

Old Forest

Definition

Old forests are biologically mature forests, often having escaped stand-replacing disturbance for more than 100 years and exhibiting minimal evidence of human-caused disturbance as well as continuity of process, senescence of trees, and regeneration response. In addition, these forests may exhibit many of the following associated characteristics: 1) some trees exceeding 150 years in age for most forest types (100 years for balsam fir, 200 years for eastern hemlock); 2) native tree species characteristic of the forest type present in multiple ages; and 3) complex stand structures that include a broad distribution of tree diameters, multiple vertical vegetative layers, natural canopy gaps, abundant coarse woody material (reflecting the diameters of the standing trees) in all stages of decay and numerous large standing dead trees. It is expected that old forests operate under natural disturbance regimes and may include small areas of regenerating forest as a result of these disturbances.

Ecological Function

Historically, the vast majority of Vermont's landscape was old forest, and it is the original habitat condition for many species. The state's native flora and fauna that have been here prior to European settlement are adapted to this landscape of old, structurally complex forest punctuated by natural disturbance gaps and occasional natural openings such as wetlands or rock outcrops. The complex physical structure of old forests creates diverse habitats, many of which are absent or much less abundant in younger forests.

As a result of the persistent structural and vegetative complexity above ground and the diverse biome belowground and associated complex biotic and abiotic relationships that develop over time, old forests also protect water quality, and sequester and store carbon, provide opportunities for adaptation of species and community relationships to climate and other environmental changes, and an ecological benchmark against which to measure active management of Vermont's forests.

Priority Target for an Ecologically Functional Landscape

Within the matrix forest in the highest priority forest blocks in each biophysical region, 15% should be managed as, or for, an old forest condition. 4,000-acre minimum patch sizes are preferred as they are most likely to accommodate large-scale natural disturbance events. Smaller minimum patch sizes are offered for biophysical regions that are more fragmented and where only smaller forest blocks remain. Total Acres/minimum preferred patch sizes as follows:

- Champlain Hills - 13,000/1,000
- Champlain Valley - 15,000/500
- Northeastern Highlands - 59,000/4,000
- Northern Green Mountains - 95,000/4,000
- Northern Vermont Piedmont - 78,000/1,000
- Southern Green Mountains - 91,000/4,000

- Southern Vermont Piedmont - 31,000/1,000
- Taconic Mountains - 33,000/1,000
- Vermont Valley - 4,000/500

Matrix forest communities should be represented as old forest according to their natural distribution in each biophysical region. Patches of old forest that are smaller than the minimum preferred patch size also provide important ecological functions and contribute to the numerical goals for each biophysical region, but with the acknowledgement that these small patches are more susceptible to stand-replacing natural disturbance events and likely do not provide all the functions of larger, connected patches.

Highest Priority:

All of the above targets for old forest are highest priority.

Guidelines for Maintaining Ecological Function

Old forests should operate under natural disturbance regimes, and need to be maintained in patches large enough to accommodate natural disturbance regimes without compromising old forest characteristics dominating the patch. Species composition and structures should be appropriate to the natural community type. The forest and natural community condition should not be significantly impacted by non-native plant species. Management may be needed to control invasive species or remediate human impacts, but management should not interfere with normal natural process or alter native species composition.

