

**Monitoring Protocols
for
Lysimachia asperulifolia
(Rough-leaved loosestrife)**

Goal: Maintain stable and expanding populations of Rough-leaved loosestrife across its range to achieve recovery of the species. The goal is to conduct some form of management that improves the habitat for Rough-leaved loosestrife and to monitor the consequences of this management. The primary management tool is fire. Monitoring will then take place to assess the trends in abundance in response to the management regime.

Objective: To implement a consistent monitoring protocol for Rough-leaved loosestrife for identified population centers to determine stability of populations. Population centers are on Federal, state and private lands, as specified in the Rough-leaved loosestrife Recovery Plan (USFWS 1995).

Approach: Select one of three levels of monitoring for populations on public and private lands across the species' range. Populations should be selected to allow for comparisons of the species' variability across its range.

Level One Monitoring: Qualitative

Objective 1. Conduct a survey to locate occurrences of Rough-leaved loosestrife. Fill out the NC NHP Endangered and Rare Plant Field Survey Form (attached) and submit to the North Carolina Natural Heritage Program. Update the survey form every two years.

Objective 2. If possible, GPS sites and add coordinates to survey form.

Level Two Monitoring: Quantitative

Objective 1. In select populations of 250 or fewer stems, conduct a census that includes total number of stems, include total number of flowering and fruiting stems. If the land manager is unable to census during the flowering and fruiting season, then determine total number of stems only. Attempt to conduct an annual census because a minimum of ten years of data is required to perform a population viability analysis. It is possible to skip years; however, this delays data analysis beyond ten years.

Complete and return NC Plant Conservation Program (NC PCP) Monitoring Form.

Objective 2. If possible, GPS sites and add coordinates to survey form. Estimate the extent of aerial coverage or measure sides of populations. For example, population occupies an area bounded by x by x square meters.

Level Three Monitoring: Quantitative

Objective 1. In select populations of over 250 stems, count total number of stems and total number of flowering and fruiting stems for each randomly placed permanent plot on belt transects. If the land manager is unable to census during the flowering and fruiting season, then determine total number of stems only. As for level two, the goal is to perform a minimum of ten (not necessarily consecutive) annual censuses for each population. Map the approximate boundary of the population to derive population area.

Randomly place belt transects across the population running from the pocosin edge outward and into the savanna. Place enough plots to census 10% or more of the total population. Suggested plot size is 1/2 to 1 meter by 5 to 10 meters. During the first year of monitoring, check for consistency and determine amount of measurement error by conducting multiple counts in sequence (e.g., on the same day) for two or three plots per site. Repeat every two to three years.

If requested, a NC PCP botanist will meet with land managers the first year and help design and establish permanent plots. Complete and return NC Plant Conservation Program (NC PCP) Monitoring Form.

Data Collection and Analysis:

The NC PCP will send annual reminder notices to land managers to monitor their populations. **The NC PCP will collect and analyze data from Levels Two and Three, then share this information with the monitoring committee and land managers.**

Timeline:

May - July	Monitor and collect field data
September 1	Send data to NC PCP
December 1	NC PCP analyze data
January or February	Monitoring committee meet and send update to land managers

Status Survey:

Funding permitting, every ten years a state or Federal agency will coordinate a status survey that includes populations on public and private property.

Monitoring Committee:

Representatives from NC PCP, NC NHP, US FWS and land managers will review monitoring data and address the recovery progress. The monitoring committee will also prioritize research needs and encourage academic research.

Photopoint Monitoring (Optional):

Some land managers may wish to use photo documentation in certain populations. This is a simple means of documenting the landscape condition and shrub cover over several years. Considerations for photopoint monitoring are:

1. Establish and mark a permanent point
2. For archival purposes, use either black and white prints (film: Kodak T-max 100) or Kodachrome slides with E-13 processing
3. The vertical angle of the camera maintained at 90 degrees
4. Take the photograph with the sun behind or directly above
5. Record date, time, and name of photographer
6. Store prints and slides in dark, cool, low relative humidity location in a metal file or cabinet. Place slides in plastic holders.

