

**Final Recovery Planning Outline with Listing Status Review Triggers
for the Illinois Endangered Leatherflower (*Clematis viorna*)**

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Approved by the Illinois Endangered Species Protection Board at the February 20, 2014 Special Meeting.

Common Name: Leatherflower
Scientific Name: *Clematis viorna* (Linn.)
Family: Ranunculaceae
Synonyms: Vasevine

Status

Leatherflower (*Clematis viorna*) is endangered in Illinois (17 Ill. Adm. Code 1050). It was first listed in 1980 as an endangered species due to restricted habitats or low populations in Illinois (Mankowski 2012).

The species is not listed as federally endangered or threatened.

NatureServe gives the species a global rank of G5 (secure) and a national rank of N5 (secure). It is ranked as S1 (critically imperiled) in Illinois. Other state rankings include an S1 rank for the species in Missouri, Pennsylvania, and Delaware, an S3 rank (vulnerable) in Maryland, an S4 rank (apparently secure) in Kentucky, Virginia, and West Virginia, an S5 rank (secure) in North Carolina and Georgia, and it is not ranked in the remaining states with distribution (NatureServe 2013; Figure 1).

Total Range

Leatherflower ranges across the eastern United States and into Canada where it is considered an exotic (Figure 1).

Illinois Distribution

In Illinois, the species is historically known from the southeastern part of the state (Herkert and Ebinger 2002). There are historic museum and/or the Illinois Natural Heritage (Biotics 4) Database (Database) element occurrence records (EOs) from six counties (EOs have been established from three of the six counties) and two Natural Division Sections (EOs have been established in both of the Sections) (Herkert and Ebinger 2002, INHD 2013; Tables 1 and 2, Figure 2).

Currently, there are a total of 3 EOs (across 3 counties) in the Database for *C. viorna* although 1 EO is listed as “destroyed”. At the time of initial listing, location information was brought forth to establish only 1 EO (in 1 county and within 1 Natural Division Section) and since then 2 EOs (in 2 new counties and 1 additional Natural Division Section) have been added for the species: 1 in 2001 and 1 in 2011. While new EOs have been added since listing, not every EO is surveyed each year or regularly (2 of the 3 EOs have been surveyed in the last 10 years), so the number of EOs with observations in any given year or 5-year interval may not reflect the true status of the species (see Figure 3). There have been recent observations (since 2002) at 1 EO in 1 county; representing 1 of the 3 counties and 2 of the 3 Natural Division Sections with known historic distribution. One EO occurs on property that is formally protected by dedication as an Illinois Nature Preserve or registration as an Illinois Land and Water Reserve, but that EO was reported as “destroyed” in 2005 by river entrenchment (INHD 2013; Tables 1, 2, and 3, and Figure 2).

