The Office of Kentucky Nature Preserves

Pine Barrens Restoration in Kentucky

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Natural Areas and
Recovery Branch
10-03-2019

Duties of the Office of Kentucky Nature Preserves

To secure a system of State Nature Preserves for present and future Generations. KRS 146.440

To promote scientific and spiritual values of an unspoiled natural environment. KRS 146.410

To recognize, conserve, and restore rare and endangered plants. KRS 146.600

To provide a clearing house of information on the environment, plants, and animals. KRS 146.485

To preserve Kentucky's Wild Rivers for ecological and recreational purposes. KRS 146.200-360

To manage Kentucky Heritage Land Conservation Fund's natural areas program. KRS 146.550-570

The Kentucky Heritage Land Conservation Fund

Preserving Kentucky's Natural Treasures

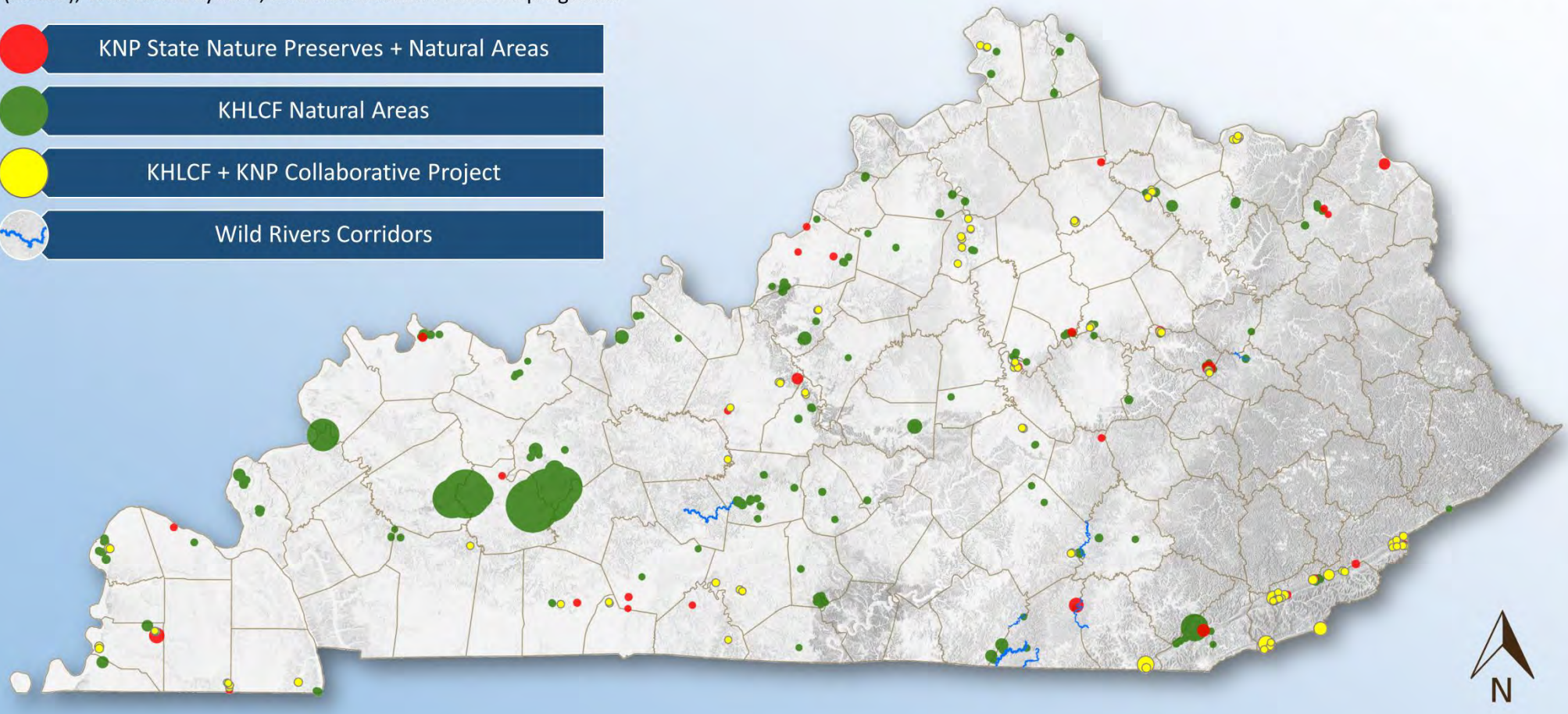
Office of Kentucky Nature Preserves

KENTUCKY ENERGY & ENVIRONMENT CABINET

THE OFFICE OF KENTUCKY NATURE PRESERVES

The Office of Kentucky Nature Preserves (KNP) conserves natural areas through the Kentucky Heritage Land Conservation Fund (KHLCF), Wild Rivers System, and State Nature Preserves programs.

- KNP State Nature Preserves + Natural Areas
- KHLCF Natural Areas
- KHLCF + KNP Collaborative Project
- Wild Rivers Corridors



http://eec.ky.gov

300 Sower Blvd | Frankfort, KY 40601

https://www.facebook.com/KentuckyNaturePreserves/

KNP programs conserve:

25,000 acres on **47** KNP-owned State Nature Preserves and Natural Areas

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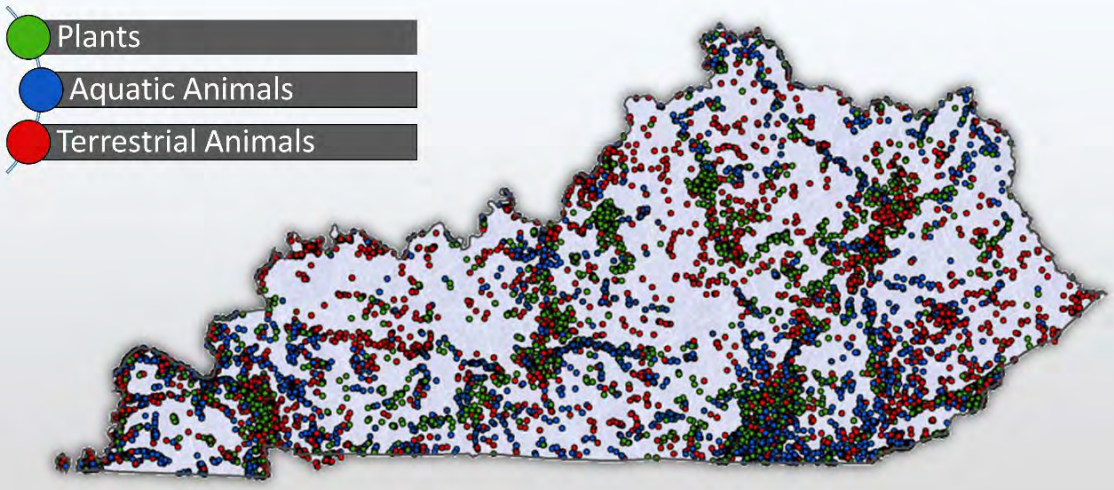
7,000 acres on **22** partner-owned State Nature Preserves

