

# Winners and Losers in a Changing Climate

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# 162 State Endangered or Threatend Plants

SCIENTIFIC NAME	COMMON NAME	STATE STATUS	GLOBAL STATUS	DISTRIBUTION	Forested
<i>Adiantum viridimontanum</i>	Green Mountain maidenhair-fern	T	G3	Endemic	
<i>Agastache nepetoides</i>	Yellow giant hyssop	T	G5	Peripheral NE	
<i>Agastache scrophulariifolia</i>	Purple giant hyssop	T	G4	Peripheral NE	
<i>Allium canadense</i>	Wild garlic	T	G5	Peripheral NE	Floodplain Forest
<i>Ammophila breviligulata</i> ssp. <i>champlainensis</i>	Champlain beach grass	E	G2G3Q	Endemic	
<i>Anemone multifida</i>	Early thimbleweed	E	G5	Peripheral South	
<i>Anthoxanthum monticola</i>	Alpine Sweet-grass	T	G5	Peripheral South	
<i>Anticlea glauca</i>	White Camas	E	G5T4	Peripheral East	
<i>Aplectrum hyemale</i>	Putty-root	T	G5	Peripheral NE	No. Hardwood Forest
<i>Arabidopsis lyrata</i>	Lyre-leaved Rock-cress	T	G5	Peripheral NE	Oak Pine Forest
<i>Arethusa bulbosa</i>	Arethusa	T	G4	Central Common to North	
<i>Arisaema dracontium</i>	Green dragon	T	G5	Peripheral NE	Floodplain Forest
<i>Asclepias amplexicaulis</i>	Blunt-leaved milkweed	T	G5	Peripheral NE	
<i>Asclepias tuberosa</i>	Butterfly-weed	T	G5?	Peripheral NE	
<i>Asclepia verticillata</i>	Whorled milkweed	E	G5	Periheral East	

# Global Ranks vs. Distribution

Global Rank	Number of Spp	Percentage	Peripheral	Other
G1 or T1	2	1.2%		Endemic 2
G2	4	2.5%	1	Endemic 2 Disjunct 1
G3	6	3.7%	4	Endemic 1 Central 1
G4	31	19.1%	24	Central 7
G5	119	73.5%	100	Disjunct 2 Central 17
<p><u>Notes:</u></p> <ul style="list-style-type: none"> <li>• Endemic Species: <i>Adiantum viridimontanum</i>, <i>Ammophila breviligulata</i> ssp. <i>champlainensis</i>,</li> <li>• <i>Astragalus robbinsii</i> var <i>jesupii</i>, <i>Isoetes viridimontana</i>, <i>Nabalus boottii</i></li> <li>• Disjunct Species: <i>Hudsonia tomentosa</i>, <i>Lathyrus japonicas</i> var. <i>maritimus</i>, <i>Minuartia marcescens</i></li> </ul>				

# T and E Plants with Distribution Status

<u>Category</u>	<u>Number of Species</u>	<u>Percent of Species</u>	<u>Total for Category</u>
Endemic	5	3.0%	3.0%
Disjunct	3	1.9 %	1.9%
Central	25	15.4%	15.4%
Peripheral North	28	17.3%	Peripheral North = NE + N 42.0%
Peripheral NE	40	24.7%	
Peripheral South	51	31.5%	Peripheral South = SE + S 32.1%
Peripheral SE	1	0.6%	
Peripheral E	9	5.6%	Peripheral East 5.6%
Totals	162		Peripheral Total 79.7%

# T & E Plants in Forested Habitat

Distribution	Number of Species	Percentage	Community Type
<b>North including NE</b>	27	61.40%	Mesic Maple-Ash-Hickory-Oak Forest 7
			Dry Oak-Hickory Hophornbeam Forest 6
			Red Oak-Northern Hardwood Forest 3
			Floodplain Forest 3
			Oak - Pine Forests 3
			Hemlock-Hardwood Forest 2
<b>South including SE</b>	9	20.50%	Cedar Swamps 6
			Oak- Hickory-Hophornbeam, Montane SF, Rich No Hdwd Forests: 1 Each
<b>Central</b>	6	13.60%	Cedar Swamps 2
			White Pine-Black Oak Forest 2
			Oak-Hickory-Hophornbeam, Rich No Hdwd: 1 Each
<b>East</b>	2	4.50%	Mesic Maple-Ash-Hickory-Oak, Dry Oak Forest: 1 Each



# CONCLUSIONS

- The majority of Vermont's listed plant species are on the periphery of their range (80%). This is typically reflected in a low Global Rank, i.e. G5 or G4 (over 90% of listed plants).
- Slightly more listed plants are on the northern periphery (42%) vs. the southern periphery (31%)
- This bodes well for many of the listed plants persisting as the climate warms. Other factors aside, species on the northern periphery would be expected to expand in VT whereas those on the southern periphery would be expected to contract.

# ASSUMPTIONS & SPECULATION

- Changing climatic conditions could favor more ruderal, disturbance adapted species that can respond more quickly to climate induced changes however, more stress tolerant species might persist in situ in climate refugia.
- Survival is likely to depend on phenology, synchronization with pollinators, competitive capability, continued persistence of habitat, etc.
- Best Use of Resources:
  - Likely won't be able to protect every individual species
  - Protect Habitat (refugia) and Landscape Connectivity
  - Focus on those plants that are Globally Rare or Disjunct in Vermont
  - Consider Assisted Migration for G1&2 and Disjunct Species.

