

Survey of the native, endangered Kankakee Mallow, *Iliamna remota*, in Kankakee County, Illinois

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Abstract. *Iliamna remota* Greene (Malvaceae) is an endangered species that is endemic to Langham Island in the Kankakee River, in Kankakee County, Illinois. In 1984, the population was shown to be declining and in danger of extinction. Recovery plans were made and management of the island, including controlled burns and mechanical and chemical control of exotic species, have since re-established the population. A survey was conducted to estimate the current population size and status of *I. remota* on the island. Data recorded included stem, flower, and fruit numbers, global positioning of concentrated *I. remota* colonies, and the range of the population on the island. The population was found to be surviving and limited to the northwest portion of the island, with overall stem numbers well over 1000 in the population. In late June, flowering appeared to be prolific. By late July, however, flowering was sporadic, but many flowering stems had set seed. An inventory of species growing among and near the *I. remota* colonies was recorded also. Non-native species such as *Poa pratensis* L. and *Lonicera maackii* (Rupr.) Maxim. were found to be in most colonies of *I. remota* and could therefore, possibly cause future decreases in population size. Further monitoring and managing via prescribed burns and chemical control of exotics may improve the survival and fitness of the *Iliamna remota* population on the island.

INTRODUCTION

Iliamna remota Greene (Malvaceae) is a perennial, herbaceous plant which is endangered in Illinois and endemic to Langham Island in the Kankakee River, in Kankakee County (Figure 1) (Herkert and Ebinger, 2002). This species was first documented to be on the island in 1872 by Reverend E. J. Hill (Strausbaugh and Core, 1932; Sherff, 1946). The population occurs along the northwest portion of the island, wherein most plants have been noted to exist in abundance along the ridge leading down to the river (Sherff, 1946; Schwegman, 1984). In 1966, Langham Island was dedicated as an Illinois Nature Preserve with the primary goal of preserving the *Iliamna remota* population (Schwegman, 1984).

The population was suggested to be in danger of extinction in 1984, after the total number of flowering stems declined from 109 in 1981 to 49 in 1983. The population was also concentrated into five stands in 1983, rather than a more or less continuous population as noted in 1973, further supporting notions of extinction (Schwegman, 1984).

A recovery plan was drawn up in 1984 to avoid extinction and ensure population fitness. Predominant recovery plan recommendations included mechanical and chemical eradication of invasive, woody shrubs, namely *Lonicera maackii*, to reduce canopy cover, controlled burns to maintain open environments optimal for *I. remota* growth and development, and yearly surveys of the population including direct counts of flowering and vegetative stems and seedlings (Schwegman, 1984).

The population was maintained for almost 20 years as per recovery plan suggestions. Data from this study showed that there was an overall increase in population size from 180 total stems in 1983 to 1,646 stems in 2002 (Glass et al, 2003). However, management of this island has been lacking since 2003, which may increase the potential for declines in the population.

The objective of this study was to estimate the population size of *Iliamna remota* on Langham Island to provide information to determine the status of the population. This information would be useful for management plans.

MATERIALS AND METHODS

- ❖ Permission was granted for this study through an Illinois Nature Preserves special permit and the Illinois Department of Natural Resources.
- ❖ A GPS unit (Trimble Pro XRS) was used to mark positions where *I. remota* first occurred, concentrated colonies, and the last area where *I. remota* occurred. Population length was based on first and last coordinates. Coordinates were based on the Illinois State Plane East Zone global positioning system.
- ❖ Position coordinates where *I. remota* occurred were overlaid on a high-resolution map of Langham Island (created by GIS specialist, Roger Diercks of Kankakee County). Position points (on map) were formatted to corroborate with stem numbers per colony using a Jenks scale.
- ❖ A visual survey of species occurring among and at the edge of *I. remota* colonies was recorded.
- ❖ Mean numbers of flower buds, open flowers, and fruits per stem were recorded from ten colonies in June 2005.
- ❖ The number of fruits per stem was recorded based on random choices of plants per colony in July 2005.
- ❖ Fruits were collected from six random colonies, stored at room temperature (22°C), treated with a 10 second hot water dip (80°C), and germinated in Jiffy® Soilless Potting Mix to test for viability.