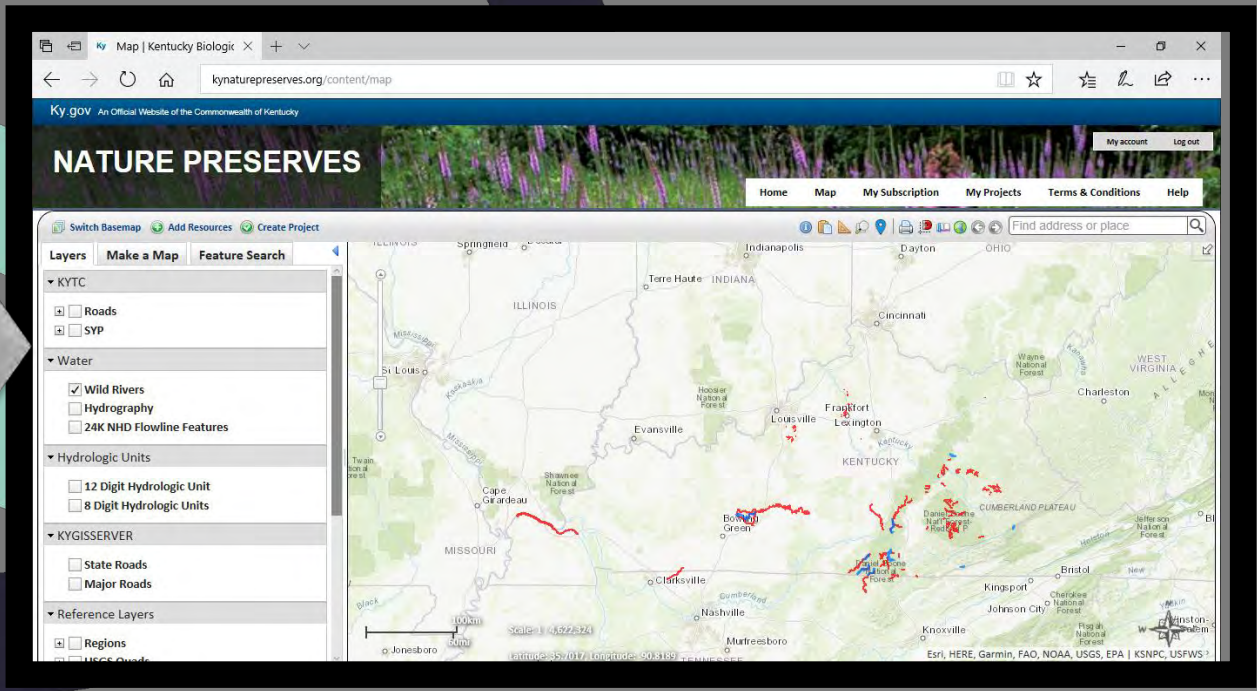
70,000 acres on **78** partner-owned KHLCF natural areas

26,000 acres on **9** Wild River Corridors



The KNP Natural Heritage Database includes 18,774 high quality source features records and 14,974 element occurrence records of the 862 species and communities we track.

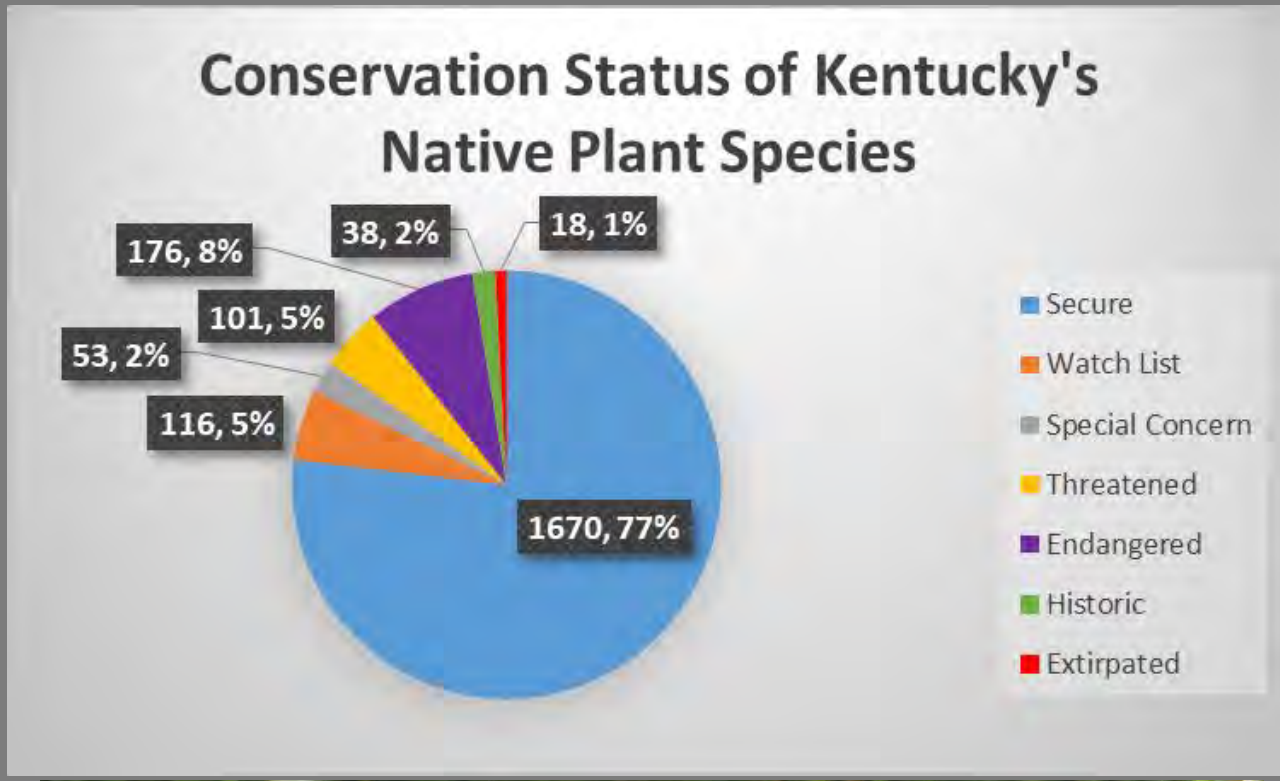
The Kentucky Biological Assessment Tool (KY-BAT) is a self-service conservation planning tool that allows customers to submit projects and receive data within minutes at KYNaturePreserves.org

