

Plant Risk Assessment & Management Protocol for Minnesota

Minnesota Noxious Weed Advisory Committee

Approved November 17, 2020



Introduction, Objectives, & Rationale

The Minnesota Plant Risk Assessment & Management Protocol is intended to serve as a tool for the objective assessment of the potential risks associated with the introduction of non-native, terrestrial plant species into Minnesota and the regulation and management of species documented as being harmful (native and non-native) that are already variously present in the State. Recognizing that decisions to regulate the introduction and use of plants can have significant impacts on plant industries and the livelihoods of people, the protocol has been thoughtfully and carefully designed to incorporate the best scientific information available pertaining to risks. The protocol also strives to balance concerns about potential negative impacts with any recognized benefits associated with the plants in question.

While their numbers are limited, comprising considerably less than 1% of the species introduced (Williamson and Fritter, 1996), examples of non-native plants becoming invasive and subsequently having significant negative impacts on native and cultivated plant communities are well documented. Examples of introduced plants that have had significant negative impacts on Minnesota landscapes and ecosystems include spotted knapweed [*Centaurea stoebe* L. ssp. *micranthos* (Gugler) Hayek], Canada thistle [*Cirsium arvense* (L.) Scop.], purple loosestrife (*Lythrum salicaria* L.), and common buckthorn (*Rhamnus cathartica* L.).

Predicting invasive potential is not an easy task for both statistical and biological reasons (Williamson, 2001). The potential exists for predictive efforts to restrict the introduction of species having economic value, yet still not prevent the introduction of the occasional invasive species (Lonsdale and Smith, 2001). Even with these limitations, prediction remains a useful tool in the effort to prevent the introduction of invasive species. Several traits, including a short juvenile phase, the production of large amounts of viable seed, especially when combined with effective vectors of dissemination such as through the activities of animals, and, perhaps most disturbingly from a horticultural standpoint, the ability to survive under adverse conditions – a desirable trait for horticultural selections – can, however serve as indicators of a plant's invasive potential and the basis for risk assessment and possible regulation.

To these ends, the primary objectives of the Minnesota Plant Risk Assessment & Management Protocol are to:

Provide a science based and objective process for reviewing non-native plants and genotypes.

- Prevent the introduction of non-native plant species that have the potential to become invasive and harm native, agricultural, or managed plant communities in Minnesota.
- Raise awareness of the problems associated with invasive plants and promote cooperative efforts to prevent or minimize any negative effects of future plant introductions or previously introduced plants now documented as being of concern.
- Provide a mechanism for categorizing plants already present in Minnesota from a regulatory perspective based on the provisions of the Minnesota Noxious Weed Law wherein harmful plants are categorized as Prohibited Noxious Weeds on the Eradicate List, Prohibited Noxious Weeds on the Control List, Restricted Noxious Weeds, and Specially Regulated Plants.
- Limit the potential for negative effects of weeds on public health, the environment, public roads, crops, livestock and other property, and ecosystems.

The protocol provides a process for gathering information about the invasive potential of a given species and ultimately using that information to make a recommendation of how the species should be regulated or managed in Minnesota. Great care has been taken to ensure that the protocol is comprehensive and is not biased for or against any species or group of plants – all plants evaluated are subject to the same review process and standards. Dioecious species are, perhaps, unique depending on whether both male and female plants are currently present and their risk will, therefore, be reviewed based on the presence of male plants alone, female plants alone, and both male and female plants being present and the ability to exclude plants of the opposite sex as determined by the Minnesota Noxious Weed Advisory Committee (NWAC). The Protocol recognizes that some plants may require regulation for reasons other than invasive potential including health concerns or significant negative economic impacts. For these reasons, the ability to review and regulate native species is retained, but such regulation should be an uncommon occurrence and reasons for regulating native plants must be clear and convincing.

It is expressly not the intent of this protocol to arbitrarily prevent the introduction and use of non-native plant species in the State of Minnesota. That most plant introductions will not escape cultivation and become invasive and the potential benefits associated with future plant introductions are recognized. History shows, however, that even one bad actor can have significant environmental and economic consequences and justifies the effort to prevent the introduction of such species into the State. To these ends the protocol strives to treat all plants in a standardized, equal, and unbiased fashion and to carefully document the information used to make regulatory decisions.

