

Vermont's Wildlife Action Plan*

November 22, 2005

Appendix K Exotic Invasive & Pest Species

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**formally the Comprehensive Wildlife Conservation Strategy (CWCS)*

Introduction to Invasive Exotic and Pest Species

Invasive exotic and pest species are one of the most frequently noted problems impacting Vermont's Species of Greatest Conservation Need (SGCN) and their habitats. Invasive species can literally overwhelm native species and their habitats forcing the natives out. Invasive plants such as Japanese knotweed, phragmites, and purple loosestrife can change soil composition, change water tables and disrupt insect cycles. They often lack food value that wildlife depend upon compared with the plants they've replaced. Some invasive animals prey heavily upon natives while others such as the alewife and zebra mussel out-compete natives for food and nutrients with significant impacts reverberating up and down food chains.

The problem of invasives isn't simply a local one. Each year the United States loses 1.7 million acres to the spread of these invasives and estimates of the total costs of invasive species in the United States amounts to more than \$130 billion annually (Pimentel et al. 1999). About 42% of the species on the federal Threatened or Endangered species lists are at risk primarily because of non-indigenous species (Wilcove et al. 1998).

Some non-natives species are considered invasives or pests. Some are deemed beneficial (e.g. apple trees) while others are considered neutral (e.g. Queen Anne's lace and goldfish). An invasive species is defined by the National Invasive Species Council (Executive Order 13112); <http://www.invasivespecies.gov/>) as a species that is:

- 1) Non-native (or alien) to the ecosystem under consideration; and,
- 2) Whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

The national strategy to address invasive species encompasses four elements (US Forest Service 2004)

- 1) Prevention
- 2) Early detection and rapid response
- 3) Control and management
- 4) Rehabilitation and restoration

Strategies to address impacts from invasive exotic and pest species are noted here in each species conservation summary (Appendix A) and in the habitat, community, and landscape summaries (Appendix B). However, the world of invasive exotic control and eradication is a rapidly evolving one. This section of the CWCS report provides lists of invasive species maintained by state agencies and along with key resources that readers should check for more up-to-date information and expert assistance.

Vermont's Invasive Species

The three lists of invasive species currently maintained by the state were developed for different reasons and with different publics in mind. Combined they identify the most significant invasives in the state. They are:

- 1) Invasive Species Watch List for Vermont. 2/18/ 2005. Department of Environmental Conservation. Waterbury, VT.
www.anr.state.vt.us/dec/waterq/wqdhhome.htm
- 2) Non-native Plant and Animal Species in Aquatic and Wetland Habitats in Vermont. 5/2004. Vermont Department of Environmental Conservation, Waterbury, VT.
www.anr.state.vt.us/dec/waterq/lakes/docs/ans/lp_ans-list.pdf
- 3) Quarantine #3: Noxious Weeds. 4/22/2002 Vermont Agency of Agriculture. Montpelier, VT. www.vermontagriculture.com/noxiousweeds.PDF

Additional Resources

The Vermont Fish & Wildlife Department's *Baitfish of Vermont* is a 38-page guidebook was produced to help baitfish dealers and anglers identify the species of baitfish that are legal to use for fishing in Vermont.

Stop Aquatic Hitchhikers! SAH is a public awareness campaign dealing with the national aquatic invasive species issue. <http://www.protectyourwaters.net>

References

- Pimentel D., L. Lach, R. Zuniga, and D. Morrison. 1999. Environmental and Economic Costs Associated With Non-Indigenous Species In The United States College of Agriculture and Life Sciences, Cornell University. Ithaca, NY
- US Forest Service. October 2004. National Strategy and Implementation Plan for Invasive Species Management. US Department of Agriculture. Washington DC.
www.fs.fed.us/foresthealth/publications/Invasive_Species.pdf
- Wilcove D.S., D. Rothstein, J. Bubow, A. Phillips, and E. Losos. 1998. Quantifying Threats to Imperiled Species in The United States. *BioScience* 48(8): 607-615.

Invasive Species Watch List for Vermont

Vermont Invasive Exotic Plant Committee
February 18, 2005

Introduction

This is a list of non-native plants that have some potential to become invasive in Vermont based on their behavior in northeastern states. Since not enough is known about the distribution or abundance of these species in Vermont, or their potential to become invasive in Vermont, we hope this list encourages people to observe, assess and report where these species occur and how rapidly they may be spreading.

