

September 18, 2014

## The Questions to Be Considered by the Terrestrial-Wetland Team

After several discussions, we are getting closer to finalizing several decisions related to the ecosystem design. Here are outstanding questions and some comments about where we stand:

### **1) How much of the total landscape should be in core areas?**

Reference points: Scenario 3 (25%) vs. Scenario 6 (20%) or Scenario 7 (30%)

Comments: core areas do not encompass the totality of the landscape that we think is necessary to achieve our conservation vision, rather they represent what we think are the highest priorities or the most important places to start. If too much of the landscape is represented, then we aren't being strategic, but if too little we will omit unique and important areas. Are any of these options about right? Are they too much? (Recall areas outside the core areas will be reflected in a tiering or continuous valuation as well.)

### **2) Are we confirmed on using a weighted approach for ecosystems of high concern or value?**

Reference points: Scenario 3 (weighted) vs. Scenario 8 (unweighted)

Comments: we agreed upon a weighting system for ecosystems but wanted to see how the results played out before making a final decision. The results indicate that the weighted approach did lead to a higher proportion of certain ecosystem types, like Alpine, being represented in the final design. Note that the results were somewhat diluted because the cores also represent a weighting between IEI and TNC terrestrial resilience. There still are some systems that appear to be underrepresented, like pine barrens, that we may want to pursue further.

### **3) Fewer, larger core areas vs. more, smaller ones**

Reference points: Scenario 3 (fewer, larger) vs. Scenario 4 (more, smaller)

Comments: these two options represent trade-offs between larger, more cohesive units and smaller, more distributed ones. Overall the representation of ecosystem types is reasonably similar. For the ecosystem types that are very limited in distribution within the watershed, the more-smaller option tends to capture a higher proportion of their occurrence (e.g., various marsh and shrub-swamp types), but there are exceptions (e.g., alpine). Take a look at the map and consider the number of units (approx.. 600 vs. 1,900) – in addition to ecological considerations, does one have an advantage over the other in terms of practicality and implementation? (We are not bound by either of these variations, they serve as examples.) A subsidiary question is also what we think about a minimum core area size (currently 4.5-9 acres, in practice larger).

#### **4) Incorporate Rare Natural Communities and Floodplains Prior to Designating Core Areas, or Later in the Design?**

Reference points: Scenario 3 (without incorporating rare communities) vs. Scenario 5 (with)

Note: composition figures do not reflect the fact that even for scenarios that do not incorporate rare communities (all scenarios except 5), representation in the final design will increase because rare communities will be added back in. Rare natural communities and floodplains are a separate layer within the on-line map that you can turn on to see the patterns of how they are represented in different scenarios.

Comments: results indicate that, all else being equal, requiring all rare natural communities to serve as “seeds” for core area definition results in about 40% more core areas, which on average are correspondingly smaller. So there are substantial trade-offs between larger, more intact blocks vs. somewhat smaller and in some cases more isolated ones. The implications of omitting rare natural communities are two-fold: the subsequent connectivity analysis will not encompass them, and “buffers” will not be created around them in the core-building process. (Note that many rare natural communities actually end up being part of core areas – those that are already in favorable landscape conditions. The previous statement only applies to those that do not, which are likely to be smallest and most isolated.) But the flip side is that the ecological integrity and resiliency analyses are highlighting areas anticipated to be intact and viable now and into the future, and “overriding” those analyses to add rare communities may result in a loss of representation of high integrity and connectivity among the core area network.

#### **5) Whether and How to Stratify the Distribution of Core Areas?**

Reference points: HUC 8 scaling (Scenario 1) vs. full watershed (Scenario 2) vs. a hybrid of the two (Scenario 3).

Note: as of Sept. 18, Scenarios 1 and 2 can be compared to each other, but only with caution to the other scenarios (all hybrid approaches). Scenarios 1 & 2 are being re-run in a way that will result in fewer, larger core areas comparable to the size and number of core areas for Scenario 3.