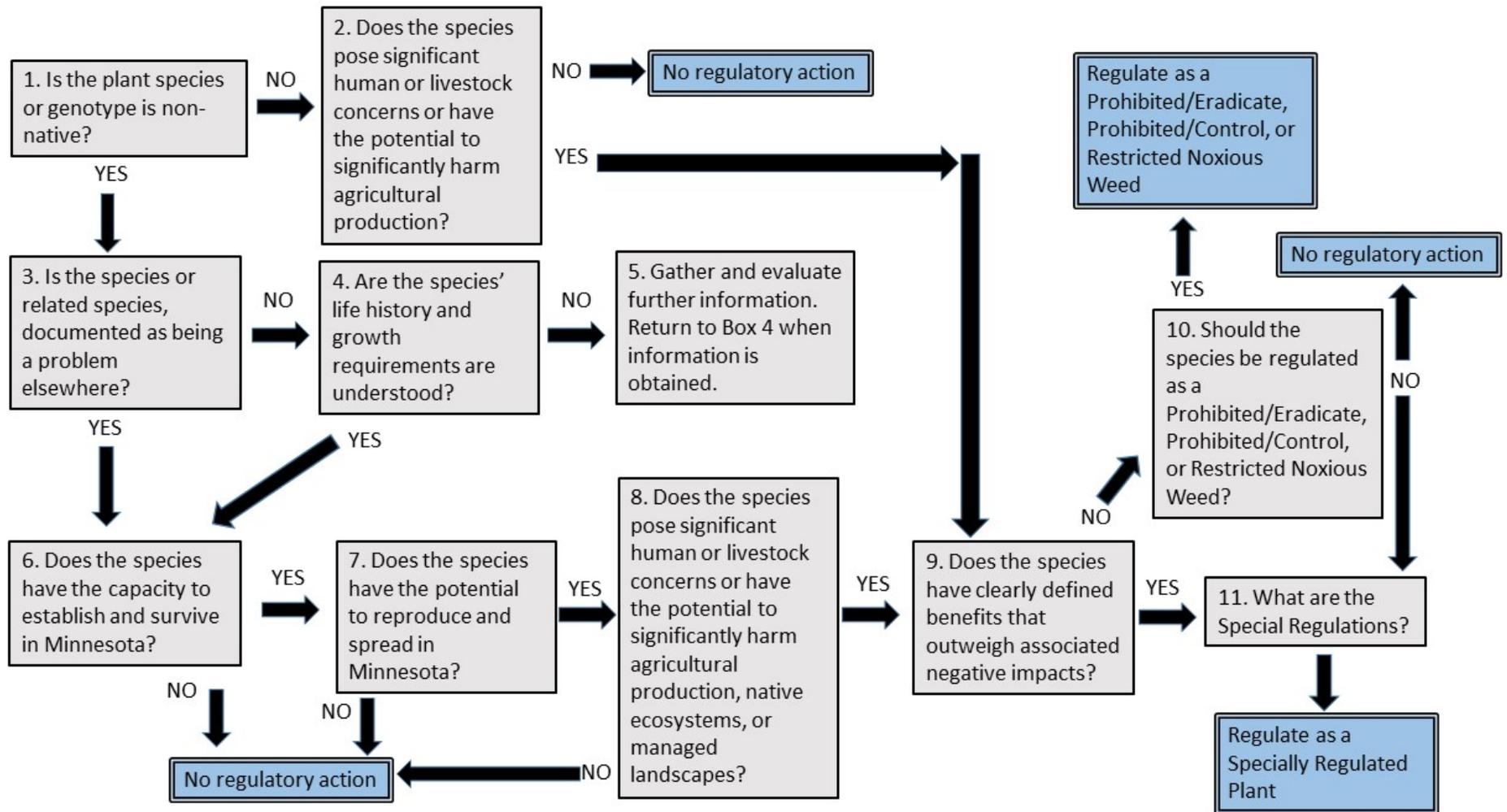
The ultimate goal of this risk assessment protocol is to protect native, agricultural, and managed plant communities, people, livestock, wildlife and property in Minnesota from harmful effects that might be associated with introduced species without unduly hampering new introductions and their potential benefits. To this end, the Minnesota Noxious Weed Advisory Committee (NWAC) encourages continuing input from interested parties to update and improve the effectiveness and objectivity of this protocol.

(Original 2/18/2003; revised 9/22/2010, 2/3/2011, 12/3/2019, 11/17/2020)

Generalized Flow Chart for the Noxious Weed Risk Assessment

The following flow chart and explanation give a broad overview of the risk assessment process. Refer to the in depth questions in this protocol for a more detailed explanation of the process.

Figure of the generalized flow chart for the noxious weed risk assessment:



Text explanation of the generalized flow chart for the noxious weed risk assessment:

This is a generalized diagram of the risk assessment process as a flow chart. When completing the review, there may be points when the reviewer needs to pause to gather more information to complete the review. The questions in the flow chart are listed below.

