



RESPONSIVENESS SUMMARY

COMMENTS ON THE WATER RESOURCES RIVERWIDE OVERVIEW

February 8, 2008

Laura Weit, Watershed Planner, NH Department of Environmental Services

Well done, yet again! The *Riverwide Overview – Water Resources* is a great model for other river management plans. The tone is spot on for its intended audience, plus it really raises awareness that the river is force that is to be respected and protected, and is something that connects all of us. In addition, it strikes a delicate balance between economic development and environmental protection, both of which are mutually beneficial. Here are a few comments to consider.

1. Nice way of incorporating the Connecticut River watershed into the second paragraph on the first page.
2. Great inclusion of CRJC's broad goal of "assuring responsible economic development and economically sound environmental protection" in the second to last paragraph on the second page.
3. Nice focus on using collaboration to reach consensus, by being inclusive of all stakeholders in the last paragraph on the second page. It's the right way to go!
4. Great way of explaining the difference between "controlling" and "managing" flooding on page 5!
5. Nice summary of the effectiveness of riparian buffers on page six. The cost benefit analysis of riparian buffers and built infrastructure is especially important.
6. In the third recommendation on page eight should "volunteer" be replaced with "native" or "vegetation" in the following sentence "The often-too-small strip of grass, ferns, and other "volunteer" plants have a big job to do to keep trash, road pollutants, and sand out of the water?"
7. On pages seven and eight it might be helpful to include easements as a tool to establish and maintain vegetative buffers.
8. Nice layman's explanation of fluvial geomorphology on page 9!
9. It is important to note on page 11 that if impervious surface limitations are increased to 30% within the protected shoreland a DES approved stormwater management plan is required.
10. For page 24, it may be helpful to note New Hampshire, along with several other states, efforts to sue EPA to enforce their requirements regarding mercury.

CRJC response – Thank you. We will add language regarding use of easements to protect riparian buffers, and will incorporate specific recommendations such as #9 in an appendix and in our local subcommittees' chapters, where details about the Comprehensive Shoreland Protection Act will be presented. We will add language on the states' efforts toward enforcement of mercury requirements.

Timothy Carney, NH DES Dam Bureau

No comments, well done.

CRJC response – Thank you.

stergios Spanos, Jeff Andrews and Paul Susca, NH DES Source Water Protection Program

1. *Shoreland Protection*. This section does not explain the rationale behind protecting only 4th order streams, or 3rd and 4th order streams. This section presents an opportunity to summarize the scientific research that indicates that all streams are important in protecting the quality of the mainstem, and that protecting the shoreland of all streams is important to protecting quality in the mainstem. It would also be interesting to see a discussion of state-level protection vs. local-level protection - pros and cons. It is not clear why there are separate sections on shoreland protection and riparian buffers.
2. *Wastewater discharges* -
 - a. It is expected that nitrogen limits, reporting and monitoring will be required on new NPDES permits. Page 13, 2nd paragraph from the bottom typo (sewerage should be sewer). Opportunity #4: It should be clear

that it is the states' congressional delegation and the municipalities that should seek additional federal assistance and not the agencies. For NH, State Aid Grants and the State Revolving Fund area resources that are currently available. Note: Lebanon is currently negotiating a consent decree with EPA for its CSO issue.

b. The second recommendation, that NH should prohibit certain land uses over aquifers, should also be applied to VT aquifers once they're mapped. Also, DES could provide info on the extent to which municipalities protect their aquifers, but it might not be of interest if the same info isn't available for VT. Same thing for public water supply wells.

3. *Agriculture* - The section on agriculture mentions that NH offers grants to farmers to create nutrient management plans. Grants are also available from Dick Uncles (NH Dept Ag, Markets and Foods) to implement nutrient BMPs, especially where there's a water quality benefit.