About one-third of the plant species found in Vermont are not native to our state. Many of these introductions are beneficial and economically important (e.g. red clover, our state flower) and many others are neutral in their impact (e.g. mullein or Queen Anne's lace.) A small percentage of the non-native plants, about 8%, have the potential to create environmental and economic harm due to their ability to grow rapidly, profusely and widely. It is these non-native invasive plant species that the Vermont Invasive Exotic Plant Committee is monitoring.

Definition

An invasive species is defined by the National Invasive Species Council as a species that is

- 1) non-native (or alien) to the ecosystem under consideration **and**
- 2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health. (Executive Order 13112; <http://www.invasivespecies.gov/>)

Invasive species can be plants, animals, and other organisms (e.g., microbes). Human actions are the **primary** means of invasive species introductions.

Watch List versus the Noxious Weed Quarantine

This Watch List is different from the Noxious Weed Quarantine Rule created in 2002 by the Vermont Agency of Agriculture, Food and Markets. The Watch List is intended for public information and as a way to enlist volunteers to monitor potentially harmful plants in Vermont. The Watch List has no regulatory force.

The Noxious Weed Quarantine Rule has the force of law. It was created to regulate the importation, movement, sale, possession, cultivation and/or distribution of 32 invasive plants. For more information about the Noxious Weed Quarantine Rule see www.state.vt.us/agric/invasive.htm. The rule plus additional information is also posted at www.uvm.edu/mastergardener/. Click the yellow circle at the bottom for Invasive Plant Info.

Purpose of the Watch List

The purpose of this Watch List is to alert and inform people about some plants that may become invasive in Vermont. We've included species known to be invasive elsewhere but their status in Vermont is uncertain. The listed plants are primarily those that may spread into Vermont's natural habitats; this list does not include plants that may be pests of agricultural lands or disturbed habitats such as roadsides. Some of these plants are not yet here as far as we know. Others are here but no one knows how extensively they occur or whether they are spreading. We hope that by making this list public, people will be motivated to help track the occurrence, distribution and rate of spread of the listed plants throughout Vermont.

Criteria

For inclusion on the Watch List, a plant must meet at least #1 and #2, and either #3 or #4.

1. The taxon¹ is nonindigenous² to northeastern North America.
2. The taxon may negatively affect native species or natural communities.
3. In Vermont, the taxon has the potential, based on its biology and its colonization history in the northeast or elsewhere, for rapid and widespread dispersal and establishment over spatial gaps away from the site of introduction.
4. The taxon is acknowledged to be invasive in northeastern North America but its Vermont status is unknown or unclear. This may result from lack of field experience with the taxon or from difficulty in taxonomic determination.

Invasive Species Impacts

Invasive non-native species are the second greatest worldwide threat to native species and ecosystems after direct habitat destruction³. In the United States invasive non-native plants spread on public lands at the rate of 4,600 acres per day, or one-tenth the size of an average Vermont town.⁴ Invasive non-native plants can displace native species, disrupt ecosystem relationships, degrade wildlife habitat, impede recreation and cause economic damage to forests, agricultural crops and other managed lands. Invasive species cost the American public an estimated \$138 billion each year⁵ and negatively impact about 42% of the plant and animal species listed by the Federal government as threatened or endangered⁶.

¹ A taxon can be a species, a subspecies or variety

² Indigenous means native to an area.

³ Randall, J. 1996. Weed Control for the Preservation of Biological Diversity. *Weed Technology* 10: 370-383.

⁴ Westbrooks, R. 1998. Pulling Together: National Strategy for Invasive Plant Management. Federal Interagency Committee for Management of Noxious and Exotic Weeds.

⁵ Pimental, D., L. Lach, R. Zuniga, D. Morrison. 2000. Environmental and Economic Costs Associated with Non-Indigenous Species in the United States. *BioScience* 50:53-65.

⁶ Wilcove, D.S., D. Rothstein, J. Bubow, A. Phillips, E. Losos. 1998. Quantifying Threats to Imperiled Species in the United States. *BioScience* 48(8):607-615.

