

## Core Team Meeting Notes

### Connecticut River Pilot Core Team Meeting in

#### Hadley, Massachusetts

**August 28, 2014, 10:00 a.m. to 2:00 p.m.**

**Attendees by Phone:** Anne Kuhn, Bill Jenkins, Bob Houston, Catherine Doyle-Capitman, Chad Rittenhouse

#### **NANCY – GENERAL UPDATES**

Welcome everyone! We have an exciting agenda today and will be able to share some results!

Thanks again to Maritza Mallek for helping to post notes from previous meetings and in getting the website better organized. Please take a look at it.

Our next core team meeting will be September 26, but definitely not at the Regional Office. May be at a local hotel or in the Great Falls Discovery Center in Turner's Falls. Stay Tuned. I will send out the venue with the announcement.

We asked at the last team meeting for you to hold October 31 for another core team meeting, and after further reflection, we are asking you to hold also Friday, November 21 and Friday, December 19. We have been making great progress as of late and what I'm hearing from the folks involved is that they see this too. You may be surprised that we're asking for more of your time, but this is a Pilot and we've had some bumps in the road. We're at a critical juncture and it's important to see this project all the way through. I really appreciate the enthusiasm and support from everyone. Initially (in February) we anticipated having results in August and September, and now we're adjusting expectations. We want to address any concerns or frustrations that might exist promptly, so please get in touch with Scott, Andrew, or myself if you need to discuss this. I haven't actually heard anything negative, but we just want you to know we're available to hear and address your concerns related to the extension of the project. We hope to spend the December meeting evaluating the process and discussing whether we should stay together as a team for implementation.

Key Decisions Document – We have copies for those in the room and it is also available on the [website](#). This is very much a draft, but we hope it will be helpful to everyone and perhaps useful if any of you have supervisors who are wondering what you've been up to. This was actually inspired by a request from Emily Preston to see a more thorough accounting of the progress and decisions made on the Pilot. Please read it over and send any feedback to Scott within the next week or so.

On September 10<sup>th</sup> Bill Labich (Highstead) is hosting a meeting with 10 Regional Conservation Partnerships. Scott and Nancy will be giving a presentation on the CT River pilot project and related

conservation design work to this group. There is another larger meeting of RCPs in November that we will present at as well. Attending meetings like this is part of our outreach efforts regarding the Pilot.

### **RANDY DETTMERS – TERRESTRIAL SUBTEAM UPDATES**

We've focused for the last month on weighting species for the upcoming phase of this project which is designing core area networks based on species. This effort will eventually complement the ecosystem-based approach. I've completed a species-weighting matrix to guide us through this process. A handout with the matrix is available in hard copy for those present, as well as on the website (see link above). The methodology presented here is to use a matrix to identify threats, responsibility, and rarity for each representative species and to use these considerations to weight each species in the conservation design. Our goal is a transparent and logical strategy for species weighting.

**Andrew Milliken:** What does it mean to give greater weight/emphasis to species that are predicted to be vulnerable to climate change? Have you discussed this?

**Randy:** Yes, we have discussed it quite a bit. . I think the overall feeling is that we still want to provide increased weight to suites of species that are vulnerable to climate change, in recognition of the fact that we want to try and maintain as much habitat as we can for as long as we can in order to allow for transitions, migration, etc. We also want to place some emphasis on areas where species and their habitats are predicted to be resilient to climate change. So we've talked about it quite a lot, and our decisions are still pending, but there is a clear interest in trying to increase weight for those vulnerable species.

**John Warner:** Some of these matrix categories are clearly related to the habitat, but some are related to specific species. Some representative species might have threats that are not faced by the species they represent. How are you sorting that out?

**Randy:** We've also discussed this point. We're trying to acknowledge where this situation occurs, and ensure that we focus not only on the representative species itself, but also the suite of species it represents. So we're trying to balance those, although at this point we don't have a fully defined way of doing that.

### **ANDREW MACLACHLAN – AQUATICS SUBTEAM UPDATES**

(Slides also available on this core team meeting agenda page, on the NALCC website).

We have noticed that decisions are being made more quickly now than earlier. If we think about what we were doing in April – it was a lot of reading, a lot of listening, and a lot of absorbing the potential for this project. But now we're really starting to make more progress, which perhaps hasn't always been clear while we're in the weeds getting to the point where we can make a decision. I also want to acknowledge that these decisions are made with difficulty. I think both teams have experienced challenges in reaching consensus and committing to using processes and models that are new to all of us. If the decisions were easy, they would be made by now. We're making hard decisions and we're doing conservation in a new way, and we're going to have something significant to offer with the

products associated with this Landscape Conservation Design. Transitioning from using only empirical evidence, to using models and complex algorithms is a hard but critical step if we want to realize the potential from this project.

