

**Final Recovery Planning Outline with Listing Status Review Triggers  
for the Illinois Endangered Bloodleaf (*Iresine rhizomatosa*)**

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

**Common Name:** Bloodleaf  
**Scientific Name:** *Iresine rhizomatosa*  
**Family:** Amaranthaceae  
**Synonyms:** Eastern Bloodleaf, Judah's Bush

**Status**

Bloodleaf (*Iresine rhizomatosa*) 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 it is not ranked at a national scale. It is ranked as S1 (critically imperiled) in Illinois. Other state rankings include an S1 rank (critically imperiled) for the species in Maryland; an S2 rank (imperiled) in Indiana and North Carolina; an S3 rank (vulnerable) in Virginia; and, an S5 rank (secure) in Kentucky. It is not ranked in the remaining states with distribution (NatureServe 2013; Figure 1).

**Total Range**

Bloodleaf ranges across the southeastern U.S. from Alabama to Texas, north to Virginia and Maryland, Indiana, Illinois, Missouri, and Kansas (Steyermark 1963; NatureServe 2013; Figure 1).

**Illinois Distribution**

Bloodleaf reaches its northern range limit in the Wabash and Ohio River floodplain forests of southeastern Illinois (Herkert and Ebinger 2002). There are historic museum and/or the Illinois Natural Heritage (Biotics 4) Database (Database) element occurrence records (EOs) from 5 counties (EOs have been established from 4 of the 5 counties) and 2 Natural Division Sections (EOs have been established in both Sections) (Herkert and Ebinger 2002, INHD 2013; Tables 1 and 2, Figure 2).

Currently, there are a total of 6 EOs (across 4 counties) in the Database for *I. rhizomatosa*. At the time of initial listing, location information was brought forth to establish no EOs. Following listing, a total of 6 EOs have been added (across 5 counties and 2 Natural Division Sections). Not every EO is surveyed each year or regularly (4 EOs have no reports since at least 2002), 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 2 EOs across 2 counties; representing 2 of the 5 counties and 1 of the 2 Natural Division Sections with known historic distribution. Two EOs occur on properties that are formally protected by dedication as an Illinois Nature Preserve or registration as an Illinois Land and Water Reserve (INHD 2013; Tables 1, 2, and 3, and Figure 2).

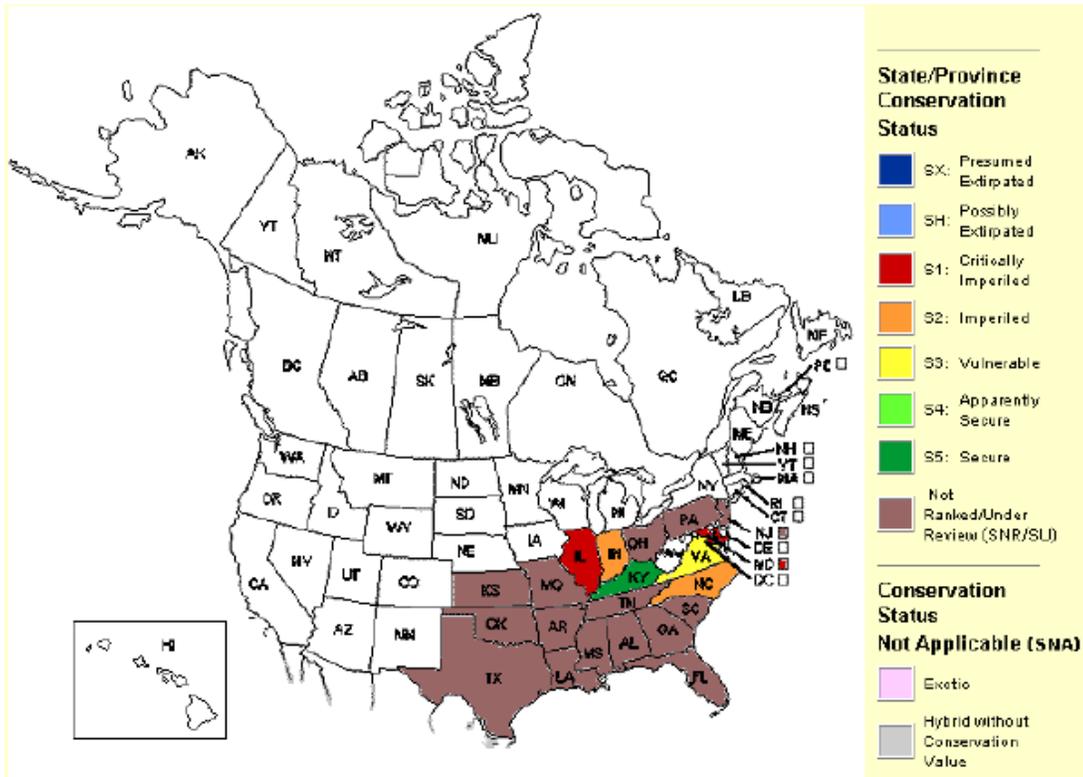


Figure 1. Distribution and NatureServe status of *Iresine rhizomatosa*, by state and province (NatureServe 2013).

