

**Appendix 1. At-Risk Natural Communities and Plant and Animal Species Associated with the Champlain Valley**

<b>Natural Communities Associated with the Champlain Valley</b>	<b>G-Rank</b>	<b>S-Rank</b>
Alder Swamp	GNR	S5
Black Spruce Swamp	GNR	S2
Black Spruce Woodland Bog	GNR	S2
Boreal Talus Woodland	GNR	S3
Buttonbush Swamp	GNR	S2
Calcareous Red Maple-Tamarack Swamp	GNR	S2
Calcareous Riverside Seep	G3	S1
Cave/Mine	GNR	SNR
Cold-Air Talus Woodland	GNR	S1
Deep Bulrush Marsh	GNR	S4
Dry Oak Forest	GNR	S3
Dry Oak Woodland	GNR	S2
Dry Oak-Hickory-Hophornbeam Forest	GNR	S3
Dwarf Shrub Bog	GNR	S2
Hard Water Lake/Pond	GNR	SNR
Hemlock Forest	GNR	S4
Hemlock Swamp	GNR	S2
Lake Sand Beach	GNR	S2
Lake Shale or Cobble Beach	GNR	S3
Lakeshore Grassland	GNR	S2
Lakeside Floodplain Forest	GNR	S3
Limestone Bluff Cedar-Pine Forest	G3	S1
Marl Pond	GNR	SNR
Mesic Maple-Ash-Hickory-Oak Forest	GNR	S3
Mesic Red Oak-Northern Hardwood Forest	GNR	S3
Northern Hardwood Forest	GNR	S5
Northern Hardwood Talus Woodland	GNR	S3
Northern White Cedar Swamp	GNR	S3
Open Talus	GNR	S2
Pitch Pine Woodland Bog	GNR	S1

<b>Natural Communities Associated with the Champlain Valley</b>	<b>G-Rank</b>	<b>S-Rank</b>
Pitch Pine-Oak-Heath Rocky Summit	GNR	S1
Poor Fen	GNR	S2
Red Cedar Woodland	GNR	S2
Red Maple-Black Ash Seepage Swamp	GNR	S4
Red Maple-Northern White Cedar Swamp	G3?	S3
Red Maple-Sphagnum Acidic Basin Swamp	GNR	S3
Red Maple-White Pine-Huckleberry Swamp	GNR	S1
Red or Silver Maple-Green Ash Swamp	GNR	S3
Red Pine Forest or Woodland	GNR	S2
Rich Northern Hardwood Forest	G4	S4
River Mud Shore	GNR	S3
River Sand or Gravel Shore	GNR	S3
Rivershore Grassland	GNR	S3
Riverside Outcrop	GNR	S3
Sand Dune	G2?	S1
Sedge Meadow	GNR	S4
Shallow Emergent Marsh	GNR	S4
Silver Maple-Ostrich Fern Riverine Floodplain Forest	GNR	S3
Silver Maple-Sensitive Fern Riverine Floodplain Forest	GNR	S3
Spruce-Fir-Tamarack Swamp	GNR	S3
Subterranean Stream/Pool	GNR	SNR
Sugar Maple-Ostrich Fern Riverine Floodplain Forest	GNR	S2
Sweet Gale Shoreline Swamp	GNR	S3
Temperate Acidic Cliff	GNR	S4
Temperate Acidic Outcrop	GNR	S4
Temperate Calcareous Cliff	G4	S3
Temperate Calcareous Outcrop	GNR	S3
Transition Hardwood Talus Woodland	GNR	S3
Vernal Pool	GNR	S3
White Pine-Red Oak-Black Oak Forest	GNR	S3