I want to give an update on the current strategy for creating core areas for the aquatic systems. What we're looking at is taking the top X% (example shown is 5%) of segments as a *seed*, and then we *extend* upstream *and* downstream of the highest quality segment. This essentially becomes our core area. Next, we create an *area of influence*, which is not necessarily the same as habitat of importance. The area of influence is grown out from the aquatic core area. At the upper reaches of a stream, this looks somewhat like a HUC. Lower down, this looks more like a riparian zone. The point here is to identify the parts of the landscape that have the highest potential to impact the aquatic systems near them.

The subteam meeting this afternoon will focus on species.

#### **KEVIN MCGARIGAL – UMASS TEAM UPDATES**

I want to let you know this is the last of the remote presentations, which should facilitate our working together through the process. Today my presentation includes a review of the steps that we have gone through and then a discussion of the core area delineation and prioritization scheme. If time permits, I'll also go through the connectivity assessment for designing the core area network.

Slides 1-4 Review of process.

Slide 5 – Variables considered for creating terrestrial core areas (multiplied out, this results in 24 alternatives considered)

Slide 6-7 – Weighted vs. unweighted selection index.. “Weighting” includes two types of weightings: 1) giving different weights for IEI and TNC Terrestrial Resilience rather than equal weight (i.e., higher weight for IEI), and 2) placing higher weights on particular ecological systems and macrogroups as identified by the terrestrial/wetland team.

Slide 8 – Some macrogroups that were upweighted gained only a small percent in cores. To increase the amount in cores, we could significantly increase the weights assigned to those macrogroups or systems.

Slide 9 – Shows difference between scaling the integrated ecosystem index to generate core areas across full watershed vs. by HUC8s (subwatersheds). Key difference is that when scaling by the watershed, fewer core areas are located in the more developed, southern regions of the watershed, while more core areas are included in the northern extent of the watershed. When scaling by HUC8s, the more southerly core areas are included, and some northern areas drop out.

Slide 10 – We also created a hybrid approach that is intermediate between scaling by the full Connecticut River watershed and scaling by HUC-8's. It is created by taking the average of the CTR-scaled and HUC8-scaled results.

Slides 11-12 – Our original plan was to use the state-identified rare natural communities to act as “seeds” to generate core areas along with other high value ecological areas. However, we discovered that including rare communities in the index results in more smaller cores, because many of the rare communities are isolated or disjunct. So we generated an alternative where rare communities did not automatically act as seeds for core areas.

**Scott:** Can you describe again the difference between including the rare communities within cores vs. adding them later?

**Kevin:** We realized that the rare communities were often small, isolated, and disjunct. Many of them are surrounded by development. So there is poor landscape context for many of them, which leads to small and fragmented core areas. That may not be what we want as far as creating a connected core area network design and the watershed scale. So the alternative presented is a core area network without rare communities, which would form the basis of the connectivity network. Then at the end we would add in the rare communities, and they could be labeled core areas or high priority areas or something else. But the decision to be made is whether to include them in core areas and thus in the connectivity analysis, or not. The information on Slide 12 does not include the outcome if you do the rare community overlay I just described. In actuality a large number of rare communities, maybe half, do end up in core areas even when they aren’t forced to be there, but those in poorer landscape context are omitted.

Slide 13-14 – Compares alternatives of the total percentage of the landscape incorporated into core areas being either 20%, 25%, or 30%. (Results are for core areas based on the weighted index *without* rare communities and using the hybrid scaling.)

Slide 15 – “More Smaller”: Used a 10% slice of selection index as seeds. Then grow cores until 25% of the landscape is in cores. “Fewer larger”: Used a 5% slice of selection index as seeds. Then grow cores until 25% of landscape is in cores. Main difference is in the number of cores, and in the observed minimum size.

Slide 16 – Notice that the wetland types have increased representation under the more/smaller cores. When we use the fewer/larger strategy, we pick up more of the matrix forest types that are very common.

Slide 17 – Summary of decisions to make around terrestrial core areas. UMass suggested choices are underlined.

Slide 18 – One example of a core area network, based on underlined choices from Slide 17.

Slide 19 – Looking at how many of core areas have some level of permanent protection from development.