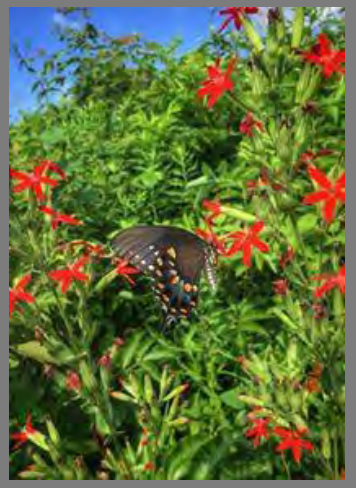


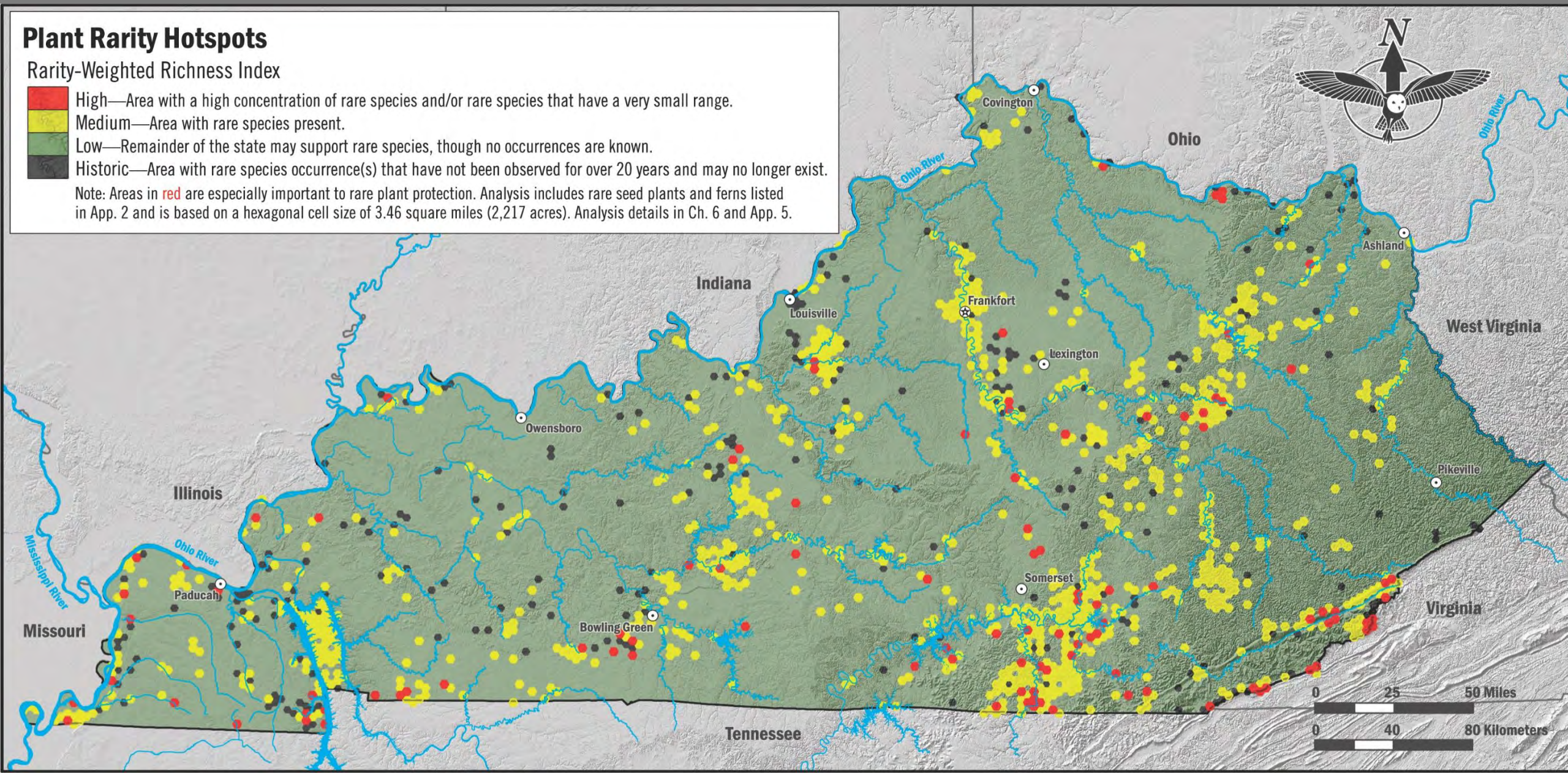
Rare and native plant facts

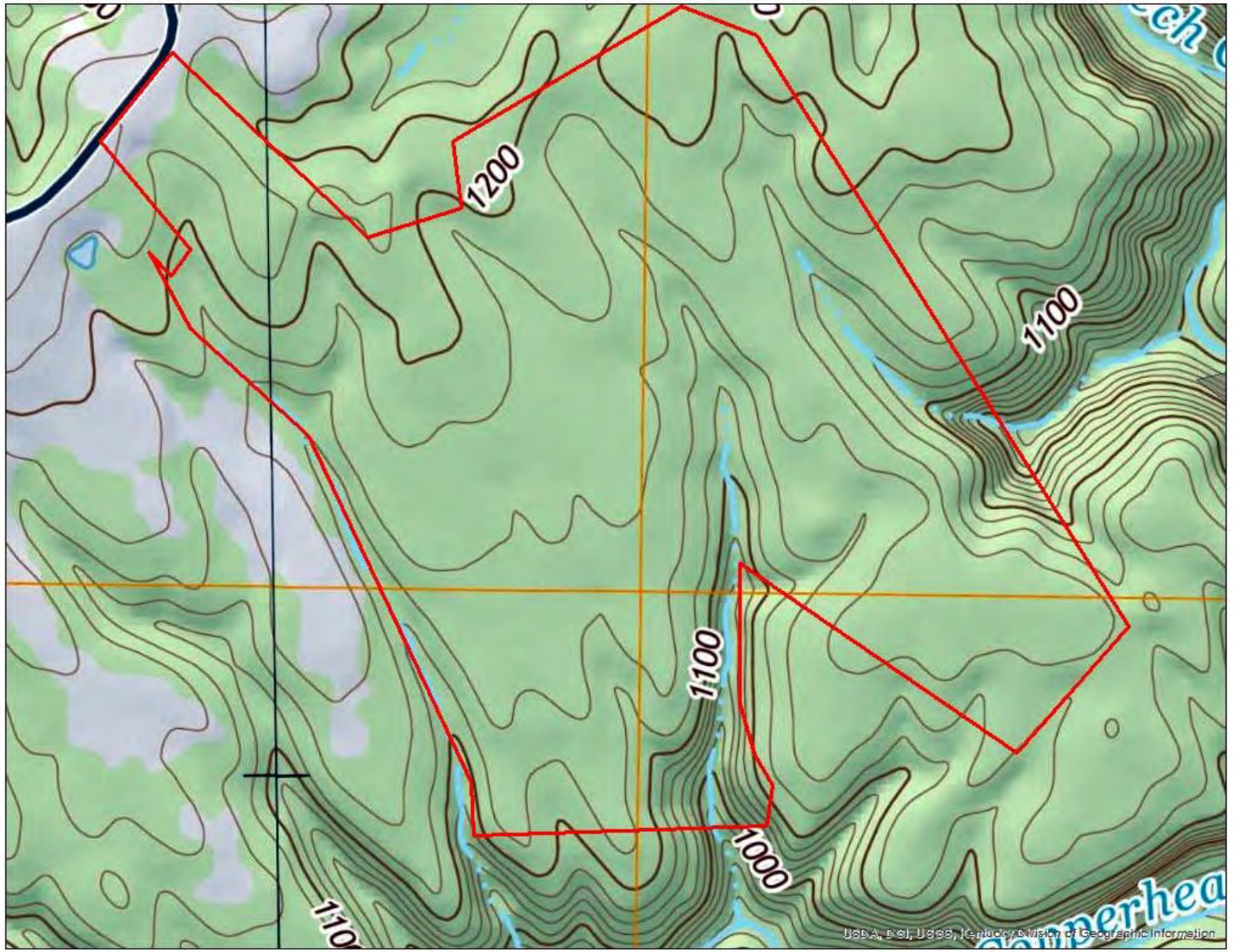
RARE PLANT LISTING

- 25% of Kentucky Plants are rare and declining [Federal or state listed endangered, threatened, special concern, watch list]
- Many more “common” native plants that used to be more widespread have become regionally rare and are also declining, i.e. spring ephemerals
- Hidden discoveries, undescribed species






