Appendix I – Research Natural Areas

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Appendix I – Research Natural Areas

Introduction and Summary

According to the Forest Service Manual (FSM 4063), research natural areas (RNAs), “…are parts of a national network of ecological areas designated in perpetuity for research and education and/or to maintain biological diversity on National Forest System lands.” Research natural areas are for non-manipulative research, observation, and study. They also may assist in implementing provisions of special acts, such as the Endangered Species Act and the monitoring provisions of the National Forest Management Act”.

The objectives of establishing research natural areas are to (FSM 4063.2):

1. Preserve a wide spectrum of pristine representative areas that typify important forest, shrubland, grassland, alpine, aquatic, geological, and similar natural situations that have special or unique characteristics of scientific interest and importance that, in combination, form a national network of ecological areas for research, education, and maintenance of biological diversity.
2. Preserve and maintain genetic diversity.
3. Protect against serious environmental disruptions.
4. Serve as reference areas for the study of succession.
5. Provide onsite and extension educational activities.
6. Serve as baseline areas for measuring long-term ecological changes.
7. Serve as control areas for comparing results from manipulative research.
8. Monitor effects of resource management techniques and practices.

The Eastern Region’s focus is on representation of vegetation at the alliance level within subsections. A draft regional RNA assessment was completed in 2000 to gather information on the current level of representation of ecological systems in the RNA network, and to guide selection of new RNAs (Faber-Langendoen et al 2000). About 17% of the Ottawa alliance-subsection combinations are represented. Designation of a RNA requires completion of an establishment record and approvals by the Regional Forester and Station Director. Environmental effects analysis under NEPA is also required, and can be completed as part of Forest Plan revision or through Forest Plan amendment.

There is one established RNA on the Ottawa located within the McCormick Wilderness (3,675 acres). In the 1986 Forest Plan, there were two candidate RNAs (cRNAs) identified; one located within the Sylvania Wilderness (2,740 acres) and one within the Sturgeon River Gorge Wilderness (210 acres).

As part of the Forest Plan revision process, the Ottawa proposed to evaluate the two candidate RNAs for their vegetation alliance-subsection representation. If the candidates include alliance-subsection combinations that are already represented in an established RNA or RNA-equivalent
(e.g., areas with similar protection), then there may not be a need to establish the candidate sites. If the candidates do not duplicate other sites, then these two candidates (and no others) could be carried forward in the Forest Plan revision process. The representation analysis is outlined below.

**Candidate Research Natural Area Representation Analysis**

In April 2000, a draft report was prepared by Don Faber-Langendoen, Kristin Snow, and Lucy Tyrrell assessing Eastern Region RNAs and RNA-equivalents for representation of vegetation alliances by ecological subsection (Faber-Langendoen et al 2000). This document includes tables showing plant communities that are represented in established preserves, and community types that are lacking representation. These lists can be used to determine need for additional research set-asides. As part of Forest Plan revision, the Ottawa reviewed the two cRNAs to see which cells in the tables could be filled if the Sturgeon River Gorge or Sylvania candidate sites were to be established. The possible representation of types was then compared to types that are already represented in another preserve.

**Sturgeon River Gorge cRNA**

The 1986 Forest Plan FEIS included a discussion of a cRNA proposed within the Sturgeon River Gorge Wilderness. Appendix E of the 1986 Forest Plan FEIS included a draft establishment record for an area of about 120 acres (USDA Forest Service 1986). The appendix also notes the potential to expand this candidate area to about 210 acres, to add geologic features not included in the smaller tract. Text in the appendix shows the intent to collect data on this additional area and eventually establish the expanded RNA (USDA Forest Service 1986). In the RNA program files, there is a revised draft establishment record for the candidate RNA (Metzger 1993). In this report, a larger candidate area (281 acres) is delineated and timber types are mapped. Based on the intent of the 1986 Forest Plan to expand the area, and the detailed map prepared for the draft establishment record (which appears to have been close to final approval, based on notes in the files), the 1993 paper map is used in this representation analysis. When this boundary was added to the Ottawa GIS, the resulting more accurate acreage estimate is 314 acres.

