

## 5. Non-Native Invasive Species (NNIS)

Non-native invasive species alter the type and abundance of organisms, relative abundance of species, and function of ecosystem processes, usually with undesirable outcomes (Olson 1999). The composition of plant communities can be altered often by displacement of native species. NNIS may cause changes in wildlife habitat, soil properties through increased erosion, the amount of organic matter and nutrients, and by adding chemical compounds that interfere with soil organisms, quality of scenery, and in some cases may harm human health.

Invasive earthworms are discussed in the soils section.

### Key Points

- An environmental assessment for *Non-native Invasive Plant Management* is complete. A decision was made in October 2011 and implementation is planned for the spring 2012.
- Very little survey or monitoring data has been collected thus far. A design and protocol need to be developed and applied.
- Effectiveness of NNIS management needs to be determined in the future.

### Monitoring Questions

To what extent is Forest management contributing or responding to populations of terrestrial or aquatic non-native species that threaten native ecosystems?

### Background

Non-native invasive species population trends are analyzed in the Forest Plan EIS based on surrogate indicators for NNIS habitat, specifically miles of maintenance level 1 roads, miles of temporary roads, and water access. This is based on the assumption that NNIS occupy disturbed habitats such as roadsides. However the primary concern about NNIS is their effect on intact ecosystems and the services that these ecosystems provide.

The Forest is faced with a choice between monitoring indirect measures of invasive species – roads and water access; or monitoring the actual effects of NNIS themselves.

In addressing the latter, monitoring questions are:

- Is the number of species of NNIS increasing?
- Is the number of populations increasing?
- Are the existing populations increasing in extent or abundance?
- How are NNIS responding to activities such as timber harvest and recreation?
- How effective are the management actions aimed at preventing, eradicating and reducing NNIS?

### Results

Thus far surveys for NNIS have been limited. Most survey efforts on the Forest are aimed at detecting RFSS potentially affected by timber harvest. Invasive data is sometimes collected as

part of this effort, but survey priorities and design are done with the objective of collecting RFSS data and not primarily aimed at collecting NNIS data. One exception is the population of garlic mustard in the Stony Point area which is well characterized and recorded in the corporate database; and purple loosestrife which has been documented well on some lakes but not in all.

Some surveys were conducted in past years aimed at collecting NNIS data but these efforts lacked a systematic design and were conducted by personnel with widely varying degrees of training and knowledge of species targeted for survey. Survey efforts were targeted primarily to roadside habitats rather than to more natural ecosystems.

The Forest has a lot of data about weeds of disturbed areas that happen to be non-native but much less data about NNIS that occur in less-disturbed ecosystems. Another drawback of existing NNIS data is the lack of data about the surveys themselves in the corporate database. We know where NNIS have been found and recorded, but no record exists of where surveys were conducted and no NNIS were found.

Only a very small amount of monitoring of NNIS has occurred on the Forest. Prior to 2010, this has primarily taken the form of accumulation of anecdotal knowledge of the efficacy of hand pulling and other treatment methods on garlic mustard. In 2010 a quick qualitative assessment of the effect of hand pulling on garlic mustard and mowing on spotted knapweed was conducted and recorded in the Forest Service Activity Tracking System (FACTS).

## **New Issues**

Climate change is likely to lead to increased problems with NNIS on the Chippewa. This is due to two reasons: new species migrating into the area because climate is becoming more hospitable to species from warmer areas and loss of native species cover creating habitat for NNIS. As growing seasons become longer, and rainfall patterns change, existing native species may become less prevalent and the climate may become more hospitable to NNIS adapted to warmer climates.

## **Implications**

Increased prevalence of invasive species due to climate change could lead to a wide range of effects on habitat for plants and wildlife. The exact nature of these changes is difficult to predict with any certainty, given that even current effects of invasive species are often only known in an imprecise way. For instance, we can see an invasion of hybrid cattail completely transform a wetland from a complex grouping of many native plant species to a single species stand dominated by cattails, but can only point to a few studies showing subtle changes such as a negative effect to amphibian reproduction due to changes in composition of leaf litter. The overall change in vegetation cover is obvious, but very little may be explicitly known of the changes affecting other species that use the habitat. Given that we have only sparse information beyond seeing a change in species composition, which is assumed to be harmful to the ecosystem as a whole, we cannot predict exact implications but can be assured that large scale, significant changes are likely, and that many of the changes are likely to be undesirable for the values and services that intact ecosystems provide.

## **Recommendations**

- Assess the effectiveness of future NNIS management efforts on the Forest. NNIS management is expected to increase following the anticipated implementation of a Forest-wide non-native invasive plan after the completion of an environmental assessment. All NNIS management activities should be assessed either quantitatively or qualitatively until we are confident that the management method is cost effective at achieving management goals. Once a management method is proven to be effective, smaller samples should be evaluated to ensure that methods are being appropriately implemented in keeping with site specific ecosystem objectives.
- More inventory effort targeted at at-risk ecosystems and the invasive species with potential for harm to these systems is needed. Examples include buckthorn, garlic mustard, and purple loosestrife which invade undisturbed native plant communities but are in early stages of establishment so management should be effective.
- Monitor the effectiveness of all NNIS control efforts that are implemented in the future.