Plant Rarity Hotspots
Rarity-Weighted Richness Index
High—Area with a high concentration of rare species and/or rare species that have a very small range.
Medium—Area with rare species present.
Low—Remainder of the state may support rare species, though no occurrences are known.
Historic—Area with rare species occurrence(s) that have not been observed for over 20 years and may no longer exist.
Note: Areas in red are especially important to rare plant protection. Analysis includes rare seed plants and ferns listed in App. 2 and is based on a hexagonal cell size of 3.46 square miles (2,217 acres). Analysis details in Ch. 6 and App. 5.
N
Ohio
Indiana
Illinois
Missouri
Kentucky
West Virginia
Virginia
Tennessee
Ohio River
Mississippi River
Covington
Louisville
Frankfort
Lexington
Ashland
Owensboro
Paducah
Bowling Green
Somerset
Pikeville
0 25 50 Miles
0 40 80 Kilometers



250 acres purchased between 2001-2018 (3 tracts)

Rare Plants:

Platanthera integrilabia

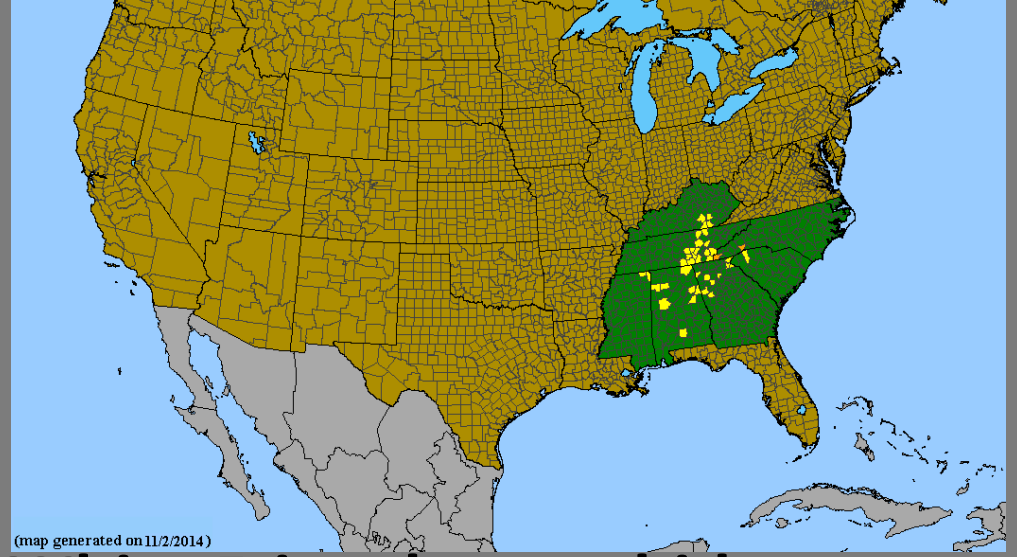
Helianthus eggertii

Communities:

Appalachian Acid Seep/Bog

Appalachian Pin/Oak Forest

Hemlock Mixed Forest



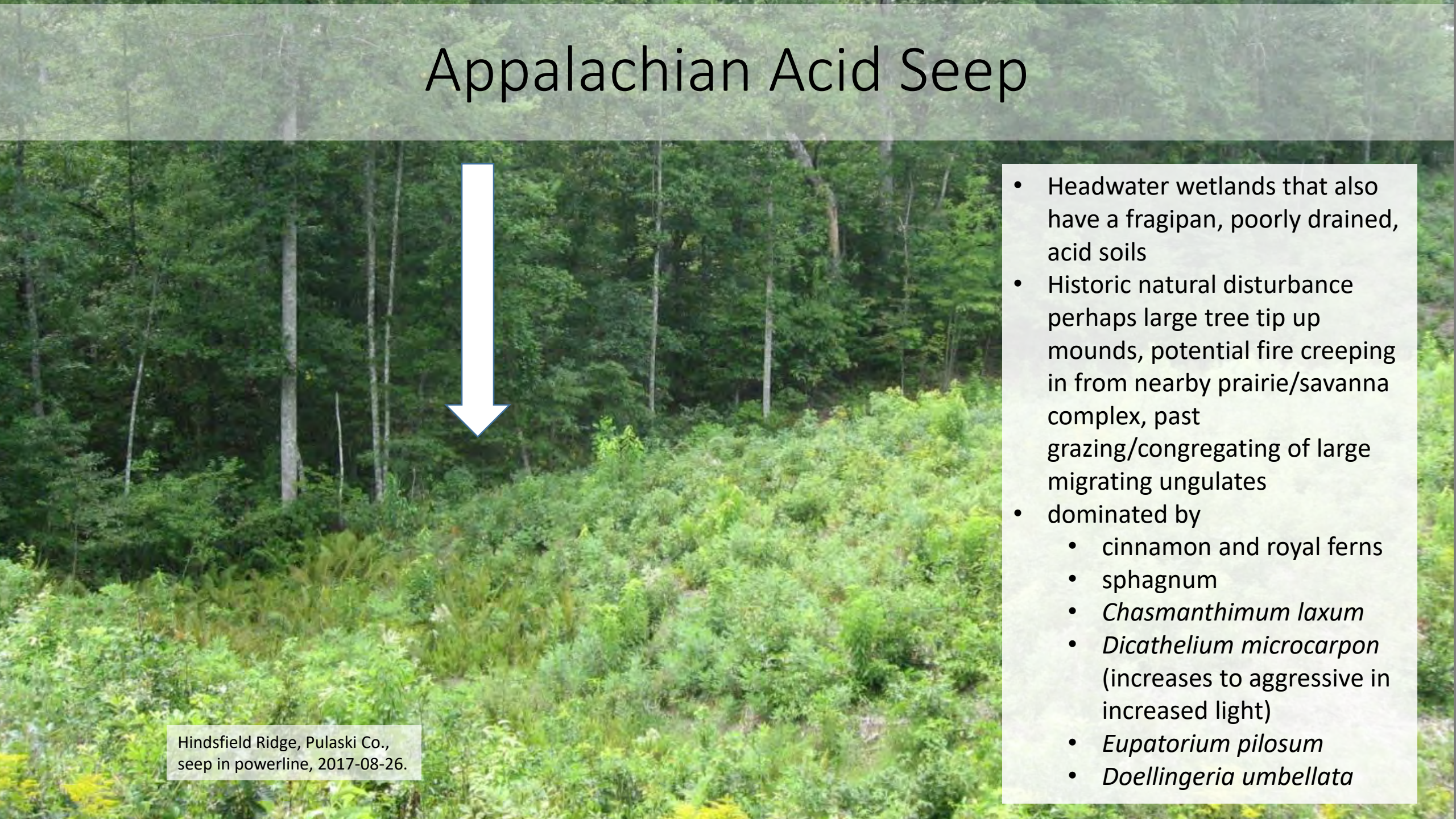
White Fringeless orchid

(*Platanthera integrilabia*)

Candidate in 1999

Federally threatened in 2016

Appalachian Acid Seep



- Headwater wetlands that also have a fragipan, poorly drained, acid soils
- Historic natural disturbance perhaps large tree tip up mounds, potential fire creeping in from nearby prairie/savanna complex, past grazing/congregating of large migrating ungulates
- dominated by
  - cinnamon and royal ferns
  - sphagnum
  - *Chasmanthimum laxum*
  - *Dicathelium microcarpon* (increases to aggressive in increased light)
  - *Eupatorium pilosum*
  - *Doellingeria umbellata*

Hindsfield Ridge, Pulaski Co., seep in powerline, 2017-08-26.

