DEPARTMENT OF NATURAL RESOURCES
DIVISION OF FORESTRY GUIDELINES ON
INVASIVE SPECIES PREVENTION

May 2016

The Invasive Species Operation Order 113 Discipline Guidelines for the Forestry Division have been accepted and approved

/s/ Forrest Boe  6/22/2016
Approved by Forrest L. Boe, Division Director  Date
**Internal Policy Framework Information - Guidelines**

These guidelines are a procedural document of the Division of Forestry. This page summarizes relevant internal policy information.

<table>
<thead>
<tr>
<th>Document approved by:</th>
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<tbody>
<tr>
<td>__________________________ Date: __________________________</td>
</tr>
<tr>
<td>Forrest Boe, Director</td>
</tr>
<tr>
<td>Minnesota Department of Natural Resources, Division of Forestry</td>
</tr>
</tbody>
</table>

**Title of Guidelines**..............DoF Discipline Guidelines on Invasive Species Prevention, June 2016  
**Supersedes**..........................DoF Discipline Guidelines on Invasive Species Prevention, March 2012  
**Document Owner**.............Susan Burks, Invasive Species Program Coordinator  
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**Related Division Policies** ....[Division Policy 03, TIS Program Manual](#)  
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I INTRODUCTION

BACKGROUND

Minnesota Department of Natural Resources (DNR) protects and manages the diverse natural resources of Minnesota. Because invasive species have the potential to adversely affect these natural resources, it is the DNR’s intention to limit the introduction of invasive species onto DNR managed lands and waters, limit their rate of geographical spread, and reduce their impact on high value resources. Operation Order 113 sets forth department policy and guidelines to:

- **“Prevent or limit the introduction, establishment and spread of invasive species.”** Most of the department’s field-based inventory, management, and regulatory activities are potential pathways for the introduction or spread of invasive species. Movement of equipment, organisms, and organic and inorganic material, are potential pathways. Each of these pathways must to be considered and addressed to reduce the risk of spreading invasive species.

- **Implement site-level management to limit the spread and impact of invasive species.** Invasive species are present in all types of habitats in the state. Many of the department’s field-based activities can potentially cause increases in invasive species abundance and thereby negatively impact a site. Site-level management should include planning, implementation, and evaluation guidelines that reduce the impacts of invasive species and the risk of their spread.”

The operational order requires divisions and bureaus to develop discipline guidelines to implement the operational order. In response, three Division of Forestry (DoF) documents were created. The DoF Invasive Species Guidelines (first developed in 2008), provide a series of activity-specific recommendations designed to prevent the introduction and spread of invasive species. Division Policy 3 (DP3) defines specific staff roles and responsibilities within the DoF relative to invasive species prevention and management. All DoF staff members are expected to fulfill the roles and responsibilities outlined in DP3 3. DoF staff members are also expected to consider the recommendations outlined under the specific forestry practices they undertake and to the extent feasible, carry out the recommended actions. Where conditions warrant significant deviation from these guidelines, staff members are to discuss the situation with their immediate supervisor and where appropriate, the invasive species program coordinator.

The third document outlines invasive species specifications to be used in DoF contracts, leases and permits and provides a decision tree to help project administrators decide when and where additional specifications are needed. Many of these specifications can be found in Forestry Information Systems (FORIST), such as the Timber Sale Module (TSM). This last document is in the process of being expanded to create an invasive species program manual in response to changes in the DoF invasive species program that include new positions at the area and region levels, and new annual work plan targets in invasive species survey and management. To be completed in fiscal year 2017, the manual will cover area planning, site evaluation, treatment prioritization, survey and treatment methods, monitoring procedures and contract language for new and renewing permits, leases and contracts.

USING THIS DOCUMENT

This document is organized into four primary areas; 1) guidelines for planning prevention activities, 2) daily field practices all staff members, vendors and visitors are expected to follow, 3) prevention guidelines for specific forest management activities and 4) pest-specific guidelines for sites where they are known to occur.
Also included in this document is a glossary of terms and list of references.

Prevention guidelines are organized into a series of “activity sheets.” The activity sheets are designed to allow supervisors and project administrators to print just the pages they need in order to inform those involved in the project. See page 5 for a list of activity sheets.

For future reference, this document will be posted on the intranet under Silviculture and Forest Health policies, along with DP3. When complete, the DoF Manual for Invasive Species Management will be posted at the same location. Contact the Forestry Invasive Species Program Coordinator with any questions.

PLANNING PREVENTION ACTIVITIES

A key step in managing the spread of invasive species is appropriate pre-operation planning. It is important to understand what native and invasive species occur on-site and how they are likely to respond to planned management activities. It is also important to understand the logistical needs of the planned operation and how the various components of the operation are likely to affect the site and the species present.

Before any planned activity, use this list to help you prepare:
1. Stand management goals have been identified.
2. Possible management tools/practices have been identified.
3. Invasive species occurrence data along access routes have been reviewed.
4. Possible management tools/practices have been assessed relative to their potential to alter plant resources (light, soil moisture, bulk density or nutrients) and soil disturbance.
5. Possible management tools/practices have been assessed relative to their potential to introduce or benefit the invasive species present.
6. The most appropriate management tools and practices have been selected based on the following:
   • Invasive species life cycle and stage most easily controlled
   • Invasive species reproduction and dispersal strategies
   • Likely pathways of spread – stream, road and trail crossings and utility corridors
   • The material needed and sources that are free of weed seeds (gravel, sand, rock, mulch, etc.)
   • Equipment needs and pieces that minimize the accumulation and spread of seed and plant debris
   • Pre-operation treatment options to control invasive species populations
   • Potential to reroute access, staging or parking areas to stay out of existing infestations
   • Potential to exclude infested areas from proposed practices
   • Alternate scheduling options (e.g. mowing or grading least to most infested site, or winter harvest)
   • Specifications needed in associated contracts, leases or permits
   • Effective strategies to inform support staff members and vendor(s), and foster collaboration
   • Post operation monitoring to determine operation success as well as any associated changes in the invasive species on site.
   • Potential retreatment needs

II MINIMUM DAILY FIELD PRACTICES

Preventing the spread of invasive species is an important part of the DNR “safety culture” as it applies to the natural resources we protect. Without it, we cannot ensure the long-term sustainability of the forests, prairies, lakes, or wetlands under our charge. As such, it is a critical part of doing business every day, just as is protecting ourselves from accidents and injury. In the long run, we are all responsible for ensuring that our
actions do not negatively impact our natural resources, whether at work or play. From that perspective, the following daily field practices apply to everyone and everywhere we interact with the outdoors.

These guidelines represent the minimum that should be done every day. If done regularly, these actions should take a minimal amount of time and will become a part of your standard operations. As minimum guidelines, these actions do not take into account the risks associated with specific activities. Nor do they take into account the biology of specific invasive pests. In each activity we undertake, Forestry staff members are to review the activity and pest specific guidelines contained in this document and make sure actions appropriate to the situation are chosen and effectively carried out.

<table>
<thead>
<tr>
<th>Minimum Daily Field Practices:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Be aware of invasive plants, pests or pathogens in the area where you are working and plan your day accordingly.</td>
</tr>
<tr>
<td>• Before entering and before leaving a site, check your clothing, gear, animals, vehicle and equipment and remove caked mud, dirt clods, and reproductive plant parts (seeds, berries, fruit, cones, flower or seed stalks, and roots).</td>
</tr>
<tr>
<td>• While on-site, avoid moving through existing patches of invasive species.</td>
</tr>
<tr>
<td>• Pay attention while in the field and report new or changing infestations.</td>
</tr>
</tbody>
</table>

**Note:**

• It is unlawful to transport articles regulated under state or federal quarantine out of the quarantined area without a compliance agreement or limited permit.
• It is unlawful to move state listed noxious weeds from one site to another, except by permit. It is important to be aware of regulated species and where they occur.
• It is unlawful to transport water from infested waters, except by permit. It is important to be aware of infested bodies of water and where they occur.
• Do not move water, soil, gravel or raw wood products known to harbor invasive species from infested sites.

For information on noxious weeds, and state and federal quarantines check with the Minnesota Department of Agriculture (MDA).
### III FORESTRY FIELD ACTIVITIES

The following table lists activities performed on division managed lands in order of the overall risk of introducing new or spreading existing invasive species populations. On the page number referenced for each activity, you will find a list of recommended actions that can help reduce the risk of introduction or spread of invasive species. Find your planned activities and review the list of recommended actions. Build those actions into your work plan, where appropriate.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description of Activity</th>
<th>Overall Risk</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road Construction &amp; Maintenance</td>
<td>Includes grading, graveling, roadside mowing/spraying, culvert installation, gate and sign installation, parking lot maintenance and road re-construction or new construction.</td>
<td>High</td>
<td>7</td>
</tr>
<tr>
<td>Site Preparation</td>
<td>Includes all types of mechanical site preparation prior to planting or seeding.</td>
<td>High</td>
<td>9</td>
</tr>
<tr>
<td>Gravel Operations</td>
<td>Includes gravel pit management and operation, gravel crushing, gravel spreading.</td>
<td>High</td>
<td>11</td>
</tr>
<tr>
<td>Planting Operations</td>
<td>Includes both machine and hand planting operations.</td>
<td>High to Mod</td>
<td>13</td>
</tr>
<tr>
<td>Harvest Operations &amp; Deer Exclosures</td>
<td>Includes all ground-based timber and biomass harvesting operations and related activities utilizing large equipment, including timber sales and timber stand improvement operations. It also includes installation of deer exclosures utilizing large equipment.</td>
<td>Summer – High to Mod Winter – Mod to Low</td>
<td>15</td>
</tr>
<tr>
<td>Fire Operations for Wildfire Suppression &amp; Prescribed Burning</td>
<td>Includes ground operations utilized for wildfire suppression and prescribed burns, and mowing and other maintenance performed in the establishment and maintenance of fuel or firebreaks.</td>
<td>High to Mod</td>
<td>17</td>
</tr>
<tr>
<td>Invasive Plant Management</td>
<td>Includes aerial and ground-based operations to carry out pesticide, mechanical or cultural treatment of invasive terrestrial plants.</td>
<td>High to Low</td>
<td>19</td>
</tr>
<tr>
<td>Nursery Visits &amp; Operations</td>
<td>Includes all nursery practices and operations at related sorting, packing and storage facilities.</td>
<td>High to Low</td>
<td>21</td>
</tr>
<tr>
<td>Recreation &amp; Special Events</td>
<td>Includes activities such as use of ATV or OHV, forest campgrounds, and activities like hunting, berry picking, bird watching and special events such as a road rally, motorcycle enduro or endurance horse riding.</td>
<td>High to Low</td>
<td>23</td>
</tr>
<tr>
<td>Forest Pest Management Insects &amp; Diseases</td>
<td>Includes aerial and ground activities and treatments to manage or control insects and diseases, such as sanitation, vibratory plowing, wood disposal, pesticide applications, pruning, etc.</td>
<td>High to Low</td>
<td>25</td>
</tr>
<tr>
<td>Special Products &amp; Fuel Wood Permits</td>
<td>Includes all ground operations associated with special forest products such as gravel, hay, straw, seed, soil, fir boughs, birch bark, grape vines, mushrooms, etc. and fuel wood sales.</td>
<td>Moderate</td>
<td>27</td>
</tr>
<tr>
<td>Seed Orchard Management &amp; Seed &amp; Cone Collection</td>
<td>Includes seed of orchard management, and collection of seeds and cones to be used on state lands (including seed collected on private lands).</td>
<td>Moderate</td>
<td>29</td>
</tr>
<tr>
<td>Stand Improvement &amp; Protection</td>
<td>Includes the use of small power and hand tools and labor to accomplish the following activities: mechanical &amp; chemical release, cleaning, spacing, pruning, bud capping, and application of repellents. The use of large equipment in stand thinning or cleaning operations and installation of deer exclosures or fencing is covered under timber harvest operations because of the similarity in risks.</td>
<td>Moderate</td>
<td>32</td>
</tr>
<tr>
<td>Seeding Operations</td>
<td>Includes all types of mechanical site preparation prior to seeding.</td>
<td>Mod to Low</td>
<td>34</td>
</tr>
<tr>
<td>General Maintenance</td>
<td>Includes maintenance of area office or workstation grounds and equipment located at the facility. Also includes maintenance of windbreaks and fences and off-site debris and garbage pick-up.</td>
<td>Mod to Low</td>
<td>36</td>
</tr>
<tr>
<td>Land Transactions</td>
<td>Includes land acquisitions, sales, exchanges, leases, easements, and permits on state land.</td>
<td>Mod to Low</td>
<td>38</td>
</tr>
<tr>
<td>General Site Visits</td>
<td>Includes inventories, stand exams, regeneration checks, native plant community assessment native plant community mapping, field surveys, urban and rural public assists and enforcement activities.</td>
<td>Low</td>
<td>40</td>
</tr>
</tbody>
</table>
Road Construction & Maintenance: DoF Invasive Species Prevention Guidelines

Description: Includes grading, roadside mowing or spraying, culvert installation, gate and sign installation, parking lot maintenance and road re-construction or new construction.