CRJC response – We appreciate your detailed suggestions. We will amplify language regarding third and fourth order streams. Regarding a discussion of state-level vs. local-level protection of shorelands, we believe that the choice depends upon the specific issue at hand, and so will consider this question as we discuss implementing the plan. The question will also be discussed in the Vermont legislature as that state considers adopting new shoreland protection measures this year. We have chosen to treat riparian buffer and shoreland protection issues separately, in order to highlight the many values of buffers, which can be protected through a number of means, not all of them regulatory. Regarding seeking federal assistance for CSO remediation and other water quality problems, it is our hope that state agencies will put in a request to the Congressional delegation for funding. We will add language for Vermont regarding land use over aquifers, and expand our note regarding funding for farm activities.

Neil Kamman, VT Department of Environmental Conservation - Water Quality Division

I just had a quick look at your great looking CRJC Water Resources plan. I specifically reviewed the text on Mercury, since as you may know, that is one of my research and management areas of expertise. I would like to commend CRJC for your clear position on this issue, and your incorporation of the most up-to-date information. Your recommendations are quite sound. I have two suggestions. First, you might wish to include text or recommendations regarding testing other CT River hydro facilities. One significant drawback to the otherwise excellent EPA study was that the fishes analyzed were not specifically geographically tied to the locations of collection, but rather to broad reaches. This affected our ability to use the data for waterbody-specific risk assessments, even while the data were very useful from a reach-wide perspective. Therefore, a sound recommendation would be to include impoundment-specific testing with the recommended re-do of the CT River sampling. Second, as part of the 401 certification of 15 Mile Falls, the operators are required to carry out fish tissue mercury testing at five-year intervals. It may be worth mentioning this in the text.

I am available to address any questions you might have.

CRJC response – We agree on the problems associated with the way the fish samples were treated in the EPA study (as did the principal investigator who took over the project long after the design was in place), especially in Reach 7. We will add language regarding this and the 15 Mile Falls requirements. Thank you for your review.

Cathy Kashanski, VT ANR DEC Water Quality Division

I read portions of the draft Riverwide Overview of Water Resources for the Connecticut River Management Plan that you sent out for comment in mid-December 2007. It is always a pleasure to read the comprehensive and specific writing of the CRJC with respect to issues and actions for the Connecticut River and its tributaries.

I had just two comments with respect to the Shoreland Protection section of the Overview. In Opportunity #4 on page 4 there is the suggestion for Vermont and New Hampshire to provide GIS layers and mapping of setbacks and buffers for towns to use. Unless Vermont mapped the town required buffers, this suggestion seems ahead of reality because Vermont has no statewide minimum setbacks and buffers yet. There is also the sentence about snapping a 250' offset from the centerline of all rivers of interest, however NH measures from the ordinary high water mark and so it seems that that should be the starting point for mapping a setback. On #5, there is the statement that “Vermont needs enabling legislation to allow this” meaning I assume setbacks from the river for structures. Vermont towns

can require setbacks and buffers for structures now, however, – the general zoning bylaw authorization for towns in Title 24, chapter 117, Section 4411 allows this.

Just a small point and final suggestion is to add to the Riparian Buffer section a few words. On page 7 under “Opportunities” I would add to the last sentence in the introductory paragraph: “They also provide biological services, protecting aquatic habitat by shading water and capturing pollutants, adding leaves and woody debris to the river ecosystem, and providing rich wildlife habitat and travel corridors.”

CRJC response – We appreciate your comments. It is our hope that Vermont will enact shoreland protection this session, which would provide a basis for GIS mapping of the features addressed by this legislation. We believe it could be done if ANR and the regional planning commissions worked more closely together. It would be possible to prioritize which reaches are mapped first. We will revisit our language on mapping of the shoreland, since each state appears headed toward a different definition of it (NH= 250 feet, proposed VT language = 500-1000 feet). The information could provide very important information for the enactment of setbacks, plus indicate where buffers are adequate, where they are inadequate, and where they could be improved. We will note the Vermont authorization for towns to establish their own protection, however, there has never been legislation that provides guidance to towns on how they should approach the issue of buffers, and until the guidance exists, we are concerned that many towns will shy away from protecting buffers since it can be too complex and difficult to enforce. We will expand our language on riparian buffers as you suggest.