## Target Plant Species Associated with a Natural Community

	Common Name	Scientific Name	Status	Consevation Goals and Objectives	Eligible Conservation/ Management Activities
<b>Valley Clayplain Forest</b>	Gray's Sedge	<i>Carex grayi</i>	State: Uncommon	To Conserve at Least Five Quality Remnant Examples of This Natural Community, with at Least Two Sites of Size to Maintain the Long Term Integrity of the Habitat	<ul style="list-style-type: none"> <li>* Conservation Easements</li> <li>* Landowner Management Agreements for Forest Management</li> <li>* Plantings of Native Tree Species</li> <li>* Control of Invasive Species (e.g., buckthorn, honeysuckle)</li> </ul>
	Minnesota Sedge	<i>Carex albursina</i>	State: Uncommon		
	Folliculate Sedge	<i>Carex folliculata</i>	State: Uncommon		
	Handsome Sedge	<i>Carex formosa</i>	State: Uncommon		
	Stout Woodreed	<i>Cinna arundinacia</i>	State: Uncommon		
	Blunt-leaved Sandwort	<i>Moehringia lateriflora</i>	State: Uncommon		
	Fragrant Sumac	<i>Rhus aromatica</i>	State: Uncommon		
	Loose Sedge	<i>Carex laxiculmis</i>	State: Uncommon to Rare		
	Drooping Bluegrass	<i>Poa saltuensis</i>	State: Uncommon to Rare		
	Hidden Sedge	<i>Carex umbellata</i>	State: Rare		
	American Hazelnut	<i>Corylus americana</i>	State: Rare		
	Rough Avens	<i>Geum laciniatum</i>	State: Rare		

	<b>Common Name</b>	<b>Scientific Name</b>	<b>Status</b>	<b>Conservation Goals and Objectives</b>	<b>Eligible Conservation/ Management Activities</b>
<b>Valley Clayplain Forest</b>	Yellow bartonia	<i>Bartonia virginica</i>	State: Rare	To Conserve at Least Five Quality Remnant Examples of This Natural Community, with at Least Two Sites of Size to Maintain the Long Term Integrity of the Habitat	<ul style="list-style-type: none"> <li>* Conservation Easements</li> <li>* Landowner Management Agreements for Forest Management</li> <li>* Plantings of Native Tree Species</li> <li>* Control of Invasive Species (e.g., buckthorn, honeysuckle)</li> </ul>
	Harsh Sunflower	<i>Helianthus strumosus</i>	State: Threatened		
	Short Styled Snakeroot	<i>Sanicula canadensis</i>	State: Threatened		
	Buxbaum's Sedge	<i>Carex buxbaumii</i>	State: Endangered		
	Many-leaved Sedge	<i>Scirpus polyphyllus</i>	State: Endangered		
	Broad Beech Fern	<i>Thelypteris hexagonoptera</i>	State: Rare		
<b>Pine-Oak-Heath Sandplain Forest</b>	Yellow Wild Indigo	<i>Baptisia tinctoria</i>	State: Historic	To Conserve Parts or All the Remaining Viable Examples of This Natural Community	<ul style="list-style-type: none"> <li>* Conservation Easements</li> <li>* Landowner Management Agreements for Forest Management</li> <li>* Plantings of Native Species</li> <li>* Controlled Burns</li> <li>* Soil Scarification</li> </ul>
	Canada Frostweed	<i>Helianthemum canadense</i>	State: Uncommon		
	Yellow Panic Grass	<i>Panicum xanthophysum</i>	State: Uncommon		
	Lace Love Grass	<i>Eragrostis capillaries</i>	State: Uncommon to Rare		
	Spiked Grass	<i>Aristida longispica</i>	State: Rare		
	Silvery Sedge	<i>Carex argyranthera</i>	State: Rare		
	Fernald Sedge	<i>Carex merit-fernaldii</i>	State: Rare		

Pine-Oak-Heath Sandplain Forest	Common Name	Scientific Name	Status	Conservation Goals and Objectives	Eligible Conservation/ Management Activities
	Wild Sensitive Plant	<i>Cassia nictitans</i>	State: Rare	To Conserve Parts or All the Remaining Viable Examples of This Natural Community	<ul style="list-style-type: none"> <li>* Conservation Easements</li> <li>* Landowner Management Agreements for Forest Management</li> <li>* Plantings of Native Species</li> <li>* Controlled Burns</li> <li>* Soil Scarification</li> </ul>
	Few Flowered Panic Grass	<i>Panicum oligosanthes</i>	State: Rare		
	Raced Milkwort	<i>Polygala polygama</i>	State: Rare		
	Whorled Milkwort	<i>Polygala verticillata</i>	State: Rare		
	Scarlet Oak	<i>Quercus coccinea</i>	State: Rare		
	Slender Knotweed	<i>Polygonum tenue</i>	State: Rare		
	Plains Frostweed	<i>Helianthemum bicknellii</i>	State: Threatened		
	Sweet Goldenrod	<i>Solidago odora</i>	State: Threatened		
	Blunt-leaved Milkweed	<i>Asclepias amplexicaulis</i>	State: Threatened		
	Low Bindweed	<i>Calystegia spithamea</i>	State: Threatened		
	Muehlenburg's Sedge	<i>Carex muehlenbergii</i>	State: Threatened		
	Low Bindweed	<i>Calystegia spithamaea</i>	State: Threatened		
	Houghton's Sedge*	<i>Cyperus houghtonii</i>	State: Threatened		
Harsh Sunflower	<i>Helianthus strumosus</i>	State: Threatened			