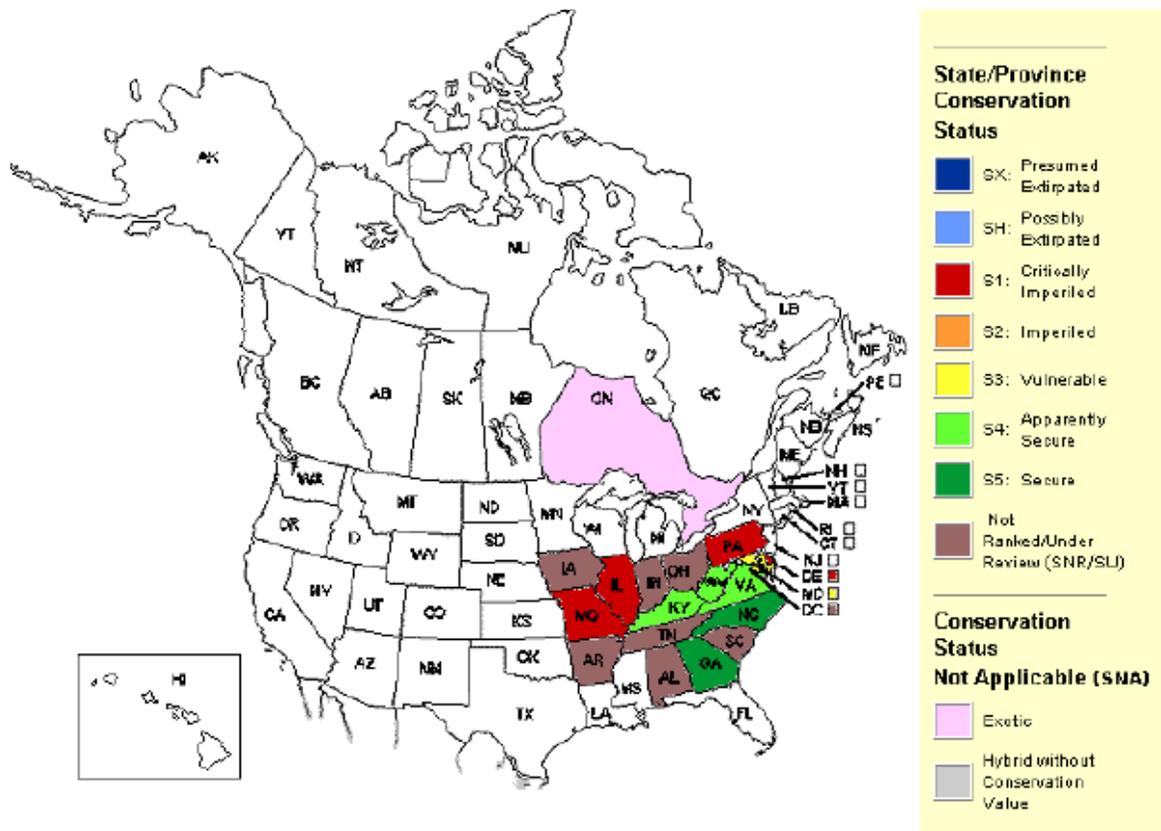


Figure 1. Distribution and NatureServe status of *Clematis viorna*, by state and province (NatureServe 2013).

Table 1. Illinois county distribution of *Clematis viorna*

	Historic (with no EO)	EO with historic obs	EO w/ recent (since 2002) obs
Crawford			X
Jasper	X		
Johnson		X	
Lawrence		X	
Richland	X		
Wayne	X		

Table 2. Illinois Natural Division and Section distribution of *Clematis viorna*

DIVISION	SECTION	Historic (with no EO)	EOs with historic obs	EOs with recent (w/in last 10 yrs) obs
Wisconsin Driftless				
Rock River Hill Country	Freeport			
	Oregon			
Northeastern Morainal	Morainal			
	Lake Michigan Dunes			
	Chicago Lake Plain			
	Winnebago Drift			
Grand Prairie	Grand Prairie			
	Springfield			
	Western			
	Green River Lowland			
	Kankakee Sand Area			
Upper Mississippi River and Illinois River Bottomlands	Illinois River			
	Mississippi River			

Western Forest-Prairie	Galesburg			
	Carlinville			
Middle Mississippi Border	Glaciated			
	Driftless			
Southern Till Plain	Effingham Plain			
	Mt. Vernon Hill Country			
Wabash Border	Bottomlands	?	1	1
	Southern Uplands			
	Vermilion River			
Ozark Division	Northern			
	Central			
	Southern			
Lower Mississippi River Bottomlands	Northern			
	Southern			
Shawnee Hills	Greater Shawnee Hills			
	Lesser Shawnee Hills			
Coastal Plain	Cretaceous Hills			
	Bottomlands	?	1	

Note: "Historic with no EO" location information is not precise and assignment to Natural Division Section is based on a combination of known county occurrence, habitat association, and other Natural Division Section occurrences.

