Exotic and Invasive Species

The presence of exotic (non-native) or invasive species influences long-term management cost and strategies. Weed species in the first category are considered invasive. Invasive species will lower the remnant’s quality over time and can present significant challenges to long-term restoration and management of the site. Applying no management to the site means losing the remnant plant community to the invasive species, yet control methods used on invasive species may in themselves be detrimental to the remnant.

Invasive: Weed species that outcompete native species and threaten to destroy native plant communities.

Persistent: Weed species that occur regularly in prairie but are not aggressive woody species.

Opportunistic: Weed species that would probably be eliminated with the site. It is important to apply equal effort toward the recovery of the remnant in response to management activities, and to prioritize resources for acquisition, preservation, rehabilitation, and management of remnant sites. If natural areas are to be compared, inventories of consistent scope and precision must be conducted. A thorough plant inventory requires at least monthly surveys throughout the growing season. Factors that will affect the total number of species identified include the size of the site, the number of observers, and the amount of time spent surveying the site. It is important to apply equal effort toward each inventory so that meaningful comparisons can be made between sites.

Assessing Remnant Quality

Assessment gives a measure of a remnant’s quality, which guides and prioritizes long-term management objectives. Major influences of quality are native species diversity (absent vs. present), and the presence of exotic or invasive species. The presence of exotic or invasive species is an immediate threat to the remnant (see Remnant Quality Indicators table below). There are three main objectives of remnant assessment: 1) to determine appropriate management strategies for the site (i.e., Do No Harm), 2) to monitor the recovery of the remnant in response to management activities, and 3) to prioritize resources for acquisition, preservation, rehabilitation, and management of remnant sites. If natural areas are to be compared, inventories of consistent scope and precision must be conducted. A thorough plant inventory requires at least monthly surveys throughout the growing season. Factors that will affect the total number of species identified include the size of the site, the number of observers, and the amount of time spent surveying the site. It is important to apply equal effort toward each inventory so that meaningful comparisons can be made between sites.

<table>
<thead>
<tr>
<th>Common weed species of tallgrass prairie</th>
<th>Exotic</th>
<th>Persistent</th>
<th>Opportunistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Name</td>
<td>Scientific Name</td>
<td>Common Name</td>
<td>Scientific Name</td>
</tr>
<tr>
<td>Common teasel</td>
<td>Dipsacus sylvestris</td>
<td>White sweet clover</td>
<td>Melilotus alba</td>
</tr>
<tr>
<td>Purple loosestrife</td>
<td>Lythrum salicaria</td>
<td>Poison Ivy</td>
<td>Toxicodendron radicans</td>
</tr>
<tr>
<td>Purple prairiegrass</td>
<td>Miscanthus sinensis</td>
<td>White sweet clover</td>
<td>Melilotus alba</td>
</tr>
<tr>
<td>Red clover grass</td>
<td>Rhamnus cathartica</td>
<td>Giant ragweed</td>
<td>Antoscaria rohdia</td>
</tr>
<tr>
<td>Common teasel</td>
<td>Dipsacus sylvestris</td>
<td>White sweet clover</td>
<td>Melilotus alba</td>
</tr>
<tr>
<td>Purple loosestrife</td>
<td>Lythrum salicaria</td>
<td>Poison Ivy</td>
<td>Toxicodendron radicans</td>
</tr>
<tr>
<td>Purple prairiegrass</td>
<td>Miscanthus sinensis</td>
<td>White sweet clover</td>
<td>Melilotus alba</td>
</tr>
<tr>
<td>Red clover grass</td>
<td>Rhamnus cathartica</td>
<td>Giant ragweed</td>
<td>Antoscaria rohdia</td>
</tr>
</tbody>
</table>

Other Factors Affecting Remnant Quality/Management

Other factors that may affect the remnant’s quality and management include the size and shape of the remnant, distance from and connectivity to other remnants, and land-use surrounding the remnant (Saunders et al. 1999). The smaller the remnant, the greater the impact external forces (invasive species, herbicide drift, nutrient and water influx) will have on the quality and long-term survival of the remnant. Larger remnants are likely to have greater diversity because they are more likely to encompass different types of habitat, yet high-quality remnants as small as 10 acres (4 hectares) may possess the majority of the local diversity present in a much larger prairie (Robertson et al. 1997). The size of a remnant also determines the potential population size of a species. Larger populations tend to have greater levels of genetic diversity, and thus may be more resilient (adaptive) to environmental stressors and more resistant to extinction (Gilpin and Soule 1986). There is also evidence that seed viability increases with larger populations, possibly because they attract more pollinators and/or are more genetically diverse (Menges 1993). Mitigating these negative impacts to small isolated remnants by modifying surrounding land use will enhance the quality of the remnant areas being preserved.