Restoration Needs

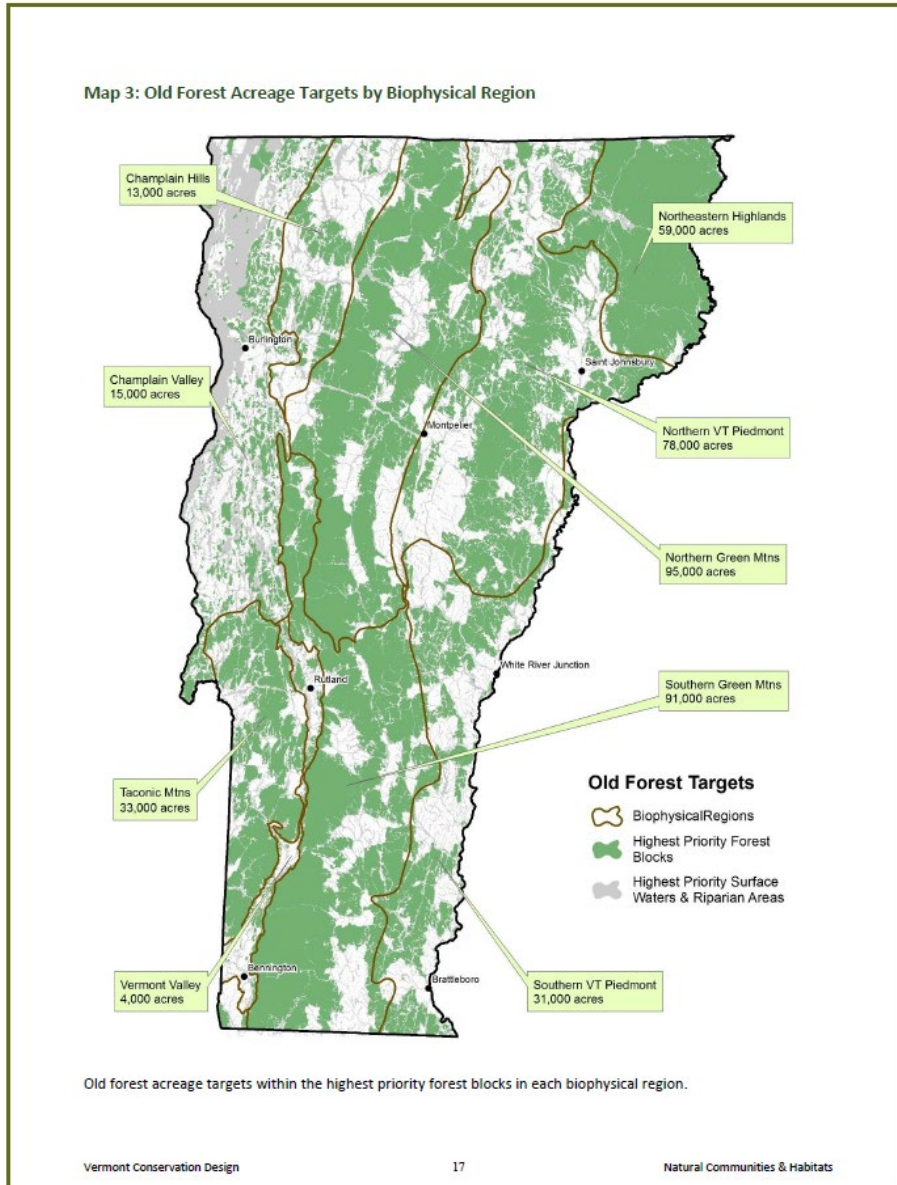
Although there are small patches of old forest scattered around the state, old forest is absent in Vermont as a functional component of the landscape. In most forests, passive restoration will result in old forest conditions. In some cases, active forest management may be beneficial to promote forest composition and structure suitable for subsequent passive restoration.

Methods and Rationale

The native species of Vermont evolved in a landscape dominated by old forest. Many of these species are well-adapted to the complex and diverse structure that develops in large areas of old forest. The closer the target is to the historic old forest condition, the greater the likelihood that the landscape will support all of Vermont's native forest species and fully provide the forest's ecological services. There are no known thresholds between the current forest condition (essentially no old forest) and the historic condition. We used professional judgement and consideration of natural disturbance regimes and the various ecological functions provided by old forest (Appendix C) to arrive at a target level we felt confident would reintroduce functioning old forest to the Vermont landscape. Minimum preferred patch sizes were established based on expected disturbance regimes (Lorimer and White 2003). These preferred patch sizes were adjusted down in biophysical regions where contiguous forest was limited by fragmentation and non-forest area.

Mapping Comments

Old forest targets are not mapped due to a lack of spatial information at this time.



For more information

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