The Cumberland HCP Science Advisory Committee Meeting Notes
Cumberland Mountain State Park, Crossville, Tennessee
9:00 a.m.—3:30 p.m. (Central Time), Wednesday, 27 October 2010
Water Resources Day

9:00 - 9:15 a.m. (Central) **Arrivals, greetings, and refreshments**

9:15 - 9:20 a.m. **Introductions and overview of goals for the meeting**
Sean Blomquist, Tennessee Technological University

- **a.** Hayden has decided to step back as the SAC Coordinator, and Sean is the acting coordinator now; however, the HCP is preparing to hire a new coordinator. Hayden thanked the SAC for their sustained support.
- **b.** The group activity this afternoon will follow-up with the surveys.

9:20 - 9:30 a.m. **Update and status of the Cumberlands HCP project**
Katherine Medlock, The Nature Conservancy

- **a.** Katherine is the new project director for Water Resources HCP. Alex Wyss and Katherine both got promoted within The Nature Conservancy.
- **b.** It has been a productive year. We established an outreach team in counties within the project area. We established a legal team and Core Teams. Take modeling has begun. We completed four covered activity accounts and conceptual models that link the potential covered species with habitat needs, etc. We have draft Biological Goals and Objectives.
- **c.** Joe Daraio has left, and the HCP will be hiring a new Postdoc. There will be changes in staff over the next year.
- **d.** The HCP helps fund research to help answer questions that we have. Thanks to the SAC for support and special thanks to the SAC staff.

9:30 - 12:30 p.m. **Cumberland HCP Focused Research Presentations *(*denotes presenter)***
(Presentations available on website; questions and discussions noted below)

1. **Factors affecting populations of the Cumberland elktoe *Alasmidonta atropurpurea* (Rafinesque, 1831) and the Cumberland papershell *Anodontoides denigrata* (Lea, 1852). *Jim Layzer* and Kendall Moles (Tennessee Technological University)***

    - **a.** Has anyone sampled above the beaver ponds? We did sample above one, but we didn't find anything.
    - **b.** What about the species in Bone Camp Creek that was not what they thought it was? Back in the 1800s, someone described a mussel from the upper Cumberland system and said it was not the same species that was a couple of hundred miles away. In the early 1900s, there was a survey conducted, and they found the recognized species. Without even seeing the shells, they said the other guy must have been incorrect. The correct description is *denigrata*.

2. **Predicting the presence of C*ambarus pristinus* with preliminary notes on its life history.** ***John Johansen* and Hayden Mattingly (Tennessee Technological University)***

    a. Perhaps the conductivities coincide with the stream orders that you are finding them in. You could run a regression on conductivity vs. stream order.
    b. We have taken conductivity readings in October; whereas, they were taken in the summer previously. Does leaf litter affect conductivity? Yes. There may be different components that affect conductivity at different times of the year.
    c. Streams that are on sandstone will generally have lower conductivity. Where limestone is, you may have inputs from caves and have higher ions. Think about the geology of this.
    d. Have you looked at historic mining areas? No, but it would be good to look into. There are strong correlations with increased conductivities and mining.

3. **Clonal structure and population status of Virginia meadowsweet (*Spiraea virginiana*).** ***Jessica Brzyski* and Theresa Culley (University of Cincinnati)***

    a. With the number of self-incompatibility alleles, the more you have the better? Yes.
    b. You didn't look to the East? They are plentiful in West Virginia and other areas in East.
    c. Any difference in the stream, as the plants go down the stream? There is the hypothesis that as you move down the stream, you may accumulate more genotypes. That is not what I saw. The *f* populations were huge and had more variation in them.
    d. Have you looked at what is available commercially? We have looked at some, and they don't have much genetic variation in them either. We haven't looked at cultivars or orientals.
    e. Would you run the risk of outbreeding with translocation? Yes. We would need to do some greenhouse work and look at the offspring's fitness.
    f. With those populations that are highly clonal, how different do they have to be for sexual reproduction to take place? That is difficult to answer. Plants that I looked at had the same loci. I have read info, and it stated they had to have 60-70% different genetic makeup.
    g. There is no historical data on their range or where they were located. We think they have been isolated for generations. They are long-lived. One paper said one plant was 90 years old.
    h. What about Japanese spiraea? They are different genetically. There are 14 different loci in native spiraea, and 5 worked in the Japanese spiraea. The problem is now that they are quickly invading these areas near Virginia spiraea. There is the fear that they will be able to hybridize. It is clonal as well.

4. **Monitoring solutions for city streams.** ***Karina Bynum (Tennessee Department of Environment and Conservation)***

    a. Is this a set of protocols that TDEC has developed? All MS4 programs will have to collect data in the streams.
    b. The data will be housed (map on Google Earth with links to a geodatabase), and there will be a link on Crossville's website.
    c. This info will be available to the city of Crossville? It can be available to everyone. To get the entire package, you will have to contact the city of Crossville.
    d. Is this linked to the new TDEC database? TDEC's water quality database is where data from the MS4 will be integrated. TDEC does not want to house everyone's data.
    e. Is the city of Crossville collecting all of the data? Yes, it is in the works. They did the assessments about 3 years ago according to Maryland's protocol by hand, and then put it in electronic form. The plan is to hire someone through a grant who will put the data into the geodatabase, probably within a year. Two people will be in the field. They can do direct data entry while in the field. Data

collection will start in January, and we should be able to see something in the second quarter of 2011. If anyone needs the data that Crossville has now, they can provide it, but the database is not user friendly.

f. The city will not be monitoring outside of the city, but they will try to put the data that the watershed association collects in the county into the same database.