Associated Risks:

<table>
<thead>
<tr>
<th>Site Disturbance</th>
<th>Equipment Moving On/Off Site</th>
<th>Materials Moving On/Off Site</th>
<th>Overall Risk of Introducing Invasives</th>
<th>Overall Risk of Spreading Invasives</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>High</td>
<td>High</td>
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<td>High</td>
</tr>
</tbody>
</table>

Minimum Daily Field Practices:

- Be aware of invasive plants, pests or pathogens in the area where you are working and plan your day accordingly.
- Before entering and before leaving a site, check your clothing, gear, animals, vehicle and equipment and remove caked mud, dirt clods, and reproductive plant parts (seeds, berries, fruit, cones, flower or seed stalks, and roots).
- While on-site, avoid moving through existing patches of invasive species.
- Pay attention while in the field and report new or changing infestations.

Note:

- It is unlawful to transport articles regulated under state or federal quarantine out of the quarantined area without a compliance agreement or limited permit.
- It is unlawful to move state listed noxious weeds from one site to another, except by permit. It is important to be aware of regulated species and where they occur.
- It is unlawful to transport water from infested waters, except by permit. It is important to be aware of infested bodies of water and where they occur.
- Do not move water, soil, gravel or raw wood products known to harbor invasive species from infested sites.

For information on noxious weeds, and state and federal quarantines check with the Minnesota Department of Agriculture (MDA).

Pre-operation planning:

- Review the most current invasive species occurrence data.
- Where possible and invasives will negatively impact the desired outcome of the operation, control known infestations prior to the planned activity.
- Where prior control isn’t possible, organize work schedules to move from least to progressively more infested sites.
- Map designated staging areas and infested areas to avoid due to existing infestations.
- Consider life cycle and seed production when developing mowing and grading schedules.
- Plan activities to minimize crossings such as trails and utility corridors that may serve as pathways of spread, the frequency of site entries.
- Locate sources of needed materials such as gravel, seed, mulch, and soil stabilization mats and rolls, which are free of weed seeds.
- If weed-free material isn’t available, plan to scrape off the top 6-12” of the available material to access the clean, underlying material. If suitable, use as fill material or arrange to segregate the infested material and where possible, cover it until the seed bank has been depleted (the length of time will depend on the invasive species present and how long it’s seed can remain viable).
- Make inspection of vehicles and equipment by DoF personnel part of the start-up procedure.
- Include any needed invasive species specifications in the bid documents, contract, permit or lease.
- Review invasive species prevention guidelines and map of designated areas with support staff members and vendors involved in the project prior to starting field operations.
- Makes arrangements for post-operation monitoring carried out in the context of normal field work.

**During Field Operations:**
- Follow the daily field practices above.
- Clean equipment before leaving the shop or bull pen; before crossing any trails or utility corridors; before moving to a new site; and at the end of each day.
- Minimize the bare soil areas during construction and maintenance operations.
- Periodically inspect operations and inform the lead worker of any issues and the actions needed to correct them.
- Document observations indicating a new introduction or evidence an existing infestation is spreading.
- Where feasible, restrict public access to disturbed areas and sites known to be infested.
Site Preparation: DoF Invasive Species Prevention Guidelines

**Description:** All types of mechanical site preparation prior to planting or seeding

**Associated Risks:**

<table>
<thead>
<tr>
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</thead>
<tbody>
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</table>

**Minimum Daily Field Practices:**

- Be aware of invasive plants, pests or pathogens in the area where you are working and plan your day accordingly.
- Before entering and before leaving a site, check your clothing, gear, animals, vehicle and equipment and remove caked mud, dirt clods, and reproductive plant parts (seeds, berries, fruit, cones, flower or seed stalks, and roots).
- While on-site, avoid moving through existing patches of invasive species.
- Pay attention while in the field and report new or changing infestations.

**Note:**

- It is unlawful to transport articles regulated under state or federal quarantine out of the quarantined area without a compliance agreement or limited permit.
- It is unlawful to move state listed noxious weeds from one site to another, except by permit. It is important to be aware of regulated species and where they occur.
- It is unlawful to transport water from infested waters, except by permit. It is important to be aware of infested bodies of water and where they occur.
- Do not move water, soil, gravel or raw wood products known to harbor invasive species from infested sites.

For information on noxious weeds, and state and federal quarantines check with the Minnesota Department of Agriculture (MDA).

**Pre-operation planning:**

- Avoid site preparation if management objectives can be met without it.
- Review the most current invasive species occurrence data.
- Where possible and where invasives will negatively impact the desired outcome of the operation, control known infestations prior to the planned activity.
- Where prior control isn’t possible, consider the following and plan accordingly:
  - Winter site preparation if that will meet site objectives.
  - The invasive species present and when they produce seed – plan to be off the site during that time.
  - Methods that limit the area disturbed and the length of time soil is exposed.
  - Parking and staging areas that avoid existing infestations.
- Map designated staging areas and infested areas to avoid due to existing infestations.
- Plan activities to minimize the frequency of site entries.
- Make inspection of vehicles and equipment by DoF personnel part of the start-up procedure.
- Include any needed invasive species specifications in the bid documents, contract or lease.
- Review invasive species prevention guidelines and map of designated areas with staff members and vendors involved in the project prior to starting field operations.
- Make arrangements for post-operation monitoring carried out in the context of normal field work.
During Field Operations:

- Follow the daily field practices above.
- Clean your equipment before leaving the shop or bull pin; before moving to a new site, and at the end of each day.
- Periodically inspect operations and inform the lead worker of any issues and the actions needed to correct them.
- Document observations indicating a new introduction or evidence an existing infestation is spreading.
- Where feasible, restrict public access to disturbed areas and sites known to be infested.
Gravel Operations: DoF Invasive Species Prevention Guidelines

Description: Includes rock crushing, gravel pit management and operation. Spreading gravel is covered under Road Construction and Maintenance on page 6.

Associated Risks

<table>
<thead>
<tr>
<th>Site Disturbance</th>
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<tbody>
<tr>
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</table>

Minimum Daily Field Practices:

- Be aware of invasive plants, pests or pathogens in the area where you are working and plan your day accordingly.
- Before entering and before leaving a site, check your clothing, gear, animals, vehicle and equipment and remove caked mud, dirt clods, and reproductive plant parts (seeds, berries, fruit, cones, flower or seed stalks, and roots).
- While on-site, avoid moving through existing patches of invasive species.
- Pay attention while in the field and report new or changing infestations.

Note:

- It is unlawful to transport articles regulated under state or federal quarantine out of the quarantined area without a compliance agreement or limited permit.
- It is unlawful to move state listed noxious weeds from one site to another, except by permit. It is important to be aware of regulated species and where they occur.
- It is unlawful to transport water from infested waters, except by permit. It is important to be aware of infested bodies of water and where they occur.
- Do not move water, soil, gravel or raw wood products known to harbor invasive species from infested sites.

For information on noxious weeds, and state and federal quarantines check with the Minnesota Department of Agriculture (MDA).

Pre-operation planning:

- Monitor and maintain current invasive species occurrence data on all active state managed gravel pits (re-inventory every 7 years).
- Establish and maintain regular treatment regime on all active state managed gravel pits. For infested sites, treat every other year for a minimum of three treatments. Then spot treat as needed.
- Inspect gravel pit before using material for local projects. If infested and a weed-free source is not available, plan to remove the top 6-12” of infested material and segregate. Cover infested pile to deplete the seed bank (the length of time will depend on the species present and how long their seed remains viable). Treat uncovered material as needed to avoid establishing a new seed bank.
- Specify invasive species management in all new and renewing gravel pit leases. Gravel pit lessees are responsible for control of invasive species on the lease site before removing material for use on other ownerships.
- Require that all pesticides be reviewed and approved by the DNR prior to use.
- Make annual pesticide use reports part of the lease conditions.
- Make obstructing access upon lease expiration part of lease conditions.
- Include any needed invasive species specifications in the bid documents, contract or lease.
• Review invasive species prevention guidelines with staff members and leasees prior to starting field operations.

**Gravel pit management and operation:**
• Follow the daily field practices above.
• Thoroughly clean vehicles, equipment and personal gear before moving on-site.
• Reclaim gravel pit when depleted or inactive. Spread topsoil and revegetate exposed soil as quickly as possible.
• Use native plants or seed mixes to revegetate the area.
• Restrict public access to the extent feasible.
• Work with Enforcement to limit unauthorized access.
Planting Operations: DoF Invasive Species Prevention Guidelines

Description: Includes both machine and hand planting operations.

Associated Risks
Sub-category: Machine Planting

<table>
<thead>
<tr>
<th>Site Disturbance</th>
<th>Equipment Moving On/Off Site</th>
<th>Materials Moving On/Off Site</th>
<th>Overall Risk of Introducing Invasives</th>
<th>Overall Risk of Spreading Invasives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

Sub-category: Hand Planting

<table>
<thead>
<tr>
<th>Site Disturbance</th>
<th>Equipment Moving On/Off Site</th>
<th>Materials Moving On/Off Site</th>
<th>Overall Risk of Introducing Invasives</th>
<th>Overall Risk of Spreading Invasives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Low</td>
<td>High</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

Minimum Daily Field Practices:

- Be aware of invasive plants, pests or pathogens in the area where you are working and plan your day accordingly.
- Before entering and before leaving a site, check your clothing, gear, animals, vehicle and equipment and remove caked mud, dirt clods, and reproductive plant parts (seeds, berries, fruit, cones, flower or seed stalks, and roots).
- While on-site, avoid moving through existing patches of invasive species.
- Pay attention while in the field and report new or changing infestations.

Note:

- It is unlawful to transport articles regulated under state or federal quarantine out of the quarantined area without a compliance agreement or limited permit.
- It is unlawful to move state listed noxious weeds from one site to another, except by permit. It is important to be aware of regulated species and where they occur.
- It is unlawful to transport water from infested waters, except by permit. It is important to be aware of infested bodies of water and where they occur.
- Do not move water, soil, gravel or raw wood products known to harbor invasive species from infested sites.

For information on noxious weeds, and state and federal quarantines check with the Minnesota Department of Agriculture (MDA).