Box 1: Is the plant species or genotype non-native? If yes go to Box 3, if no go to Box 2.

Box 2: Does the species pose significant human or livestock concerns or have the potential to significantly harm agricultural production? If yes go to Box 9, if no then do not regulate.

Box 3: Is the species, or a related species, documented as being a problem elsewhere? If yes go to Box 6, if no go to Box 4.

Box 4: Are the species' life history and growth requirements understood? If yes go to Box 6, if no go to Box 5.

Box 5: Gather and evaluate further information. Continue to collect data, then once data is gathered, go to Box 4

Box 6: Does the species have the capacity to establish and survive in Minnesota? If yes go to Box 7, if no then do not regulate.

Box 7: Does the species have the potential to reproduce and spread in Minnesota? If yes go to Box 8, if no then do not regulate.

Box 8: Does the species pose significant human or livestock concerns or have the potential to significantly harm agricultural production, native ecosystems, or managed landscapes? If yes go to Box 9, if no then do not regulate.

Box 9: Does the species have clearly defined benefits that outweigh associated negative impacts? If yes go to Box 11, if no go to Box 10.

Box 10: Should the species be regulated as Prohibited/Eradicate, Prohibited/Control, or Restricted Noxious Weed? If yes, regulate the plant as a Prohibited/Eradicate, Prohibited/Control, or Restricted Noxious Weed. If no go to either Box 11 or do not regulate based on the answer to Question 10I.

Box 11: What are the specific regulations proposed? Explain the regulations and regulate as a Specially Regulated Plant.

Risk Assessment Questions

Box 1

1 – IS THE PLANT SPECIES OR GENOTYPE IS NON-NATIVE?

Overview:

The purpose of Box #1 is to separate native species from non-native species and genotypes. As a general rule, native species should not be regulated as noxious weeds. It is recognized, however, that in a limited number of instances regulation of native species may be justified under certain conditions. The Minnesota Department of Natural Resources [MNTaxa: State of Minnesota Vascular Plant Checklist](#) will serve as the authority on what plants are native to Minnesota.

Questions to Consider:

- 1A. Is the species or genotype non-native to Minnesota?
 - Yes → Go to Box #3 of the Plant Risk Assessment & Management Protocol
 - No → Go to Box #2 of the Plant Risk Assessment & Management Protocol

Box 2

2 – DOES THE SPECIES POSE SIGNIFICANT HUMAN OR LIVESTOCK HEALTH CONCERNS OR HAVE THE POTENTIAL TO SIGNIFICANTLY HARM AGRICULTURAL PRODUCTION

Overview:

The purpose of Box #2 is to determine whether there is justification for the regulation of a native species. Although it is envisioned that regulation of native species will be an infrequent occurrence, the ability to review any potentially harmful effects associated with native species and to regulate native plants should remain an option.

Questions to Consider:

- 2A. Does the plant have toxic qualities that pose a significant risk, to livestock, wildlife, or people?
 - Yes → Go to Box #9 of the Plant Risk Assessment & Management Protocol
 - No → Go to Question B below

- 2B. Does the plant cause significant financial losses associated with decreased yields, reduced quality, or increased production costs?
 - Yes → Go to Box #9 of the Plant Risk Assessment & Management Protocol
 - No → THE SPECIES IS NOT BELIEVED TO BE A RISK so should not be regulated

Box 3

3 – IS THE SPECIES, OR A RELATED SPECIES, DOCUMENTED AS BEING A PROBLEM ELSEWHERE?

Overview:

One of the best predictors of invasiveness is whether or not a particular species is invasive in other parts of the world (Reichard, 2001). Box #3 seeks documentation that the plant in question is a problem in habitats similar to those found in Minnesota; if so, there is at least a theoretical chance that the plant could be of concern if it can survive in Minnesota. Experience with the plant in other areas may, thus, be helpful in determining if a plant has the potential to become a problem in Minnesota.

Questions to Consider:

- 3A. Is the plant, or a related species, documented as being a problem elsewhere?
- Yes → Go to Box #6 of the Plant Risk Assessment & Management Protocol
 - No → Go to Box #4 of the Plant Risk Assessment & Management Protocol

Boxes 4 and 5

4 – ARE THE SPECIES' LIFE HISTORY AND GROWTH REQUIREMENTS SUFFICIENTLY UNDERSTOOD?