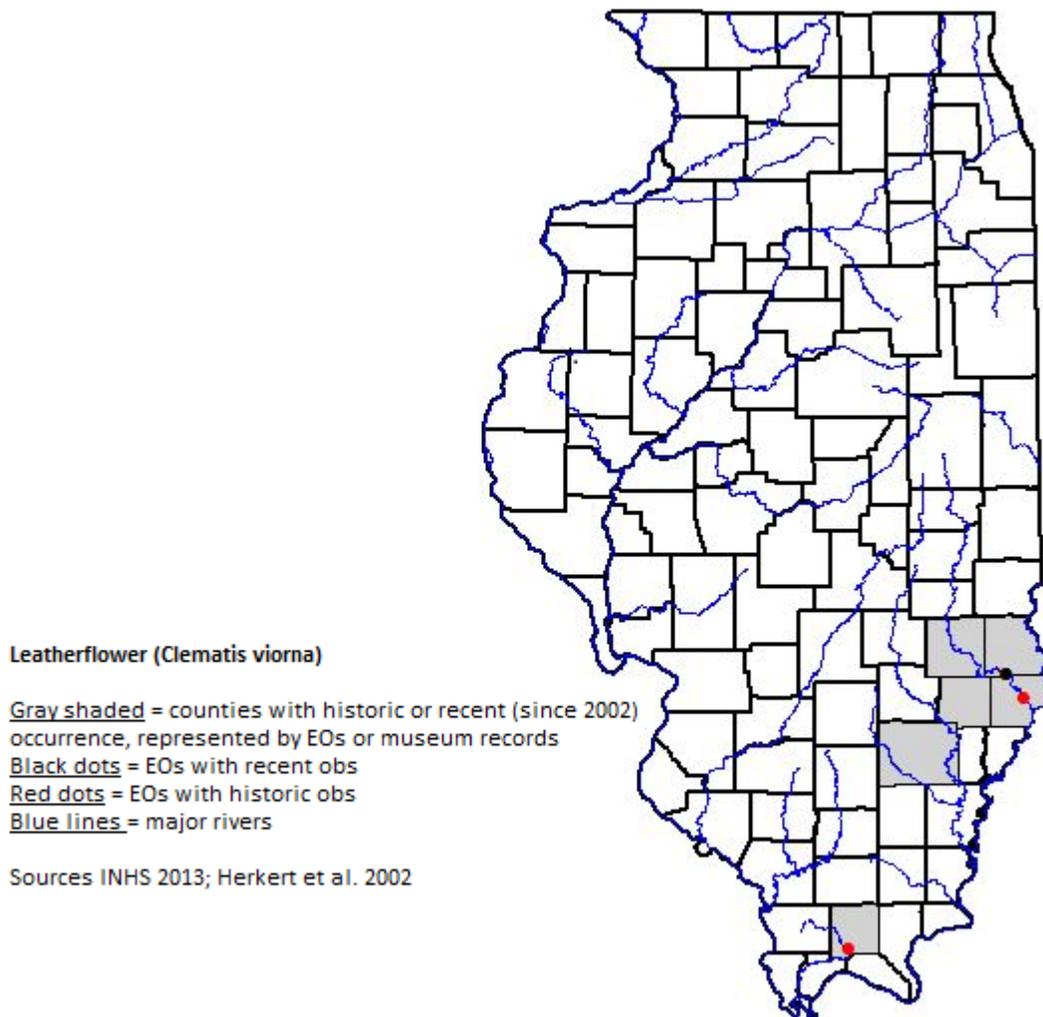


Figure 2. Historic and current distribution of *Clematis viorna* in Illinois.

Table 3. Select Illinois Natural Heritage (Biotics 4) Database information for *Clematis viorna*: Last observation date; total number of element occurrences (EOs); number of EOs observed since 2002; number of EOs protected as Illinois Nature Preserves or Illinois Land and Water Reserves; number of topographic quadrangles captured by total EOs; number of counties captured by total EOs; and, number of counties captured by EOs observed since 2002.