Pre-operation planning:

- Review the most current invasive species occurrence data.
- Where possible and where invasives will negatively impact the desired outcome of the operation, control known infestations prior to the planting.
- Where prior control isn’t possible, organize work schedules to move from least to progressively more infested sites.
- Include any needed invasive species specifications in the bid documents, contract, permit or lease.
- Where possible, use local sources for all plant material and seed.
- Inspect all plant material to be sure it is healthy and pest free (see nursery operation guidelines).
• Map designated staging areas, and infested areas to avoid due to existing infestations.
• As a condition of the contract, require planters to clean vehicles, planting equipment, boots, and clothing before moving on-site.
• Make inspection of vehicles and equipment by DoF personnel part of the start-up procedure.
• Include any needed invasive species specifications in the bid documents, contract or lease.
• Review invasive species prevention guidelines and map of designated areas with support staff members and vendors involved in the project prior to starting field operations.
• Makes arrangements for post-operation monitoring carried out in the context of normal field work.

During operations:
• Follow the daily field practices above.
• If picking up trees at the nursery, see guidelines for Nursery Operations. Once done, sweep truck and trailer and dispose of the sweepings in a dumpster.
• Dispose of any shipping boxes or recycle them locally. Don’t leave them on the planting site.
• If using a root dip, hose out the bucket between sites and start with a new batch of root dip at each planting site. That way, if there is contamination by a soil-borne fungus, it won’t be spread from site to site by the root dip solutions.
• Periodically inspect planting operations to monitor guideline implementation. Inform lead worker of any issues found and the corrective actions needed.
• Clean vehicles, equipment and personal gear before leaving the site or before entering a new site.
• Where feasible, restrict public access to disturbed areas and sites known to be infested.
Harvest Operations & Deer Exclosures: DoF Invasive Species Prevention Guidelines

Description: Includes ground-based timber and biomass harvesting operations and related activities utilizing large equipment, including timber sales and timber stand improvement operations where large equipment is used. It also includes installation of deer exclosures utilizing large equipment.

Associated risks:
Sub-category: Temporary access route

<table>
<thead>
<tr>
<th>Site Disturbance</th>
<th>Equipment Moving On/Off Site</th>
<th>Materials Moving On/Off Site</th>
<th>Overall Risk of Introducing Invasives</th>
<th>Overall Risk of Spreading Invasives</th>
</tr>
</thead>
<tbody>
<tr>
<td>High (Moderate)</td>
<td>High (Moderate)</td>
<td>High (Moderate)</td>
<td>High (Moderate)</td>
<td>High (Moderate)</td>
</tr>
</tbody>
</table>

Sub-category: Felling, Skidding and Forwarding

<table>
<thead>
<tr>
<th>Site Disturbance</th>
<th>Equipment Moving On/Off Site</th>
<th>Materials Moving On/Off Site</th>
<th>Overall Risk of Introducing Invasives</th>
<th>Overall Risk of Spreading Invasives</th>
</tr>
</thead>
<tbody>
<tr>
<td>High (Moderate)</td>
<td>High (Moderate)</td>
<td>Moderate (Low)</td>
<td>High (Moderate)</td>
<td>High (Moderate)</td>
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</table>

Sub-category: Slashing

<table>
<thead>
<tr>
<th>Site Disturbance</th>
<th>Equipment Moving On/Off Site</th>
<th>Materials Moving On/Off Site</th>
<th>Overall Risk of Introducing Invasives</th>
<th>Overall Risk of Spreading Invasives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate (Low)</td>
<td>High (Moderate)</td>
<td>Moderate (Low)</td>
<td>Moderate (Low)</td>
<td>Moderate (Low)</td>
</tr>
</tbody>
</table>

Sub-category: Hauling**

<table>
<thead>
<tr>
<th>Site Disturbance</th>
<th>Equipment Moving On/Off Site</th>
<th>Materials Moving On/Off Site</th>
<th>Overall Risk of Introducing Invasives</th>
<th>Overall Risk of Spreading Invasives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (Low)</td>
<td>Moderate (Low)</td>
<td>Moderate (Low)</td>
<td>Moderate (Low)</td>
<td>Moderate (Low)</td>
</tr>
</tbody>
</table>

** Risks assume logging trucks are traveling only between permit landings and the mill.

Pre-operation planning:
- Review the most current invasive species occurrence data.
- Where possible and where invasives will negatively impact the desired outcome of the operation, control known infestations prior to the planned activity.
- Map landings and staging areas and areas to avoid due to existing infestations.
- Where invasive plant infestations are specific to a certain area, consider separate landings and harvest the “clean” area first avoiding movement of equipment from infested to non-infested areas.
- When consistent with management objectives and site conditions, consider winter harvest to minimize site disturbance.
- Plan activities to minimize crossings such as trails and utility corridors that may serve as pathways of spread, and the frequency of site entries.
Minimum Daily Field Practices:

- Be aware of invasive plants, pests or pathogens in the area where you are working and plan your day accordingly.
- Before entering and before leaving a site, check your clothing, gear, animals, vehicle and equipment and remove caked mud, dirt clods, and reproductive plant parts (seeds, berries, fruit, cones, flower or seed stalks, and roots).
- While on-site, avoid moving through existing patches of invasive species.
- Pay attention while in the field and report new or changing infestations.

Note:

- It is unlawful to transport articles regulated under state or federal quarantine out of the quarantined area without a compliance agreement or limited permit.
- It is unlawful to move state listed noxious weeds from one site to another, except by permit. It is important to be aware of regulated species and where they occur.
- It is unlawful to transport water from infested waters, except by permit. It is important to be aware of infested bodies of water and where they occur.
- Do not move water, soil, gravel or raw wood products known to harbor invasive species from infested sites.

For information on noxious weeds, and state and federal quarantines check with the Minnesota Department of Agriculture (MDA).

Temporary access routes:

- Follow the daily field practices above.
- Thoroughly clean vehicles and equipment before entering the site.
- Where feasible, minimize bare soil areas during construction and maintenance operations.
- Periodically inspect operations and inform the lead worker of any issues and the actions needed to correct them.
- Document observations indicating a new introduction or evidence an existing infestation is spreading.
- Clean vehicles, equipment and personal gear before leaving the site and before entering a new site.
- Where feasible, restrict public access to disturbed areas and sites known to be infested.

During operations:

- Follow the daily field practices above.
- Periodically inspect active operations, inform the lead worker of any issues found and the actions needed to remedy the situation.
- Clean vehicles, equipment and personal gear before leaving the site (Note - logging trucks traveling between permit landings and the mill are exempt from cleaning standards).
- Monitor and report new introductions or evidence an existing infestation is spreading.
- Clean vehicles, equipment and personal gear before leaving the site or before entering a new site.
- Where feasible, restrict public access to disturbed areas and sites known to be infested.
Fire Operations: DoF Invasive Species Prevention Guidelines

Description: Includes ground operations utilized for wildfire suppression and prescribed burns, and mowing and other maintenance performed in the establishment and maintenance of fuel or firebreaks.

Associated Risks:

Sub-category: Ground-based Wildfire Suppression

<table>
<thead>
<tr>
<th>Associated Risks: Site Disturbance</th>
<th>Equipment Moving On/Off Site</th>
<th>Materials Moving On/Off Site</th>
<th>Overall Risk of Introducing Invasives</th>
<th>Overall Risk of Spreading Invasives</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>High</td>
<td>Moderate</td>
<td>High</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

Sub-category: Aerial Wildfire Suppression

<table>
<thead>
<tr>
<th>Associated Risks: Site Disturbance</th>
<th>Equipment Moving On/Off Site</th>
<th>Materials Moving On/Off Site</th>
<th>Overall Risk of Introducing Invasives</th>
<th>Overall Risk of Spreading Invasives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Moderate</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>

Sub-category: Drafting Operations

<table>
<thead>
<tr>
<th>Site Disturbance</th>
<th>Equipment Moving On/Off Site</th>
<th>Materials Moving On/Off Site</th>
<th>Overall Risk of Introducing Invasives</th>
<th>Overall Risk of Spreading Invasives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

Sub-category: Prescribed Fire

<table>
<thead>
<tr>
<th>Site Disturbance</th>
<th>Equipment Moving On/Off Site</th>
<th>Materials Moving On/Off Site</th>
<th>Overall Risk of Introducing Invasives</th>
<th>Overall Risk of Spreading Invasives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate</td>
<td>High</td>
<td>Moderate</td>
<td>High</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

Minimum Daily Field Practices:

- Be aware of invasive plants, pests or pathogens in the area where you are working and plan your day accordingly.
- Before entering and before leaving a site, check your clothing, gear, animals, vehicle and equipment and remove caked mud, dirt clods, and reproductive plant parts (seeds, berries, fruit, cones, flower or seed stalks, and roots).
- While on-site, avoid moving through existing patches of invasive species.
- Pay attention while in the field and report new or changing infestations.

Note:

- It is unlawful to transport articles regulated under state or federal quarantine out of the quarantined area without a compliance agreement or limited permit.
- It is unlawful to move state listed noxious weeds from one site to another, except by permit. It is important to be aware of regulated species and where they occur.
- It is unlawful to transport water from infested waters, except by permit. It is important to be aware of infested bodies of water and where they occur.
- Do not move water, soil, gravel or raw wood products known to harbor invasive species from infested sites.

For information on noxious weeds, and state and federal quarantines check with the Minnesota Department of Agriculture (MDA).
Pre-season Planning – Suppression:
- Thoroughly clean vehicles, equipment and personal gear before the start of the fire season.
- Make sure local cooperators likely to respond to a state land fire are doing the same.
- Identify and inspect aerial staging areas and landing pads for existing infestations.
- Where feasible, mow or treat existing infestations prior to the fire season.
- Review list of “Infested Waters” in your area and if needed, locate alternate sources of water.
- Review the Aerial Operations Plan and be familiar with its invasive species guidelines.

Wildfire Suppression:
- Where needed, follow guidelines for infested waters.
- Thoroughly clean vehicles, equipment and personal gear during down time between fires; and before and after moving to an out-of-state assignment.
- Thoroughly clean vehicles, equipment and personal gear before moving to a new aerial staging area or landing pad. Make sure local cooperators likely to respond to a state land fire are doing the same.
- On DNR lands, conduct post-burn monitoring as part of normal field work.
- Identify and report where new introductions, seed flush or regrowth of invasive species have occurred.
- After a fire on non-DNR lands, inform the landowner of any invasive species noticed while on-site.

Pre-season Planning - Prescribed Fire:
- Follow the pre-season suppression procedures above.
- Review the most current invasive species occurrence data.
- Where possible and where invasives will negatively impact the desired outcome of the operation, control known infestations prior to the planned activity.
- Consider alternative treatments if burning is not possible without favoring the invasive species present.
- Locate water bodies deeper than 15 feet with areas that do not contain vegetation for any drafting operations needed.
- Include any needed invasive species specifications in the bid documents and contract.
- Review invasive species prevention guidelines and map of designated areas with staff members and vendors involved in the project prior to starting field operations.
- Make arrangements for post-operation monitoring carried out in the context of normal field work.

Prescribed fire:
- Follow the daily field practices above.
- Manage and reduce burn intensity and frequency on-sites susceptible to sterilization.
- When burning piles, minimize the number and size of piles; burn on frozen ground when possible.
- Conduct post-burn monitoring and treat any invasive or undesirable species, such as sprouts or germinated seed; be aware of the possibility of a seed flush following a burn.
- Thoroughly clean vehicles, equipment and personal gear before entering a new site.
Invasive Plant Management: DoF Invasive Species Prevention Guidelines

Description: Includes aerial and ground-based operations to carry out pesticide, mechanical or cultural treatment of invasive terrestrial plants.

