go back to beaver reestablishment and what that may look like. First of all we have to deal with NEPA, the National Environmental Policy Act, and go through that. In other words, dig deep and look at all the factors affected by the action and a manager, ultimately somebody above me, gets to decide if we go forward or not given the pluses and minuses of doing the project. They do this with every project, this one is no different. Fish and Wildlife Services looks at the impact to endangered species in critical habitat, which likewise feeds into NEPA. We make a well-informed decision based on fact, science, and best management judgment. When we go through all of that, ultimately the Game and Fish Department gets to decide what's next. I'm hoping we get through those first two stages by early spring - I think that's reasonable, but as you know, things can get delayed when we get in the public eye or public inquiry. Things can take longer. It's like a slinky you can stretch out quite a bit.

**John:** The BLM manages land and AZ Game and Fish manages the wildlife. We hold the wildlife in trust with the public, so it's a publicly owned resource managed by the Game and Fish Department, and the department answers to the Arizona Game and Fish Commission which is a 5-member citizen board. The first step is the EA through the NEPA process; that clears the first hurdle. I think there may be a little too much enthusiasm for how quickly this thing will proceed, because there is a need for all the aspects to be looked at. That's important because it is controversial and it's controversial for a reason. I started out my career with Game and Fish and my first internship was working on leopard frogs. It was a survey of the Coconino National Forest for leopard frogs and I thought it was going to be the greatest job I ever had, finding frogs all over the place, but I only found one. That was when we started having some serious decline.

We want to make sure we're doing things right; we want to make sure all the biologists and scientists have the opportunity to provide their input. Once it goes through the NEPA process, we have our own process within the Game and Fish Department called the Environmental Assessment Checklist Process and it'll go through another round of process internally and

ultimately it'll have to be decided by those above me if it proceeds at all. This is by no means a done deal, there's a lot of work to do, there's a lot of science to get through, and there's a lot of opportunities for the public to provide input.

**Doug:** One of our roles for the Fish and Wildlife Service when there are listed species that will potentially be impacted, which will be the case for Cienega Creek because it's home to two listed fish, a listed garter snake, a listed plant, one listed frog, potentially cuckoos, and periodically Southwestern Willow Flycatchers. When BLM did their management plan in 2002, we considered the release of beavers for the species that were listed at the time. However, there have been more species listed since then, so we will do another what we call consultation. Generally, because we work close together, that's mostly a formality that we try to do concurrently with the NEPA process so we aren't another speed bump in the process.

**Trevor:** So I think Watershed Management Group's role and your role in all of this - and we will keep you informed as we go forward - is that we think the general consensus is that this a good thing, but we have to look at all the aspects. We don't want to make a mistake where we brought non-native frogs or non-native fish into an area where a lot of money and effort was made to get rid of it. So really we're going to be asking our River Run Network and community of folks in the Tucson basin to comment.

I think it's really imperative that the BLM be prepared to deal with these issues and do the monitoring and then management that will be needed to make sure that the good works of the beavers in engineering our river corridors is not undone by the unfortunate side effect of ponding water and attracting non-native species. We'll, of course, provide talking points for any comments when the comment period opens and you'll be hearing a lot more about this from all of us here at WMG over the next 6 to 12 months.

### **What can we do to help restore these critical habitat areas? How do we play a role in that?**

**Trevor:** We've done a couple field trips down to the sites that have been proposed on Ciénega Creek and we'll be revisiting those sites on Black Friday, the Friday after Thanksgiving. Instead of going to the mall, we're going to the creek. We're having a creek walk and we are going to cap that at about forty people so if you are interested, please sign up sooner rather than later.

I'll mention that right now we have two grants we're working on: one from the Bureau of Reclamation and one from the Arizona Department of Environmental Quality for about \$300,000 to work in the Ciénega Creek watershed to start healing erosion, slow the flow of the water down, spread it out and sink it in. These are areas we're working in tributary arroyos to the actual creek because working in the creek is super expensive and there's a lot more permitting and a lot more planning that has to happen, but the low hanging fruit here is those tributary drainages. If we can slow the stormwater flows down before they reach the creek then they are going through the system, but they're going much slower and supporting the growth of those trees that the beavers need to survive. So that's what we're doing here in the Tucson basin.

Ciénega Creek is directly attached to the Tucson basin via Pantano Wash; Ciénega Creek comes into Vail, turns into the Pantano Wash, the Pantano Wash comes up and meets the Tanque Verde and that turns into the Rillito River. That confluence used to be a giant ciénega that the army ditched and drained when they took Fort Lowell out of downtown and put it out there, so we know that the habitat was there at that confluence at one time. If they put beavers out next year and there's a big, giant storm and they get flushed through that system they could end up at that confluence, but there's no habitat. Over the next decade or two for me, and the next 50 years for my younger coworkers, we have this vision of restoring that habitat so if the beavers do come into that system they can survive and thrive there. So that's what we're out there doing.

**Doug:** As we've briefly touched on there have been some concerns from other biologists about the potential impacts of putting beavers in but my from perspective both on Ciénega Creek and what we have observed on the Upper Santa Cruz there are already deep pools there, there's already magnets where people can potentially put in nasty non-natives. The Upper Santa Cruz is overrun with non-native fish and non-native bullfrogs already. The pools were 8 feet deep, maybe now they're 10 feet deep.

I'm a fish biologist. Fish and other aquatic species need water and the prognosis for water in this part of the continent with climate change and the continuing drought is not good. Whatever we can do to maintain water in our streams we are fully supportive of.

**Jeff:** I'd like to make a parting shot along those lines. BLM manages ecosystems and vegetation and watersheds and right now we're looking at climate change and we've got groundwater pumping. The buzzword is resilience in our agency right now. How do we increase the resilience of some of our ecosystems? The San Pedro River and Cienega Creek really are endangered ecosystems given what's coming, so how do we build that resilience? We fix watersheds, which you folks are doing, and we add things like beaver that assist in the recharge of shallow aquifers. We're hoping that we have some influence on what is coming with climate change and counteract some of the groundwater withdrawal. It's really a matter of faith because we don't have a lot of examples where its been done and measured exactly what the results were and all that, so this will be kind of an experiment. We plan on doing the monitoring of the groundwater in the channel and the water and vegetation so we can use it as a feedback loop and see where things are going right and what we need to do to help the system prosper and relate what we find to other people who are working with beaver in Southern Arizona or other dry locales in the West.

**Antonio:** We are working with Watershed Management Group with the support of the Arizona Department of Environmental Equality. For us in Mexico, we need to use best practices to motivate others to understand the importance of these species.