Comments: Comparing the maps, at a gross scale there are a lot of similarities between the HUC8 vs. watershed scaling, and they are quite comparable for southern Vermont, southern NH, and the western part of the Mass. part of the watershed. The biggest differences are in the northern end of the watershed (more representation by the full watershed scaling) and in eastern Mass. and the southern CT part of the watershed (much greater representation by the HUC8 scaling). Does the full watershed scaling achieve adequate distribution of core areas or should stratification be employed? Regarding ecosystem composition, the HUC8 vs. full watershed scaling have complicated differences that do not follow a simple pattern. Reflecting the fact there tend to be more and larger core areas in the northern part of the watershed when no stratification is used (full watershed), it appears to be that some of the more northerly types like bogs are better represented with full watershed scaling, and more southerly are better represented with the HUC8 scaling.

**Terrestrial Ecosystem Core Areas for Review by the Terrestrial / Wetlands Subteam  
September 2014 Draft**

| Name              | Core area number and size | Weighting of IEI  | Rare communities | Amount of landscape in core areas | Scaling                        |
|-------------------|---------------------------|-------------------|------------------|-----------------------------------|--------------------------------|
| <b>Scenario 1</b> | Fewer / larger            | Weighted          | Without          | 25%                               | <b>HUC8</b>                    |
| <b>Scenario 2</b> | Fewer / larger            | Weighted          | Without          | 25%                               | <b>Full Conn. R. Watershed</b> |
| <b>Scenario 3</b> | Fewer / larger            | Weighted          | Without          | 25%                               | Hybrid                         |
| <b>Scenario 4</b> | <b>More / smaller</b>     | Weighted          | Without          | 25%                               | Hybrid                         |
| <b>Scenario 5</b> | Fewer / larger            | Weighted          | <b>With</b>      | 25%                               | Hybrid                         |
| <b>Scenario 6</b> | Fewer / larger            | Weighted          | Without          | <b>20%</b>                        | Hybrid                         |
| <b>Scenario 7</b> | Fewer / larger            | Weighted          | Without          | <b>30%</b>                        | Hybrid                         |
| <b>Scenario 8</b> | Fewer / larger            | <b>Unweighted</b> | Without          | 25%                               | Hybrid                         |

Description of Columns:

2. Core area number and size: two variations have been prepared. The “fewer / larger” core area approach starts with the top 5% of the landscape (as scored by UMass IEI and TNC terrestrial resiliency) and then “grows out” these core areas until the amount of the landscape in column 5 (e.g., 25%) is reached. The “more / smaller” core area approach is similar but uses the top 10% of the landscape to grow out into cores. (Minimum size cutoff = 9 acres for the fewer/larger and 4.5 acres for the more/smaller approaches.)

3. Weighting of IEI: two variations. The weighted version reflects higher priority for particular ecosystem types (e.g., floodplain forests) expressed by the team; it also places higher weight on IEI vs. TNC resiliency. The unweighted version places equal weight on ecosystem macrogroups (within IEI) as well as equal weights for IEI and TNC resiliency.

4. Rare communities: two variations. In one option “With,” all rare natural communities automatically are “seeds” for core areas. In the “Without” option, rare natural communities are not automatic seeds for core areas, although frequently they do occur in core areas. Note: in the “Without” option, rare natural communities will be incorporated into the design as high priorities with equivalent status to core areas *after* the connectivity analysis is used to illustrate priority linkages among core areas.

5. Amount of landscape in core areas: three variations. Core areas are grown until they encompass either 20%, 25%, or 30% of the landscape.

6. Scaling: three variations. For “HUC8” scaling, best core areas are identified within each of the 14 HUC8 subwatersheds separately. For “Full Conn. R. Watershed,” best core areas are selected across the watershed without regard to which subwatershed they occur in. The “Hybrid” approach represents a combination of these two approaches.