List of Watch Species in Vermont

Scientific Name	Common Name
<i>Acer ginnala</i> Maxim.	Amur maple
<i>Acer platanoides</i> L.	Norway maple
<i>Alnus glutinosa</i> (L.) Gaertner	European black alder
<i>Amorpha fruticosa</i> L.	False indigo
<i>Ampelopsis brevipedunculata</i> (Maxim.) Trautv.	Porcelainberry
<i>Anthriscus sylvestris</i> (L.) Hoffm.	Wild chervil
<i>Berberis thunbergii</i> DC.	Japanese barberry
<i>Berberis vulgaris</i> L.	Common barberry
<i>Callitriche stagnalis</i> Scop.	Pond water-starwort
<i>Cardamine impatiens</i> L.	Narrowleaf bittercress
<i>Centaurea maculosa</i> L. Syn.: <i>Centaurea biebersteinii</i> DC	Spotted knapweed
<i>Elaeagnus angustifolia</i> L.	Russian olive
<i>Elaeagnus umbellata</i> Thunb.	Autumn olive
<i>Euonymus alata</i> (Thunb.) Sieb.	Winged euonymus
<i>Euphorbia cyparissias</i> L.	Cypress spurge
<i>Glyceria maxima</i> (Hartman) Holmberg	Reed mannagrass
<i>Hesperis matronalis</i> L.	Dame's rocket
<i>Iris pseudacorus</i> L.	Yellow iris
<i>Ligustrum obtusifolium</i> Sieb. & Zucc.	Border privet
<i>Lonicera xylosteum</i> L.	Dwarf honeysuckle
<i>Lysimachia vulgaris</i> L.	Garden Loosestrife
<i>Marsilea quadrifolia</i> L.	European watercress
<i>Microstegium vimineum</i> (Trin.) A. Camus	Japanese stilt grass
<i>Najas minor</i> Allioni	Brittle waternymph
<i>Paulownia tomentosa</i> (Thunb.) Sieb & Zucc. Ex Ste.	Princess tree
<i>Phalaris arundinacea</i> L.	Reed canary grass
<i>Polygonum perfoliatum</i> L.	Mile-a-minute vine
<i>Polygonum sachalinense</i> F. Schmidt ex Maxim. Syn: <i>Fallopia sachalinensis</i> (F. Schmidt ex Maxim.) Dcne.	Giant knotweed
<i>Populus alba</i> L.	White poplar
<i>Robinia pseudoacacia</i> L.	Black locust
<i>Rorripa nasturtium-aquaticum</i> (L.) Hayek Syn: <i>Nasturtium officinale</i> Ait. f.	Watercress
<i>Rosa multiflora</i> Thunb. ex Murr.	Multiflora rose

What You Can Do

We encourage you to identify, observe, map or measure, and report on the status of any of these plants you find in your vicinity. By making this Watch List public, we hope that people will pay more attention to the plants around them, help in the effort to collect data and watch these species for signs of invasiveness. A more comprehensive list of plant species that can become invasive throughout New England is on the website of the Invasive Plant Atlas of New England (IPANE) at <http://invasives.ceb.uconn.edu/ipane/>.

Please send us, the Vermont Invasive Exotic Plant Committee, information on these plants and consider becoming a volunteer for IPANE (see box on the following page.)

To report invasive non-native terrestrial plants

Kathy Decker, Vermont Department of Forests, Parks and Recreation
802-751-0117

kathy.decker@anr.state.vt.us

To report invasive non-native aquatic plants

Ann Bove, Vermont Department of Environmental Conservation
802-241-3782

ann.bove@anr.state.vt.us

For identification help, see these websites

<http://invasives.eeb.uconn.edu/ipane/>

<http://tncweeds.ucdavis.edu/>

About VTIEPC

The Vermont Invasive Exotic Plant Committee is comprised of representatives from state and federal government, non-profit organizations, private industry, and concerned individuals. The Committee meets semi-annually to assemble and disseminate information about invasive exotic plants. The goal of the Committee is to “provide coordination and guidance on invasive exotic plant issues so as to protect natural communities, native species, agricultural and forestry interests, and human use and enjoyment of Vermont’s natural resources.”