5 – GATHER AND EVALUATE FURTHER INFORMATION

Overview:

Just because a particular plant has not been documented as being a problem somewhere else doesn't eliminate the possibility that the plant may have the potential to become a problem in Minnesota. To make a sound determination regarding the invasive potential of the plant being evaluated, the plant's life history, tolerances, growth requirements and phenology must be characterized and sufficiently understood to allow for a reliable review of the plant's invasive potential. The information collected at this stage will be needed to answer the questions associated with Boxes #6 and #7 of the Plant Risk Assessment & Management Protocol and ultimately any determination regarding the invasive potential of the plant in question. It is imperative that the information collected be comprehensive, based on the best scientific information available, and well documented.

Questions to Consider:

Box 4:

4A. Are the plants life history and growth requirements well understood?

Yes → Go to Box #6 of the Plant Risk Assessment & Management Protocol

No → Go to Box #5 of the Plant Risk Assessment & Management Protocol

Box 5:

Once additional information is gathered, return to Box 4

Box 6

6 – DOES THE SPECIES HAVE THE CAPACITY TO ESTABLISH AND SURVIVE IN MINNESOTA?

Overview:

Climate conditions in Minnesota, particularly the cold winters, can make it difficult for many non-native plant species to establish and survive in Minnesota. The goal of this "filter" is to remove from consideration those plant species that are very unlikely to persist in the Minnesota climate. If information about a species indicates the possibility that it may be able to tolerate Minnesota conditions, the plant should be evaluated further. Climate is often a primary factor that determines whether a plant will be able to establish and survive in Minnesota. For some species climate change and the projected climate in Minnesota may also be a factor.

Criteria for Decision:

The ability of a plant to become established and survive in Minnesota can be demonstrated in several ways:

- The plant, or a closely related species, is documented as already being present in Minnesota.
- Information on plant hardiness zones, published literature, predicted range maps, and/or confirmed reports indicate the plant is likely to be able to survive in Minnesota.

It is recognized that the ability of a plant to survive in Minnesota and in specific locations will also be dependent on other tolerance factors related to adaptability which should also be considered – soil factors (fertility, pH, etc.), light requirements (full sun vs. various levels of shade tolerance), disturbance factors (disturbed vs. undisturbed sites - flooding/drawdowns, fire, compacted soils, cultivation, herbicide management, etc.), habitat specificity (woodland, prairie, wetland, urban sites, etc.), pest interactions, etc. Reviewers may also take into account future climate conditions in their review if applicable.

Questions to consider:

6A. Is the plant, or a close relative, currently established in Minnesota?

- Yes → Go to Box #7 of the Plant Risk Assessment Protocol
No → Go to Question B below

6B. Has the plant become established in areas having a climate and growing conditions similar to those found in Minnesota?

- Yes → Go to Box #7 of the Plant Risk Assessment Protocol
No → Go to Question C below

6C. Has the plant become established in areas having a climate and growing conditions similar to those projected to be present in Minnesota under future climate projections?

- Yes → Go to Box #7 of the Plant Risk Assessment Protocol
No → THE SPECIES IS NOT BELIEVED TO BE A RISK
Unknown → Go to Box #7 of the Plant Risk Assessment Protocol

Box 7

7 – DOES THE SPECIES HAVE THE POTENTIAL TO REPRODUCE & SPREAD IN MINNESOTA?

Overview:

At this point in the Plant Risk Assessment & Management Protocol, it has been determined that the plant species has a high probability of being able to establish and survive in Minnesota. Box #7 focuses on identifying those species that have a high likelihood of spreading once established. This assessment is largely based on life history characteristics that have been linked with invasiveness in other risk assessment models or in scientific studies. The reviewer should investigate if there are cultivars of the species which are known to differ in reproductive characteristics from the species and note those differences. If the plant is a dioecious species risk may vary depending on whether both male and female plants are currently present. If this is a factor, note how the impacts vary and if there is the ability to exclude plants of one sex. If a species is not regulated and in the future additional information because available that better answers questions in Box 7, then the plant can be chosen by the Noxious Weed Advisory Committee to be re-evaluated.

Criteria for Decision:

If the plant has any of the following characteristics, and no natural controls that are native to Minnesota have been documented to check the spread of the species, the plant is considered to have a high likelihood of reproducing and spreading in Minnesota:

- The species reproduces successfully by vegetative means and the vegetative propagules are readily dispersed to new sites by natural means (wind, water, animals, birds, etc.) or human activity (machinery, transport of agricultural products, etc.).
- The species reproduces successfully by seed and the seeds produced are numerous, cold hardy, and readily dispersed to new areas by natural means (wind, water, animals, birds, etc.) or human activity (machinery, vehicles, transport of agricultural products, etc.).
- The species is self-fertile and produces seeds that are readily dispersed to new sites by natural means (wind, water, animals, birds, etc.) or human activity (machinery, vehicles, transport of agricultural products, etc.).
- The species has the capacity to hybridize with native species resulting in fertile offspring without human intervention.
- The species is a woody vine or shrub that reaches sexual maturity (becomes reproductive) within three years; within five years for tree species.
- The species is documented to spread, despite not fitting any of the above criteria.