5. Land use effects on embeddedness in the Obed Wild and Scenic River System*. Margot Carter* and Evan Hart (Tennessee Technological University)*

a. Are your landuse percentages from the entire watershed or at your site? They are from that point upstream, but I have thought about looking at it from a watershed scale.

b. Are you taking into account activities that are occurring now that will impact these streams later? There will be impacts at one of your sites from a dam project. There is a stream above the dam project. Dennis Gregg with the Obed Watershed Community Association can share this information with Margot.

c. You should do correlation analyses at different spatial scales. This info will help us determine whether or not our buffers are good enough and will help in making management decisions.

d. The definition of fines was less than 2 mm. Some streams are sandy, and that's normal for those streams.

e. Do you have any historical data? No. Dennis offered to give Margot data that they have collected.

f. What are the land use layers that you used? It was the national land cover dataset from The Nature Conservancy's database.

6. Aquatic Habitat Mapping of River Systems. *Paul Ayers and Ken Swinson* (University of Tennessee)*

a. Have you gone down to spotfin chub sites to ground truth them? We have gone to some sites. Have they taken the habitat suitability data and done an overlay? Not that Ken knows of. Some spotfin chub locations are hard to access. Are there going to be plans to do that? Probably. Once there have been more developments, it would be good to go out and ground truth this.

b. Have any endangered species locations been overlain with this model? This could be done for Big South Fork, but at Obed, we only have places that we've been to. We have not gone to places where we don't know if the species are there, yet the model shows suitable/optimal habitat.

c. What time of year did you do this? We try to go at low or base flow, when the system is as low as possible before we can't run it.

d. What is the accessibility of this data for the HCP? Ken believes they can give this info to the HCP, and he will talk to Paul about it. NPS will cooperate with the HCP, but they have to go through an administrative process first.

12:30 - 1:15 p.m. **Lunch Buffet Upstairs in Restaurant**

1:15 - 1:30 p.m. **Door Prizes**

1:30 - 1:45 p.m. **Hydrologic Modeling**
Evan Hart and Joe Daraio, Tennessee Technological University and Sean Blomquist, University of Tennessee

a. How will this hydraulic model track changes in rainfall patterns? This is a question about climate change. It's a big issue, and we are not sure how we are going to deal with it. With the hydrologic model, you can use a certain amount of rainfall. USFWS has looked at significant changes in seasonality and precipitation patterns. It could make a difference for species that require a certain

flow. Right now we are in a set of conditions with the climate that has been changing and will continue to change. The probabilistic approach for this is a good one. It can account for variability in data, and it will come out in the simulations.

b. With the difference in base flows, none of the reservoirs have release schedules, right? They have spillways, and you still have a spillway that is releasing some water over time. This includes farm ponds and even some of the city reservoirs. In a USGS report the Oakdale gauge on the Emory has shown an increase caused by outflow of sewage treatment plants. Cities are tripling the size of wastewater plants. Crossville is entering negotiation in harvesting water from Lake Tansi, and it will be possibly going in to the Obed and Obey. Are you going to be looking into those type deals that are being made? Hopefully someone will.

1:45 - 2:00 p.m. **Species Survey Results**
Malissa Davis, Tennessee Technological University

a. Are these covered activities related to isolated wetlands and other water resources or just anything? The Water Resources HCP is dealing with development, so it includes everything, and this may warrant a name change because the idea has changed since the Water Resources HCP first begun.

b. We have used the approach that was used in the Forest Resources HCP in picking species to include. If there were records for species and we thought we had enough to calculate take, then we included them.

c. The NPS will have to evaluate everything that occurs in wild and scenic river systems. The HCP will not take the place of other permit needs but will help streamline the process. Under section 7, there are 2 different approaches, one for sources of water in the parks and one for other streams and tributaries of those sources of water.

d. NEPA: For example, with the Lake Tansi water-harvesting project, federal funds are involved, so section 7 is required, but other permits are also required through EPA. It will be a challenge for NPS to deal with all of the section 7 determinations.

2:00 - 3:20 p.m. **Group Activity and Discussions**
(See separate small group afternoon notes)

3:20 - 3:30 p.m. **Closing Remarks**
Sean Blomquist, University of Tennessee

Main Goals for Today's Meeting

1. Inform SAC members with past and present research related to the Water Resources HCP
2. Summarize results of species survey
3. Survey follow-up

For more information about: 1) the NCFRHCP Project, please contact Alex Wyss at awyss@tnc.org or (865) 974-1955; 2) the WRHCP Project, please contact Katherine Medlock at kmedlock@tnc.org or (865) 546-5998; or visit the HCP website at www.cumberlandhcp.org.