Associated Risks:

<table>
<thead>
<tr>
<th>Sub-category: Mechanical operations</th>
<th>Overall Risk: High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Disturbance</td>
<td>Equipment Moving On/Off Site</td>
</tr>
<tr>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sub-category: Ground-based chemical applications</th>
<th>Overall Risk: Moderate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Disturbance</td>
<td>Equipment Moving On/Off Site</td>
</tr>
<tr>
<td>Moderate</td>
<td>High</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sub-category: Aerial applications to control invasive terrestrial plants</th>
<th>Overall Risk: Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Disturbance</td>
<td>Equipment Moving On/Off Staging Area</td>
</tr>
<tr>
<td>Low</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

Minimum Daily Field Practices:

- Be aware of invasive plants, pests or pathogens in the area where you are working and plan your day accordingly.
- Before entering and before leaving a site, check your clothing, gear, animals, vehicle and equipment and remove caked mud, dirt clods, and reproductive plant parts (seeds, berries, fruit, cones, flower or seed stalks, and roots).
- While on-site, avoid moving through existing patches of invasive species.
- Pay attention while in the field and report new or changing infestations.

Note:

- It is unlawful to transport articles regulated under state or federal quarantine out of the quarantined area without a compliance agreement or limited permit.
- It is unlawful to move state listed noxious weeds from one site to another, except by permit. It is important to be aware of regulated species and where they occur.
- It is unlawful to transport water from infested waters, except by permit. It is important to be aware of infested bodies of water and where they occur.
- Do not move water, soil, gravel or raw wood products known to harbor invasive species from infested sites.

For information on noxious weeds, and state and federal quarantines check with the Minnesota Department of Agriculture (MDA).

Pre-operation planning:

- Develop site-specific prevention strategies to minimize the spread of existing infestations.
- Consider invasive plant life cycle, optimal control methods and the potential need for on-going management strategies.
• Consider season of treatment, and the risk of non-target impacts.
• Consider, and where possible, minimize crossings such as trails and utility corridors that may serve as pathways of spread.
• Consider possible disposal methods and sites. If disposing of invasive plant material off site, plan to cover the load.
• Organize work schedules to move from least to progressively more infested sites.
• Plan activities to minimize frequency of site entry.
• Identify and inspect aerial application staging areas and landing pads for existing infestations.
• Review and follow pesticide use guidelines.
• Review and follow Aerial Operations Plan.
• Make inspection of vehicles and equipment by DoF personnel part of the start-up procedure.
• Include any needed invasive species specifications in the bid documents, contract or lease.
• Review invasive species prevention guidelines and map of designated areas with staff members and vendors involved in the project prior to starting field operations.
• Make arrangements for post-treatment monitoring to assess treatment success.

Mechanical treatments, including hand pulling of invasive plants:
• Follow the daily field practices above.
• When treating multiple sites, move from least to progressive more infested sites.
• Clean your equipment before leaving the shop or bull pin; before moving to a new site, and before the end of the day.
• Where possible, avoid creating bare soil which leaves the site vulnerable to reinvasion.
• Where possible, destroy all invasive plant material on-site. If plants or plant parts are to be removed from the site, contain them such that no viable plant parts can be disseminated while in transport.
• Periodically inspect operations and inform the lead worker of any issues and the actions needed to correct them.
• Thoroughly clean vehicles, equipment and personal gear before leaving the site.
• Report any infestations not treated while on-site.

Ground-based pesticide applications:
• Follow the daily field practices above.
• When treating multiple sites, move from least to progressive more infested sites.
• Periodically inspect operations and inform the lead worker of any issues and the actions needed to correct them.
• Document observations indicating a new introduction or evidence an existing infestation is spreading.
• Take appropriate actions to avoid, treat or contain any new infestations found.
• Thoroughly clean vehicles, equipment and personal gear before leaving the site.
• Where feasible, restrict public access to disturbed areas and sites known to be infested.

Aerial pesticide application:
• Follow the daily field practices above.
• Thoroughly clean vehicles, equipment and personal gear before entering a new helipad.
Nursery Visits and Operations: DoF Invasive Species Prevention Guidelines

Description: Includes all visits to a state nursery, and all nursery operations.

Associated Risks:

<table>
<thead>
<tr>
<th>Risks Associated with Nursery Operations</th>
<th>Overall Risk: High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Disturbance</td>
<td>Equipment Moving On/Off Site</td>
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<td>High</td>
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</table>

<table>
<thead>
<tr>
<th>Risks Associated with Seed and Cones Submission</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Site Disturbance</td>
<td>Equipment Moving On/Off Site</td>
</tr>
<tr>
<td>Low</td>
<td>Mod</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risks Associated with Nursery Visits</th>
<th>Overall Risk: Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Disturbance</td>
<td>Equipment Moving On/Off Site</td>
</tr>
<tr>
<td>Low</td>
<td>Mod</td>
</tr>
</tbody>
</table>

Minimum Daily Field Practices:
- Be aware of invasive plants, pests or pathogens in the area where you are working and plan your day accordingly.
- Before entering and before leaving a site, check your clothing, gear, animals, vehicle and equipment and remove caked mud, dirt clods, and reproductive plant parts (seeds, berries, fruit, cones, flower or seed stalks, and roots).
- While on-site, avoid moving through existing patches of invasive species.
- Pay attention while in the field and report new or changing infestations.

Note:
- It is unlawful to transport articles regulated under state or federal quarantine out of the quarantined area without a compliance agreement or limited permit.
- It is unlawful to move state listed noxious weeds from one site to another, except by permit. It is important to be aware of regulated species and where they occur.
- It is unlawful to transport water from infested waters, except by permit. It is important to be aware of infested bodies of water and where they occur.
- Do not move water, soil, gravel or raw wood products known to harbor invasive species from infested sites. For information on noxious weeds, and state and federal quarantines check with the Minnesota Department of Agriculture (MDA).

Nursery visits (for any purpose)
- Follow the daily field practice above.
- Make sure vehicles, equipment, and personal gear are clean before moving onto nursery grounds.
- If moving seed or plant materials, make sure all containers are clean and free of plant debris.
- Park only in designated parking areas.
- If visiting planting beds, use one of the nursery vehicles, rather than the vehicle you brought with you.

General nursery operations:
- Follow the daily field practices above.
• Thoroughly clean vehicles, equipment and personal gear before moving onto or between nurseries. Equipment cleaning should be done in an area where nursery beds won’t be contaminated. Do not allow runoff water to move onto production beds or roadways.
• Isolate rooted plant material away from outside sources to prevent nursery bed contamination. This includes transplanting stock from one state nursery onto another and over-wintering containerized stock on nursery property.
• Contain or cover all debris and garbage before leaving the site, so that any invasive species present are not spread in transit.
• Dispose of all unused plant materials (seeds, cones, fruits and branches generated during seed extraction) in a site well away from production beds.
• Take returned plant material directly to the disposal site and promptly unload plant waste. Never accept returned material at packing buildings, nursery beds, etc.
• During the growing season, destroy plant waste by burning or burying it on a weekly basis. Burn or bury all plant waste that has accumulated over the winter by April 1st of each year.
• Don’t use green dump material as compost, mulch or fill near production beds.
• In buildings, dispose of discarded seedlings and floor sweepings in the dumpster every day the buildings are used.
• Treat seeds with fungicides to disinfect their surfaces or use other appropriate protection methods.
• On a regular basis, monitor seedbeds and seedlings for invasives, especially root diseases and diseases causing latent seedling infections.
• Do not reuse paper liners in packing crates.
• Do not reuse moss, soil, or organic materials for packing.
• Sweep root cellars clear of soil and debris each spring and fall.
• Do not receive or reuse used shipping containers, including cardboard boxes.
• If suspect invasive disease found, retain specimens and contact DNR Forest Health Specialists. Halt all activities in the seedbeds, fields or buildings involved until practical eradication or mitigation practices have been developed and implemented.
• Where infestations are known to occur, develop and implement pest specific guidelines as needed.

Receiving seed sourced outside the nursery:
• For seed measurement and packaging at the areas, see guidelines under seed collection.
• Provide the Areas with new or clean bags to measure and transport collected seed.
• Develop an area away from the production beds to deliver, store, sort and clean seed submitted by the Areas.
• Thoroughly sweep and clean the staging area daily after receiving, sorting or cleaning seed submitted by the Areas.
• Dispose of all sweepings, used bags and unused plant material in the dumpster, away from the production beds.

Receiving plant stock sourced outside the nursery:
• Wash or sweep the packing building daily and after packing is complete. Include hands, gloves, and boots in the cleanup. Dispose of all sweepings and debris in a dumpster.
• Develop an area where only outside transplants are planted that is well away from the production beds. Clean equipment and boots each time these areas are entered.
**Recreation and Special Events: DoF Invasive Species Prevention Guidelines**

**Description:** Includes activities such as hunting, berry picking, bird watching and special events such as a road rally or motorcycle enduro or endurance horse riding.

**NOTE - ENFORCEMENT OF THESE GUIDELINES IS DEPENDENT ON EFFECTIVE COLLABORATION WITH THE DIVISION OF PARKS AND TRAILS AND PUBLIC EDUCATION. LOOK FOR OPPORTUNITIES FOR OUTREACH AND EDUCATION.**

**Associated Risks:**

<table>
<thead>
<tr>
<th>Sub-category: ATV, OHV &amp; Trails</th>
<th>Overall Risk: High</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Site Disturbance</strong></td>
<td><strong>Equipment Moving On/Off Site</strong></td>
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<tr>
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<td>High</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sub-category: Horse Trails &amp; Campgrounds</th>
<th>Overall Risk: High</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Site Disturbance</strong></td>
<td><strong>Equipment Moving On/Off Site</strong></td>
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<tr>
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<td>Moderate</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Sub-category: Forest Campgrounds</th>
<th>Overall Risk: Moderate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Site Disturbance</strong></td>
<td><strong>Equipment Moving On/Off Site</strong></td>
</tr>
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<td>High</td>
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</table>

<table>
<thead>
<tr>
<th>Sub-category: Special Events</th>
<th>Overall Risk: Moderate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Site Disturbance</strong></td>
<td><strong>Equipment Moving On/Off Site</strong></td>
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<table>
<thead>
<tr>
<th>Sub-category: Dispersed Recreation</th>
<th>Overall Risk: Low</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Site Disturbance</strong></td>
<td><strong>Equipment Moving On/Off Site</strong></td>
</tr>
<tr>
<td>Low</td>
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</table>

**Pre-event planning:**

- Inspect the proposed event site, parking areas and access routes for invasive species and treat where feasible.
- Where treatment is not possible, consider excluding portions of the site from the use permit or moving the event to another site.
- Require all hay or straw used on-site be certified weed-free. This includes horseback riders, as well as motorcycle or other events using hay or straw to define racetracks or event perimeters.
- As a condition of the special event permit, require participants to thoroughly clean all gear, equipment and vehicles before bringing them onto state land.
• Review invasive species prevention guidelines and map of designated areas with the event planner and vendors involved in the event prior to set-up.
• Make arrangements for post-event monitoring carried out in the context of normal field work.

After the event:
• Inspect the event site for significant soil disturbance and reseed where necessary.
• Check adjacent forest stands and forest roads for new or spreading infestations and treat where feasible.

Off-road recreation:
• Follow the daily practices below.
• Identify area projects with the potential for future ATV or OHV abuse, and include contract specifications regarding site closure upon completion.
• Where not already signed, work with Parks and Trails to post signage on designated trails and at state forest campgrounds conveying the Division’s come clean leave clean policy.
• Verify infestations reported by Trail Ambassadors and treat where feasible.
• Inspect parking areas and access routes leading to high quality natural areas and control invasive species where feasible. Consider limiting access where necessary.
• Check forest stands and roads adjacent to or intersected by high-traffic trails for invasive species and treat where necessary and feasible.
• Follow daily field practices below whenever in the field.

Minimum Daily Field Practices:
• Be aware of invasive plants, pests or pathogens in the area where you are working and plan your day accordingly.
• Before entering and before leaving a site, check your clothing, gear, animals, vehicle and equipment and remove caked mud, dirt clods, and reproductive plant parts (seeds, berries, fruit, cones, flower or seed stalks, and roots).
• While on-site, avoid moving through existing patches of invasive species.
• Pay attention while in the field and report new or changing infestations.