RESULTS

- ❖ The *Iliamna remota* population occurred from the middle to northwestern portion of the island, with a length of approximately 325m (Figure 2). The population was continuous within this range with concentrated areas recorded as colonies in order to estimate population size.
- ❖ Coordinates per colony are shown in Table 1.
- ❖ Total stem number was 1074 (Table 1).
- ❖ A visual survey showed *Poa pratensis*, *Elymus villosus*, *Cercis canadensis*, and *Lonicera maackii* to be dominant at the site (Table 2) (Mohlenbrock, 2002).
- ❖ Mean numbers and standard deviations of flower buds, open flowers, and fruits per stem were 1.57±1.17, 1.17±0.86, and 2.07±1.65 in June 2005.
- ❖ Mean number of fruits per stem was 4.17±2.47. In late July 2005, fruits were abundant, while flowers were rare.
- ❖ 36% of seeds collected from Langham Island during this study germinated.

Table 1. *Iliamna remota* colony coordinates and number of stems.

Colony #	X Coordinates	Y Coordinates	# of Stems
1	1085596.24188	1646751.65769	8
2	1085511.18926	1646810.69330	13
3	1085481.68734	1646935.01594	75
4	1085405.33189	1647100.66349	12
5	1085309.74929	1647318.07209	12
6	1085283.67252	1647338.38232	231
7	1085292.66288	1647371.17920	78
8	1085283.99328	1647388.56829	68
9	1085278.51029	1647420.42367	26
10	1085224.79993	1647497.58760	450
11	1085212.73024	1647530.60695	100
12	1085114.54694	1647796.01309	1
TOTAL:			1074



Stems lacking flowers in July 2005.

The crew in July 2005 (S. Jones, J. Ebinger, H. Owen, and V. Gutowski).



Table 2. Vascular plant species found within and at the edge of *I. remota* colonies, excluding colonies #1 and #12.

Herbaceous species	Colonies										
	2	3	4	5	6	7	8	9	10	11	
Native											
<i>Ageratina altissima</i> (L.) R. M. King & H. Robins.					x	x	x				
<i>Asclepias syriaca</i> L.									x		
<i>Carex</i> L. spp.			x	x	x	x	x	x		x	
<i>Elymus villosus</i> Muhl.		x	x	x	x	x	x	x	x	x	
<i>Erigeron annuus</i> (L.) Pers.								x			x
<i>Geum canadense</i> Jacq.					x	x	x				
<i>Hypericum sphaerocarpon</i> Michx.		x			x			x	x		x
<i>Muhlenbergia frondosa</i> (Poir.) Fern.		x				x					
<i>Oxalis stricta</i> L.			x	x	x	x	x	x	x	x	x
<i>Penstemon digitalis</i> Nutt.					x			x			
<i>Phalaris arundinacea</i> L.			x	x				x			x
<i>Solidago canadensis</i> L.			x	x	x	x	x	x	x	x	x
<i>Teucrium canadense</i> L.			x							x	x
<i>Verbesina heliathoides</i> Michx.						x	x	x			x
<i>Viola pratincola</i> Greene					x						
Non-native											
<i>Achillea millefolium</i> L.		x									
<i>Asparagus officinalis</i> L.											x
<i>Mellilotus albus</i> Medic.									x	x	x
<i>Poa pratensis</i> L.		x	x	x	x	x	x	x	x	x	x
<i>Torilis japonica</i> (Houtt.) DC.							x				
Woody species											
Native											
<i>Cercis canadensis</i> L.			x	x	x	x	x	x	x	x	x
<i>Parthenocissus quinquefolia</i> (L.) Planch.									x		x
<i>Ptelea trifoliata</i> L.		x				x	x				x
<i>Rubus occidentalis</i> L.				x			x	x	x	x	x
<i>Smilax tamnoides</i> L.			x		x	x	x	x	x	x	x
<i>Toxicodendron radicans</i> (L.) Kuntze.				x	x	x	x	x	x	x	x
Non-native											
<i>Lonicera maackii</i> (Rupr.) Maxim.		x	x	x		x	x	x	x	x	x



Figure 1. Kankakee County, Illinois (Illinois Plant Information Network, 2005).

