Non-Native Invasive Species

Introduction

This chapter is divided into two subsections: Non-native invasive species (NNIS) abundance and control measures. NNIS abundance examines the types and amounts of NNIS found on the Superior National Forest, while control measures examines the acreage of NNIS control measures and their effectiveness.

NNIS Abundance

Monitoring Question

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

Forest Plan direction comes from O-WL-37: Reduce the spread of terrestrial or aquatic non-native invasive species that pose a risk to native ecosystems.

This monitoring question and driver are appropriate because NNIS can threaten the health of entire ecosystems and negatively impact many other resource management activities. Many factors can contribute to the spread of NNIS, including forest management. By monitoring the types of NNIS and their abundance over time, we can determine to what degree our resource management activities are contributing to NNIS spread and, more importantly, the level of risk that NNIS pose to ecosystems on the Superior National Forest.

The unit of measure is acres of NNIS infestations and the unit of comparison is trend in NNIS acreage.

The units of measure and comparison were chosen because it is a concise summary of NNIS abundance, and can be easily tracked from year to year to gain an understanding of NNIS trends over time. NNIS trends can inform managers about which native ecosystems are at risk and can suggest which species require control measures.

Monitoring Methods

During the summer of 2009, NNIS abundance was measured during mid-level data collection and during NNIS treatment activities Forest-wide. Known sites were visited, and any new NNIS sites that were observed were inventoried (data source: GIS layer "noxiousweed_master_011910). Standard data collection protocols were used to determine the acreage of sites (USDA Forest Service 2007). Data collected for each site included species present, GPS location, and acreage.

After NNIS data was entered in an agency database, total NNIS acreage and number of NNIS sites were tallied for comparison with previous years.

Results

Approximately 2,102 acres of terrestrial NNIS exist on the Superior National Forest. The majority of these infestations are orange and yellow hawkweeds and oxeye daisy, which exist along nearly every roadside. About 1,900 new infestations totaling 25 acres were found during 2009 (Table 7.1). The highest risk species on the SNF includes: common buckthorn, leafy spurge, purple loosestrife, spotted knapweed, Canada thistle, Tatarian honeysuckle, garlic mustard, and goutweed.

Table 7.1. Non-native invasive plants infestation detected on the Superior National Forest in 2009.

Area	Sites	Acres
Metro Midlevel	209	0.9
Toohey Midlevel	62	2.3
Pelican Midlevel	98	3.5
Windy Midlevel	187	1.8
BWCAW	128	0.2
Sites found during NNIP treatments	1230	16.4
Decommissioned roads = 8 of 12 roads had inventoried acres		

Although Table 7.1 documents an increase in terrestrial NNIS abundance, 349 NNIS occurrences were visited in 2009 but no NNIS were found at these sites. These are sites where past control measures were effective and eradicated the local occurrence. In summary, there was a net increase of NNIS during 2009, but ongoing treatments are causing local declines in NNIS abundance on the Forest.

Many of the infestations detected during the monitoring were treated with herbicide in 2009 (Control Measures section below). Early detection and treatment of these species will help reduce future spread of NNIS.

Implications

The total terrestrial infested area on the SNF has been slowly increasing (Table 7.2). This increase is primarily due to a combination of enhanced inventories and discoveries as well as new infestations starting along travel corridors. The current levels of terrestrial NNIS abundance are consistent with assumptions and expectations analyzed in the Forest Plan Final EIS. The primary assumption made in the Forest Plan Final EIS was that terrestrial NNIS spread would primarily be tied to transportation corridors; this continues to be true. When any kind of access road is constructed, ground disturbance occurs that creates a good site for NNIS, and new roads are always connected to existing roads where source populations of NNIS may exist. Movement of gravel from infested pits and road maintenance activities also contributes to NNIS spread. Other types of resource management, such as timber harvest, mineral exploration, and fire management, as well as simply traveling on existing roads, contributes to NNIS spread; but these do not contribute as much as construction and maintenance of travel corridors.

Table 7. 2. Acres of non-native invasive plant infestation on the Superior National Forest, 2004-2009.						
Year	2004	2005	2006	2007	2008	2009
Acres of non-native invasive plant infestation	1850	2000	2025	2046	2072	2102

Conclusions about NNIS made in the Forest Plan Final EIS effects analysis remain valid at this time. The Final EIS acknowledges that resource management activities will result in increases in NNIS abundance. However, this abundance would be limited by integrated pest management actions, implementation of Forest Plan direction, and by the shade-intolerant nature of most of the terrestrial NNIS. What we have seen in the last five years is a slow increase in terrestrial NNIS (Table 7.2) concurrent with implementation of integrated pest management activities, many of which have been documented in past Monitoring and Evaluation Reports. The two most important of these have probably been education and outreach activities, and increasing levels of NNIS treatment. Although no standards or guidelines related to NNIS were monitored in 2009, past Monitoring and Evaluation reports have shown that standards and guidelines have been successful at limiting NNIS spread. Forest Plan Final EIS conclusions will continue to be evaluated for validity in the future.