Pine-Oak-Heath Sandplain Forest	Common Name	Scientific Name	Status	Conservation Goals and Objectives	Eligible Conservation/ Management Activities
	Large Whorled Pogonia	<i>Isotria verticillata</i>	State: Threatened	To Conserve Parts or All the Remaining Viable Examples of This Natural Community	<ul style="list-style-type: none"> <li>* Conservation Easements</li> <li>* Landowner Management Agreements for Forest Management</li> <li>* Plantings of Native Species</li> <li>* Controlled Burns</li> <li>* Soil Scarification</li> </ul>
	Hairy Lettuce	<i>Lactuca hirsute</i>	State: Threatened		
	Slender Mountain Rice	<i>Oryzopsis pungens</i>	State: Threatened		
	Dry Sedge	<i>Carex siccata</i>	State: Endangered		
	Wild Lupine	<i>Lupinus perennis</i>	State: Endangered		
Other Target Plant Species	Awned Sedge*	<i>Carex atherodes</i>	Region: Extremely rare	There is no landowner information for this newly discovered species in VT. They need to be informed and protection and management discussed.	<ul style="list-style-type: none"> <li>* Conservation easements</li> <li>* Landowner Management Agreements</li> </ul>
			State: Extremely rare		
	Davis' Sedge*	<i>Carex davisii</i>	Region: Rare	The only VT population needs to be monitored to determine whether it is being impacted by nearby exotic plants. If so, control needs to begin. Also seeds need to be collected and stored.	<ul style="list-style-type: none"> <li>* Hand-pulling exotic plant species</li> </ul>
			State: Extremely rare		
	Northern Wild Comfrey*	<i>Cynoglossum virginianum</i>	Global: Rare	Conduct yearly monitoring of deer exclosure, consider expanding exclosure, and continue to remove exotics. Determine ownership at second site.	<ul style="list-style-type: none"> <li>* Hand pulling exotic plant species</li> <li>* Fencing</li> </ul>
			State: Threatened		
Houghton's Flat Sedge*	<i>Cyperus houghtonii</i>	Region: Rare	This sandplain species would benefit from sandplain management including controlled burning, clearing, and soil scarification. Pursue conservation easements.	<ul style="list-style-type: none"> <li>* Conservation easements</li> <li>* Landowner Management Agreements for controlled burns and forest management</li> </ul>	
		State: Threatened			
Northern Stickseed*	<i>Hackelia deflexa</i>	Region: Rare	A number of sites need landowner information, others require seed collection and banking and thinning of overstory vegetation. Pursue long-term protection of sites.	<ul style="list-style-type: none"> <li>* Conservation easements</li> <li>* Landowner Management Agreements for forest management</li> </ul>	
		State: Threatened			