Native Plant ID Resources

- Grasses of Iowa. www.eecb.iastate.edu/research/lovegrass
- Kansas Wildflowers and Grasses. www.lib.ku.edu/wildflower
- Plant Iowa Native. www.plantiontnative.org
- USDA Plants National Database. www.plants.usda.gov
Why are Prairie Remnants Important?

Remnants really are islands of biodiversity remaining after large-scale conversion of the prairie ecosystem. Remnants are repositories of biological, ecological and cultural values, and deserve preservation and management. They may contain once common animal and plant species now threatened with extinction, or harbor rare populations of species with unique genetic traits and adaptations. Remnants are benchmarks against which to measure the success of modern-day prairie restorations, providing a reference point for species composition, ecosystem functions, and soil health. The utility of remnants as the “gold” standards of fertility, soil structure, and soil health. Ultimately, prairie reconstruction would not be possible without the seed sources and ecological information that remnants offer. The greatest threat to small remnants is continued isolation from surrounding land use activities or misguided management from surrounding land use activities or misguided management within the remnant. Buffering, reconnecting, and restoring prairie on the landscape is critical if native remnant tallgrass prairie is to be preserved as a viable ecosystem well into the future.

Where Do Remnants Persist?

Surprisingly, remnants do persist in the highly fragmented and intensely farmed landscape of the modern Midwest. Leopold, in the first half of the 1900s, observed that prairie plants were “content with any roadside, rocky knoll, or sandy hillside not needed for cow and plow” (Leopold 1999). These remain likely places to look for remnant prairie today. Prairie also persists in early transportation corridors (i.e., rights-of-way) for roads and railroads, and recovering pastures if not too heavily grazed. Prairie may persist in out-of-the-way corners of farm fields cut off by creeks or otherwise inaccessible to tillage equipment and protected from herbicide drift. Historic old-settler cemeteries, established on prominent hilltops and fenced from grazing may harbor remnant prairie. Many of these sites have been mowed at times in the past but recovered when mowing ceased, or the prairie plants survived in the surrounding fence line. A few are preserved as prairie and maintained by volunteers and county or state resource managers.

Until the mid-1900s, prairie hay was prized as high-quality forage for workhorses, and typically harvested once in mid-summer each year. Most prairie hay meadows were lost with the widespread mechanization of farming after World War II. A few hayed prairies remain in areas that were too wet, rocky, or small to row-crop, or where the landowner preserved the practice as a cultural tradition.

Aerial photographs, particularly infrared, can help pinpoint likely areas to field check for prairie remnants. Knowledge of the vigor and density of vegetation and time of year of the photo is key to interpreting the red colors of infrared aerial photography. The red tone of color infrared aerial photographs is usually associated with live vegetation. Very intense reds indicate dense vegetation growing vigorously at the time the photograph was taken. In any case, it’s critical to field check potential sites. In Iowa, aerial photographs, including historical, black and white, and infrared, are available from the Iowa Geographic Map Server at ortho.gis.iastate.edu. Aerial photographs are also available at local Natural Resources Conservation Service (NRCS) offices.

Are all remnants the same?

No two remnants are alike. Some may be wet prairie, while others may be dry prairie, or anywhere in between. Likewise, many other types of remnant native plant communities exist, including wetlands (fens, bogs, seeps, sedge meadows, etc.) and woodlands (forest, open woodlands, savannas).

Native Species Diversity

The more native species present, the greater the quality of the remnant. Ecologists refer to the number of species present on a site as species richness. A site with 80 plant species has greater species richness than a site with 20 plant species. The types of species present and their abundance and distribution are also important considerations of quality. Species diversity, defined as the relative abundance of species throughout the site combined with the number of species present, gives a more complete description of remnant quality. Two prairies of the same native species richness (number of species) may differ considerably in diversity if one site has only a few individuals of many species while the other has many, well-represented individuals of each species.

Prior Land Use History

Information about prior land use at a site may be gleaned from the current or past landowner, local residents, or state or federal agencies. Historic aerial or landscape photographs can add valuable insight into land use history. Original land survey records from the 1800s may indicate whether an area was considered prairie, savanna (categorized as ‘woodland,’ ‘open/oak woods,’ or ‘timber’), or wetland at the time of the survey. This information can be used to guide restoration efforts. Iowa land records are available at iowalandrecords.org.