2007: Seep habitat had closed in with hardwoods which caused a loss of groundwater and surface level water. Seep habitat declined in quality , rare plants declined and disappeared

2009

Eastern Upper Seep-center point-south aspect

2012-2018: Management of hardwoods and construction of debris dams. Populations of rare plants have increased, and seep community is restored

2017

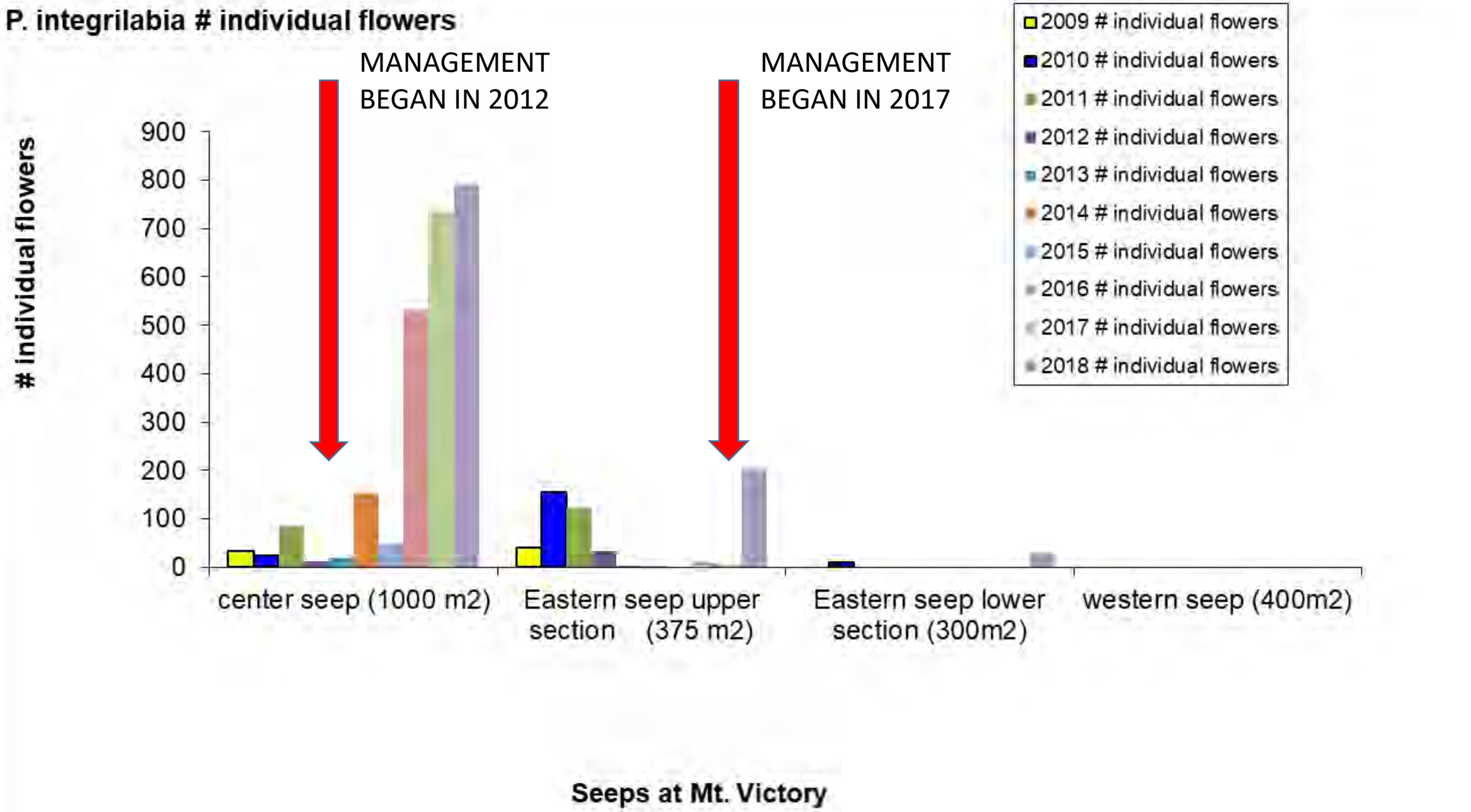
Eastern upper Seep-North End-south aspect

2009

2017

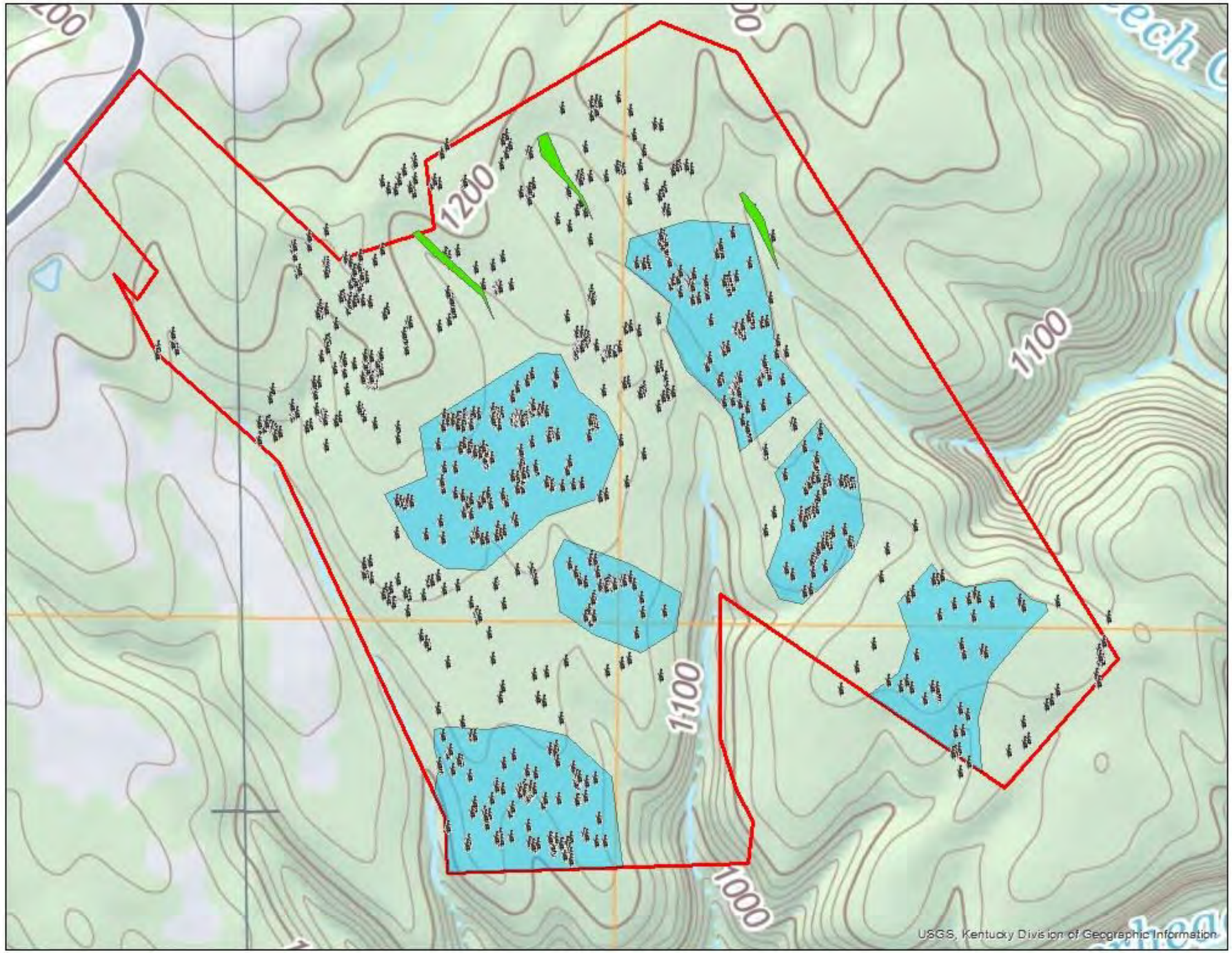
2012

Figure 1. Debris dam in central portion of the Center seep.