If any of the above characteristics apply to the species in question, it should be further evaluated, progressively, against the following criteria:

- The species produces prolific amounts of viable, cold hardy seeds (e.g., purple loosestrife).
- The species exhibits strong seed/seedling vigor including extended dormancy and the ability to establish significant seed banks resulting in increased establishment success.
- The species produces low numbers of viable seeds, but still has a strong ability to become established (e.g., leafy spurge).
- The seeds, and/or vegetative material, have effective dispersal vectors, either by natural means (wind, water, animals, birds, etc.) or by human intervention (by machinery or vehicles).
- There are no existing natural controls, species native to Minnesota, documented to check the spread of the species being evaluated.

Questions to Consider:

7A. Are there cultivars of the plant that are known to differ in reproductive properties from the species?

Yes → Answer the questions for the original species starting with Question B below. When you've completed Questions 7B-I, go to Question 7J and explain which cultivars differ from the species in reproductive potential and how.

No or Unknown → Go to Question B below

7B. Does the plant reproduce by asexual/vegetative means?

Yes → Go to Question C below

No → Go to Question D below

7C. Are the asexual propagules - vegetative parts having the capacity to develop into new plants - effectively dispersed to new areas?

Yes → Go to Question I below

No → Go to Question D below

7D. Does the plant produce large amounts of viable, cold hardy seeds? For woody species, document the average age the species produces viable seed.

Yes → Go to Question G below

No → Go to Question E below

7E. For species that produce low numbers of viable seeds, do they have a high level of seed/seedling vigor or remain viable for an extended period (seed bank)?

Yes → Go to Question G below

No → Go to Question F below

7F. Is the plant self-fertile?

Yes → Go to Question G below

No → Go to Question H below

7G. Are sexual propagules – viable seeds – effectively dispersed to new areas? List and consider all vectors.

Yes → Go to Question I below

No → Go to Question H below

7H. Can the species hybridize with native species (or other introduced species) and produce viable seed and fertile offspring in the absence of human intervention?

Yes → Go to Question I below

No → Go to Question I below

7I. Do natural controls, species native to Minnesota, which have been documented to effectively prevent the spread of the species in question?

Yes → THE SPECIES IS NOT CURRENTLY BELIEVED TO BE A RISK

No → Go to Box #8 of the Plant Risk Assessment Protocol

7J. Was the answer to Question 7A (Are there cultivars that differ in reproductive properties from the original species) “Yes”?

Yes → Document those cultivars and differences here.

No → Continue with risk assessment.

Box 8

8 – DOES THE SPECIES POSE SIGNIFICANT HUMAN OR LIVESTOCK CONCERNS OR HAVE THE POTENTIAL TO SIGNIFICANTLY HARM AGRICULTURAL PRODUCTION, NATIVE ECOSYSTEMS, OR MANAGED LANDSCAPES?

Overview:

The purpose of this box is to identify and quantify the potential for harmful impacts to agricultural production, native ecosystems, or managed landscapes associated with the plant under review from an economic and environmental standpoint. The potentially harmful impacts and their significance must be documented and supported by expert testimony. An affirmative outcome at this level of review will result in a recommendation that the plant be regulated. If the potential for harm associated with a particular plant remains essentially unknown, the result may be that the plant not be regulated as part of that risk assessment process. If a species is not regulated and in the future additional information because available that better answers questions in Box 8, then the plant can be chosen by the Noxious Weed Advisory Committee to be re-evaluated.