Ned Swanberg, Aaron Moore, Kari Dolan, VT DEC River Management Program

Thank you for very much for the invitation to comment on the draft CRJC Water Resources plan. It was very helpful to be encouraged to read and comment – it helped us understand more about the work of the CRJC and see continuing opportunities for collaboration. It is wonderful to have an organization in the basin with such a clear mission for the river in all of its complexity.

General Comments

1. This overview is an excellent document. It lays out an important roadmap for restoring the Connecticut River basin, providing narrative descriptive components and recommendations for action by different governmental agencies.
2. The report notes lateral erosion rates along the mainstem at 5-10’/year and the need for effective erosion hazard planning. This is very much a concern carried by the VT DEC Fluvial Erosion Hazard work. Perhaps there is some potential for CRJC to work with VT DEC and NH to discuss funding options and initiate some similar work on the Connecticut River mainstem in the near future.
3. The overview notes that only “four of 53 towns” along the Connecticut in NH and VT having prohibitions on development in the floodplain. The DEC River Management Program has taken steps to update and strengthen recommendations for flood hazard regulations. It is too late for the FEMA Map Modernization process to do this in Windham and Windsor Counties, however the CRJC might be interested in some of the additional regulatory measures adopted recently in those areas.
4. The CRJC Overview points to issues relating to floodplain development vs. historical village centers. The CRJC also flags agricultural structure issues – notably greenhouse construction (picture Longwind Farms in Thetford). Certainly more intense agricultural land use is evident globally and the use of more hoop houses, greenhouses, and hydroponic facilities is very likely. VT DEC River Management Program has begun working more closely with the VT Dept of Agriculture, but more work will be needed.

Specific Comments

5. Pg 5: There are other reasons besides topography (mountainous terrain with narrow valleys) that explain why erosion hazards are "prevalent." Other reasons include: extreme climate, history of traditional channelization practices that include dredging, straightening, rock armoring, and berming the banks, and encroachment.
6. Pg 5-6: The report describes the growing farming infrastructure on floodplains. We support farmers' interests in pursuing strategies to keep the farming operations viable. Note, however, that such infrastructure should be kept out of floodways and buffers. Keeping floodways and vegetated buffers intact will minimize impacts associated with stormwater runoff from the additional impervious cover.

7. Pg 8: The opening sentence could be amended to recognize that rivers move vertically and laterally to seek a stable slope and depth in order to most efficiently move its sediment load: "While it is the nature of rivers and streams to move laterally and vertically to adjust slope to most efficiently move sediment through the landscape..."
8. Pg. 8: In the same section, we would suggesting recognizing how changes in hydrology from stormwater runoff also cause rivers to adjust: "Rivers are constantly adjusting to many changes, from dam building or breaching to changes in hydrology due to increases in stormwater runoff, deforestation, reforestation..."
9. Pg 8: We would recommend modifying the next sentence to read: "The river has been attempting to restore a natural path by seeking a stable slope and depth to handle its sediment load ever since.
10. Pg 9: We would recommend adjusting your comment that people cannot stop erosion, since people try to treat erosion - effectively stopping erosion at a specific location for some period of time: "People cannot completely stop erosion - they can only speed it up or slow it down. Often, their attempts to treat localized erosion moves the problem elsewhere downstream."
11. Pg. 9: We would recommend strengthening the options for treating erosion: "The best solution is avoidance - establishing a river corridor protection strategy that gives the stream the room it needs to re-establish healthy equilibrium conditions. Another important deterrent is allowing the banks..."
12. Pg 9-10. The report introduces fluvial erosion hazards in the last paragraph. We recommend this minor change: Vermont's River Management Program has developed a fluvial erosion hazard mapping method to better identify areas along streams that are highly prone to flood damages due to erosion.
13. Note that floods have a greatest impact in terms of cost and loss of life on transportation infrastructure; principally due to catastrophic erosion affecting roads, road drainage systems, bridges, and culverts. We recommend incorporating this point into the report.
14. Note that dams and under-size stream crossings (bridges and culverts) affect sediment transport. Consider adding information about this problem, which can explain why stream channels are incised and have lost floodplain access downstream of dams:
 - a. Dams significantly alter the size and quantity of bed sediments and how they are moved, sorted, and distributed along the stream. When the transport of sediments is interrupted in an impoundment, the channel becomes vertically unstable. The stream channel upstream of the dam aggrades as the sediment drops out. The stream bed degrades downstream of the dam with the drop in sediment load. Bed degradation downstream prevents annual flood flows from reaching floodplain, creating greater channel instability. This discontinuity of sediment transport has been observed above and below dams, diversions, and undersized culverts throughout Vermont.
 - b. Materials aggrading in the slower and deeper water behind the dam affect habitat by smothering substrates that provide cover for aquatic organisms. In watersheds with high sediment loads, the aggradation process behind a dam during storm events may lead to significant changes in flood stage, bed and bank erosion, and in some cases a rapid change of course of the stream and a catastrophic failure of the dam as experienced on the Suncook River (New Hampshire) in 2006. These erosion/deposition processes often lead to significant impacts to habitat and water quality and fluvial erosion hazards over a period of decades.