P. integrilabia # individual flowers
MANAGEMENT BEGAN IN 2012
MANAGEMENT BEGAN IN 2017
2009 # individual flowers
2010 # individual flowers
2011 # individual flowers
2012 # individual flowers
2013 # individual flowers
2014 # individual flowers
2015 # individual flowers
2016 # individual flowers
2017 # individual flowers
2018 # individual flowers
individual flowers
900
800
700
600
500
400
300
200
100
0
center seep (1000 m2)
Eastern seep upper section (375 m2)
Eastern seep lower section (300m2)
western seep (400m2)
Seeps at Mt. Victory

Partnerships and Funding

- Ability to hire Grant Funded Time Limited positions
- Utilized NFWF grant and internal funds that had been awarded for management through Heritage Land Conservation Fund
- Developed MOA with KY Division of Forestry to utilize their seasonal fire fighters to complete mid story removal
- Increased the number of technicians we employed



Articles of Dedication

Mapped Shortleaf winter 2018

Left buffer around the seeps

Western seep will be included

Multiple other smaller seeps have been identified within the area and are included in the treatments and fire units

Rules of Engagement:

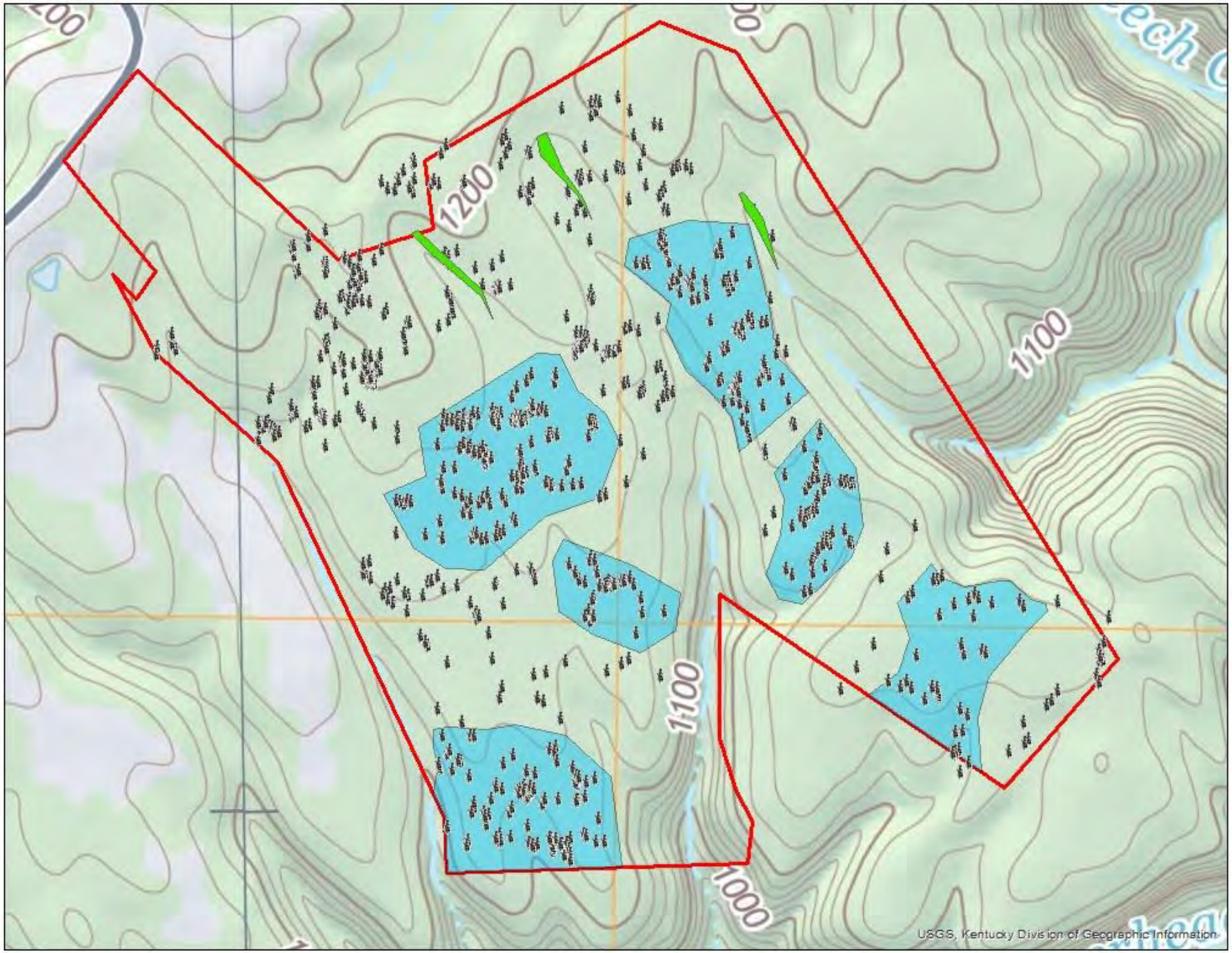
Anything under 6” DBH is cut, bucked up, and put to the ground