Last Observation	Total # EOs	# EOs observed since Jan 2002	# of EOs protected as NP/LWR	# topo quads	# Counties	# Counties since 2002
5/25/2011	3	1	1	2	3	1

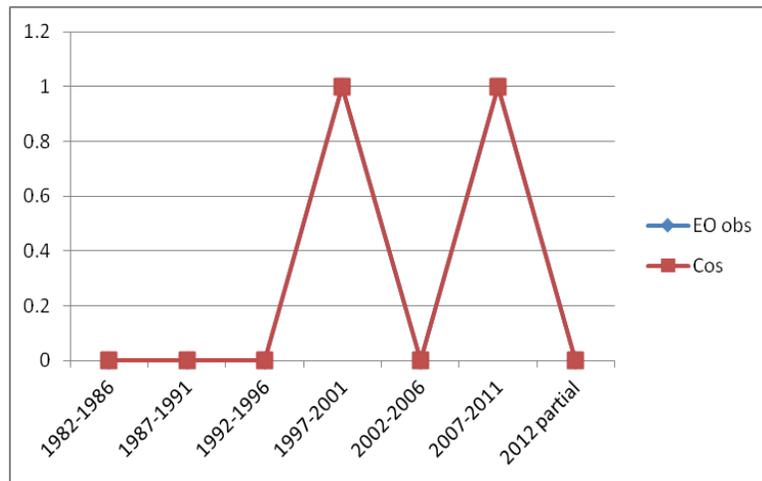


Figure 3. The number of *Clematis viorna* EOs in Illinois with observation during respective 5-year intervals and for 2012 (partial).

Description, Biology, and Habitat

Description

Clematis viorna is a perennial, climbing or sprawling herb, with slightly woody, shallowly grooved, 6-angled and slightly downy to glabrous stems that may attain a length of 8 to 12 feet (2.4-3.7 m) (Herkert and Ebinger 2002; NatureServe 2013). Leaves are compound with 2-4 pairs of thin leaflets, ovate to lanceolate to broadly elliptic, acute to acuminate, cuneate to rounded at the base, entire, glabrous above, puberulent and not conspicuously reticulate beneath (Gleason and Cronquist 1963). Flowers are solitary on a long peduncle with blue to purple sepals (Mohlenbrock 2002; NatureServe 2013). Peduncles usually have 2 bracts and 1 nodding flower. Sepals are four in number, forming a campanulate calyx, very thick, purple, oblong-lanceolate, 1.5-2.5 cm long with acuminate recurved tips; petals absent. The stamens are numerous, the anthers and filaments about equal in length. The achenes are ovoid, brownish, strigose, the persistent style plumose, to 2.5 cm long. In Illinois, it flowers from May to August (Mohlenbrock 2002).

Species Biology

Clematis viorna is a climbing or sprawling phanerophyte with perennating bud height of 25 cm or higher and vines that can reach 12 feet in length (Gibson 1961). *Clematis* seeds may germination in about six months to a year (International Clematis Society 2013). For introductions, plants can be grown from seed, stem cuttings or layering. To grow plants from seed, seeds should be collected in the fall when seed is brown. Seedheads may be gathered from the plants by hand, dried, and shaken to remove the seeds from the heads. Place the container with the seeds in a zip lock polyethylene bag and place it outside in a shady spot (or a refrigerator) for several months during the winter so that they go through several freeze/thaw cycles. Plant seeds in sterile seed starting mix, covering seeds with a thin layer of sand. Alternatively, untreated seed can be sown in the fall soon after collection. Stems cuttings are most successful if taken early in the year from one year old softwood cuttings.

Habitat

In Illinois, *Clematis viorna* has been most commonly reported from floodplain forests. In Indiana, it has been reported from streambanks, roadsides, railroad rights of way, dense wooded hillsides and thickets, low woodlands, the margin of small lake draining from a bog and pin oak flat woods (Butler University Friesner Herbarium Digital Collection accessed July 19, 2013).

Reasons for Status and Threats

C. viorna occurs in restricted habitat of wet mesic forests and thickets of floodplain forest in southern Illinois. Threats include conversion of habitat, alteration of hydrology (including draining or inundation), woody encroachment, and alteration of canopy that may cause excessive shading or sun. It should be communicated to local land managers that local hydrology should not be altered or subjected to extreme fluctuation and that saturated soils should also not be drained in areas where leatherflower occurs.