CRJC response – We greatly appreciate your detailed comments. We welcome a discussion about partnering in the future. Thank you for providing amplified language on the reasons for erosion hazards, which we will add. We share your concern about the growing incursions of farm infrastructure such as greenhouses in the floodway and buffer. We will revise our language as you suggest on pages 8-10, and agree that avoidance is the best and easiest option. We will amplify our language on transportation infrastructure, recalling recent deaths in the Cold River watershed attributable to this cause, and note the effects of dams and undersized stream crossings on sediment transport, although we prefer to avoid a technical discussion in this overview. Our appendices will direct the interested reader to your program and others so that they can get more information.

Laura Hanrahan, VT Agency of Agriculture, Farms, and Markets

(Agriculture Section) First, the AAPs don't require nutrient management plans, just soil testing and applications at agronomic rates-a farm doesn't necessarily have to have a physical plan (MFO and LFO farms are the exception b/c by law they have to have an NMP on site). Also, there are additional programs that farmers can use besides CREP. For example, the Agency has the NMP program to pay for plans, the FAP program to assist with cropping practices, and the Alternative Manure Management program which helps bring income back to the farm or at least reduce the

energy consumption from the grid by producing it with farm wastes. These are just a few of the programs available to farmers. Lastly, the LFO rules have been in place since 1995, they were revised in 2007.

CRJC response – Thank you for providing this information. We will revise our language on the AAPs and note that there are several sources of support for farmers. Our appendices will direct the interested reader to your program and others so that they can get more information.

Brian Fitzgerald, VT Agency of Natural Resources River Restoration team

(Instream Flow section) Vermont also has an agency procedure for determining minimum instream flow and standards for water withdrawals that are applied in any permitting situation, but not a registration program.

(Dams section) Recommended wording change to reflect that Vermont is pursuing a way to help developers of small hydro projects to understand the resource issues involved. Agency technical staff will go out to look at a proposed project to perform a pre-feasibility assessment to identify natural resource issues, to help the applicant know whether to proceed. On Opportunity #3, replace “at periods of low flow” with “when dams are not being operated for flood control.” Replace “re-operate these dams to restore features of former aquatic habitat” with “re-operate these dams to alter flood control operations to allow for higher peak flows to restore riparian and floodplain habitats.”

CRJC response – Thank you for these clarifications. We will revise our text.

Daryl Burtnett, NH Chapter & Bob Klein, VT Chapter, The Nature Conservancy

The Nature Conservancy would like to commend you and your commissioners for your excellent summary of water resources issues contained in your draft Connecticut River Water Resources Management Plan – Water Resources – Riverwide Overview. The topic areas covered in the plan are comprehensive and thoroughly described. Likewise, the recommendations in the plan are inclusive of the full range of federal, state and local actions which will be necessary to achieve your goals for the Connecticut River watershed. In areas where the work of the Commissions and that of the Conservancy seem to converge, we offer below the following proposed additions and comments on the draft document.