Terrestrial NNIS are not approaching a threshold level on the Forest at this time. NNIS continue to spread and affect susceptible habitats; however, when the whole Superior National Forest landscape is considered, NNIS still only represent a small fraction of the vegetative cover across the landscape.

Recommendations

1. The monitoring conducted to date suggests one big area that is currently not receiving enough attention in terrestrial NNIS management -- partnerships. Invasives' do not respect property boundaries, and with the mixed ownership patterns on the SNF, coordinated NNIS management efforts are critical. Partnership efforts have been initiated, for example, with the Cook County Invasives Team Cooperative Weed Management Area, but more partnership efforts are needed to increase NNIS management effectiveness in the future.

Control Measures

Monitoring Question

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

Forest Plan direction comes from O-WL-38: Use Integrated Pest Management to: (a) Eradicate any populations of new invaders. (b) Contain or eradicate populations of recent invaders. (c) Limit the spread of widespread, established invaders within the planning area.

This monitoring question is appropriate because NNIS can threaten the health of entire ecosystems and negatively impact many other resource management activities. The driver (O-WL-38) provides general direction on how to manage invasive species. Together, the

monitoring question and driver help address the question of what and how much is the Forest doing to combat NNIS in an integrated manner. Not only does this demonstrate to the public and partners that we use multiple approaches to manage invasive species, but this element is also useful in project level cumulative effects analysis.

The unit of measure selected is acres of NNIS control measures, effectiveness and the unit of comparison is trend in NNIS control acreage and trend in control effectiveness.

The unit of measure was chosen because the measure is a concise summary of how effective the Forest has been at managing NNIS, and can be easily tracked from year to year to gain an understanding of NNIS trends over time. The unit of comparison was selected because NNIS control measure trends can inform managers about whether the Forest is being responsive to NNIS threats to native ecosystems and how successful we are at combating these threats.

Monitoring Methods

During summer of 2009, four types of control measures were performed: herbicide application, hand treatment, mowing, and biological control release. Monitoring of treatment effectiveness was conducted on at least 50 percent of the treated acres, and monitoring took place from two weeks to eight weeks after treatments occurred. Monitoring took place on all districts. The protocol for effectiveness monitoring for control measures was to drive a particular road where control measures were performed, with the NNIS GIS layer in hand, and make an estimate of the percent of NNIS on that road that were killed or controlled by the treatment. Control measures and treatment effectiveness were entered in FACTS and summary reports were run (data source: FACTS_invas_perf 1.xlsx).

Results

In 2009, 4,010 NNIS infestations representing 184.6 acres were treated (Table 7.3). Terrestrial NNIS that were targeted include: spotted knapweed, Canada thistle, bull thistle, Siberian peabush, St. Johnswort, Tatar honeysuckle, tansy, purple loosestrife, plumeless thistle, leafy spurge, oxeye daisy, and orange hawkweed. The majority of the treatments were herbicide application, but some mowing, hand-pulling, and bio-controls (purple loosestrife-eating beetles) were used as well.

The success of SNF NNIP control treatments was monitored in 2009. There were 1,901 treatment sites representing 126 acres monitored. Figure 7.1 shows treatment effectiveness. The average treatment effectiveness at these sites was 84 percent (Table 10.3). Figure's 7.1 and 7.2 display typical before and after results through the application of herbicide on select NNIS on the SNF.

Figure 7.1. Before spraying St. Johnswort with herbicide on FR791 on the Laurentian Ranger District.

Figure 7.2. After spraying St. Johnswort with herbicide on FR791 on the Laurentian Ranger District.

Table 7.3. Acres of annual non-native invasive plant treatment and treatment effectiveness, 2005-2009					
Year	2005	2006	2007	2008	2009
Acres treated	8	20	82	86	185
Average Treatment Effectiveness	Not measured	90%	65%	53%	84%

Implications

Despite an increase in documented infestations since 2004, the amount of acres treated has been increasing annually as well. Comparing acres treated (Table 7.3) to total acres inventoried (Table 7.2), data amounts show that we are treating only about 9 percent of the total inventoried acres. However, of the 2,102 inventoried acres, approximately 1,800 acres are hawkweeds or oxeye daisy; which are so abundant that we generally do not even attempt to treat them because herbicide impacts of spraying this many acres would be quite large. Of the remaining inventoried acres, we are treating approximately 61 percent of inventoried infestations, which is about twice as much as previous years due to ARRA funds received in 2009. Also in 2009, approximately 349 NNIS sites were visited but no NNIS were found, suggesting that past treatments at these sites had successfully eradicated them. Treatment effectiveness was also much higher in 2009 than in past years (Table 7.3). All of these facts suggest that the Superior National Forest is making progress in combating terrestrial NNIS impacts.

Recommendations

There are no recommendations for this monitoring item.

References

USDA Forest Service 2007. Data recording protocols for invasive species management. 31 pp.

GIS layer: noxiousweed_master_011910

FACTS_invas_perf 1.xlsx