**North Carolina Plant Conservation Program
Monitoring Form for Levels Two and Three**

Species Name: Lysimachia asperulifolia (Rough-leaved loosestrife)

Census Date:

Name of Land Manager or Agency:

Name of Person(s) Conducting Census:

Name of Population or Element Occurrence Number:

Management History:

Date of Last Burn: Month Year

Notes About Burn (very hot, crown fire; cool, ground fire, etc):

Previous Burn(s) (if possible, provide first year only):

Month Year

Month Year

Month Year

Additional management information (provide if possible):

Timber Data:

1. Pines (include species, basal area, average dbh and number of stems/acre):

2. Hardwoods (average diameter breast height, number of stems/acre, height):

Description of location of plow lines for fire breaks:

If present, evergreen shrub drain:

proximity of population to drain:

condition of the vegetation within the drain:

_____% switchcane _____% grasses _____% shrubs _____% trees

_____% canopy cover in pines _____% canopy cover in hardwoods

Description of other management practices:

Level Two Data:

Total Number of Stems: _____stems

Total Number of Budding/Flowering and/or Fruiting Stems:

_____budding _____flowering _____fruiting stems

Level Three:

Total Area of Population (square meters):

Area of Each Plot (square meters):

Sketch population showing position of transects and plots:

Level Three Data:

[illegible]

Return form to: N.C. Plant Conservation Program
 Post Office Box 27647
 Raleigh, NC 27611

Possible Populations for Different Levels of Monitoring by Agencies:

Holly Shelter Game Land (5 populations):

Select one or more populations at level two:	EO# 74 or 76
Select one or more populations at level three:	EO# 75, 77, or 12
Remaining populations at level one.	

Sandhill Game Land (4 populations):

Select one or more populations at level two:	EO# 06, 28, or 62
One population at level three:	EO# 14
Remaining populations at level one.	

Green Swamp - NC Nature Conservancy (5 populations):

Select one or more populations at level two:	EO# 72 or 73
Select one or more populations at level three:	EO# 10, 46, or 79
Remaining populations at level one.	

Camp McKall (1 population):

One population at level two:	EO# 61
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Sunny Point :

One population at level three:	EO# 13
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Fort Bragg (26 populations):

Select one or more populations at level two.	
Select one or more populations at level three.	
Remaining populations at level one.	

Croatan National Forest (6 populations):

Select one or more populations at level two:	EO# 04, 23, 41, or 42
Select one or more populations at level three:	EO# 16, 23, 25, or 42
Remaining populations at level one.	

Camp Lejeune (8 populations):

Select one or more populations at level two:	EO# 49, 50, 71, 80, or 82
Select one or more populations at level three:	EO# 11, 24, or 81
Remaining populations at level one.	

Fort Jackson:

Continue current monitoring protocol which is equivalent to Level Three

This table shows the number of monitored populations for each level, if each agency agrees to monitor the minimal number of populations proposed in the monitoring protocol .

Agency	Level 1	Level 2	Level 3
Holly Shelter Game Land	3	1	1
Sandhill Game Land	2	1	1
Nature Conservancy	3	1	1
Camp McKall	0	1	0
Sunny Point	0	0	1
Fort Bragg	24	1	1
Croatan Ntl Forest	4	1	1
Camp Lejeune	6	1	1
Fort Jackson	0	0	1 (their current protocol)
TOTALS	42	7	8

Level one is an update to NC NHP Endangered and Rare Plant Survey Form and are reported to NC NHP. Potentially, forty two populations would be updated every two years.

Levels two and three include census data using the NC PCP Monitoring Level form and is reported to the NC PCP. Potentially, 15 populations would be monitored on an annual basis.

**NORTH CAROLINA NATURAL HERITAGE PROGRAM
ENDANGERED AND RARE PLANT FIELD SURVEY FORM**

Species:

Common name:

Survey date:

7.5' Quad Map:

County:

Elevation:

Site location and directions: **(attach copy of map with site marked or use back of form to draw a sketch of the site):**

SPECIES INFORMATION

Number of individuals:

Define individual
(stem, clump, etc.):

Size of area in which population occurs:

Phenology:

dormant
leaf

Evidence of reproduction:

seedlings

clonal/vegetative

bud
flower
fruit

Other information:

Habitat (NC NHP natural community name and description; include quality, soils, geology, etc.):

Topographic position:

Micro-relief:

Moisture regime:

Light:

crest

flat

inundated

open

upper slope

rippled

saturated

filtered

mid slope

concave

moist

shade

lower slope

convex

dry

upland flat

drop-off

seasonally wet

alluvial

other

Other information:

Associated species:

Protection and management needs and other comments:

Landowner(s), if known:

Person making this report:

Address:

Search time:

Phone:

Other observers:

Specimens collected?

Collection #:

Repository:

Return form to: N.C. Natural Heritage Program; Division of Parks and Recreation
P.O. Box 27687; Raleigh, NC 27611