1. *Flood Storage* - The Conservancy has recently completed a GIS-based Floodplain analysis of the Connecticut River Watershed. This analysis contains four components: a digital elevation model of the historic floodplain, an analysis of current inundation patterns in an average two-year rain event, and a model predicting where floodplain forests are most likely to occur. These GIS layers could be made available to regional and local planning agencies in selecting areas where floodplain restoration would be most feasible.

Building on the above analysis, we are just beginning a research program, in collaboration with Dartmouth College and US Forest Service, examining the relationship between flow and sediment transport and how these two river processes lead to the persistence and formation of floodplain forests. While we are some years away from having data to support floodplain restoration methods, it might be worth mentioning that development of this data source is in progress.

The recent US Army Corps of Engineers (USACE) authorization might also be something to highlight here, in addition to re-visiting the natural storage document. USACE is promoting non-structural solutions to flood control, and this new authority (in addition to FEMA’s pre-mitigation planning funds) may provide an opportunity for some creative projects.

2. *Stormwater & Climate Change* - The Conservancy and many other groups have recently focused attention on the issue of culverts from an aquatic species passage standpoint. Concurrently, as you note, there is increasing concern about the design and sizing of culverts in regards to the predicted increase in flood frequency. We believe that towns have both a public safety and an ecological opportunity here. Several watersheds in the basin (West River, White River, Ashuelot River) have completed culvert assessments. These assessments can be used by states and towns to prioritize culverts for replacement by combining safety features with ecological benefits. It may also be worth noting that the NH Department of Environmental Services is in the midst of developing new and improved culvert guidelines for permitting stream crossings, in accordance with the State’s recently issued Army Corps general permit – we anticipate these will come on line within a year.

3. *Instream Flow* - The Conservancy in collaboration with the US Geological Survey and the USACE, is beginning to develop baseline flow data for the basin. Based on techniques used in the downstream states of Massachusetts and Connecticut, we will develop baseflows the two northern states that will allow planners to determine how the current hydrologic regime differs from the natural flow patterns. With this information in hand, water resource managers can make better informed decisions about future water usage.

4. *Dams* - We have some concerns about improved recreation benefits at flood control dams being a primary driver of how the issue is initially framed up. The text is limited in terms of referencing recreation benefits, however there is considerable (and appropriate) emphasis on issues of water release practices, water level fluctuations, impacts of upstream and downstream habitat, and the likely increase in new and retrofit hydropower proposals. We wonder if you are amenable to revising the "Issues" statement along the lines of: *There is room to enhance management of existing lower river dams, and a need to carefully evaluate the public benefits and river ecosystem impacts of new hydropower proposals.*

We appreciate the opportunity to comment on this document. Please feel free to contact Kim Lutz (Connecticut River Program Director) at 413-584-1016 if you have any questions.

CRJC response – Thank you for your detailed comments and for providing further insight into TNC's current activities in our watershed. We hope that TNC will make its new floodplain GIS layers available to regional and planning agencies and local governments, and look forward to learning the results of your collaborative research with Dartmouth College and the US Forest Service. We will add reference to the recent Water Resources Development Act's authorization and look forward to the possibilities that may enable. Many agencies and organizations have begun to focus on the habitat connectivity issues surrounding stream crossings, largely due to TNC leadership in this area, and we will ensure that our language emphasizes the potential for improving public safety and aquatic habitat. The lack of knowledge about base flows in the Connecticut River basin has been problematic for years, especially in the context of the requirements of NH RSA 483. We look forward to the results of this work. It was not our intent to emphasize recreation over other river uses and values, and we will revise our language to ensure that it presents a balanced perspective.

