

## **Regionally Significant Ecological Areas (Terrestrial and Wetland) Assessment Methods**

Minnesota DNR Summary, February 2003

**Overview:** The Regionally Significant Ecological Areas (Terrestrial and Wetland) Assessment is being done by the Minnesota Department of Natural Resources. The assessment covers the seven-county Twin Cities metropolitan region.

The RSEA Assessment is a science-based GIS model to identify natural areas of ecological significance. The assessment is a landscape scale, coarse-filter assessment based on satellite derived land coverage and other region wide data bases. Its purpose is to identify areas with a high likelihood of having intact native plant communities and/or high quality native animal habitats for further site level analysis.

The assessment includes the identification of Regionally Significant Ecological Areas, the incorporation of documented rare species occurrences, and mapping of river and stream corridors for wildlife. A core team of Central Region DNR staff from Regional Operations, the Ecological Services Division, and the Management Information Systems Division worked on the assessment, with advice from other DNR staff and partners from other agencies.

This document overviews the Terrestrial and Wetland Assessment. The Metropolitan Council has provided GIS support staff and satellite land cover data for the RSEA (Terrestrial and Wetland) Assessment. In addition the Metropolitan Council has partnered with DNR Fisheries staff in the development of an aquatic assessment. Information on the aquatic assessment will be available in the future.

### **Terrestrial and Wetland RSEA Definition**

Regionally Significant Ecological Areas are places where intact native plant communities and/or native animal habitats occur.

RSEAs may include high quality native plant communities mapped by the Minnesota County Biological Survey (MCBS). These plant communities are defined by their most prominent features - a combination of vegetation, hydrology, landform, soil, and natural disturbance cycles- and form recognizable units (oak forest, prairie) across the landscape. These communities may or may not provide significant habitat for animal species.

RSEAs not meeting the MCBS criteria are identified and evaluated based on land cover characteristics (size, shape, adjacent land use, and native species

diversity) and the habitat requirements of selected animals sensitive to habitat fragmentation.

RSEAs do not include areas dominated by intensively managed vegetation such as croplands, pastures, orchards, sod farms, and mowed grasses. Some RSEAs do include areas of managed vegetation; an example is an infrequently mowed grassland tract. In addition short grasses and agricultural land cover may be included in corridor mapping.

#### **Ecological principles that informed the model:**

- Size of a patch is important (bigger is better)
- Shape of a patch is important (rounder is better)
- Connectivity is important
- Adjacent land uses are important (the more compatible the surrounding land uses, the better the chances for survival)
- Higher native species diversity contributes to higher productivity and resiliency.

#### **Model process to date:**

1. A hybrid land cover map was created by the DNR and the Metropolitan Council
2. Individual ecological models were developed by the DNR
3. The individual models were applied and integrated and all native plant communities mapped by the Minnesota County Biological Survey were incorporated. (Some code 1 and 2 isolated communities less than 10 ha were eliminated.)
4. Sites were ranked as 3, 2, or 1. (See the attached RSEA map)

#### **Summary of ecological models:**

Three models were developed to map significant habitat. Literature reviews and expert opinions were combined to select native animals that could serve as indicators of significant habitats. Minnesota County Biological Survey animal survey staff was the primary consultants for this process. Habitats identified by the models harbor many other plants and animals in addition to the indicator species.

#### Forest Models

The forest models include forest interior (core) and riparian forest. The habitat requirements of 5 bird species, the red-eyed vireo, wood thrush, scarlet tanager, ovenbird and eastern wood pewee, were used to map forest core. Interior forest (core) patches were identified and ranked based on:

- Edge effect (edges, by definition not forest interior, were 120 m wide)
- Forest patch size (minimum patch size was 59 acres)
- Percent of total patch that was core

- Distance to a 'source patch' (forest patch 250 acres or greater with more than 40% core)
- Additional forest areas that are at least 492 feet wide and that are connected to the forest core patch were included. These additional areas provide habitat, buffer and connectivity benefits.

The habitat requirements of 3 birds, the cerulean warbler, Louisiana waterthrush, and the red-shouldered hawk, were used to map riparian forest areas (forests adjacent to streams). Riparian forest width is at least 492 feet. Minimum patch size was 10 acres.

### Grassland

This model included two components: 'tall grasslands' are relatively large areas of grasslands that are not mowed. They include both native and non-native grasslands. "Dry tall grasslands' are tall grasslands that occur on sandy soils; these harbor a number of rare animal and plant species. The habitat requirements of the bull snake, pocket mouse, and Blanding's turtle were used to map dry tall grassland habitat.

Grasslands were identified and ranked based on

- Size (minimum tall grassland size was 40 acres and minimum width was 295 feet; minimum dry tall grassland size was 15 acres)
- Maintained grasslands (infrequently mowed hayfields and pastures) that are connected to the 40 acres or greater in size tall grasslands were included when they were at least 295 feet wide. These additional grassland areas provide habitat, buffer and connectivity benefits.
- Incompatible adjacent land use
- Incompatible adjacent cover types
- Compatibility of adjacent cover types. Adjacent wetlands and open water increase patch score because they may provide valuable habitat for many species (amphibians, waterfowl, and small mammals).

### Wetlands and Wildlife Lakes

While many wetlands are regulated under state and/or federal laws, this model evaluates wetlands on three characteristics: (1) connectivity to uplands and other wetlands (2) diversity of upland cover types associated with the wetland (wetland and upland types were considered in the diversity model) and (3) wetland size (including larger wetland complexes as well as smaller wetlands which provide special habitats and connectivity).

Wetlands were identified and ranked based on:

- Isolated wetlands (minimum size 25 acres)

- Wetland complexes (minimum size 148 acres, which includes a 492 ft. vegetation buffer zone connecting wetlands in the complex; 3 or more wetlands must be connected to qualify as a complex)
- Wetlands associated with tall dry grasslands (minimum size 20 acres)
- Wetland forest complexes (size 1 to 10 acres, adjacent to forests and within 656 feet of a larger wetland and connected to that larger wetland by forest)
- Wildlife lakes, identified by the DNR's Wildlife Division's shallow lakes program as significant for wildlife, were also included (minimum size 50 acres)