**Ken Elowe:** Slide 17 – the last decision. Are you inferring that this is what we want, or are these your decisions?

**Kevin:** The choices we made about how to make a fewer/larger were largely made on our part. We also chose the minimum core size because we did not receive a specific minimum size value from the team. We could make the core areas larger by making the slice the top 2% or by making the minimum size larger. As a result, you will get more matrix and less rare stuff.

**Ken:** I'm trying to relate these choices back to our initial goal of providing a method for local organizations to make choices, and ensuring they have some context to make choices. It looks like with the continuum of values they do have that context.

**Kevin:** I want to emphasize that regardless of how we create the core area network, we're always going to have this continuous gradient version or the tiered version that shows the ecological value outside of the core areas.

**Patrick Comins:** This is going to be tough to ground-truth or cross-reference. Will these maps be available in GIS for us to cross-reference? And I actually need KML files, ideally, since I use Google Earth.

**Kevin:** Yes, we've been trying to make these packages available to the team. Creating a map package did not work so we're going to explore alternatives. I don't know yet about Google Earth; that's something we'd have to look into.

**Patrick:** I'm thinking about forest birds specifically, and I'm concerned that the core areas are too small.

**Kevin:** Most of these are thousands of acres. Near the mouth some cores are 10,000 acres. You're right; for individual species a high value set of habitat could look different. This may be an outcome of the species-based approach.

**Mitch Hartley:** Back to fewer/larger and more/smaller. You talked about minimum sizes. In this slide, the minimum size is 130 acres, but the specified minimum size was much smaller (9 acres).

**Kevin:** We started with the top 5% slice and used those as seeds. Those could vary in size from one cell upwards. So after taking the slice, we dropped as potential seeds any contiguous cells that were not at least 40 cells or 9 acres. After that, we grew core areas from the seeds until we had captured 25% of the landscape. The result of that is a minimum core size of 130 acres. So if we made the minimum 80 cells, we'll have many fewer cores and they'll all be larger, but we'll still cover 25% of the landscape.

**Ken:** I want to briefly go back to Patrick's question and emphasize that the point you made is important. When we do the species part, which is currently happening, I think many concerns about forest cores not being large enough will be allayed and questions answered.

**Jeff Horan:** I'd like to go back to the decision points slide. I also want to say that this presentation is really helpful for decision-making. Here are my thoughts. The weighted makes sense, but the hybrid-scaled stuff – I'm willing to torture the data till we get what we want, but I'm not sure what we're trying to achieve with the hybrid scale. I personally prefer the HUC8. The other thing that worries me is the rare communities' piece. I suspect we're going to have to apply expert knowledge to that. My last comment is that once we add the species and connectivity components, I'm thinking this will change a

lot of this. I want to know what you're thinking about displaying this. Are you thinking of a continuous surface or by some kind of quartiles or quintiles?

**Kevin:** I hope everyone goes through the thought process you just showed. I hope we can reach consensus on each of these decisions. As far as display of areas outside of the cores, that is for the group to decide but we could show the results in either percentiles or as a continuous surface. A continuous surface would better capture all of the information available in the data but either approach could be chosen.

**BJ Richardson:** I just wanted to follow up on Mitch's question – can you provide more detail on how you created the cores from seeds?

**Kevin:** We used a resistant kernel approach where you start with a seed (an area of highest ecological value) and then spread to adjacent areas. The kernel spreads farther through areas with higher values in the selection index so that core values are most likely to be made of high value "stuff."

**Bill Labich:** Why would you not include linkages between the rare communities, even if they're not in ideal locations?

**Kevin:** Are you asking if we build the network without the rare communities?

**Bill:** I wonder if the 5<sup>th</sup> bullet on your slide, if you go without rare communities, you are already deciding to go with fewer/larger.

**Kevin:** No, the more/smaller will slice it at the top 10%, so we're picking up more places of high value that aren't necessarily rare communities, but they are highest quality habitat.

Slide 20 – Aquatic Core areas

Slide 21 – After looking at TNC Resiliency and influence on results, we decided it wasn't very useful in making decisions about aquatic areas only because the Resiliency layer is based on landform variability, which isn't as applicable to lentic/lotic environments. I'm thinking strongly that we're going to take this out, but the results presented today include Resiliency. The big impact of this is that it dramatically changes the percent representation across the watershed. So there are several reason to pull this out, and I caution you to take our results today with a grain of salt. The weighted vs. un-weighted selection indices differ in that the weighted version includes a lower weight assigned to stream temperature (which is itself only located in headwater creeks) vs. IEI.