Alison Meaders, Northeastern Vermont Development Association & CRJC Commissioner

Thanks so much for giving us the opportunity to weigh in. I don't have any major comments or concerns, but I thought I'd share these items with you:

Regarding involvement with emergency planners: NVDA has two Local Emergency Planning Committees in its region -- LEPC 9 and LEPC 10. Their meetings are open to the public and upcoming meetings are likely to address new topics. They're also trying to expand the region's emergency planning efforts, so I think they would welcome the opportunity to discuss flooding concerns with Connecticut River Joint Commissioners. I would like to pass this on to the members of the LEPC for review if they haven't seen it yet, but since it's in draft form, I would like to hear from you that this is okay.

Then, just a general observation: Most of the recommendations depend on outreach and education if they are to be implemented. Fortunately, big changes may be in the works for Vermont (particularly if the pending legislation regarding buffers H.0549 is adopted), and our member communities will be needing technical assistance. We're also slated to get new flood maps over the next year or so, and we'll be working with communities to re-vamp flood regs. The recommendation from this plan to prohibit new building in the 100-year floodplain will be met in some of our towns with some resistance, and in some cases, will not be feasible. But at any rate, outreach and education will be necessary. Like all the regional planning commissions, we have limited resources to facilitate training and outreach for communities, but we can always encourage towns to avail themselves of the municipal education grants (\$800 each) to bring training to their communities. Such trainings may serve as a springboard for discussion and possibly help residents reach a consensus on a very difficult issue. We try to do whatever we can to plug the Municipal Education Grant Program, and if there is some way we can use this program to focus on the goals presented here, that would be great.

CRJC response – We would be pleased to have you share the draft with your local emergency planning committees. Thank you for your comments. We agree that education and outreach about these issues is essential, and hope to provide complementary assistance.

Bob Christie, Connecticut River Commissioner

p.18, # 3. US Army Corps. etc.... , line 5 "*It should* take advantage.... "

end of line 6, add: "*It should work in consort with NH Dept. of Environmental Services to resolve issues of dam ownership; if a dam in a tributary of the CR that is non-functional or in a state of serious disrepair or disintegration has been found to be owned by the ACE, it should be encouraged to act expeditiously with NH DES to effect removal of such a dam.....*" - or wording to that effect.

CRJC response – We will add language to this effect, noting that this is a very real situation for a few towns.

Jim Blake, Westmoreland representative to the Wantastiquet Subcommittee.

Great document and a real asset to our communities. Thanks for all of your work. Would it be appropriate to include enforcement/clarification within chapters that do identify State Statutes or other significant resources? For example, page 7 sites several State Statutes, but has no reference source for more information. This might be a DES department and phone number, and might be helpful to an individual or town agent wanting to quickly get clarification about an issue. Are there any chances of adding some photos to the report where they might be informative?

1. Page 4 - Flood Storage - talks about VT damage at the rate of 2 -3 million/hr.; is informative but does not reveal the total damage. Was that damage for 4 hours or forty?
2. Page 5 - “the land to continue to develop here than to allow new” – how about “to develop there” instead?
3. Page 7 – uses of buffers might include hiking and bird watching.
4. Page 10 – item 5 might include the Army Corps work at the Westmoreland site. Ongoing monitoring by our sub-committee might be appropriate for future work.
5. Page 26 – The culvert replacement issue might somehow remind the reader about the issue of blocking passage of aquatic animals.

I noticed that the old “recommendations” has been replaced with “opportunities” which is probably more politically correct and non-threatening, but in my mind it is not perhaps as direct. I’m wondering if others might feel the same way?

CRJC response – Thank you for taking the time to review this draft. We do plan to use photographs, maps, and other illustrations in the published plan, as well as an appendix on sources of assistance at the state level. We’ll add your suggestions about uses of buffers and clarify the language on page 4 regarding flood damages. Most subcommittee members have expressed reluctance about serving as project site monitors. We will add text on aquatic habitat connectivity. Observing that the response to these issues is sometimes a recommendation and sometimes observation of an opportunity, we will use both terms.