Low population numbers is also a threat to *Clematis viorna* in Illinois. The species is currently known from only two EOs (the third EO for the species was reported as extirpated in 2005) and most recent observations report only 3 plants at one site and 1 plant at the other site.

Recovery Objectives and Criteria

The Illinois Endangered Species Protection Board is required by law to review, and revise as necessary, the Illinois List of Endangered and Threatened Species at least every five years. We propose that measures of population size and distribution, as documented in the Illinois Department of Natural Resources (Biotics 4) Database, be used to trigger a detailed review of the species' status by the Illinois Endangered Species Protection Board. The measures were developed relative to the status and distribution of the species at the time of original listing and the definitions of "endangered" and "threatened". Achieving the levels of population size and distribution proposed in this outline shall not prompt an "automatic" change in the status of the species in Illinois, and the Endangered Species Protection Board may review the status or status review criteria of the species at any time. Other factors, including known threats, productivity, and extent and condition of protected habitat, should be considered with population size and distribution data to judge whether a change in status is warranted.

Definitions of "endangered" and "threatened" under the Illinois Endangered Species Protection Act.

Endangered in Illinois – in danger of extinction in the wild in Illinois due to one or more causes including but not limited to, the destruction, diminution or disturbance of habitat, overexploitation, predation, pollution, disease, or other natural or manmade factors affecting its prospects of survival.

Threatened in Illinois – likely to become endangered in the wild in Illinois within the foreseeable future.

Listing Status Review Triggers

Endangered – Over the last 5-years, the Natural Heritage (Biotics 4) Database has element occurrence reports for the species that fall below the levels identified in the "Threatened" Listing Status Review Trigger.

Threatened – Over the last 5 years, the Natural Heritage (Biotics 4) Database has element occurrence reports for the species of at least 6 EOs with observations that demonstrate natural recruitment across 3 counties and within 1 Natural Division Section known for historic distribution and at least 3 of the 6 EOs should have observations in more than one year during the last 10 years. At least 3 EOs must be protected. For EOs that have undergone population manipulation, they must have been liberated from population interventions for at least 3 years and meet the above criteria.

Secure – Remove from the IL List – Over the last 5 years, the Natural Heritage (Biotics 4) Database has element occurrence reports for the species of at least 12 EOs with observations that demonstrate natural recruitment across 6 counties and within 2 Natural Division Sections known for historic distribution and at least 6 of the 12 EOs should have observations in more than one year during the last 10 years. At least 6 EOs must be protected. For EOs that have undergone population manipulation, they must have been liberated from population interventions for at least 3 years and meet the above criteria.

Recommended Recovery Strategies

Recommended recovery strategies include a combination of monitoring, management, and protection for known populations and a prescription for testing a translocation program for the species to establish new populations. Translocations will be compliant with the INPC/IESPB/IDNR Plant Translocation and Restoration Policy (current version) and will be conducted according to site-specific prescriptions that will include a schedule of review to evaluate the success or failure of individual translocations, the need for prescription adjustments, and whether they should be continued. Translocations will need to be successful and liberated from population manipulation as described above in the Listing Status Review Triggers before they will be considered “wild” occurrences in the statewide population.

Recovery Strategy 1: Assess current status and distribution

- a. Conduct surveys at 1/5 of known EOs annually to confirm presence/absence and population numbers of all EOs, within each 5-year cycle. Surveys should cover information necessary to complete an Element Occurrence Reporting form and include the following specific information: the total number of individuals at a location (indicate count or estimate); the number or percent of individuals from younger age classes that demonstrate natural recruitment (indicate count or estimate); the area surveyed and what % of proximate suitable habitat the survey area represents (include a map); and, search effort (person hours).
- b. Conduct surveys at three historic locales with no EOs to confirm presence/absence and population numbers (if present), within a 5-year period.
- c. Survey for additional suitable habitat and new occurrences in counties/Natural Division Sections known for historic and current populations where EOs have been established.
- d. Report results annually to the Illinois Natural Heritage (Biotics 4) Database.
- e. At the end of the initial 5-year period, assess whether additional surveys are warranted for areas identified in (b) and (c) or if these locales should be considered low priority areas in allocating future resources.