Note:
• It is unlawful to transport articles regulated under state or federal quarantine out of the quarantined area without a compliance agreement or limited permit.
• It is unlawful to move state listed noxious weeds from one site to another, except by permit. It is important to be aware of regulated species and where they occur.
• It is unlawful to transport water from infested waters, except by permit. It is important to be aware of infested bodies of water and where they occur.
• Do not move water, soil, gravel or raw wood products known to harbor invasive species from infested sites.

For information on noxious weeds, and state and federal quarantines check with the Minnesota Department of Agriculture (MDA).
Forest Pest Management (Insects and Pathogens of Trees): DoF Invasive Species Prevention Guidelines

Description: Includes aerial and ground activities (such as vibratory plowing) and treatments to manage or control insects and diseases, such as sanitation, pesticide applications and mating disruption. For pest control activities that involve harvest operations or prescribed fire, see the invasive species guidelines under those headings.

Associated Risks:

Sub-category: Sanitation and mechanical control operations

<table>
<thead>
<tr>
<th>Site Disturbance</th>
<th>Equipment Moving On/Off Site</th>
<th>Materials Moving On/Off Site</th>
<th>Overall Risk of Introducing Invasives</th>
<th>Overall Risk of Spreading Invasives</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>High</td>
<td>High</td>
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</table>

Sub-category: Ground-based pesticide operations

<table>
<thead>
<tr>
<th>Site Disturbance</th>
<th>Equipment Moving On/Off Site</th>
<th>Materials Moving On/Off Site</th>
<th>Overall Risk of Introducing Invasives</th>
<th>Overall Risk of Spreading Invasives</th>
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<td>Moderate</td>
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</tbody>
</table>

Sub-category: Aerial pesticide operations

<table>
<thead>
<tr>
<th>Site Disturbance</th>
<th>Equipment Moving On/Off Staging Area</th>
<th>Materials Moving On/Off Site</th>
<th>Overall Risk of Introducing Invasives</th>
<th>Overall Risk of Spreading Invasives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Moderate</td>
<td>Low</td>
<td>Low</td>
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</tr>
</tbody>
</table>

Sub-category: Macro or micro-infusion of pesticides

<table>
<thead>
<tr>
<th>Site Disturbance</th>
<th>Equipment Moving On/Off Site</th>
<th>Materials Moving On/Off Site</th>
<th>Overall Risk of Introducing Invasives</th>
<th>Overall Risk of Spreading Invasives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Moderate</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>

Pre-operation Planning:

- Review state and federal quarantines and any regulations that apply to the site.
- Review pest-specific prevention guidelines.
- Where possible consider aerial application to avoid spreading invasive plants.
- If using aerial applications, inspect helipad or other staging area prior to treatment.
- If using ground applications, review invasive plant occurrence data, being sure it’s up-to-date.
- Where possible and where invasives will negatively impact the desired outcome of the operation, control known invasive plant infestations prior to planned activities, keeping in mind that it may take multiple years to control an established woody plant infestation.
- Where prior control of an herbaceous invasive plant isn’t possible, consider the following and plan accordingly:
  - The invasive species present and when they produce seed – plan to be off the site during that time.
  - Methods that limit the area disturbed and the length of time soil is exposed.
  - Parking and staging areas that avoid existing invasive plant infestations.
- Make inspection of vehicles and equipment by DoF personnel part of the start-up procedure.
- Include any needed invasive species specifications in the bid documents, contract, or lease.
• Review invasive species prevention guidelines and map of designated areas with staff members and vendors involved in the project prior to starting field operations.
• Make arrangements for post-treatment monitoring carried out in the context of normal field work.

**Ground-based pesticide applications:**
• Follow the daily field practices below.
• Follow all pesticide use guidelines.
• Follow pest-specific guidelines (Table 2).
• When treating multiple sites, move from least infested to more heavily infested sites.
• Periodically inspect operations and inform the lead worker of any issues and the actions needed to correct them.
• Clean vehicles, equipment and personal gear before leaving the site or entering a new site.
• Conduct post treatment monitoring to ensure treatment success.
• Document observations indicating a new introduction or evidence an existing infestation is spreading.
• Where feasible, restrict public access to disturbed areas and sites known to be infested.

**Aerial pesticide operations:**
• Follow the daily practices below.
• Follow all pesticide use guidelines.
• Follow pest-specific guidelines (Table 2).
• Follow Aircraft Operations Plan.
• Where feasible, restrict public access during the operation.
• Conduct post treatment monitoring to ensure treatment success.
• Clean vehicles, equipment and personal gear before leaving the staging area or entering a new site.

**Minimum Daily Field Practices:**
• Be aware of invasive plants, pests or pathogens in the area where you are working and plan your day accordingly.
• Before entering and before leaving a site, check your clothing, gear, animals, vehicle and equipment and remove caked mud, dirt clods, and reproductive plant parts (seeds, berries, fruit, cones, flower or seed stalks, and roots).
• While on-site, avoid moving through existing patches of invasive species.
• Pay attention while in the field and report new or changing infestations.

**Note:**
• It is unlawful to transport articles regulated under state or federal quarantine out of the quarantined area without a compliance agreement or limited permit.
• It is unlawful to move state listed noxious weeds from one site to another, except by permit. It is important to be aware of regulated species and where they occur.
• It is unlawful to transport water from infested waters, except by permit. It is important to be aware of infested bodies of water and where they occur.
• Do not move water, soil, gravel or raw wood products known to harbor invasive species from infested sites.

For information on noxious weeds, and state and federal quarantines check with the Minnesota Department of Agriculture (MDA).
Special Products and Fuel Wood Permits: DoF Invasive Species Prevention Guidelines

**Description:** Includes all ground operations associated with special forest products such as fir boughs, birch bark, grape vines, mushrooms, and fuel wood sales. Harvesting inorganic materials, such as sand, gravel or rock is covered under Gravel Operations on page 10.

**NOTE - ENFORCEMENT OF THESE GUIDELINES IS DEPENDENT ON EFFECTIVE PUBLIC EDUCATION.**

**Associated Risks:**

**Sub-category: Temporary access routes**

<table>
<thead>
<tr>
<th>Site Disturbance</th>
<th>Equipment Moving On/Off Site</th>
<th>Materials Moving On/Off Site</th>
<th>Overall Risk of Introducing Invasives</th>
<th>Overall Risk of Spreading Invasives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
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</table>

**Sub-category: Harvesting or hauling forest products**

<table>
<thead>
<tr>
<th>Site Disturbance</th>
<th>Equipment Moving On/Off Site</th>
<th>Materials Moving On/Off Site</th>
<th>Overall Risk of Introducing Invasives</th>
<th>Overall Risk of Spreading Invasives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

**Minimum Daily Field Practices:**

- Be aware of invasive plants, pests or pathogens in the area where you are working and plan your day accordingly.
- Before entering and before leaving a site, check your clothing, gear, animals, vehicle and equipment and remove caked mud, dirt clods, and reproductive plant parts (seeds, berries, fruit, cones, flower or seed stalks, and roots).
- While on-site, avoid moving through existing patches of invasive species.
- Pay attention while in the field and report new or changing infestations.

**Note:**

- It is unlawful to transport articles regulated under state or federal quarantine out of the quarantined area without a compliance agreement or limited permit.
- It is unlawful to move state listed noxious weeds from one site to another, except by permit. It is important to be aware of regulated species and where they occur.
- It is unlawful to transport water from infested waters, except by permit. It is important to be aware of infested bodies of water and where they occur.
- Do not move water, soil, gravel or raw wood products known to harbor invasive species from infested sites.

For information on noxious weeds, and state and federal quarantines check with the Minnesota Department of Agriculture (MDA).

**Pre-operation Planning:**

- Review the most current invasive species occurrence data.
- Where possible, control known infestations prior to the planned activity.
- Avoid issuing special products permits on-sites known to be infested with invasive plants, pests, or pathogens. Where not possible, consider the following and write the permit accordingly:
  - Winter harvest if that will meet management objectives.
The invasive species present and when they produce seed – plan to be off the site during that time.
Methods that limit the area disturbed and the length of time soil is exposed.
Parking and staging areas that avoid existing infestations.

- Map staging areas and infested areas to avoid due to existing infestations.
- Plan activities to minimize crossings such as trails and utility corridors that may serve as pathways of spread, and the frequency of site entries.
- Make inspection of vehicles and equipment by DoF personnel part of the start-up procedure.
- Include any needed invasive species specifications in the permit or lease.
- Review invasive species prevention guidelines and map of designated areas with staff members and vendors involved in the project prior to starting field operations.
- Makes arrangements for post-operation monitoring carried out in the context of normal field work.

Temporary access routes:
- Follow the daily field practices above.
- Clean equipment before leaving the shop or bull pin; before crossing any trails or utilize corridors; before moving to a new site; and at the end of each day.
- Where feasible, minimize bare soil areas during construction and maintenance operations.
- Periodically inspect operations and inform the lead worker of any issues and the actions needed to correct them.
- Document observations indicating a new introduction or evidence an existing infestation is spreading.
- Clean vehicles, equipment and personal gear before leaving the site and before entering a new site.
- Where feasible, restrict public access to disturbed areas and sites known to be infested.

During harvest operations:
- Follow the daily field practices above.
- Periodically inspect active operations, inform the lead worker of any issues found and the actions needed to remedy the situation.
- Clean vehicles, equipment and personal gear before leaving the site or before entering a new site.
- Document observations indicating a new introduction or evidence an existing infestation is spreading.
- Where feasible, restrict public access to disturbed areas and sites known to be infested.
Seed Orchard Management, and Seed and Cone Collection: DoF Invasive Species Prevention Guidelines

**Description:** Includes seed and cone collection on all lands and care of state-owned seed orchards.

**Associated Risks:**

<table>
<thead>
<tr>
<th>Seed Collection on State-Owned Land</th>
<th>Overall Risk: Moderate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Disturbance</td>
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<tr>
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<td>Moderate</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Seed Collection at the Area Offices</th>
<th>Overall Risk: Moderate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Disturbance</td>
<td>Equipment Moving On/Off Site</td>
</tr>
<tr>
<td>Low</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>State Seed Orchard Management</th>
<th>Overall Risk: Moderate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Disturbance</td>
<td>Equipment Moving On/Off Site</td>
</tr>
<tr>
<td>Low</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

**Minimum Daily Field Practices:**

- Be aware of invasive plants, pests or pathogens in the area where you are working and plan your day accordingly.
- Before entering and before leaving a site, check your clothing, gear, animals, vehicle and equipment and remove caked mud, dirt clods, and reproductive plant parts (seeds, berries, fruit, cones, flower or seed stalks, and roots).
- While on-site, avoid moving through existing patches of invasive species.
- Pay attention while in the field and report new or changing infestations.

**Note:**

- It is unlawful to transport articles regulated under state or federal quarantine out of the quarantined area without a compliance agreement or limited permit.
- It is unlawful to move state listed noxious weeds from one site to another, except by permit. It is important to be aware of regulated species and where they occur.
- It is unlawful to transport water from infested waters, except by permit. It is important to be aware of infested bodies of water and where they occur.
- Do not move water, soil, gravel or raw wood products known to harbor invasive species from infested sites.

For information on noxious weeds, and state and federal quarantines check with the Minnesota Department of Agriculture (MDA).

**Pre-operation planning at seed orchards:**

- Annually inspect seed orchards before collecting seeds or cones.
- If found infested, halt all activities in the seedbeds, fields or buildings involved until practical eradication or mitigation practices have been developed and implemented.
- Where necessary, review forest pest-specific guidelines (Table 2).
• Conduct post-treatment inspections to ensure treatment success.
• Map staging areas and areas to avoid due to existing infestation.
• Thoroughly clean all collection tools – ladders, clippers, pole saws, etc. of all dirt and debris before use in a place where dirt and plant debris can be disposed of effectively.
• Obtain clean bags from the nursery with which to measure and package seed provided by private collectors.
• Be sure all shipping containers (baskets, bags, etc.) are free of plant material and dirt before use.
• Review invasive species prevention guidelines and map of designated areas with staff members and vendors involved in the project prior to starting field operations.