The Sturgeon River Gorge cRNA falls entirely within an ecological subsection which was called “212Jn” in the 2000 Report (Faber-Langendoen et al. 2000), but which is now called “212Sn” in revised terrestrial ecological unit mapping. See Appendix D of the 2006 Forest Plan for more information on ecological unit mapping. The cRNA representation is compared to the “212Jn” column in the report tables on pages 362-364 in the 2000 Report (Faber-Langendoen et al. 2000). The draft establishment record included a map of forest cover types for the cRNA. These were compared to the vegetation alliances. All were considered low quality occurrences, based on their (small) size, composition and context (Faber-Langendoen et al. 2000), except the northern white cedar forest alliance. Based on the map, the following alliances are represented in the Sturgeon River Gorge cRNA for the subsection Keweenaw Moraines and Plains1 (212Jn/Sn):

- Eastern hemlock-yellow birch forest alliance
- Eastern hemlock forest alliance
- Eastern white pine-eastern hemlock forest alliance
- Red pine forest alliance
• White pine forest alliance
• White spruce-balsam fir-aspen forest alliance
• Sugar maple-yellow birch-(American beech) forest alliance
• Quaking aspen-paper birch forest alliance
• Northern white cedar forest alliance
• Black ash-red maple saturated forest alliance

The 2000 Report notes that not all possible RNA-equivalents have been fully evaluated, resulting in less apparent representation than may be the actual case. However, all of the above types are known to occur in the 212Jn subsection and on National Forest System (NFS) lands (Faber-Langendoen et al. 2000).

Of the above list, there is known representation in an RNA-equivalent of the following types:

• Sugar maple-yellow birch-(American beech) forest alliance (low quality)
• Quaking aspen-paper birch forest alliance (medium-high quality)
• Northern white cedar forest alliance (low quality)

The other types do not apparently have representation in an RNA or RNA-equivalent. The cRNA boundary could be modified to drop some of the aspen which is already represented, but the sugar maple and cedar types are more central in the cRNA and would be hard to drop from the cRNA.

In addition to the vegetation representation, Sturgeon River Gorge cRNA includes several geologic features that are uncommon in the Forest Service’s RNA system: oxbow lake, abandoned oxbow basin, terraces, escarpment terrace, associated drainages, and a rim-to-river cross-section of a major Midwestern gorge (Metzger 1993).

The 2000 Report also notes that Subsection 212Jn may be a medium priority for addressing gaps for the Ottawa, based on percentage of subsection land that is in the National Forest System. Of the subsection, 4.6% is on NFS lands, while 3% of the Ottawa is in this subsection (Faber-Langendoen et al. 2000). The Ottawa includes 8 subsections; this one is 5th in order of prominence and quite a bit less than the first three.

The map below shows the Ottawa boundary superimposed over the subsection map. The subsection shown in light gray is 212Jn. Any RNA-equivalent that would represent these same types would have to be found in this area. For the 2000 Report, none were found (Faber-Langendoen et al. 2000). There is one RNA-equivalent in this subsection, a Nature Conservancy preserve at Horseshoe Harbor, but it does not include the same vegetation types as the Sturgeon River Gorge cRNA.
Given the vegetation representation that would be provided by the cRNA, and the geologic features, this cRNA is recommended to be maintained as a candidate as part of Forest Plan revision. The RNA designation and boundary would overlay management area (MA) 5.2, Sturgeon River Gorge Wilderness and MA 8.1, Designated Wild and Scenic Rivers. Establishment of this cRNA is not proposed concurrent with decisions made during this Forest Plan revision. The Forest Service Research branch will need to determine the priority of this candidate for establishment into the RNA system.