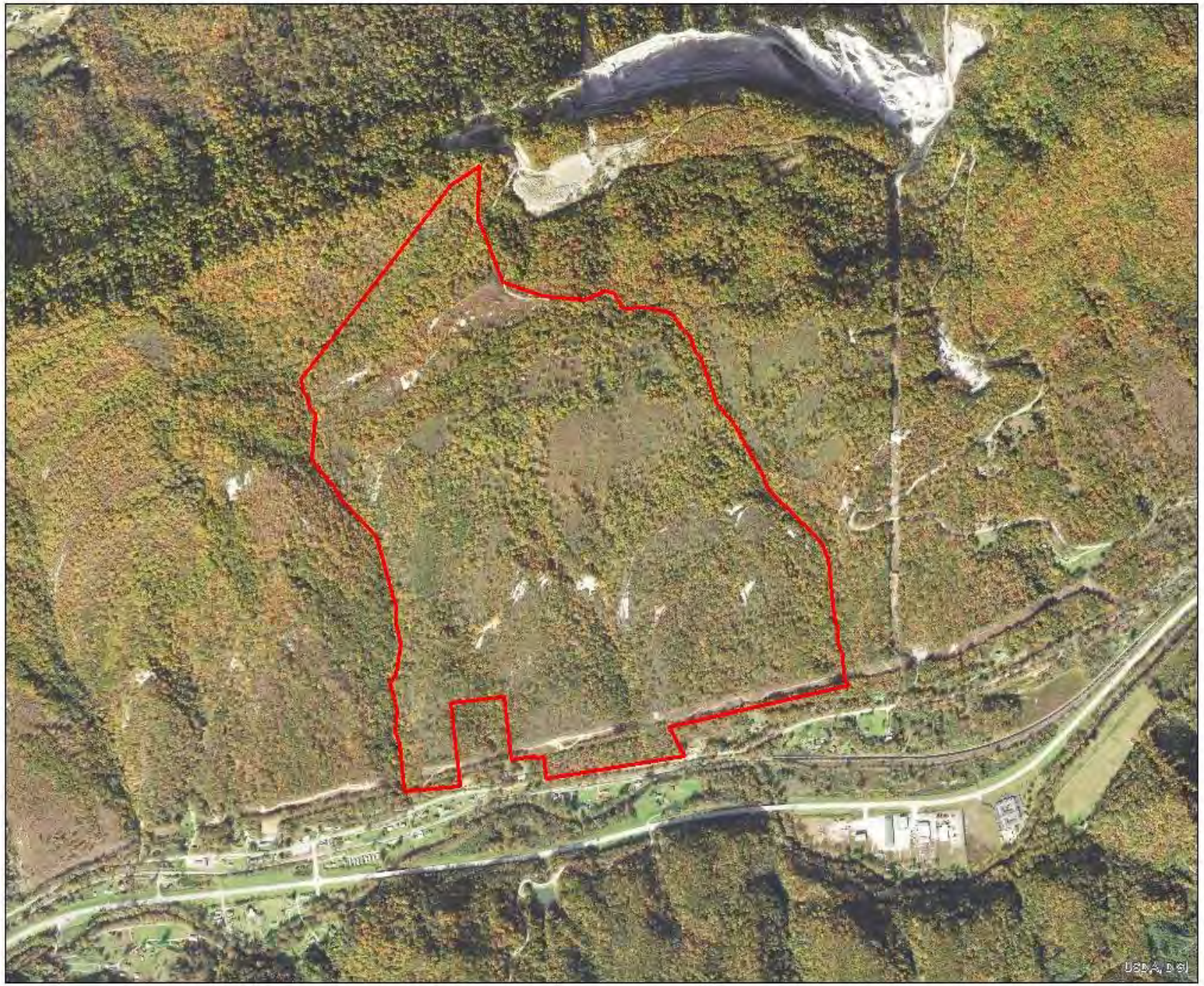
All stems are treated with triclopyr

Undesirables > 6” are girdled and treated with herbicide (Red Maples, Black gum, Sourwood, Poplar)

Over story trees will be girdled after fire operations in spring of 2020


Before
After


1200
1100
1100
1000
USGS, Kentucky Division of Geographic Information



Hi Lewis Pine Barrens SNP (302 ac)

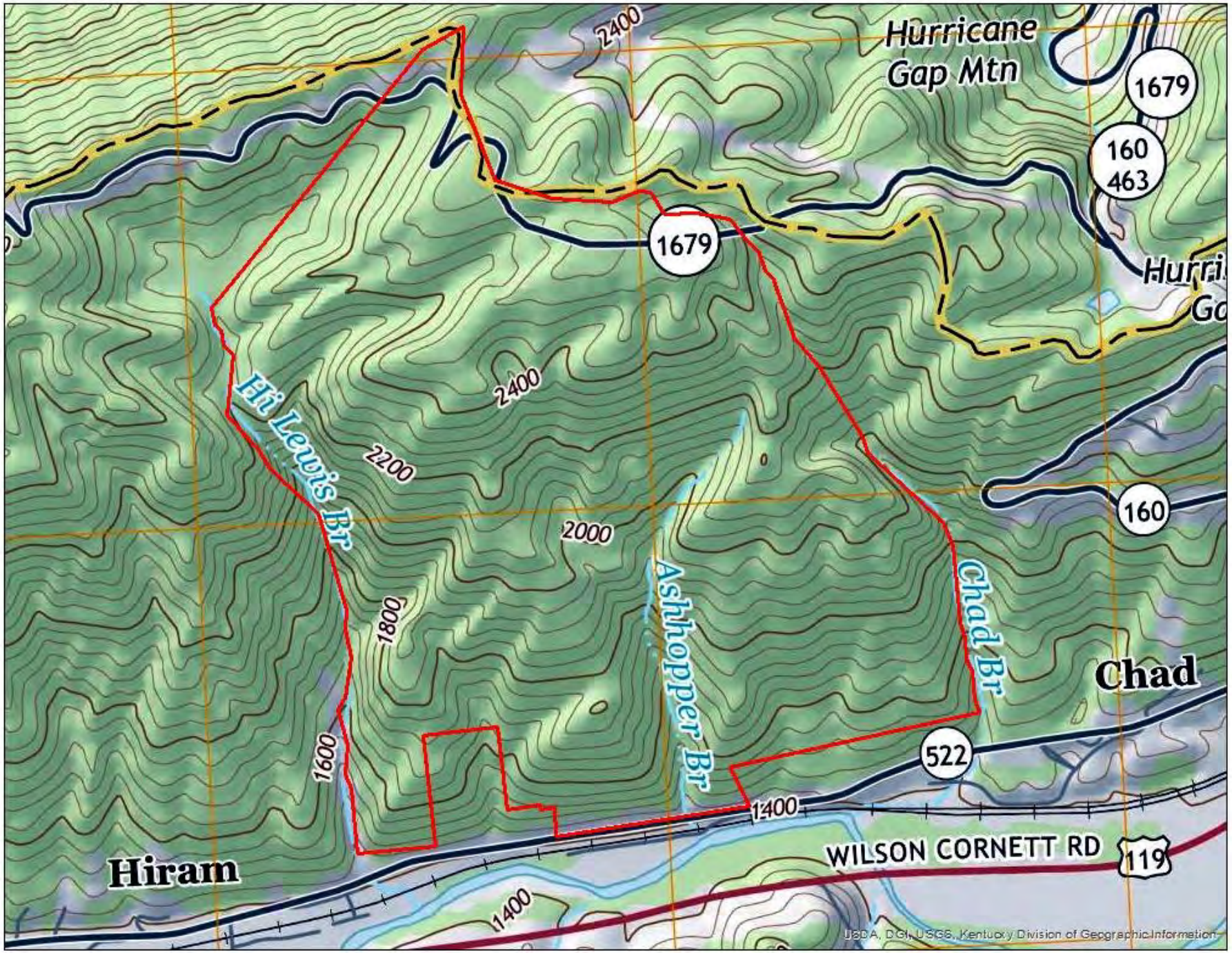
Protects rare community "Appalachian Xeric Pine Savanah-Woodland"