Questions to Consider:

- 8A. Does the plant have toxic qualities, or other detrimental qualities, that pose a significant risk to livestock, wildlife, or people?
Yes → Go to Box #9 of the Plant Risk Assessment Protocol
No → Go to Question B below
- 8B. Does, or could, the plant cause significant financial losses associated with decreased yields, reduced crop quality, or increased production costs?
Yes → Go to Box #9 of the Plant Risk Assessment Protocol
No → Go to Question C below
- 8C. Can the plant aggressively displace native species through competition (including allelopathic effects)?
Yes → Go to Box #9 of the plant Risk Assessment Protocol
No → Go to Question D below
- 8D. Can the plant hybridize with native species resulting in a modified gene pool and potentially negative impacts on native populations?
Yes → Go to Box #9 of the Plant Risk Assessment Protocol
No → Go to Question E below
- 8E. Does the plant have the potential to change native ecosystems (adds a vegetative layer, affects ground or surface water levels, etc.)?
Yes → Go to Box #9 of the Plant Risk Assessment Protocol
No → Go to Question F below
- 8F. Does the plant have the potential to introduce or harbor another pest or serve as an alternate host?
Yes → Go to Box #9 of the Plant Risk Assessment Protocol
No → THE SPECIES IS NOT CURRENTLY BELIEVED TO BE A RISK

Box 9

9 – DOES THE SPECIES HAVE CLEARLY DEFINED BENEFITS THAT OUTWEIGH ASSOCIATED NEGATIVE IMPACTS?

Overview:

Plants reaching this level of the Plant Risk Assessment & Management Protocol have been shown to have the capacity to become established and spread in Minnesota with the potential for significant, negative economic or environmental impacts through their impacts on agricultural production, native ecosystems, or managed landscapes.

If regulated, plants will be placed into one of four regulatory options under the Minnesota Noxious Weed Law:

1. Prohibited / Eradicate Noxious Weeds – must be eradicated in all locations statewide; importation, sale, and transportation within the State are prohibited.
2. Prohibited / Control Noxious Weeds – must be managed to prevent seed production and spread to new areas; importation, sale, and transportation within the State are prohibited.
3. Restricted Noxious Weeds – importation, sale, and transportation within the State are prohibited.
4. Specially Regulated Plants – allowed but subject to a statewide management plan with management requirements that may vary within the State.

If the plant is regulated, the level of regulation will depend on whether the plant is currently present in Minnesota, the value of the plant, the ability to control the plant in relation to the current distribution, the damage the plant might cause, and the confidence that regulation will effectively reduce the spread to new areas. It is therefore necessary to consider how the plant is used or would be used if introduced – in other words, does the plant have value relative to its negative characteristics? If the plant has clearly defined benefits, it must then be determined if the spread of the plant can be prevented through best management practices or use of an alternative plant. If control is not possible, the Minnesota Noxious Weed Advisory Committee must then consider the economic (state economy, provides livelihood, important food value, etc.), environmental (erosion control, nutrient sink, wildlife benefits, etc.), and/or cultural benefits of the plant and decide whether those benefits outweigh the negative impacts identified at Box #8.

Criteria for Decision:

It will be necessary to gather the following information in order to come to a decision for Box #9:

- Document whether the plant is currently present and/or in use in Minnesota and serves a valuable function (including native species) in Minnesota and, if so, for what purpose.
- Determine whether the spread of the plant can be prevented through the implementation of best management practices.
- Determine if suitable alternatives to the plant are available. The suitable alternatives will provide the same functions and have similar characteristics to the species in question.

Questions to Consider:

9A. Is the plant currently being used or produced and/or sold in Minnesota or native to Minnesota?

Yes → Go to Question B below

No → Go to Box #10 of the Plant Risk Assessment Protocol

9B. Is the plant an introduced species and can its spread be effectively and easily prevented or controlled, or its negative impacts minimized, through carefully designed and executed management practices?

Yes → Go to Box #11 of the Plant Risk Assessment Protocol

No → Go to Question C below

9C. Is the plant native to Minnesota?

Yes → Go to Question E below

No → Go to Question D below

9D. Is a non-invasive, alternative plant material or cultivar commercially available that could serve the same purpose as the plant of concern?

Yes → Go to Box #10 of the Plant Risk Assessment Protocol

No → Go to Question E below

9E. Does the plant benefit Minnesota to a greater extent than the negative impacts identified at Box #8?

Yes → Go to Box #11 of the Plant Risk Assessment Protocol

No → Go to Box #10 of the Plant Risk Assessment Protocol

Box 10

10 – SHOULD THE SPECIES BE REGULATED AS A PROHIBITED/ERADICATE, PROHIBITED/CONTROL, OR RESTRICTED NOXIOUS WEED?

