

## ***Triphora trianthophora***

### Status

Federal status: G3G4 (rounded G3) N?, Not listed

NH state status: S2, Threatened

ME state status: S1, Threatened

Listed in Flora Conservanda as a Division 2a species (greater than 20 current occurrences, but a substantial number of those have a small number of individuals). The species receives protection as an endangered or threatened species in 13 states and in Ontario.

Stems for this species do not appear above ground each year; plants may persist as subterranean tuberoids for extended periods. Periodic dormancy may result in a site containing hundreds of aboveground stems in some years and few or no stems in other years. This inconsistency and the fact that it grows, flowers, and fruits in about a month in late summer, make determination of population trends very difficult.

The expert panel indicated it is likely a C outcome now and in the foreseeable future, both range-wide and on the WMNF. It occurs in lower elevation, tillable habitat so there probably was historical habitat loss to agriculture and extensive logging, and more recent loss to development.

### Distribution

*Triphora trianthophora* occurs in Ontario, Canada, and New England (except Connecticut (H) and Rhode Island), south to Florida and west to Nebraska (except Pennsylvania (H), Minnesota, North Dakota, and South Dakota) and south to Texas. It occurs in 30 states, but it is rare throughout much of its range. This species also occurs in some parts of Central America including Mexico, Guatemala, and Panama.

In New Hampshire, 10 extant and 11 historic occurrences are documented from Madison, Conway, Wakefield, Albany, Chatham, Sandwich, Tamworth, Conway, Bartlett, Holderness, Laconia, Meredith, Milford, Hillsborough, and Winchester. The WMNF has three known extant occurrences in New Hampshire, two in Chatham and one in Albany. In Maine, this species is known from 7 extant and 1 historic occurrences in Stow, Stoneham, Hiram, Brownfield, Raymond, and Parsonfield. The WMNF also has three known extant occurrences in Maine, two in Stow and one in Stoneham.

### Habitat

In New England, *Triphora trianthophora* grows primarily in moist, beech-dominated woods in terrain-formed leaf litter pockets. Appropriate light, moisture, soil temperature, and mycorrhizal and saprophytic relationships are important to this species. One study indicates that *Triphora trianthophora* is always associated with *Fagus grandifolia* in New England. There are usually few, if any, herbaceous species growing adjacent to this species. Soil is usually acidic at New England sites, but can be calcareous, and soil temperatures are often high. The orchid is never found on predominantly mineral soil. *Triphora trianthophora* prefers filtered light from a canopy closure of 70-80%.

This species also can be found on or near decaying logs, along streams, in floodplain forests, at the edge of swamps, and on steep mountain slopes. It is occasionally reported from sphagnum bogs or mixed forest borders of bogs.

### Limiting Factors

Timber harvest may damage or destroy individual plants or colonies, alter light and moisture regimes, change overstory composition, and alter important soil characteristics. All of these habitat changes could reduce habitat quality or quantity for this species, and logging has been identified by several sources as a threat. Precise light requirements for the orchid are unknown. However, many of the extant sites occur in mature beech forests and the expert panel estimated the preferred canopy closure for this species in northern New England at 70-80%. Comments in Natural Heritage Program databases suggest that selective harvest may be appropriate for this species in conditions that are thought to be too shaded. Overall, the impact of timber harvest on this species is unknown and may depend on habitat conditions before and after the harvest.

Several sites across New England have been lost to development. Road maintenance activities, such as culvert maintenance, plowing and sanding, and roadside cutting, and road widening may impact habitat suitability for some populations.

Recreational use, timber harvest, and other activities might result in trampling and other direct impacts to individuals and small populations. Whether the tendency of this species to remain underground for years at a time will buffer some of these potential direct impacts is unknown. Its stolons are fragile, near the litter surface, and may be easily impacted by above-ground activity, which could reduce reproduction.

The small size of many populations makes them vulnerable to stochastic events that may destroy populations. Population size and apparently heavy reliance on vegetative reproduction may result in low genetic diversity, which could reduce the species' ability to adapt to environmental changes. The cryptic nature of the orchid makes it especially vulnerable to inadvertent disturbance.

Herbivory and collection also are threats, but the extent and impact of these threats is unknown.

The distribution of beech may be reduced significantly as a result of global warming, which would reduce suitable habitat for *Triphora trianthophora*. Atmospheric deposition is suspected in the decline of the fungal symbiont of some orchid species. Whether this applies to *Triphora trianthophora* is unknown.

### Viability concern

A rounded global rank of G3, along with documentation of occurrence on the WMNF, make this an automatic Regional Forester's Sensitive Species for the Forest. WMNF contains 22% of NH population. WMNF management can affect some of the potential threats.

### Management activities that might affect populations or viability

There are indications in the literature that timber harvest can benefit this species or reduce habitat quality and eliminate individuals. Clearcuts or other harvest methods that dramatically open the canopy would eliminate suitable habitat for many years. Individual

tree selection and other methods than maintain canopy closure over 70% may help retain habitat suitability. Any type of harvest could directly impact individuals and their stolons if the ground is not frozen.

Road maintenance, widening, and movement could directly impact individuals and alter habitat suitability.

### References

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