Other Target Plant Species	Common Name	Scientific Name	Status	Conservation Goals and Objectives	Eligible Conservation/ Management Activities
	Goldenseal*	<i>Hydrastis canadensis</i>	Region: Rare	Two sites need long-term protection via an easement; one site also needs removal of competing vegetation. The third site needs rerouting of nearby trails and continued monitoring.	* Conservation easements * Landowner Management Agreements for vegetation removal * Trail relocation
			State: Endangered		
	Large-bracted Tick-trefoil*	<i>Desmodium cuspidatum</i>	Region: Rare	One site needs removal of encroaching vegetation and landowner and easement holder need to be notified of its presence. Two other sites need to be surveyed to determine whether plants are still extant.	* Conservation easements * Landowner Management Agreements for controlling exotic plants
			State: Endangered		
	Many-fruited False Loosestrife*	<i>Ludwigia polycarpa</i>	Region: Rare	Neither population in VT has been observed in recent surveys. Continue to survey, but explore reintroduction.	* Landowner Management Agreements for species reintroduction and forest management
			State: Endangered		
	North American Lake Cress*	<i>Neobeckia aquatica</i>	Region: Rare	Exotics need to be controlled at three of the four populations and agricultural runoff needs to be reduced at two sites.	* Landowner Management Agreements for controlling exotic plant species and agricultural runoff
			State: Threatened		
	Stiff Witch Grass*	<i>Panicum flexile</i>	Region: Rare	One site needs possible canopy thinning and seed collection for banking. The second site needs recent survey to confirm occurrence and determine ownership.	* Landowner Management Agreements for forest management
State: Endangered					
White-flowered Leafcup*	<i>Polymnia canadensis</i>	Region: Rare	Pursue long-term protection at both VT sites via an easement or acquisition.	* Conservation easements * Landowner Management Agreements for land management	
		State: Endangered			
Ogden's Pondweed*	<i>Potamogeton ogdenii</i>	Global: Rare	Reduce agricultural runoff at two sites, control invasive water chestnut at one site, and attempt to relocate the third population.	* Landowner Management Agreements for controlling agricultural runoff and exotic plant species	
		State: Extremely rare			
Pinedrops*	<i>Pterospora andromedea</i>	Region: Rare	Pursue long-term protection at both VT sites; both sites need more recent inventory.	* Conservation easements * Landowner Management Agreements for land management	
		State: Endangered			

Other Target Plant Species	Common Name	Scientific Name	Status	Conservation Goals and Objectives	Eligible Conservation/ Management Activities
	Marsh Valerian*	<i>Valeriana uliginosa</i>	Region: Rare	Pursue long-term protection via a conservation easement at the only extant VT site. This site also needs selective cutting. Resurvey historic site.	* Conservation easements * Landowner Management Agreements for forest management
			State: Endangered		
	Yellow Pimpernel*	<i>Taenidia integerrima</i>	Regional: Rare	Determine ownership and pursue long-term protection via conservation easements at a number of sites. A few sites would benefit from thinning the herbaceous layer and scarifying the soil.	* Conservation easements * Landowner Management Agreements for forest management
			State: Threatened		
	Ram's Head Lady's Slipper	<i>Cypripedium arietinum</i>	Global: Rare	Protect all remaining occurrences on private lands	* Conservation easements * Landowner Management Agreements for forest management
			State: Threatened		
	Sparse-flowered Sedge	<i>Carex tenuiflora</i>	State: Rare	To be determined	* Conservation easements * Landowner Management Agreements for forest management and beaver management
	Golden Corydalis	<i>Corydalis aurea</i>	State: Threatened	To be determined	* Conservation easements * Landowner Management Agreements for forest management, controlling exotic plants
	Beach Heather	<i>Hudsonia tomentosa</i>	State: Threatened	To be determined	* Conservation easements * Landowner Management Agreements for forest management * Fencing
	Harry Bush Clover	<i>Lespedeza hirta</i>	State: Threatened	To be determined	* Conservation easements * Landowner Management Agreements for forest management
	Putty-root**	<i>Aplectrum hyemale</i>	Region: Rare	To be determined from New England Wildflower Society Conservation Plan	* Conservation easements * Landowner Management Agreements for forest management
State: Threatened					
False Hop Sedge**	<i>Carex lupuliformis</i>	Global: Rare	To be determined from New England Wildflower Society Conservation Plan	* Conservation easements	
		State: Rare			
Tansy-mustard**	<i>Descurainia pinnata</i>	Region: Rare	To be determined from New England Wildflower Society Conservation Plan	* Conservation easements * Landowner Management Agreements for forest management	
		State: Rare			