Seed and cone collection at seed orchards:
• Follow the daily field practices above.
• Upon entering a collection-site, do a site inspection for invasive species. If invasive plants are observed, alert all collectors to avoid the area, collect in the un-infested areas first.
• Do not collect seeds or cones that are obviously infected or damaged due to insects, fungi, rusts or other pests.
• Remove all plant debris before placing seed or cones in shipping containers.
• Dispose of all debris in a dumpster. Avoid using nursery green dumps because this may result in further movement of seeds or plant parts.
• After use, clean containers either away from the nursery or in a place where dirt and plant debris can be disposed of effectively. When using burlap bags, turn them inside out and shake them vigorously.
• Thoroughly clean all facilities used for handling seeds, cones or branches (ex. Eveleth drive-in coolers); vehicles used for transporting seeds, cones or branches; and all equipment, tools and personal gear after each use and before returning to the nursery.

State seed orchard maintenance:
• Follow the daily field practices above.
• Thoroughly clean vehicles, equipment and personal gear before entering any seed orchard and before returning to the nursery. This is particularly important before and after using mowing equipment because seeds and plant parts easily stick to mower decks and flair mowers.

Pre-operation planning at area offices collecting seed:
• Locate a site with a concrete floor.
• Annually inspect the office staging area for invasive species and treat as needed to maintain a pest free space.
• Thoroughly clean all collection tools – ladders, clippers, pole saws, etc. of all dirt and debris before use in a place where dirt and plant debris can be disposed of effectively.
• Obtain clean bags from the nursery with which to measure and package seed provided by private collectors.
• Be sure all shipping containers (baskets, bags, etc.) are free of plant material and dirt before use.
• Review invasive species prevention guidelines and map of designated areas with staff members and vendors involved in the project prior to starting field operations.

Seed collection at Area Offices:
• Sweep the concrete staging area daily and dispose of all sweepings in a dumpster.
• Remove all plant debris before placing seed or cones in bags. Dispose of all debris in a dumpster.
• Measure, seal, store and transport filled bags such that the outside of the bags remains free of soil, seeds, bark, etc.
• After use, clean shipping containers either away from the nursery or in a place where dirt and plant debris can be disposed of effectively. When using burlap bags, turn them inside out and shake them vigorously.
• Thoroughly clean vehicles, equipment, tools and personal gear before entering the nursery.
Stand Improvement and Protection: DoF Invasive Species Prevention Guidelines

Description: Includes the use of small power and hand tools and labor to accomplish the following activities: mechanical & chemical release, cleaning, spacing, pruning, bud capping, and application of repellents. The use of large equipment in stand thinning or cleaning operations, and installation of deer exclosures or fencing is covered under timber harvest operations on page 14.

Associated Risks:

<table>
<thead>
<tr>
<th>Site Disturbance</th>
<th>Equipment Moving On/Off Site</th>
<th>Materials Moving On/Off Site</th>
<th>Overall Risk of Introducing Invasives</th>
<th>Overall Risk of Spreading Invasives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

Minimum Daily Field Practices:

- Be aware of invasive plants, pests or pathogens in the area where you are working and plan your day accordingly.
- Before entering and before leaving a site, check your clothing, gear, animals, vehicle and equipment and remove caked mud, dirt clods, and reproductive plant parts (seeds, berries, fruit, cones, flower or seed stalks, and roots).
- While on-site, avoid moving through existing patches of invasive species.
- Pay attention while in the field and report new or changing infestations.

Note:

- It is unlawful to transport articles regulated under state or federal quarantine out of the quarantined area without a compliance agreement or limited permit.
- It is unlawful to move state listed noxious weeds from one site to another, except by permit. It is important to be aware of regulated species and where they occur.
- It is unlawful to transport water from infested waters, except by permit. It is important to be aware of infested bodies of water and where they occur.
- Do not move water, soil, gravel or raw wood products known to harbor invasive species from infested sites.

For information on noxious weeds, and state and federal quarantines check with the Minnesota Department of Agriculture (MDA).

Pre-operation Planning:

- Review the most current invasive species occurrence data.
- Where possible and where invasives will negatively impact the desired outcome of the operation, control known infestations prior to the planned activity.
- Map landings and staging areas and areas to avoid due to existing infestations.
- When consistent with management objectives and site conditions, consider winter harvest to minimize site disturbance.
- Plan activities to minimize crossings such as trails and utility corridors that may serve as pathways of spread, and the frequency of site entries.
- Make inspection of vehicles and equipment by DoF personnel part of the start-up procedure.
- Include any needed invasive species specifications in the bid documents, contract or lease.
- Review invasive species prevention guidelines and map of designated areas with staff members and vendors involved in the project prior to starting field operations.
- Make arrangements for post-operation monitoring carried out in the context of normal field work.
During operations:

- Follow the daily field practices above.
- Periodically inspect active operations, inform the lead worker of any issues found and the actions needed to remedy the situation.
- Document observations indicating a new introduction or evidence an existing infestation is spreading.
- Clean vehicles, equipment and personal gear before leaving the site or before entering a new site.
- Where feasible, restrict public access to disturbed areas and sites known to be infested.
Seeding Operations: DoF Invasive Species Prevention Guidelines

Description: Includes aerial seeding and direct ground seeding operations

Associated Risks:

Sub-category: Direct Hardwood Seeding for Reforestation Purposes. Overall Risk: Moderate

<table>
<thead>
<tr>
<th>Site Disturbance</th>
<th>Equipment Moving On/Off Site</th>
<th>Materials Moving On/Off Site</th>
<th>Overall Risk of Introducing Invasives</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Moderate</td>
<td>High</td>
<td>Moderate</td>
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<td>Moderate</td>
</tr>
</tbody>
</table>

Sub-category Direct Conifer Seeding Overall Risk: Low

<table>
<thead>
<tr>
<th>Site Disturbance</th>
<th>Equipment Moving On/Off Site</th>
<th>Materials Moving On/Off Site</th>
<th>Overall Risk of Introducing Invasives</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
<td>Low</td>
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</table>

Sub-category: Aerial Seeding Overall Risk: Low

<table>
<thead>
<tr>
<th>Site Disturbance</th>
<th>Equipment Moving On/Off Site</th>
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<td>Low</td>
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</tbody>
</table>

Minimum Daily Field Practices:

- Be aware of invasive plants, pests or pathogens in the area where you are working and plan your day accordingly.
- Before entering and before leaving a site, check your clothing, gear, animals, vehicle and equipment and remove caked mud, dirt clods, and reproductive plant parts (seeds, berries, fruit, cones, flower or seed stalks, and roots).
- While on-site, avoid moving through existing patches of invasive species.
- Pay attention while in the field and report new or changing infestations.

Note:

- It is unlawful to transport articles regulated under state or federal quarantine out of the quarantined area without a compliance agreement or limited permit.
- It is unlawful to move state listed noxious weeds from one site to another, except by permit. It is important to be aware of regulated species and where they occur.
- It is unlawful to transport water from infested waters, except by permit. It is important to be aware of infested bodies of water and where they occur.
- Do not move water, soil, gravel or raw wood products known to harbor invasive species from infested sites.

For information on noxious weeds, and state and federal quarantines check with the Minnesota Department of Agriculture (MDA).

Pre-operation planning:

- Review the most current invasive species occurrence data.
- Include any needed invasive species specifications in the bid documents, contract, permit or lease.
- Control known infestations prior to the planned activity.
- Map designated staging areas, and infested areas to avoid due to existing infestations.
• Use native seed mixes and locate sources that are free of weed seeds.
• Locate sources of other needed materials such as mulch or stabilization mats which are free of weed seeds.
• Require contractors to thoroughly clean vehicles, equipment and personal gear prior to starting the project as a condition of operation.
• Make inspection of vehicles and equipment by DoF personnel part of the start-up procedure.
• Include any needed invasive species specifications in the bid documents, contract or lease.
• Review invasive species prevention guidelines and map of designated areas with staff members and vendors involved in the project prior to starting field operations.
• Makes arrangements for post-operation monitoring carried out in the context of normal field work.

**All hardwood seeding operations:**
• Follow the daily field practices above.
• Clean equipment before leaving the shop or bull pin; before crossing any trails or utilize corridors; before moving to a new site; and at the end of each day.
  - Periodically inspect operations and inform the lead worker of any issues and the actions needed to correct them.
• Document observations indicating a new introduction or evidence an existing infestation is spreading.
• Where feasible, restrict public access to disturbed areas and sites known to be infested.

**Direct conifer seeding:**
• Follow the daily field practices above.
• Clean equipment before leaving the shop or bull pin; before crossing any trails or utilize corridors; before moving to a new site; and at the end of each day.
• Since site preparation is done one year in advance before the actual seeding, follow the guidelines outlined for prescribed burns and site preparation.
• On-sites infested with Reed Canary grass, follow pest-specific management guidelines to control this invasive plant prior to seeding.
• Periodically inspect operations and inform the lead worker of any issues and the actions needed to correct them.
• Document observations indicating a new introduction or evidence an existing infestation is spreading.

**Aerial seeding:**
• Follow the daily field practices above.
• Clean vehicles, equipment and personal gear before leaving the site and before entering a new staging area.
• Inspect landing and loading sites for invasive species and treat as needed and funding allows.
• Where treatment isn’t possible, consider moving the landing and loading site.
• Document observations indicating a new introduction or evidence an existing infestation is spreading.
Facility Maintenance: DoF Invasive Species Prevention Guidelines

Description: Includes maintenance of area office or workstation grounds and equipment located at the facility. Also includes maintenance of windbreaks and fences and off-site debris and garbage pick-up.

Associated Risks:

<table>
<thead>
<tr>
<th>Sub-category: fences and windbreaks</th>
<th>Overall Risk: Moderate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Disturbance</td>
<td>Equipment Moving On/Off Site</td>
</tr>
<tr>
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<td>Moderate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sub-category: debris and garbage pick-up</th>
<th>Overall Risk: Moderate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Disturbance</td>
<td>Equipment Moving On/Off Site</td>
</tr>
<tr>
<td>Low</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sub-category: Maintenance of Office Grounds and Equipment</th>
<th>Overall Risk: Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Disturbance</td>
<td>Equipment Moving On/Off Site</td>
</tr>
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<td>Low</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

Minimum Daily Field Practices:
- Be aware of invasive plants, pests or pathogens in the area where you are working and plan your day accordingly.
- Before entering and before leaving a site, check your clothing, gear, animals, vehicle and equipment and remove caked mud, dirt clods, and reproductive plant parts (seeds, berries, fruit, cones, flower or seed stalks, and roots).
- While on-site, avoid moving through existing patches of invasive species.
- Pay attention while in the field and report new or changing infestations.

Note:
- It is unlawful to transport articles regulated under state or federal quarantine out of the quarantined area without a compliance agreement or limited permit.
- It is unlawful to move state listed noxious weeds from one site to another, except by permit. It is important to be aware of regulated species and where they occur.
- It is unlawful to transport water from infested waters, except by permit. It is important to be aware of infested bodies of water and where they occur.
- Do not move water, soil, gravel or raw wood products known to harbor invasive species from infested sites.

For information on noxious weeds, and state and federal quarantines check with the Minnesota Department of Agriculture (MDA).