**Sylvania cRNA**

This cRNA falls entirely within Ecological Subsection 212Jc, Winegar Moraine. The 1986 Forest Plan’s FEIS included a brief discussion of the proposed RNA and showed a boundary (USDA Forest Service 1986). The area was estimated at 2,740 acres. This boundary has been added to the Forest GIS, where acreage is calculated as about 2,837 acres. The difference is probably due to improved ability to calculate acreages through use of GIS. No establishment record has been drafted, although the RNA program files include some notes on data collected for the area.
Both forest type and ecological landtype phase (ELTP) mapping have been completed for the cRNA. These maps were used to determine vegetation alliance representation. For the upland areas, the two methods agree on cover type. However, the forest type mapping showed some wetland areas as lowland brush (alder, dogwood, willow) while the ELTP system mapped these same stands as ELTP 40, such as the *Picea-Chamaedaphne-Sphagnum* habitat type, which is shown as forested and open bogs. Based on the stands’ locations on the moraine, that is, fringing lakes and in depressions, and the scale at which the two mapping systems operate, the ELTP-based information appeared more detailed and accurate and therefore was used for wetlands. Some forested wetlands (cedar and hemlock) appear to be present using the ELTP system and not using forest type mapping.

All the occurrences of upland forest were considered medium to high quality occurrences, based on their size, composition, and context (Faber-Langendoen et al. 2000). Based on the combined map information, the following alliances are represented in the Sylvania cRNA for the Winegar Moraine subsection (212Jc):

- Eastern hemlock-yellow birch forest alliance
- Eastern hemlock forest alliance
- Sugar maple-yellow birch-(American beech) forest alliance
- Sugar maple-white ash-American basswood forest alliance
- Black spruce-tamarack saturated forest alliance
- Northern white cedar saturated forest alliance
- Leatherleaf saturated dwarf shrubland alliance
- Eastern hemlock saturated forest alliance

All of the above types are known to occur in the 212Jc subsection and on NFS lands. Of the above list, there is known representation in an RNA-equivalent of the following types (Faber-Langendoen et al. 2000):

- Eastern hemlock-yellow birch forest alliance
- Eastern hemlock forest alliance
- Sugar maple-yellow birch-(American beech) forest alliance (low quality)
- Northern white cedar saturated forest alliance

There is also known representation of both black spruce saturated forest and tamarack saturated forest alliances (Faber-Langendoen et al. 2000); these may equate to the ELTP-based black spruce-tamarack saturated forest alliance identified for Sylvania cRNA. Any of those three similar types could be equated to the ELTP symbol in question. Leatherleaf saturated dwarf shrubland alliance is an inclusion in an RNA-equivalent (Faber-Langendoen et al. 2000). Eastern hemlock saturated forest alliance is a minor type, a small patch alliance, thus representation of this type may be less critical.

In the subsection 212Jc, there are two RNAs on the Chequamegon-Nicolet National Forest, four State of Wisconsin natural areas, and three Nature Conservancy Preserves, which provide the known representation. Generally, most of the vegetation types in the cRNA have representation elsewhere on the Winegar Moraine subsection.
In addition to the vegetation representation, Sylvania cRNA includes 14 small lakes and part of larger Devil’s Head Lake.

The 2000 Report notes Subsection 212Jc may be a high priority for addressing gaps for the Ottawa, based on percentage of subsection land that is in the National Forest System. Of the subsection, 15% is on NFS lands, while 43% of the Ottawa is in this subsection (Faber-Langendoen et al. 2000). The Ottawa includes eight subsections; this one is 3rd in order of prominence.

Figure I-1 (on page I-4) shows the Ottawa boundary superimposed over the subsection map. The subsection shown in dark gray is 212Jc. RNAs and equivalents which include the Sylvania target vegetation alliances occur in this dark gray area.

There is no limit specified on the number of times a vegetation alliance may be represented on a subsection, and all of the types noted above as being represented were only represented once. The 2000 Report (Faber-Langendoen et al. 2000) discusses the need for replicates, e.g., in case of catastrophic disturbance; and the previous Regional Guides (for RNAs) included priorities to represent types already represented once or twice (Faber-Langendoen et al. 2000). However, given that most of the vegetation types are represented on the subsection, and research has been ongoing in Sylvania without RNA designation, this cRNA is not carried forward as a recommendation for establishment.