	<b>Common Name</b>	<b>Scientific Name</b>	<b>Status</b>	<b>Conservation Goals and Objectives</b>		<b>Eligible Conservation/ Management Activities</b>
	Smooth Draba**	<i>Draba glabella</i>	Region: Rare	To be determined from New England Wildflower Society Conservation Plan		* Conservation easements * Landowner Management Agreements for forest management
			State: Threatened			
	Torrey's Rush**	<i>Juncus torreyi</i>	Region: Rare	To be determined from New England Wildflower Society Conservation Plan		* Conservation easements * Landowner Management Agreements for forest management
			State: Endangered			
	Lily-leaved Twayblade**	<i>Liparis liliifolia</i>	Region: Rare	To be determined from New England Wildflower Society Conservation Plan		* Conservation easements
			State: Threatened			
Straight-leaf Pondweed**	<i>Potamogeton strictifolius</i>	Region: Uncertain	To be determined from New England Wildflower Society Conservation Plan		* Conservation easements * Landowner Management Agreements for vegetation management	
		State: Rare				
Rough Dropseed**	<i>Sporobolus compositus</i>	Region: Rare	To be determined from New England Wildflower Society Conservation Plan		* Conservation easements * Landowner Management Agreements for vegetation and recreation management	
		State: Endangered				
<b>Target Animal Species</b>	<b>Common Name</b>	<b>Scientific Name</b>	<b>Status</b>	<b>Habitat</b>	<b>Conservation Goals and Objectives</b>	<b>Eligible Conservation/ Management Activities</b>
	Small-footed Bat	<i>Myotis leibii</i>	Region: Species of Concern	Hibernacula and Maternity Roosting Habitat	Conserve and manage 5 known current/historic hibernacula. Conserve and manage up to 10 known maternity roosting sites.	* Conservation easements * Landowner Management Agreements for forest management, cave management, and cave gates
			State: Threatened			
Indiana Bat	<i>Myotis sodalis</i>	Federal: Endangered	Hibernacula and Maternity Roosting Habitat	Conserve and manage 5 known current/historic hibernacula. Conserve and manage up to 10 known maternity roosting sites.	* Conservation easements * Landowner Management Agreements for forest management, cave management, cave gates * Rocket bat house placement and maintenance	
		State: Endangered				

Target Animal Species	Common Name	Scientific Name	Status	Habitat	Conservation Goals and Objectives	Eligible Conservation/ Management Activities
	Common Tern	<i>Sterna hirundo</i>	Region: Species of Concern	Nesting Islands on Lake Champlain	Manage predation and nesting competition on 4-5 sites.	* Nesting site management for chick shelters, monofilament grids, signage, and ant traps. * Discouraging cormorents and gulls. (Federal permits required) * Trap and transfer owls (Federal permits required)
			State: Endangered			
	Osprey	<i>Pandion haliaetus</i>	State: Endangered	Nesting Sites and Platforms	Establish 20-30 new nest sites on 20 landowners.	* Landowner Management Agreements for erecting and maintaining platforms
	Timber Rattlesnake	<i>Crotalus horridus</i>	Region: Species of Concern	Hibernacula and Foraging Habitat	Protect one hibernacula site and manage foraging habitat surrounding 2 hibernacula sites	* Conservation easement * Landowner Management Agreements for snake-human conflicts
			State: Endangered			
	Spiny Softshell Turtle	<i>Apalone spinifera</i>	State: Threatened	Nesting Sites	Protect and manage two nesting sites.	* Conservation easements * Trapping predators, fencing nest sites, and signage.
	Wood Turtle	<i>Clemmys insculpta</i>	Region: Species of Concern	Nesting Sites	Protect and manage nesting sites.	* Conservation easements * Trapping predators, fencing nest sites, and signage.
			State: Special Concern			
	Map Turtle	<i>Graptemys geographica</i>	Region: Species of Concern	Nesting Sites	Protect and manage nesting sites.	* Conservation easements * Trapping predators, fencing nest sites, and signage.
State: Special Concern						
Musk Turtle	<i>Sternotherus odoratus</i>	Region: Species of Concern	Nesting Sites	Protect and manage nesting sites.	* Conservation easements * Trapping predators, fencing nest sites, and signage.	
		State: Special Concern				