Overview:

Plants routed to Box #10 of the Plant Risk Assessment & Management Protocol may be regulated in one of three ways based on the designations outlined in the [Minnesota Noxious Weed Law](#). The potential designations include Prohibited / Eradicate Noxious Weeds, Prohibited / Control Noxious Weeds, or Restricted Noxious Weeds. Plants designated as noxious weeds have been documented as being harmful and lack sufficient benefit to justify their use. Plants with high potential impacts that are not currently present or are not widely distributed in the State will be regulated to prevent their introduction and/or broader establishment within the State (Prohibited / Eradicate; eradication required or Restricted). Those that are widely distributed in the State will be regulated to prevent their spread to new areas within the State (Prohibited / Control or Restricted). For plants already established within the State, the level of regulation (Prohibited / Control vs. Restricted) will be dependent on the level of harm and the ability to control the plant using the technology and resources available. For example, if a species is widely distributed such that control is no longer possible from a technological or fiscal standpoint, the weed may be designated as a Restricted Noxious Weed rather than a Prohibited / Control Noxious Weed to help prevent its spread to new areas within the State or it may not be regulated at all.

Criteria for Decision:

It will be necessary to gather the following information in order to come to a decision for Box #10:

- Is the plant currently established in Minnesota and if so where?
- Can the plant be reliably controlled or eradicated using existing practices and available resources (including financial resources)?
- What are the negative impacts of the plant?
- Is it likely that regulation will reduce the spread of the plant to new areas?

Questions to Consider:

10A. Is the plant currently established in Minnesota?

Yes → Go to Question D below

No → Go to Question B below.

10B. Would prohibiting this species in trade prevent the likelihood of introduction and/or establishment?

Yes → Go to Question C

No → Go to Question D

10C. Does this risk assessment support this species being a top priority for statewide eradication if found in the state?

Yes → Go to Question D

No → LIST THE PLANT AS A RESTRICTED NOXIOUS WEED. Note if there are any cultivars that should be exempt from regulation and why.

10D. Does the plant pose a serious human health threat?

Yes → Go to Question E below

No → Go to Question F below

10E. Is the health threat posed by the plant serious enough, and is the plant distribution sufficiently small enough to be manageable, and are management tools available and effective enough to justify listing as Prohibited / Eradicate species?

Yes → LIST THE PLANT AS A PROHIBITED / ERADICATE NOXIOUS WEED. Note if there are any cultivars that should be exempt from regulation and why.

No → LIST THE PLANT AS A PROHIBITED / CONTROL NOXIOUS WEED. Note if there are any cultivars that should be exempt from regulation and why.

10F. Is the plant known to cause significant ecological or economic harm and can the plant be reliably eradicated (entire plant) on a statewide basis using existing practices and available resources considering the distribution, reproductive biology and potential for spread?

- For distribution, note if the distribution is well documented, the number and acreage of known infestations and how widespread they are in the state. Note if there are infestations in border areas.
- For reproductive biology, note if there are reproductive biology factors that make the plant easier to control and eradication more likely (for example, long pre-reproductive period, self-incompatible pollination, short-lived seed bank).
- For potential for spread and re-invasion of controlled areas, note its potential to spread beyond places where it is being controlled such as deliberate planting by people, wildlife vectors, re-infestation from border states, or other factors that facilitate spread.
- For known management tools, note what management tools are available, potential non-target impacts, and the reasonableness of state management or mandating that landowners throughout the state use the management tools to eradicate or control existing plants.
- For available resources, consider the capacity of state and local personnel and availability of funding to respond to new and existing infestations.

Yes → LIST THE PLANT AS A PROHIBITED / ERADICATE NOXIOUS WEED. Note if there are any cultivars that should be exempt from regulation and why.

No → Go to Question G

10G. Is the plant known to cause significant ecological or economic harm and can the plant be reliably controlled to limit spread on a statewide basis using existing practices and available resources? Would the economic impacts or other hardships incurred in implementing control measures be reasonable considering any ongoing or potential future increase of ecological or economic harm?

- Also consider all bullet points listed under 10F when evaluating 10G.

Yes → LIST THE PLANT AS A PROHIBITED / CONTROL NOXIOUS WEED. Note if there are any cultivars that should be exempt from regulation and why.

No → Go to Question H

10H. Would prohibiting this species in trade have any significant or measurable impact to limit or reduce the existing populations or future spread of the species in Minnesota?

Yes → LIST THE PLANT AS A RESTRICTED NOXIOUS WEED. Note if there are any cultivars that should be exempt from regulation and why.

No → Go to question I.

10I. Are there any other measures that could be put in place as Special Regulations which could mitigate the impact of the species within Minnesota?

Yes → Go to box 11

No → DO NOT LIST THE PLANT

Box 11

11 – THE SPECIES IS BEING PROPOSED TO BE DESIGNATED AS A SPECIALLY REGULATED PLANT. WHAT ARE THE SPECIFIC REGULATIONS PROPOSED?