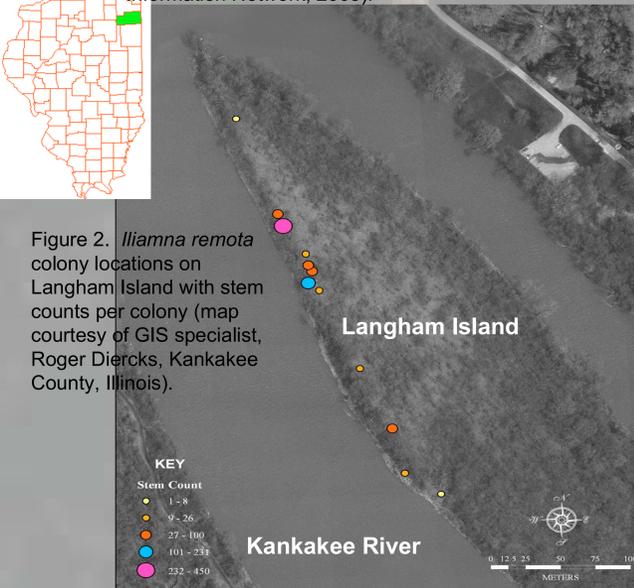


Figure 2. *Iliamna remota* colony locations on Langham Island with stem counts per colony (map courtesy of GIS specialist, Roger Diercks, Kankakee County, Illinois).

SUMMARY

Since most plants have been documented to occur in open habitats along the ridge of the island, canopy cover produced by woody species growing on the island may be a main factor for declines in population size in the future. Managing the island by controlled burns and chemical and mechanical eradication of woody species, *L. maackii* in particular, has been shown to be effective in preserving the *I. remota* population (Glass et al, 2003).

Various population lengths have been documented, including 200m in 1973 and 366m in 1984 (Schwegman, 1984). The length of the population found in this study (325m) appears to have not dramatically changed since 1984. However, in this study a moderate number of plants occurred between concentrated colonies, whereas only five stands were observed in 1983 (Schwegman, 1984). The consistency and stem number of the *I. remota* population in this study shows that the fitness of the population may be more stable compared to the consistency and stem number of the population in 1983.

Two non-native, herbaceous species, *Poa pratensis* and *Mellilotus albus*, were found within and at the edge of *I. remota* colonies in this study. These species were not documented to be found in the survey of the island conducted by J. Schwegman (1991). The main problematic species growing with *I. remota* is the exotic, invasive *L. maackii*. This species has been documented to be problematic since 1984 (Schwegman).

Flowers have been documented to bloom throughout July and August (Schwegman, 1984). Flowers in this study were abundant and in full bloom by late June, which is not in agreement with past observations. Inconsistent blooming time in this study could have been due to an abnormally dry summer.

Finally, seeds of fruits collected in this study were shown to be viable, but the percent germinated was low (36%). Since seeds were mechanically removed from the fruit, embryos may not have been fully developed, thus explaining a low germination percentage in this study.

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REFERENCES

- ❖ Glass, W., Schwegman, J.E., Heidorn, R.R., and W.E. McClain. 2003. Twenty Years of the Endangered Kankakee Mallow (*Iliamna remota*, Greene, Malvaceae) on Langham Island, Kankakee County, Illinois. Illinois Department of Natural Resources report.
- ❖ Herkert, J.R. and J.E. Ebinger. 2002. Endangered and Threatened Species of Illinois: Status and Distribution, Volume 1- Plants. Illinois Endangered Species Protection Board. P. 47.
- ❖ Illinois Plant Information Network. 2005. Retrieved on October 10th, 2005 at <http://www.fs.fed.us/ne/delaware/ilpin/1552.gif>
- ❖ Mohlenbrock, R. H. 2002. Vascular Flora of Illinois. Southern Illinois University Press, Carbondale and Edwardsville.
- ❖ Schwegman, J. E. 1991. The Vascular Flora of Langham Island, Kankakee County, Illinois. *Erigenia* 11: 1-8.
- ❖ Schwegman, J.E. 1984. State of Illinois Recovery Plan for *Iliamna remota* Greene. Division of Forest Resources and Natural Heritage. Illinois Department of Conservation. January 1984.
- ❖ Sherff, E.E. 1946. Notes on certain plants in the Gray's Manual range. *Rhodora* 48: 89-98.
- ❖ Strausbaugh, P.D. and E. L. Core. 1932. *Phymosia remota*. *Rhodora* 34: 142-146.

