

MEMORANDUM

To: Rivanna River Basin Commission
Technical Advisory Committee
From: Ridge Schuyler
Re: August 23 Discussion: Follow-Up

September 10, 2007

We are in the midst of an exciting discussion about protecting the health of the Rivanna, with a goal of recommending management strategies that can prove effective in addressing the watershed's primary threats.

As you may recall, we had an interesting and wide-ranging discussion at our last TAC meeting. We began the conversation by trying to hone in on the major threat(s) facing the Rivanna watershed. This starting-point was born of the discussion we had begun at the prior meeting, during which members of the TAC were asked to rank the threats to the Rivanna, based on their professional judgment. The overwhelming sense of the group was that "altered hydrology/landscape changes," "sedimentation," and "dam management/flow regimes" were the most pressing threats.

Before we could delve too deeply into trying to untangle the complicated and related nature of "altered hydrology/landscape changes" and "sedimentation," a point was made that before we could discuss threats, we needed to identify a desired future condition. This suggestion builds on the idea that it's difficult to know how to get to where you're going if you don't know where you want to get. As the conversation unfolded, it initiated another discussion about whether there might be different "desired future conditions" in different parts of the watershed; in other words, rather than focusing on the Rivanna watershed as a whole, perhaps we should be looking at subsets, where the desired outcomes might be different than in the outcome desired for the whole, and thus different strategies may be required for those smaller subsets. We then discussed possible methods and reasons for categorizing subwatersheds of the Rivanna.

Knowing that it is hard to continue a discussion over the course of many weeks, I wanted to offer my thoughts in preparation for the next stage of the conversation.

DESIRED FUTURE CONDITION

Biological measures. It would appear to me that if we are trying to protect the health of the Rivanna, the desired future condition would be articulated in terms of the collective health of the creatures living in or along the Rivanna's rivers and streams. The desired future condition would be to have in the Rivanna the kinds and abundance of species that occur naturally in the types of rivers and streams we have. Both StreamWatch and The Nature Conservancy have developed some criteria for assessing the health of biotic communities in the watershed. Benthic macroinvertebrate indices, for example, can form the bases of useful criteria because they reflect the diversity, trophic balance, and overall

pollution sensitivity of stream invertebrate communities. These invertebrate community profiles, in turn, reflect water quality and habitat conditions, and tend to correlate with the condition of the entire stream biological community (*i.e.* vertebrates and invertebrates). Perhaps the next step would be to determine if indices are missing and if so, gather the requisite information to finalize those. Generally, these indices provide a yardstick by which to judge progress toward full biological health. The goal could be stated either in terms of achieving a desired level of the ratings (like “good” or “very good”) or in terms of improving along the yardstick, with the ultimate objective being restoration to the natural condition (which would be a lofty goal, but one certainly worth striving to attain).

Management measure. In addition to a goal which is based on the objective measurements of the health of biotic communities living in and along our rivers and streams, we could also develop a goal based on management conditions. This approach would measure how successful we are at implementing the practices which we believe will improve the health of the rivers and streams. This type of measure would be based on our best judgment about what it will take to protect the aquatic systems. For example, a management measure might include how many miles of riparian buffer we have, how much forest we have retained, how much impervious cover there is, how many stormwater management practices have been installed, whether the flow regime has been returned to a natural state, or how much stream restoration work has been done. The decision about what to measure depends on a clear identification of the threat we want to abate and a determination about what strategies are best suited to abate that threat. These management measures are not a substitute for the ultimate objective of measuring how the life in the stream is faring, but it can tell us how effective we are at implementing any solutions we have identified.

CATEGORIZING THE WATERSHED

Biological categories. As noted above, both StreamWatch and the Conservancy (and perhaps others) have developed measures for assessing the health of the watershed. There are some gaps in our knowledge, however, that it might prove useful to fill in. For example, while we are confident about the natural communities we would expect to find in most of the Rivanna’s streams, we need to know more about the natural communities we would expect to find at the extreme ends of the spectrum—the smallest streams and the largest rivers. In order to calibrate our yardstick for measuring what we actually find in the streams and rivers compared to what we would expect to find in the natural condition, we need to make sure we understand, to the best of our ability, what we would expect to find in all stream types.

Threat-Based/Management categories. Tracking the construct discussed under the Desired Future Condition section above, we can also categorize the watershed based on certain threats, sources of threat or threat abatement/management characteristics. This categorization would be based on addressing the threat(s) we’ve identified, with an eye toward determining where best to implement the strategies we choose to abate the identified threat(s) most effectively. For example, if we are concerned about streambank

erosion, we could categorize the system based on which streambanks are most susceptible to this threat, based on soil characteristics, surrounding impervious cover and riparian buffer extent. This categorization would follow upon a determination of the threat(s) and the likely source(s) of the threat(s).

THREATS

We have not yet completed our discussion about threats. While there was a consensus that the top three threats were “altered hydrology/landscape changes,” “sedimentation,” and “dam management/flow regimes,” we have not yet determined how focusing on one or the other of these threats will affect potential management decisions. There are implications to choosing either “altered hydrology” or “sedimentation,” and it may be worth pursuing that conversation to its conclusion, so we can continue with our effort to devise potential management strategies to address the most likely threats.

We were not able to complete this discussion because we began another useful discussion about whether we should be focused on the Rivanna as a whole or on some as-yet-defined subsets (like third order subwatersheds, for example). Oftentimes, it is difficult to determine which scale is the most appropriate at which to work. While there may be specific threats that are unique to certain subsets of the Rivanna, it would seem to me that if there is an overarching threat which affects the vast majority of the watershed, then that deserves our initial focused attention. From an effectiveness standpoint, we should address the biggest threat first, especially if it is one which if not addressed would make other conservation efforts virtually useless. I would call this a “killer threat.” For example, if we determine that altered hydrology threatens the majority of aquatic systems throughout the watershed, and that if continued unabated it would lead to the permanent degradation of the system, then it would make sense to me to place the highest priority on tackling that issue. The second highest priority would then be to determine whether there are also some more localized “killer threats,” and if those exist we should consider the extent of the potential harm and address those as well. Of course, in the best of all worlds we would address all threats at once, but in the world of limited resources in which we operate, we need to prioritize.