Overview:

Plants routed to Box #11 of the Plant Risk Assessment & Management Protocol will be designated as Specially Regulated Plants; allowed, but their use is regulated through a species specific regulations. Plants designated as Specially Regulated Plants have been shown to have the potential to survive and become established and spread in Minnesota and have the potential to cause significant negative impacts, but have also been documented as having significant benefits that outweigh the associated impacts and warrant their use under certain circumstances. To this end regulatory language will be developed which seeks to limit the impacts of the plant on the people and the environment of the State.

Some plants may be of greater concern in certain locations or situations. Local government units that decide that a plant designated as a Specially Regulated Plant should be more tightly regulated in their area may petition (Minnesota Rules, part 1505.0750) to have the plant designated as a Prohibited or Restricted Noxious Weed in their jurisdiction. The Minnesota Noxious Weed Advisory Committee will review petitions and make recommendations regarding whether it is reasonable to allow plants designated as Specially Regulated Plants to be designated as Prohibited or Restricted Noxious Weeds at the local level.

Development and implementation of regulations will outline where, and under what circumstances, a Specially Regulated Plant may be allowed to be grown. The Minnesota Noxious Weed Advisory Committee will be responsible for overseeing the development of species specific regulations and recommending their approval.

Literature Cited:

Lonsdale, W.M., and C.S. Smith. 2001. Evaluating pest-screening systems - insights from epidemiology and ecology. *In: Weed Risk Assessment*. R.H. Groves, F.D. Panetta and J.G. Virtue, eds. ISBN 0 643 06561 X. CIRSO Publishing, Collingwood, Australia. [Challenges for predictions to not exclude desirable species and yet, fail to keep out invasive species]

Reichard, S. 2001. The search for patterns that enable prediction of invasion. *In: Weed Risk Assessment*. R.H. Groves, F.D. Panetta, and J.G. Virtue (eds.). ISBN 0 643 06561 X. CIRSO Publishing, Collingwood, Australia. [Overview of a predictive approach to invasiveness]

Williamson, M. 2001. Can the impacts of invasive species be predicted? *In: Weed Risk Assessment*. R.H. Groves, F.D. Panetta, and J.G. Virtue (eds.). ISBN 0 643 06561 X. CIRSO Publishing, Collingwood, Australia. [Overview of limitations to predictive efforts]

Williamson, M. and A. Fritter. 1996. The varying success of invaders. *Ecology* 77:1661-1665.

Lists of Plants Considered Invasive Elsewhere:

- British Columbia Ministry of Agriculture & Food. [Field Guide to Noxious & Other Selected Weeds of British Columbia](#)
- Gateway to [Federal & State Invasive Species Activities & Programs](#)
- Illinois Department of Natural Resources. 1994. [The Changing Illinois Environment: Critical Trends](#). Technical Report of the Critical Trends Assessment Project. Volume 3: Ecological Resources.
- [Invasive Plants of Canada Project](#)
- [Invasive Joint Venture](#) – The Bugwood Network, USDA/Forest Service, USDA/APHIS PPQ, University of Georgia - Warnell School of Forest Resources, University of Georgia - College of Agricultural & Environmental Sciences/Dept. of Entomology
- Midwest Invasive Plant Network [list of plants on invasive plant lists in Midwestern states](#)
- Taxonomic Information on Cultivated Plants in the USDA-ARS [Germplasm Resources Information Network](#) (GRIN)
- [U.S. Environmental Protection Agency](#)
- [Wisconsin Department of Natural Resources Invasive Species Lists](#)

Other Plant Risk Assessment Models & Information:

- [Biosecurity Australia Weed Risk Assessment System](#)
- [Bureau of Land Management National Invasive Species Information Management System](#)
- Daehler, C.C. and D.A. Carino. 2000. [Predicting invasive plants: Prospects for a general screening system based on current regional models](#). *Journal of Biological Invasions* 2(2): 93-102.
- [Federal Interagency Committee for Management of Noxious and Exotic Weeds](#)
- [Minnesota Nursery and Landscape Association](#)
- [National Park Service \(NPS\), Invasive Plants](#)
- [National Plant Board](#)
- [North American Plant Protection Organization](#) (NAPPO)
- [Plant Risk Evaluator by Plant Right](#)

- USDA Animal and Plant Health Inspection Service (APHIS), Plant Protection & Quarantine (PPQ) [Guidelines for Weed Risk Assessment Process](#) (2019)
- University of Florida, Institute of Food and Agricultural Sciences (IFAS) [Assessment of Non-Native Plants in Florida's Natural Areas](#) (2000)