Slide 22 – Comparison of switching to a coarse-scale selection – simply selecting HUCs – to the algorithmic, model-based approach (shown at right).

Slide 23 – large rivers have much better representation when you use the seeds. The main stem is not captured, really, by the approach selecting the "best" HUC 12s. This is an artifact of how HUCs work. HUCs are also biased toward the cold and cool, whereas the seed-based approach is more evenly

distributed. All these numbers will change if we scale using the hybrid approach and take out the TNC Resiliency layer.

Slide 24-25 – If HUC-based approach is chosen, a choice exists among which subwatershed size to select (e.g. HUC 8, 10, 12)

Slide 26 – Shows influence of nested hierarchy (choosing the best HUC 8 from the best HUC 10, etc.).

Slide 27 – This illustrates what Andrew showed at the start of the meeting, starting with seeds and then extending them up and downstream.

Slide 28 – tabular results showing the differences between using seeds only and extending the seeds, which results in longer, more contiguous core areas.

Slide 29-30 – Do we drop small seeds? Doing so is analogous to dropping terrestrial seeds below a minimum size.

Slide 31-32 – Comparison of different seed selections

Slide 33 – Decisions to be made. The underlined choices are our selections.

**Bill:** How are the people in this room and others going to implement restoration, management and conservation? At what scale will that implementation occur? Are the people in this room thinking about core area sizes for these minima? Yes, you can serve 30 m of stream. Are we using implementation to help guide how we prioritize the landscape?

**Kevin:** That's a great point. I'm not sure how much it's a question for me. You're absolutely right. The minimum size for a core area should be practically relevant. What I have heard is that in practice, conservation of aquatic resources tends to take place at coarse (i.e. HUC) scales. But my reaction to that is to point out that there is a lot of variation in riverine habitat quality below the HUC level. And that the immediate landscape context for stream reaches has a big impact on the quality of that stream.

**John Warner:** Kevin has just reviewed all the issues that the aquatic team has tackled. All of it was based on the question Bill raised – what scale matters to us? And we've been struggling, and it's hard – or we would have had an answer by now.

**Bill:** I'm working under a Forest Service grant right now and we're trying to identify watersheds in which we want to reach out to landowners about land management and restoration. In that context, a 30-m core or small area is going to be important to us, particularly if they tie into drinking water reservoirs. So there is definitely a use for a fine-scale approach.

**Kevin:** That's really great and useful for me to know – that there is a value to a higher resolution assessment that can inform decision-making. I want to point out that even though the assessment is at the 30 m scale, no cores will be 30m. Right now the minimum (by default, can be changed) seed size is a 150 m stream length. That's the minimum seed, so with extensions most cores will be even longer. The only time they wouldn't be is for if, for some reason, there was a lake on either side and it couldn't

extend upstream or downstream. Or, if there were a barrier like a dam. So, I don't see any cores being at the 30 m scale – more like the 500 -1000 m scale. Just so you know.

**Jeff:** Thank you for highlighting the implications of our decisions. I have a question about context. How do you see this component fitting into the entire conservation design? Will the aquatic cores be one component of the final core selection index? Say we chose 20% of the extended seeds – how much overlap would the aquatic seeds have with the terrestrial cores.

**Kevin:** That's a good question, and one that I can't answer. The group needs to decide how to combine the aquatic cores and "buffers" with the terrestrial cores and buffers. Clearly the two products could exist side-by-side. There will be overlap between terrestrial and aquatic cores. We could also combine them somehow. We don't have an answer for that and it's a question for the group how the two methods will be combined and presented.

**Jeff:** I would like to see them separately, but as I've said in the past, we also really want to know where we have overlap – the bang for your buck aspect. And, it seems like connectivity among all of them is important to capture.

**Kevin:** The "area of influence" includes a lot of low quality habitat and developed areas, and is conceptually distinct from the buffers around cores. So combining them might not be very useful.

**Bill Jenkins:** We're going to have to tailor the information in these products to meet certain programmatic requirements. When you're working with people to do stream restoration, you have to be able to tease out the information about streams.

**Nancy:** Thanks for everyone's participation and the discussion. We are now going to break into our subgroups. As a closing note I'd like to give Andy Fiske a chance to mention an upcoming activity for the Watershed.

**Andy Fiske:** Source to Sea cleanup is September 26-27. If you're interested, grab a poster, go to the website, and sign up. Thanks.