Table 1. Illinois county distribution of *Iresine rhizomatosa*

	Historic (with no EO)	EO with historic obs	EO w/ recent (since 2002) obs
Crawford		X	
Lawrence		X	X
Massac		X	
Pulaski	X		
Wabash		X	X

Table 2. Illinois Natural Division and Section distribution of *Iresine rhizomatosa*

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			
	Carlville			
Middle Mississippi Border	Glaciated			
	Driftless			
Southern Till Plain	Effingham Plain			
	Mt. Vernon Hill Country			
Wabash Border	Bottomlands	?	5	2
	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.

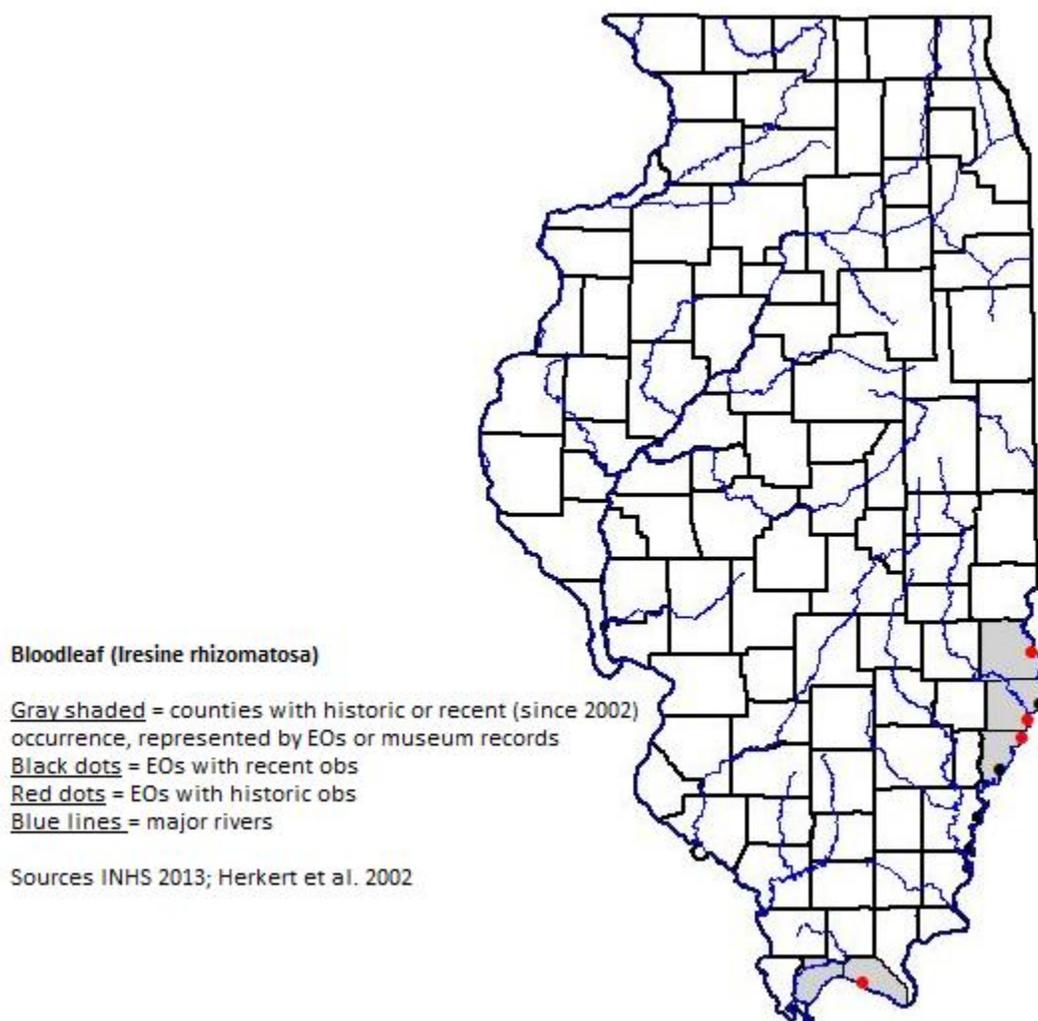


Figure 2. Historic and current distribution of *Iresine rhizomatosa* in Illinois.