Pre-operation Planning:
- Establish a cleaning site at the facility or locate one near-by.
- Be sure rinse water does not drain into a ditch a native area where weed seeds can become established.
- Thoroughly clean vehicles, equipment and personal gear before the start of the season.
• Inspect and if needed, replace any required personal protection gear (face shield for high-pressure washers, for instance).
• Review the most current invasive species occurrence data.
• Where possible and where invasives will negatively impact the desired outcome of the operation, control known infestations prior to any planned activities.
• Map staging areas and areas to avoid due to existing infestations.
• Plan activities to minimize crossings such as trails and utility corridors that may serve as pathways of spread, and the frequency of site entries.
• Locate sources of materials needed for temporary road construction such as timber mats, gravel, or soil stabilization rolls, which are free of weed seeds and forest pests.
• Review prevention guidelines and map of designated areas with support staff members and vendors involved in the project prior to starting field operations.
• Arrange for post-operation monitoring carried out in the context of normal field work.

General maintenance of facility and on-site equipment:
• Follow the daily field practices above.
• Regularly clean the wash station and any vehicles, equipment or personal gear used in the field.
• Dispose of sweepings, such as mud and plant debris in a dumpster.
• Be sure any new plantings are from a reputable nursery and don’t contain weed seeds or forest pests.
• Annually inspect the grounds for invasive species infestations, report and treat as needed.

Fence and windbreak maintenance:
• Follow the daily field practices above.
• Monitor windbreaks and fence lines for invasive species infestations and treat as needed.
• If treatment isn’t feasible, avoid infested areas while in seed.
• Clean vehicle, equipment and personal gear before going to a new site.
• Report new or spreading infestations.

Off-site debris and garbage pick-up:
• Follow the daily practices above.
• Avoid infested areas while in seed.
• Contain or cover all debris and garbage before leaving the site, so that any invasive species present are not spread in transit.
• Clean vehicle, equipment and personal gear before going to a new site.
• Report new or spreading infestations.
Land Transactions: DoF Invasive Species Prevention Guidelines

Description: Includes acquisition, sale, exchange, lease, easement, and permits on state land

Associated Risks:

Sub-category: Easements, Leases, Utility Licenses and Access Permits

<table>
<thead>
<tr>
<th>Site Disturbance</th>
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<tr>
<td>Moderate</td>
<td>High</td>
<td>Moderate</td>
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</table>

Sub-category: Acquisition or Sale

<table>
<thead>
<tr>
<th>Site Disturbance</th>
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</table>

Minimum Daily Field Practices:

- Be aware of invasive plants, pests or pathogens in the area where you are working and plan your day accordingly.
- Before entering and before leaving a site, check your clothing, gear, animals, vehicle and equipment and remove caked mud, dirt clods, and reproductive plant parts (seeds, berries, fruit, cones, flower or seed stalks, and roots).
- While on-site, avoid moving through existing patches of invasive species.
- Pay attention while in the field and report new or changing infestations.

Note:

- It is unlawful to transport articles regulated under state or federal quarantine out of the quarantined area without a compliance agreement or limited permit.
- It is unlawful to move state listed noxious weeds from one site to another, except by permit. It is important to be aware of regulated species and where they occur.
- It is unlawful to transport water from infested waters, except by permit. It is important to be aware of infested bodies of water and where they occur.
- Do not move water, soil, gravel or raw wood products known to harbor invasive species from infested sites.

For information on noxious weeds, and state and federal quarantines check with the Minnesota Department of Agriculture (MDA).

Land acquisition or sale:

- During site visits, follow the daily practices above.
- Revise the site assessment checklist to document presence of invasive species or conditions favorable to invasive species.
- Require mitigation of invasive species as a condition of privately initiated exchanges that are not of significant benefit to the state.
- Otherwise, provide for mitigation of invasive species after the acquisition.
- Document the presence of invasive species or conditions favorable to invasive species as part of the timber appraisal process prior to sale.
- Raise invasive mitigation priority on lands for sale, provide mitigation strategies to the purchaser, or require mitigation as a condition of the sale.
Pre-operation Planning:
• Review the most current invasive species occurrence data.
• Where possible and where invasives will negatively impact the desired outcome of the operation, control known infestations prior to executing the permit or lease.
• Where treatment is not possible, consider denying the permit OR excluding the infested portion of the stand from the permit or lease area.
• Map landings, staging areas and areas to avoid due to existing infestations.
• Make obstructing access upon lease or permit expiration part of the conditions.
• Require that all pesticides be reviewed and approved by the DNR prior to use.
• Make annual pesticide use reports part of the lease conditions.
• For haying operations, note history of chemical treatments and any labeled wait periods for use as feed, mulch, organic matter or site prep. Include in the permit language as needed.
• Include any needed invasive species specifications in the bid documents, contract, lease or permit.
• Review invasive species prevention guidelines and map of designated areas with staff members and vendors involved in the project prior to starting field operations.
• Make arrangements for an inspection when the permit or lease expires.

Easements, Leases, Utility Licenses and Access Permits:
• Require lessee, licensee or permit holder to following daily field practices while working on DNR lands.
• Clean equipment before leaving the shop or bull pin; before crossing any trails or utilize corridors; before moving to a new site; and at the end of each day.
• Minimize crossings such as trails and utility corridors that may serve as pathways of spread, and the frequency of site entries.
• Minimize the frequency of site entries.
• Follow all other invasive species conditions as spelled out in the lease or permit.
• Reclaim land upon lease termination: Get bare soils covered as quickly as possible; use non-invasive plants or seed mixes to reclaim exposed soil.

Haying Sites:
• Follow the daily field practices above.
• Clean equipment before leaving the shop or bull pin; before crossing any trails or utilize corridors; before moving to a new site; and at the end of each day.
• Honor any labeled wait periods for hay used as animal feed, mulch or organic matter or site prep.
• Minimize crossings such as trails and utility corridors that may serve as pathways of spread, and the frequency of site entries.
• Minimize the frequency of site entries.
• Follow all other invasive species conditions as spelled out in the lease or permit.
• Document observations indicating a new introduction or evidence an existing infestation is spreading.
**General Field Visits: DoF Invasive Species Prevention Guidelines**

**Description:** Includes inventories, stand exams, regeneration checks, native plant community assessment (ECS) work, field surveys, both urban and rural public assists and enforcement activities

**Associated Risks:**

<table>
<thead>
<tr>
<th>Site Disturbance</th>
<th>Equipment Moving On/Off Site</th>
<th>Materials Moving On/Off Site</th>
<th>Overall Risk of Introducing Invasives</th>
<th>Overall Risk of Spreading Invasives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Moderate</td>
<td>Low</td>
</tr>
</tbody>
</table>

Minimum Daily Field Practices:

- Be aware of invasive plants, pests or pathogens in the area where you are working and plan your day accordingly.
- Before entering and before leaving a site, check your clothing, gear, animals, vehicle and equipment and remove caked mud, dirt clods, and reproductive plant parts (seeds, berries, fruit, cones, flower or seed stalks, and roots).
- While on-site, avoid moving through existing patches of invasive species.
- Pay attention while in the field and report new or changing infestations.

**Note:**

- It is unlawful to transport articles regulated under state or federal quarantine out of the quarantined area without a compliance agreement or limited permit.
- It is unlawful to move state listed noxious weeds from one site to another, except by permit. It is important to be aware of regulated species and where they occur.
- It is unlawful to transport water from infested waters, except by permit. It is important to be aware of infested bodies of water and where they occur.
- Do not move water, soil, gravel or raw wood products known to harbor invasive species from infested sites.

For information on noxious weeds, and state and federal quarantines check with the Minnesota Department of Agriculture (MDA).

**Pre-operation Planning:**

- Review the most current invasive species occurrence data, being sure it’s up-to-date.
- Be aware of areas to avoid due to existing infestations.
- Be aware of state laws regulating the transport of invasive species.
- Plan work to minimize crossings such as trails and utility corridors that may serve as pathways of spread, and the frequency of site entries.
- Plan work to minimize the frequency of site entries.

**All Related Activities:**

- Follow the daily practices above.
- When collecting plant samples for plant identification or pest diagnosis take a photo first. Then put the sample in a sealed bag to avoid spreading any seeds or plant parts. Submit the photo with the sample. Once identified, reseal the bag and carefully dispose of any unknown or invasive plant specimens in a sealed bag or container.
- When infestations are found on-site, be sure to clean vehicle, equipment and personal gear before leaving the site.
• When infestations are found on private lands, alert the landowners to the risk of invasive species and advise them of any recommended monitoring and management practices needed.
• Report any new or spreading infestations found.
### IV PEST-SPECIFIC PREVENTION GUIDELINES

<table>
<thead>
<tr>
<th>Terrestrial plants:</th>
<th>Sanitation</th>
<th>Treatment</th>
<th>Prevention</th>
<th>Other</th>
<th>Status</th>
</tr>
</thead>
</table>
| Woody species       |            | • Girdle berried plants.  
• Cut or brush hog small trees and shrubs. | • Cut & treat stump or basal treat woody species.  
• Spot or broadcast spray seedlings. | • Pile and burn tops rather than hauling.  
• Minimize the number of brush piles created. | • Transporting buckthorn requires a permit.  
• Prescribed fire useful in some settings. | • Distribution varies by species.  
• Small isolated infestations warrant treatment. |
| Herbaceous species  |            | • Check clothing, gear, vehicle and equipment and remove caked mud, dirt clods, and reproductive plant parts. | • Spot or broadcast spray herbaceous plants. | • Cut or mow prior to seed set.  
• Avoid traveling through infestations.  
• Schedule work from least to most infested areas. | • Treatment varies by species. | • Distribution varies by species.  
• Small isolated infestations warrant treatment. |