Recovery Strategy 2: Promote management and protection of known populations.

- a. Work with landowners to gain commitment for developing management plans to promote compatible land uses and minimize threats for properties with extant populations.
- b. Work with landowners to promote enrollment of properties with extant populations into land protection programs such as dedication as an Illinois Nature Preserve, registration as an Illinois Land and Water Reserve, or a similar conservation easement program.

Recovery Strategy 3: Assess need and potential for augmenting existing populations and/or establishing reintroduced/introduced populations within appropriate habitat.

- a. Review status and distribution against Listing Status Review Triggers to determine if augmenting existing populations and/or reestablishing/establishing new populations is necessary.
- b. Determine whether local ecotype stock is available for collection of seed and either direct dispersal to receiving sites or for propagation and later planting of propagules to receiving sites. If local ecotype stock is not available, conduct genetic analysis of proposed translocation stock to determine genetic health and compatibility. If propagation of stock is prescribed, methods with demonstrated success

should be used – at this time, methods should follow those used for propagation and planting of *Silene regia* by Edgin (Edgin 2012).

- c. Perform an assessment of potential translocation areas based on results from Recovery Strategy 1 and relative to Recovery Strategy 3a and assess for potential impacts to other listed species in the proposed receiving sites.
- d. Relative to determinations about origin of proposed translocation stock from 3b, and consistent with the INPC/IESPB/IDNR Plant Translocation and Restoration Policy, conduct translocations at sites that have formal protection agreements in place.
- e. Translocated occurrences will be monitored annually for at least the first 3 years. Results of the first 3 years monitoring will be reviewed to determine survivorship at the receiving site and success of translocation methods and whether translocation efforts should be continued, ceased, or otherwise adjusted.
- f. Report results annually to the Illinois Natural Heritage (Biotics 4) Database.

Recovery Outline Review & Revision

This outline will be reviewed annually by the authors and staff involved with implementation. The need for revisions may be identified at any time. All substantive revisions to this outline, including but not limited to recovery objectives and recovery strategies, should be considered a new recovery plan and follow the protocol described in “The Illinois Department of Natural Resources’ Recovery Planning in the Office of Resource Conservation” (current version). As such, recovery planning may be initiated by any staff and follows an established process to ensure proper review and potential conflicts are identified. Updated information – such as new data on distribution and abundance, research results relevant to recovery considerations, changes in taxonomy or nomenclature, and corrections to factual errors in this document – may be posted as addendums to the recovery outline without changing the original document.

Estimated Timing of Strategies

Implementation may take 10 or more years: Strategies will be somewhat implemented in phases and results from the first 5-year interval will greatly inform the overall estimate. Many activities such as landowner contacts, site-specific habitat management plan development, contract administration, etc., will be ongoing throughout the year. A basic schedule of some key implementation activities is presented below.

January	Conduct annual review of recovery outline strategies to confirm priority activities for calendar year. Recovery activities of INPC and IDNR staff are included in respective annual plan of work processes.
February	
March	Confirm information and resources are in place to conduct annual field work.
April	Primary window for spring plantings for translocations (April-May). Primary window for surveys of element occurrence and potential habitat (flowering is in May-July).
May	
June	
July	
August	If fall plantings are prescribed for translocations, September is the target window.
September	
October	Ensure element occurrence survey reports have been submitted to the Biotics 4 Database. Compile information on annual surveys, translocation activities, and habitat protection.
November	
December	Complete and post biennial progress reports on <i>Clematis viorna</i> recovery.

Estimated Costs of Strategies

Estimated total cost for establishing 300 plants on 6 protected sites (what is currently estimated as necessary to achieve the population threshold for the Listing Status Review Trigger for “Secure – Remove from the IL List”) is between \$10,000 and \$12,500 plus labor for transplanting. The estimate for staff time for monitoring, habitat searches, and reporting is approximately 0.75 day/occurrence.

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