Target Animal Species	Common Name	Scientific Name	Status	Habitat	Conservation Goals and Objectives	Eligible Conservation/ Management Activities
	Painted Turtle	<i>Chrysemys picta</i>	State: Special Concern	Nesting Sites	Protect and manage nesting sites.	* Conservation easements * Trapping predators, fencing nest sites, and signage.
	Snapping Turtle	<i>Chelydra serpentina</i>	State: Special Concern	Nesting Sites	Protect and manage nesting sites.	* Conservation easements * Trapping predators, fencing nest sites, and signage.
	Jefferson Salamander	<i>Ambystoma jeffersonianum</i>	Region: Species of Concern	Vernal Pools, Wetlands, and Surrounding Upland Forests	20 breeding pools and associated upland habitats used by these species.	* Conservation easements * Landowner Management Agreements for forest management
			State: Special Concern			
	Blue-spotted Salamander	<i>Ambystoma laterale</i>	Region: Species of Concern	Vernal Pools, Wetlands, and Surrounding Upland Forests	20 breeding pools and associated upland habitats used by these species.	* Conservation easements * Landowner Management Agreements for forest management
			State: Special Concern			
	Four-toed Salamander	<i>Hemidactylium scutatum</i>	State: Special Concern	Vernal Pools, Wetlands, and Surrounding Upland Forests	20 breeding pools and associated upland habitats used by these species.	* Conservation easements * Landowner Management Agreements for forest management
Pink Heelsplitter Mussel	<i>Potamilus alatus</i>	State: Endangered	Stream and River Habitat	20 acres of riparian restoration on streams supporting species at risk mussel populations.	* Conservation easements * Riparian buffer plantings * Landowner Management Agreements for buffer zone management	

Target Animal Species	Common Name	Scientific Name	Status	Habitat	Conservation Goals and Objectives	Eligible Conservation/Management Activities
	Fluted-shell Mussel	<i>Lasmigona costata</i>	State: Endangered	Stream and River Habitat	20 acres of riparian restoration on streams supporting species at risk mussel populations.	<ul style="list-style-type: none"> <li>* Conservation easements</li> <li>* Riparian buffer plantings</li> <li>* Landowner Management Agreements for buffer zone management</li> </ul>
	Black Sandshell Mussel	<i>Ligumia recta</i>	Region: Species of Concern	Stream and River Habitat	20 acres of riparian restoration on streams supporting species at risk mussel populations.	<ul style="list-style-type: none"> <li>* Conservation easements</li> <li>* Riparian buffer plantings</li> <li>* Landowner Management Agreements for buffer zone management</li> </ul>
			State: Endangered			
	Fragile Papershell Mussel	<i>Leptodea fragilis</i>	State: Endangered	Stream and River Habitat	20 acres of riparian restoration on streams supporting species at risk mussel populations.	<ul style="list-style-type: none"> <li>* Conservation easements</li> <li>* Riparian buffer plantings</li> <li>* Landowner Management Agreements for buffer zone management</li> </ul>
	Pocketbook Mussel	<i>Lampsilis ovata</i>	State: Endangered	Stream and River Habitat	20 acres of riparian restoration on streams supporting species at risk mussel populations.	<ul style="list-style-type: none"> <li>* Conservation easements</li> <li>* Riparian buffer plantings</li> <li>* Landowner Management Agreements for buffer zone management</li> </ul>
	Cylindrical Papershell Mussel	<i>Anodontoidea ferussacianus</i>	State: Endangered	Stream and River Habitat	20 acres of riparian restoration on streams supporting species at risk mussel populations.	<ul style="list-style-type: none"> <li>* Conservation easements</li> <li>* Riparian buffer plantings</li> <li>* Landowner Management Agreements for buffer zone management</li> </ul>
	Giant Floater Mussel	<i>Pyganodon grandis</i>	State: Threatened	Stream and River Habitat	20 acres of riparian restoration on streams supporting species at risk mussel populations.	<ul style="list-style-type: none"> <li>* Conservation easements</li> <li>* Riparian buffer plantings</li> <li>* Landowner Management Agreements for buffer zone management</li> </ul>
	Elktoe Mussel	<i>Alasmidonta marginata</i>	Region: Species of Concern	Stream and River Habitat	20 acres of riparian restoration on streams supporting species at risk mussel populations.	<ul style="list-style-type: none"> <li>* Conservation easements</li> <li>* Riparian buffer plantings</li> <li>* Landowner Management Agreements for buffer zone management</li> </ul>
State: Special Concern						

\* New England Wildflower Society Conservation Plan currently available.

\*\* New England Wildflower Society Conservation Plan is in progress, expected in 2004.