<table>
<thead>
<tr>
<th>Terrestrial insects/ animals:</th>
<th>Sanitation</th>
<th>Treatment</th>
<th>Prevention</th>
<th>Other</th>
<th>Status</th>
</tr>
</thead>
</table>
| Exotic earthworms           |            | • Check clothing, gear, vehicle and equipment and remove caked mud and dirt clods. | • Brush soil off before entering or exiting a site.  
• Wash vehicles and equipment taken off highway on a weekly basis. | • Check with MDA to ensure compliance with state and federal quarantines.  
• Support state and federally guided treatment efforts. | • Distribution tends to vary by distance from lakes.  
• The Asian jumping worm has been found in the metro area.  
• For more information, consult Great Lakes Worm Watch Great Lakes Worm Watch. |
| Gypsy moth (GM)             |            | • Process wood from infested areas prior to April 1st. | • MDA uses mating disruption for low density populations.  
• BtK is used for high density populations.  
• Insecticidal oil or soap can be used on individual egg masses. | • Inspect belongings for life stages. If found, scrap off and dispose before leaving the site. | • Check with MDA to ensure compliance with state and federal quarantines.  
• Support state and federally guided treatment efforts. | • For infested counties and GM quarantine regulations, check with MDA.  
• Any article left outdoors during the growing season may be regulated. |
<table>
<thead>
<tr>
<th>Pathogens</th>
<th>Sanitation</th>
<th>Treatment</th>
<th>Prevention</th>
<th>Other</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Emerald Ash Borer (EAB)</strong></td>
<td>• Debark and remove ½” of sapwood.</td>
<td>• Systemic insecticides, applied through trunk injection or soil drench.</td>
<td>• Avoid moving ash or ash products.</td>
<td>• Check with MDA to ensure compliance with state and federal quarantines.</td>
<td>• For infested counties and EAB quarantine regulations, check with MDA.</td>
</tr>
<tr>
<td></td>
<td>• Chip or process wood from infested areas prior to April 1st.</td>
<td>• Heat wood to 160 degrees and hold for 75 minutes.</td>
<td>• Don’t move firewood.</td>
<td>• Support state and local treatment efforts.</td>
<td>• Ash and all hardwood firewood are regulated.</td>
</tr>
<tr>
<td></td>
<td>• Heat wood to 160 degrees and hold for 75 minutes.</td>
<td>• Kiln dry infested wood prior to April 1st.</td>
<td>• Check with MDA to ensure compliance with state and federal quarantines.</td>
<td>• Ash and all hardwood firewood are regulated.</td>
<td></td>
</tr>
<tr>
<td><strong>Asian longhorned beetle (ALB)</strong></td>
<td>• Harvest dead and dying trees prior to April 1st.</td>
<td>• Systemic insecticides, applied through trunk injection or soil drench.</td>
<td>• Don’t move firewood.</td>
<td>• Check with MDA to ensure compliance with state and federal quarantines.</td>
<td>• No infestations are known to occur in MN.</td>
</tr>
<tr>
<td></td>
<td>• Chip, debark, burn or process infested wood prior to April 1st.</td>
<td>• Heat wood to 160 degrees and hold for 75 minutes.</td>
<td>• Don’t move firewood.</td>
<td>• Support state and local treatment efforts.</td>
<td>• Nearest infestations are in MI and Canada.</td>
</tr>
<tr>
<td></td>
<td>• Heat wood to 160 degrees and hold for 75 minutes.</td>
<td>• Kiln dry infested wood prior to April 1st.</td>
<td>• Check with MDA to ensure compliance with state and federal quarantines.</td>
<td>• The sirex wood wasp is not federally regulated.</td>
<td></td>
</tr>
<tr>
<td><strong>Sirex woodwasp</strong></td>
<td>• Harvest dead and dying trees prior to April 1st.</td>
<td>• Systemic insecticides, applied through trunk injection or soil drench.</td>
<td>• Don’t move pine firewood.</td>
<td>• Nematode acts as effective biocontrol agent; under testing for potential release in the U.S.</td>
<td>• The entire state is quarantined for pine shoot beetle.</td>
</tr>
<tr>
<td></td>
<td>• Chip, debark, burn or process infested wood prior to April 1st.</td>
<td>• Heat wood to 160 degrees and hold for 75 minutes.</td>
<td>• Don’t move firewood.</td>
<td>• Nearest infestations are in MI and Canada.</td>
<td>• Exporters must certify with USDA. This includes pine boughs.</td>
</tr>
<tr>
<td></td>
<td>• Heat wood to 160 degrees and hold for 75 minutes.</td>
<td>• Kiln dry infested wood prior to April 1st.</td>
<td>• Check with MDA to ensure compliance with state and federal quarantines.</td>
<td>• Douglas fir beetle has been reported in Itasca County.</td>
<td></td>
</tr>
<tr>
<td><strong>Common pine shoot beetle</strong></td>
<td>• Chip, debark, burn or process infested wood prior to April 1st.</td>
<td>• Systemic insecticides, applied through trunk injection or soil drench.</td>
<td>• Don’t move firewood.</td>
<td>• Check with MDA to ensure compliance with state and federal quarantines.</td>
<td>• Douglas fir beetle has been reported in Itasca County.</td>
</tr>
<tr>
<td></td>
<td>• Heat wood to 160 degrees and hold for 75 minutes.</td>
<td>• Heat wood to 160 degrees and hold for 75 minutes.</td>
<td>• Don’t move firewood.</td>
<td>• Check with MDA to ensure compliance with state and federal quarantines.</td>
<td>• Douglas fir beetle has been reported in Itasca County.</td>
</tr>
<tr>
<td><strong>Exotic bark beetles</strong></td>
<td>• Harvest dead and dying trees prior to April 1st.</td>
<td>• Systemic insecticides, applied through trunk injection or soil drench.</td>
<td>• Kiln dry infested wood prior to April 1st.</td>
<td>• Don’t move pine firewood.</td>
<td>• Check with MDA to ensure compliance with state and federal quarantines.</td>
</tr>
<tr>
<td></td>
<td>• Chip, debark, burn or process infested wood prior to April 1st.</td>
<td>• Heat wood to 160 degrees and hold for 75 minutes.</td>
<td>• Kiln dry infested wood prior to April 1st.</td>
<td>• Check with MDA to ensure compliance with state and federal quarantines.</td>
<td>• An external quarantine has been placed on states with mountain pine beetle.</td>
</tr>
<tr>
<td></td>
<td>• Heat wood to 160 degrees and hold for 75 minutes.</td>
<td>• Kiln dry infested wood prior to April 1st.</td>
<td>• Check with MDA to ensure compliance with state and federal quarantines.</td>
<td>• An external quarantine has been placed on states with mountain pine beetle.</td>
<td>• Douglas fir beetle has been reported in Itasca County.</td>
</tr>
<tr>
<td><strong>Dutch elm disease (DED)</strong></td>
<td><strong>Harvest dead and dying trees prior to April 1st.</strong>&lt;br&gt;<strong>Disrupt root grafts prior to felling.</strong>&lt;br&gt;<strong>Chip, debark, burn, process or tightly cover infested wood prior to April 1st.</strong></td>
<td><strong>Cover and season infested firewood for a year before uncovering or distributing.</strong></td>
<td><strong>During pruning operations, sterilize all tools before moving to non-symptomatic trees.</strong>&lt;br&gt;<strong>Don’t move firewood.</strong></td>
<td><strong>Avoiding pruning during the growing season.</strong>&lt;br&gt;<strong>Fungicide injections can protect individual trees.</strong></td>
<td><strong>Occurs throughout the state.</strong>&lt;br&gt;<strong>Is regulated under local ordinance.</strong>&lt;br&gt;<strong>Control in rural areas is not feasible.</strong></td>
</tr>
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</tr>
<tr>
<td><strong>Oak Wilt (OW)</strong></td>
<td><strong>Harvest dead and dying trees prior to April 1st.</strong>&lt;br&gt;<strong>Disrupt root grafts prior to felling.</strong>&lt;br&gt;<strong>Chip, debark, burn, process or tightly cover infested wood prior to April 1st.</strong></td>
<td><strong>Cover and season infested firewood for a year before uncovering or distributing.</strong></td>
<td><strong>Sterilize tools before moving to non-symptomatic trees.</strong>&lt;br&gt;<strong>Avoid wounding oaks during April, May and June.</strong>&lt;br&gt;<strong>Don’t move firewood</strong></td>
<td><strong>Fungicide injections can protect individual trees.</strong></td>
<td><strong>Is not known to occur in parts of the state.</strong>&lt;br&gt;<strong>Is regulated under local ordinance.</strong>&lt;br&gt;<strong>Control advised where red or pin oaks are critical components of the stand.</strong>&lt;br&gt;<strong>For the current distribution of OW, see the DNR website.</strong></td>
</tr>
<tr>
<td><strong>Annosus root rot</strong></td>
<td><strong>Brush soil off before entering or exiting a site.</strong>&lt;br&gt;<strong>Wash vehicles and equipment taken off highway on a weekly basis.</strong></td>
<td><strong>Treat fresh cut conifer stumps with Cellu-Treat within 24 hrs to prevent infection.</strong>&lt;br&gt;<strong>Don’t move firewood.</strong></td>
<td><strong>Prevention is critical as there is no control.</strong>&lt;br&gt;<strong>Once on-site, it’s there for good.</strong></td>
<td><strong>Is known to occur in SE Minnesota.</strong>&lt;br&gt;<strong>Occurs throughout much of Wisconsin and is likely to be in MN.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Thousand canker disease of walnut</strong></td>
<td><strong>Harvest dead and dying trees prior to April 1st.</strong>&lt;br&gt;<strong>Chip, debark, burn, process or tightly cover infested wood prior to April 1st.</strong></td>
<td><strong>Cover and season infested firewood for a year before uncovering or distributing.</strong></td>
<td><strong>Sterilize tools before moving to non-symptomatic walnut.</strong></td>
<td><strong>Check with MDA to ensure compliance with state and federal quarantines.</strong></td>
<td><strong>Not known to occur in MN</strong>&lt;br&gt;<strong>For more information see the MDA external quarantine which regulates walnut imports.</strong>&lt;br&gt;<strong>Nearest known infestation is TN.</strong></td>
</tr>
</tbody>
</table>
V  GLOSSARY

Key terms and acronyms mentioned in the Invasive Species Operational Order 113 and Companion Handbook are identified in the following list.

**Check** - The visual examination of equipment for the presence or absence of invasive organism’s plants and viable plant pieces.

**Clean** – To follow the DoF Daily Field Practice: Before entering and leaving a site, check your clothing, gear, animals, vehicle, and equipment and remove caked mud, dirt clods, and reproductive plant parts (seeds, berries, fruit, cones, flower or seed stalks, and roots).

**Emergency** – A sudden occurrence of a serious and urgent nature that threatens life or property that requires immediate action.

**Infested site** – A site or area that has a known population of a listed invasive species.

**Infested water** – Waters designated by the Commissioner of Natural Resources that contain a population of an aquatic invasive species that could spread to other waters if use of the water and related activities are not regulated to prevent this. (Note: waters containing pathogens are not designated as infested waters as of 5/30/07.)

**Inspect** – The visual examination of equipment for the presence or absence of invasive organism’s plants and viable plant pieces.

**Invasive species** – A nonnative species that causes or may cause economic or environmental harm or harm to human health; or threatens or may threaten natural resources or the use of natural resources in the state (M.S. 84D).

**Invasive species-free** – Means free of those invasive species listed in Division Policy 3. Materials which contain other invasive species may be considered invasive species-free if the following requirement is met.

- Site upon which the materials were obtained was treated to reduce the likelihood of spreading the invasive species as outlined in discipline guidelines. Treatment method can include, but is not limited to: burning, mowing, cutting, mechanical methods, or chemicals.

**Monitor** – in the context of normal field work, to watch for and document new or expanding populations of invasive species.

**Native species** – An animal or plant species naturally present and reproducing within this state or that naturally expands from its historic range into this state (M.S. 84D).

**Nonnative species** – A species that is not a native species (M.S. 84D).

**Noxious weed** – See state prohibited and restricted noxious weeds.

**Pathogen** – Any organism capable of producing a disease state.
Pathogens of concern – Diseases as determined by the Commissioner of Natural Resources that could impact populations of aquatic life.

Plant pests – Includes, but is not limited to, an invasive species or any pest of plants, agricultural commodities, horticultural products, nursery stock, or non-cultivated plants by organisms such as insects, snails, nematodes, fungi, viruses, bacterium, microorganisms, mycoplasma-like organisms, weeds, plants, and parasitic plants.

Prohibited invasive species (of wild animals and aquatic plants) – an invasive species that has been designated as a prohibited exotic species in a rule adopted by the commissioner [of Natural Resources] under section 84D.12 (M.S. 84D).

Regulated invasive species (of wild animals and aquatic plants) – an invasive species that has been designated as a regulated exotic species in a rule adopted by the commissioner [of Natural Resources] under section 84D.12 (M.S. 84D).

State prohibited and restricted noxious weeds – an annual, biennial, or perennial plant that the commissioner [of Agriculture] designates to be injurious to public health, the environment, public roads, crops, livestock, or other property (MS 18.77, subdivision 8 and MR 1505.0750 subpart 8).

Work site – any specific site where work activities are taking place. This includes both aquatic and terrestrial sites.
VI REFERENCES

Programs and Policies:
- MNDNR Operations Orders Index – Operational Order 113
- Operational Order 113 References and Resources
- Division Policy 3 - Invasive Species Management on State Forest Lands
- MN Department of Agriculture (MDA) Noxious Weed Program
- MDA Emerald Ash Borer Program
- MDA Gypsy Moth Program - quarantine regulations
- USDA Animal and Plant Health Inspection Service (APHIS), Plant Protection and Quarantine - federal plant, animal, insect and disease regulations

Plant Identification and Management:
- National Early Detection and Distribution Mapping - EDDMapS/Midwest
- Terrestrial Invasive Species, MNDNR
- Noxious and Invasive Weeds, MDA
- Midwest Invasive Species Information Network - Species Training