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| NAME OF SPECIES: Cronartium ribicola<br>Synonyms:<br>Common Name: White pine blister rust<br><br>A. CURRENT STATUS AND DISTRIBUTION | |
| . In Wisconsin? | 1. YES ☒ NO ☐ |
| | 2. Abundance: 52 counties surveyed in 1998-2001 and 43 counties were positive for WPBR. Average infection rate statewide was 7.1% in 2001. |
| | 3. Geographic Range: Throughout Wisconsin where white pine is present but lowest in southeastern Wisconsin |
| | 4. Habitat Invaded: Wherever Ribes spp (alternative host) is present. Highest in mesic to wet mesic habitat types<br>Disturbed Areas ☒ Undisturbed Areas ☒ |
| | 5. Historical Status and Rate of Spread in Wisconsin: First documented in 1915 in Polk Cty and spread quickly due to the abundance of Ribes spp. on heavily cut-over lands. |
| | 6. Proportion of potential range occupied: The alternate host (Ribes spp) is present in all counties except 2. White pine is present in most counties outside the southeast and far southwest parts of the state. |
| II. Invasive in Similar Climate Zones | YES x NO ☐<br>Where: |
| III. Invasive in Similar Habitat Types | Forest ☒<br>Other: Wherever white pine grows in natural or planted forests. Most prevalent in dry mesic, mesic and wet mesic habitats where Ribes spp. flourishes in close vicinity to white pine. |
| IV. Habitat Effected | 1. Soil types favored (e.g. sand, silt, clay, or combinations thereof, pH): Found in a wide range of soil types but generally not in very sandy soils where dry conditions near the ground prevent the survival of spores. |
| | 2. Conservation significance of threatened habitats: In parks and natural areas where large old white pine are a valuable part of the forest. |
| V. Native Habitat | 1. List countries and native habitat types: WPBR devastates white pines in Europe, the source of infected white pine stock in Wisconsin. |
| VI. Legal Classification | 1. Listed by government entities? |
| | 2. Illegal to sell? YES ☒ NO ☐<br>Notes: Colorado and Connecticut. |
| B. ESTABLISHMENT POTENTIAL AND LIFE HISTORY TRAITS | |
| I. Life History | 1. Type of plant: NA |
| | 2. Time to Maturity: infection on white pine may exist for many years until tree dies. During this time, the canker produces spores which reinfect Ribes spp. |
| | 3. Length of Seed Viability: 1 year on alternate host, Ribes spp, |

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| | (loses leaves in winter) and many years on white pine. |
| | 4. Methods of Spread: Asexual ☒ Sexual ☒<br>Please note abundance of propagules and and other important information: Prolific spore producer with 5 spore stages during the year, 3 stages on Ribes spp and 2 on white pine. |
| | 5. Hybridization potential: NA |
| II. Climate | 1. Climate restrictions: usually requires sufficient moisture to maintain survival of basidiospores |
| | 2. Effects of potential climate change: NA |
| III. Dispersal Potential | 1.Pathways: Please check all that apply:<br>Intentional: Planting of gooseberry as an ornamental plant or for berry production<br>Other:<br><br>Unintentional:<br>Wind: spores transported by wind which increases rate of infection on stand edges or roadways<br>Water: spore survival is increased in areas of high moisture, wetlands or along waterways. |
| | 2. Distinguishing characteristics that aid in its survival and/or inhibit its control: Because the fungus can survive for many years on large white pine (often undetected), the amount of innoculum in a given area may steadily increase over time. Each year more Ribes become infected which in turn produces more spores for infection of other uninfected pines. |
| IV. Ability to go Undetected | HIGH ☐ MEDIUM ☒ LOW ☐ |
| C. DAMAGE POTENTIAL | |
| I. Competitive Ability | 1. Presence of Natural Enemies: No known natural enemies in North America. |
| | 2. Presence of Competitors: Early successional species. |
| | 3. Rate of Spread: NA<br>HIGH(1-3 yrs) ☐ MEDIUM (4-6 yrs) ☐ LOW (7-10 yrs) ☒ |
| II. Environmental Effects | 1. Alteration of ecosystem/community composition?<br>YES ☒ NO ☐ Notes: May devastate white pine in areas of high infection. |
| | 2. Alteration of ecosystem/community structure?<br>YES NO x Notes: |
| | 3. Alteration of ecosystem/community functions and processes?<br>YES ☒ NO ☐ Notes: White pine was once a very very common and valuable timber tree in Wisconsin. It is now reproducing successfully in many areas. It is important to keep infection rates low so as to maintain it's role in restoring Wisconsin's native forests. |
| | 4. Allelopathic properties? YES ☐ NO ☒<br>Notes: |
| D. SOCIO-ECONOMIC Effects | |
| I. Positive aspects of the species | Notes: Somewhat important timber tree. Very important to |

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| to the economy/society: | esthetics of forests and parks. |
| II. Potential socio-economic effects of restricting use: | Notes: |
| III. Direct and indirect effects : | Notes: Loss of native species. |
| IV. Increased cost to a sector: | Notes: |
| V. Effects on human health: | Notes: |
| **E. CONTROL AND PREVENTION** | |
| I. Detection Capability: | Notes: Identifiable by detection of dead branch often close to the ground on white pine. |
| II. Costs of Prevention (including education; please be as specific as possible): | Notes: Prevention requires education of foresters and landowners about where not to plant white pine or how to eliminate Ribes in surrounding area. Also, education in removal of lower branches of pine or planting buffer rows of alternate tree species. |
| III. Responsiveness to prevention efforts: | Notes: |
| IV. Effective Control tactics: | Mechanical ☒ Biological ☐ Chemical ☒<br>Times and uses: The most effective controls are avoiding areas where Ribes spp is prevalent. Herbicidal removal of small areas of Ribes is possible. Also, pruning lower branches of white pine may be effective as infections are most prevalent near the ground where high humidity increases spore survival and germination on needles. |
| V. Minimum Effort: | Notes: Selection of areas to plant white pine away from Ribes spp. |
| VI. Costs of Control: | Notes: Depends on amount of Ribes present and habitat type. Dry sandy areas require little control. |
| VII. Cost of prevention or control vs. Cost of allowing invasion to occur: | Notes: Allowing infection to build up in an area may devastate young white pine plantation, at least until pines are tall enough to shed lower branches. |
| VIII. Non-Target Effects of Control: | Notes: Broadcast use of herbicides can negatively affect native vegetation. |
| IX. Efficacy of monitoring: | Notes: Monitoring white pine and eliminating infected branches and trees is very effective. |
| X. Legal and landowner issues: | Notes: The majority of infections are probably in white pine plantations. |

## F. REFERENCES USED:

☒ WI DNR
☒ Other

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**Reviewer(s):** S.Dahir
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