About IPANE

The Invasive Plant Atlas of New England’s (IPANE) mission is to create a comprehensive web-accessible database of invasive and potentially invasive plants in New England that will be continually updated by a network of professionals and trained volunteers. The database will facilitate education and research that will lead to a greater understanding of invasive plant ecology and support informed conservation management. An important focus of the project is the early detection of, and rapid response to, new invasions. To learn how to volunteer go to <http://invasives.eeb.uconn.edu/ipane/>.

<h2 style="text-align: center;">Non-native Plant and Animal Species in Aquatic and Wetland Habitats in Vermont</h2> <p style="text-align: center;">Updated May 2004</p>	Elements of the VTDEC's Aquatic Nuisance Control Program				
	Control Research Technology	Environmental Monitoring	Control and Spread Prevention	Admin. of Grants and Permits	Public Info and Education
Category One: Non-native aquatic or wetland species with a demonstrated ability to be highly invasive on a localized or widespread scale. These species are currently having economic and/or ecological impacts in Vermont.					
flowering rush (<i>Butomus umbellatus</i>)		√			√
yellow flag iris (<i>Iris pseudacorus</i>)		√			√
Japanese knotweed (<i>Fallopia japonica</i>)					√
purple loosestrife (<i>Lythrum salicaria</i>)	√	√	√	√	√
Eurasian watermilfoil (<i>Myriophyllum spicatum</i>)	√	√	√	√	√
common reed (<i>Phragmites australis</i>)					√
water chestnut (<i>Trapa natans</i>)	√	√	√	√	√
zebra mussel (<i>Dreissena polymorpha</i>)	√	√	√	√	√
Category Two: Non-native aquatic or wetland species considered having the potential to be invasive on a localized or widespread scale.					
European frogbit (<i>Hydrocharis morsus-ranae</i>)		√			√
slender-leaved naiad (<i>Najas minor</i>)		√			√
yellow floating heart (<i>Nymphoides peltata</i>)		√			√
curly leaf pondweed (<i>Potamogeton crispus</i>)		√			√
great water cress (<i>Rorippa amphibia</i>)					√
alewife (<i>Alosa pseudoharengus</i>)					F&W
faucet snail (<i>Bithynia tentaculata</i>)		√			√
Chinese mystery snail (<i>Cipangopaludina chinensis</i>)		√			√
mute swan (<i>Cygnus olor</i>)			F&W		F&W
common carp (<i>Cyprinus carpio</i>)					
gizzard shad (<i>Dorosoma cepedianum</i>)					
white perch (<i>Morone americana</i>)					
rusty crayfish (<i>Orconectes rusticus</i>)		√			√
European rudd (<i>Scardinius erythrophthalmus</i>)					

<p style="text-align: center;">Non-native Plant and Animal Species in Aquatic and Wetland Habitats in Vermont Updated May 2004</p>	Elements of the VTDEC's Aquatic Nuisance Control Program					
	Control Research Technology	Environmental Monitoring	Control and Spread Prevention	Admin. of Grants and Permits	Public Info and Education	
Category Three: Non-native aquatic or wetlands species not known to be present in Vermont, but with the potential to become invasive if/when they arrive. Known regional location follows scientific name.						
<u>fanwort</u> (<i>Cabomba caroliniana</i>)	CT, MA, NH, NJ, NY, PA, RI	√	√			√
<u>Brazilian elodea</u> (<i>Egeria densa</i>)	CT, MA, NH, NJ, NY, PA	√	√			√
<u>East Indian hygrophila</u> (<i>Hygrophila polysperma</i>)	FL	√	√			√
<u>hydrilla</u> (<i>Hydrilla verticillata</i>)	CT, MA, ME, NJ, PA	√	√			√
<u>giant salvinia</u> (<i>Salvinia molesta, auriculata, biloba or herzogii</i>)	NC	√	√			√
<u>parrot's feather</u> (<i>Myriophyllum aquaticum</i>)	CT, NJ, NY, MA, PA	√	√			√
<u>variable-leaved watermilfoil</u> (<i>Myriophyllum heterophyllum</i>)	CT, MA, ME, NH, NY, RI	√	√			√
spiny water flea (<i>Bythotrephes cederstroemi</i>)	NY					√
asiatic clam (<i>Corbicula fluminea</i>)	NY, MA					
quagga mussel (<i>Dreissena bugensis</i>)	NY, Quebec	√	√			√
Eurasian ruffe (<i>Gymnocephalus cernuus</i>)	Lakes Superior & Huron					√
round goby (<i>Neogobius melanostomus</i>)	NY					√
tubenose goby (<i>Proterothinus marmoratus</i>)	NY					
tench (<i>Tinca tinca</i>)	NY		F&W			F&W