Table 3. Select Illinois Natural Heritage (Biotics 4) Database information for *Iresine rhizomatosa*: 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
9/22/2010	6	2	2	6	4	2

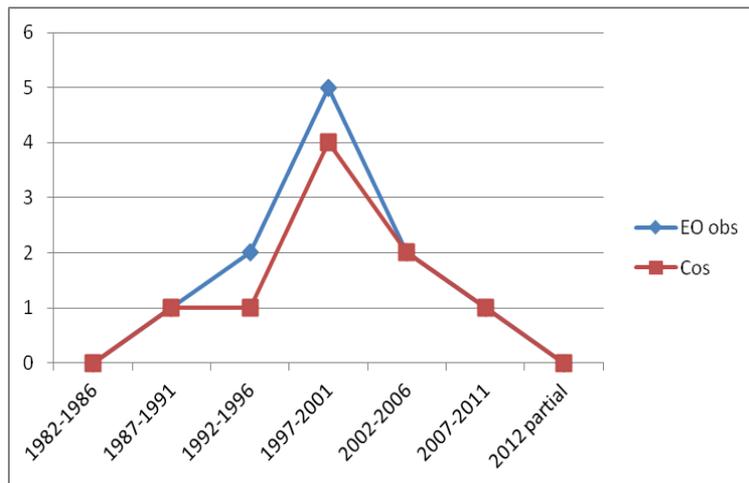


Figure 3. The number of *Iresine rhizomatosa* EOs in Illinois with observation during respective 5-year intervals and for 2012 (partial).

## Description, Biology, and Habitat

### Description

Bloodleaf is a rhizomatous, perennial herb from 5-15dm tall (eFloras 2008, Herkert and Ebinger 2002). Stems are erect or ascending, multiple from the base, glabrous, swollen and pilose at the nodes, green-striate, carinate below, branching and fistulose (Nelson and Arndt 1980). Leaves are opposite, thin, petiolate, petioles to 5cm, lance-ovate, acuminate, entire, to 14cm long, a third to half as wide, reddish at the base, glabrous, deep green above, light green below, and glabrous or with a few hairs on the veins below (Steyermark 1963; Mohlenbrock 2002, Mohlenbrock 2008). Panicles are terminal and from the upper axils, pyramidal, 1-3 dm, with innumerable small pistillate flowers in axillary and terminal panicles (Mohlenbrock 2001). Flowers are sessile, pistillate, minute and only slightly overlapping. The rachillae are clearly visible between the individual flowers, scarious-white, 1-1.4mm long. Perianth parts scarious-white, acute, ovate, 1.2mm long and broad. Inner 4 parts greenish, lanceolate, acuminate and 1mm long. The ovary is superior, green, subglobose, 0.5mm long and broad, glabrous. Styles three, each 0.3-0.4mm long, whitish. Staminate flowers minute, whitish, +/-1mm broad. Lower-most branches of the panicles subtended by small bracts, bracts and bracteoles ovate, shorter than the calyx; sepals lance-ovate, 1.2-1.5 mm, those of the pistillate flowers subtended by long (eventually 3-5 mm) hairs. Fruit rotund, 2-2.5 mm, 1-seeded covered with cotton-like hairs. In Illinois, it blooms from August – October (Mohlenbrock 2002)

### Species Biology

Bloodleaf is a hemicryptophyte with its overwintering buds at the soil surface (Gibson 1961). New populations may be established by wind- or water-dispersed seed or rhizome fragments. Seed germination rates can be less than 1% (Schwartz and Young 2013). Once established, the populations can expand vegetatively with new shoots originating from rhizomes (Edgin personal observations). Populations of bloodleaf along the Wabash River in Lawrence County, Illinois expanded rapidly following timber harvests.

### **Habitat**

Bloodleaf is typically considered a species of floodplain forests and thickets near streams (Steyermark 1963; Mohlenbrock 2002). However, the population at Robeson Hills in Lawrence County and one in northern Wabash County occur in uplands well above the floodplain (Edgin personal observations).

### **Reasons for Decline and Threats**

Bloodleaf reaches its northern range limit in the Wabash and Ohio River floodplain forests of southeastern Illinois (Herkert and Ebinger 2002). Threats include conversion of habitat, alteration of hydrology (including draining or inundation), woody encroachment, and alteration of canopy that may cause excessive shading. 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 Bloodleaf occurs.

Low population numbers is also a threat to *Iresine rhizomatosa* in Illinois. The species is currently known from six EOs, although four have not had observations since at least 2001. Most recent observation reports were “observed” at two EOs, 50+ plants at one EO, 100s of plants at one EO, approximately 200 stems at one EO, and several 1,000 flowering stems across nine locations at the final EO.

### **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 one 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 5 counties and within 2 Natural Division Section 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 is expected to 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.

May	
June	Primary window for surveys of element occurrence and potential habitat (flowering is in August-October). If fall plantings are prescribed for translocations, September/October is the target window.
July	
August	
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>Iresine rhizomatosa</i> recovery.

### Estimated Costs of Actions

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 \$6,000 and \$9,000 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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