**Trails Assessment Map Analysis**

**Analysis**

**The trails**

**Figure 1** Shows the initial Easement and master plan trails objectives, noting goals (left) and the location of certain sensitive areas identified at the time (right).

**Figure 2** maps out the trails under consideration. The left Panel shows the original Concept Map (gray) proposed by the Interim Steering Committee and as depicted in the first edition of the Management Plan.

The Panel on the right shows the initial revised trails proposal from the ACFC. A noteworthy revision is deletion of the westernmost trail in the Northeast sector (red: Ridge Top), the one closest to the long riparian buffer zone in the middle of the property determined to be a wildlife corridor (See **Figure 14** below).

Noteworthy differences between the initial and current trails plan for the purpose of my analysis included removal of the long-loop trail on the west side of the property and the inclusion of two additional trails in the Northeast sector above the Power line. One of those three trails, the furthermost east, roughly parallels that originally proposed on the Concept Map.

**Figure 3** shows an overlay of the Concept Map trails and the original trails revision. Again, the trail pointed out by the arrow has been removed with the current trail proposal.

**Figure 4** shows proposed trails (left) together with the full slate of proposed trails with current names (right). Note the deleted trail in the right panel (Ridge Top) has been removed.

**Ecological Assessment**

As perhaps best exemplified by the March 15 RCC Panel discussion, it is important in deciding where trails should be placed to assess the property at a large, middle and small or fine scale. Important in those cases is to assess ecological / wildlife impact.

Large Scale

A group of large-scale maps was assembled based on the aforementioned factors identified by the RCC Panel. A large-scale analysis with maps such as below was not really developed in the Management Plan.

As noted by RCC Panel members and elsewhere, such as the Arrowwood STA study and in the Management Plan, Richmond, possess a tier of highly-sensitive area that provide an important North-South corridor on this East side of the Champlain Valley. The large scale maps below show the location of the Andrews Community Forest within this largest context.

Data from ANR have identified different levels of habitat sensitivity, as shown in **Figure 5**. A similar profile is revealed when wildlife habitat ranking is mapped (**Figure 6** – note the Andrews Community Forest lies squarely in the middle); Highest Priority Interior Forest Blocks (**Figure-7**) and Connectivity (**Figure-8**).

This large-sale view raises questions regarding the number of trails to recommend for the Andrews Community Forest.

Intermediate Scale

Moving to an intermediate scale and focusing on the ACF, the recent Field Naturalist Study used what are called Heat Maps to assess different rating levels for sensitive features. Perhaps the most important of these was the Heat Map that assesses Habitat Sensitivity (**Figure 9**). This compiles a number of variables to show where recreational trail creation will have the most and least impact on wildlife in the Andrews Community Forest. The strategy is based on the New Hampshire Department of Fish and Game report titled “Trails for People and Wildlife”. This intermediate-level scale assessment illustrates that the western-most trail in the Northeast sector, Hemlock Valley, crosses an area possessing highest wildlife sensitivity. The eastern-most trail, East Climb, touches on the most sensitive area. The Sip of Sunshine Connector is in an area of lowest sensitivity.

As a companion to the Heat map approach, reported in the Field Naturalist study was what is defined as Zone Of Influence (ZOI) The ZOI assesses the extent of wildlife disturbance caused by trail systems in a given area. The result of their study for the proposed trail system is shown in **Figure-10**. The influence is extensive, showing, for example, that the ZOI of trials in the northeast segment (excluding Sip of Sunshine Connector) cover the areas of highest sensitivity. This presents a certain dilemma in that trails are called for in the Easement and Management Plans. The issue is what limitations should be put on trails in that area.

Fine Scale

Fine scale assessment involves identifying areas of importance for protection. This includes areas such as the following:

* Wildlife corridors
* Hemlock-Pine Forest
* Dry Oak Forest
* Mast stands
* Vernal pools
* Wetlands
* Streams
* Uncommon Natural Communities
* Deer wintering
* Upper altitude

Arrowwood in its study compiled all of these sensitive areas into a master layer labeled Ecological Sensitivity. **Figure 11** on the left shows the compiled sensitive areas in green on the left. The panel on the right shows the trails surrounded by a ZOI of 200 feet, as called for in the original Management Plan. **Figure 12** reverses the overlays on the right. **Figure 13** changes the transparency of the two layers so that one can more easily see the overlaps.

**Figures 14-26** present the layers for identified sensitive features. I note:

* The central wildlife corridor is crossed once and reached tangentially once even without the 200-foot ZOI advised in the original Master Plan (called buffer in the initial Master Plan).
* A Hemlock-Pine area heavily overlaps the Hemlock Valley Trail even without a 200-foot ZOI, shown in these slides of 200 feet, as recommended in the original MP.
* The even more sensitive Dry Oak areas are in close proximity to trails, 50- and 100- foot ZOI overlapping. As described in the Naughton State Report and indicated in **Figure 17** taken from the Field Naturalist Study, Dry Oak areas are highly sensitive for a number of reasons.
* Vernal pools are removed from trails even including a 200-foot buffer.
* Several identified wetlands overlap with trails, in close proximity even without a 200-foot ZOI.
* Mast stands impinge on trails in a number of areas.
* Perennial streams are largely separated from trails even with the 50-foot buffer often recommended by the State. Trails impinge on intermittent streams in a number of areas, some involving parallel locations, such as along Hemlock Valley.
* Uncommon Natural Communities are featured through much of the ACF, heavily overlapping trails. This may or may not present an issue depending on exact locations.
* Deer wintering areas are impaired by the Hemlock Valley trail.
* The upper trails are above the 900-foot contour.

**Figure 27** shows all sensitive layers combined with no ZOI.

**Figures 28-31** build in ZOIs at 50, 100, 150 and 200 foot ZOIs respectively over the composite of sensitive areas. **Figure 32** shows the ZOIs layered on top of one another.

**Figures 33 and 34** simplify by coloring all the sensitive areas the same (ecologically sensitive zones: green) the latter changing the transparency level to see the overlap more easily. **Figure 35** shows the 50, 100, 150 and 200 foot ZOIs as a package accounting for the totality of ecologically sensitive areas. There are a several areas where there is overlap. The main issue in the 200-foot ZOI circumstance is Hemlock Valley. Such overlaps require careful decision-making with regard to how many trails there are and where.

It has been stated in the Management Plan that a 200-foot buffer – actually should be described as a ZOI – is aspirational in terms of feasibility for (any) trails though is “best practice”. A 200-foot buffer may be aspirational in terms of being able to build a trails system. However, it is not aspirational from an ecological point of view based on literature such as the Naughton State Report, the Field Naturalist study of the Forest and the New Hampshire studies. Nor is a 200-foot buffer “best practices” for certain ecologically sensitive features. The New England based literature review by New Hampshire Fish & Wildlife concludes the ZOI should be some 400 feet either side of a trail, shown in **Figure 36**.

**Final Note**

An important next step is to determine what would be adequate ecologically protective buffers around the several sensitive features within the Forest.

Wherever a trail might be located, there is the essential need to monitor the effects of trail use. Though the need and plan to develop a Monitoring plan is described in the MP, a monitoring plan rather should be completed within the approved MP, using guidance such as described in the Naughton State Report.