√ = VT Department of Environmental Conservation

F&W = VT Department of Fish & Wildlife

For specific information on the species or programs listed above contact:

VT Department of Environmental Conservation at

802-241-3777 or www.vtwaterquality.org

or

VT Department of Fish & Wildlife at

802-241-3700 or www.anr.state.vt.us/fw/fwhome

Quarantine #3 Noxious Weeds

Vermont Department of Agriculture, Food & Markets

April 22, 2002

Vermont noxious weed quarantine was created in order to regulate the importation, movement, sale, possession, cultivation and/or distribution of certain invasive plants. These plants either pose a threat the Vermont environment or are already negatively impacting waterways and natural areas in the state. Many of these plants are becoming such a problem that there is no alternate prevention method. This rule will also prevent plants not yet found in Vermont from being introduced, and will protect the state from the many environmental, agricultural, recreational, and/or economical problems associated with their presence.

For questions and comments related to Vermont's Noxious Weed Quarantine Rule go to www.vermontagriculture.com/noxiousweeds.PDF, or contact:

VT Department of Agriculture, Food & Markets
Plant Industry Division
116 State St., Drawer 20
Montpelier, VT 05620-2901
802-828-2431
www.state.vt.us/agric/

Designated Noxious Weeds

(A) Class A Noxious Weeds.

- (1) All weeds listed in 7 C.F.R. 360.200 as amended, which is hereby incorporated 46 by reference including subsequent amendments and editions.
- (2) *Cabomba caroliniana* (fanwort)
- (3) *Egeria densa* (Brazilian elodea)
- (4) *Hydrilla verticillata* (hydrilla)
- (5) *Hygrophila polysperma* (Roxb.) T. Anderso 52 (E. Indian hygrophila)
- (6) *Myriophyllum aquaticum* (Vell.) Verdc. (Parrot feather)
- (7) *Myriophyllum heterophyllum* (variable-leaved 56 milfoil)
- (8) *Salvinia auriculata* (giant salvinia)
- (9) *Salvinia biloba* (giant salvinia)
- (10) *Salvinia herzogii* (giant salvinia)
- (11) *Salvinia molesta* (giant salvinia)
- (12) *Vincetoxicum hirundinaria* Medikus. (pale 62 swallow-wort)

(B) Class B Noxious Weeds.

- (1) *Aegopodium podagraria* L. (goutweed)
- (2) *Ailanthus altissima* (tree-of-heaven)
- (3) *Alliaria petiolata* (*A. officinalis*) (garlic mustard)
- (4) *Butomus umbellatus* (flowering rush)
- (5) *Celastrus orbiculatus* Thunb. (Oriental bittersweet)
- (6) *Fallopia japonica* (*Polygonum cuspidatum*) (Japanese knotweed)
- (7) *Hydrocharis morsus-ranae* L. (frogbit)
- (8) *Lonicera x bella* (Bell honeysuckle)
- (9) *Lonicera japonica* (Japanese honeysuckle)
- (10) *Lonicera maackii* (Amur honeysuckle)
- (11) *Lonicera morrowii* (Morrow honeysuckle)
- (12) *Lonicera tatarica* (Tartarian honeysuckle)
- (13) *Lythrum salicaria* (purple loosestrife)
- (14) *Myriophyllum spicatum* (Eurasian watermilfoil)
- (15) *Nymphoides peltata* (Gmel.) (yellow floating heart)
- (16) *Phragmites australis* (common reed)
- (17) *Potamogeton crispus* L. (curly leaf pondweed)
- (18) *Rhamnus cathartica* (common buckthorn)
- (19) *Rhamnus frangula* (glossy buckthorn)
- (20) *Trapa natans* L. (water chestnut)
- (21) *Vincetoxicum nigrum* L. (black swallow-wort)