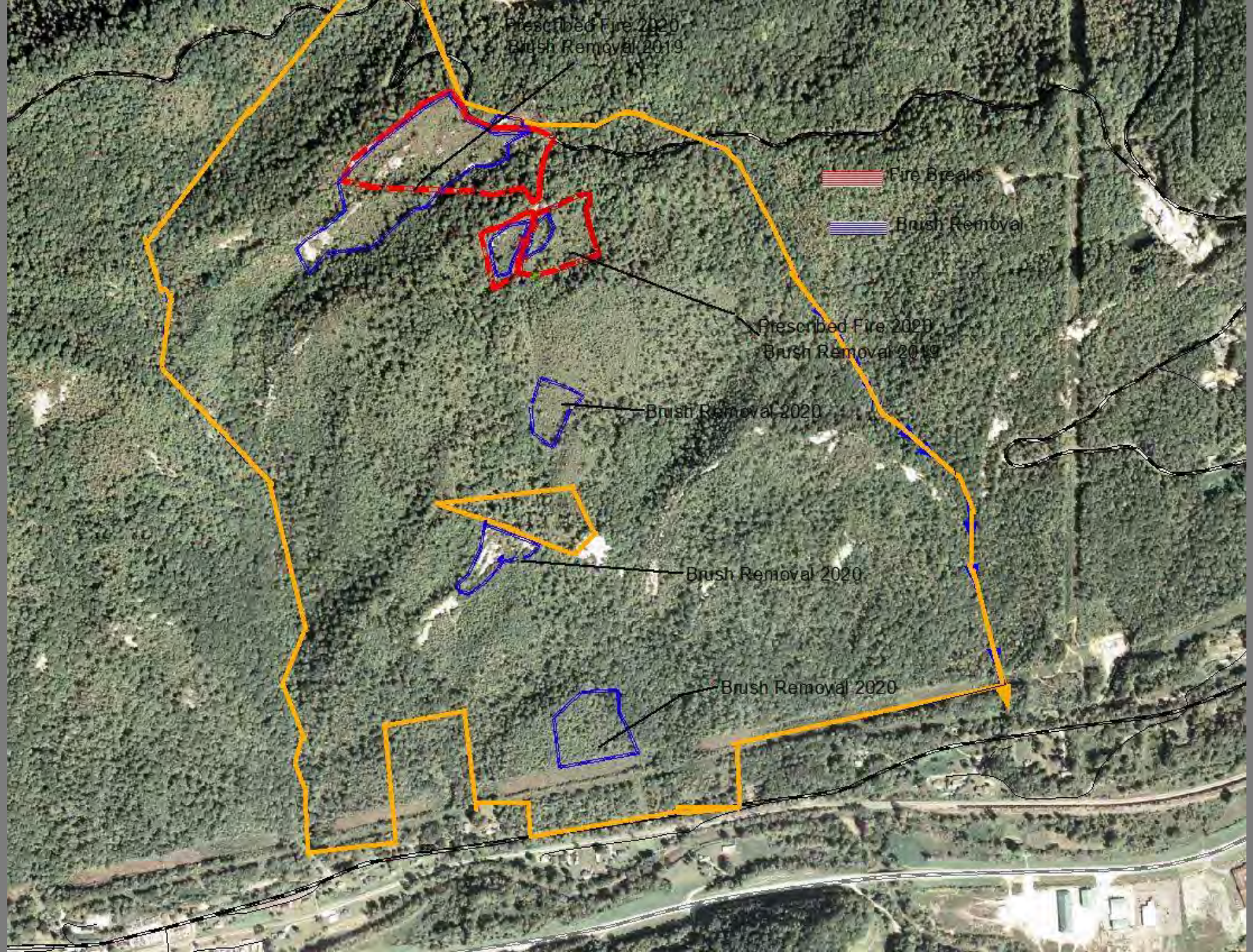
Dominated by Pitch Pine, Shortleaf, and Chestnut Oak

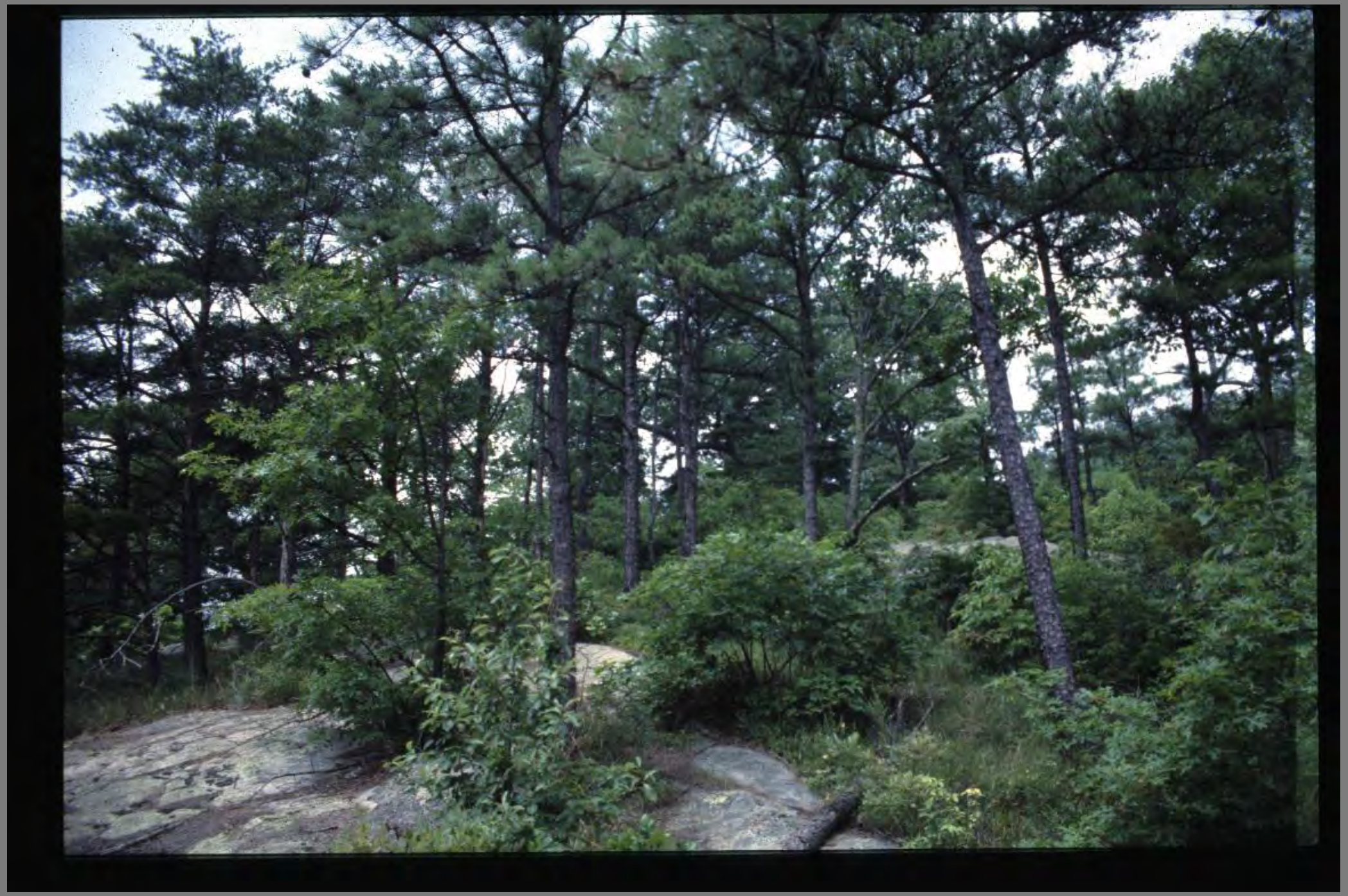
Little Bluestem, Indian Grass, Vaccinium, Mountain Laurel

Rare Species:
Barotnia virginica
Helianthemum canadense
Baptisia tinctoria

Elevation changes of over 1,000 ft


Hurricane
Gap Mtn
1679
160
463
1679
Hurri
Go
2400
2400
Hi Lewis Br
2200
2000
1800
1600
Ashhopper Br
Chad Br
160
Chad
522
1400
WILSON CORNETT RD
119
Hiram
1400
USDA, DGI, USGS, Kentucky Division of Geographic Information


Prescribed Fire 2020
Brush Removal 2019
Fire Breaks
Brush Removal
Prescribed Fire 2020
Brush Removal 2019
Brush Removal 2020
Brush Removal 2020
Brush Removal 2020




2017

Sept-Dec 2017: Brush Removal of Red Maple, Blackgum, Sourwood, Tulip Poplar, Oaks < 5” dbh

May 2018

Sept 2018-Feb 2019

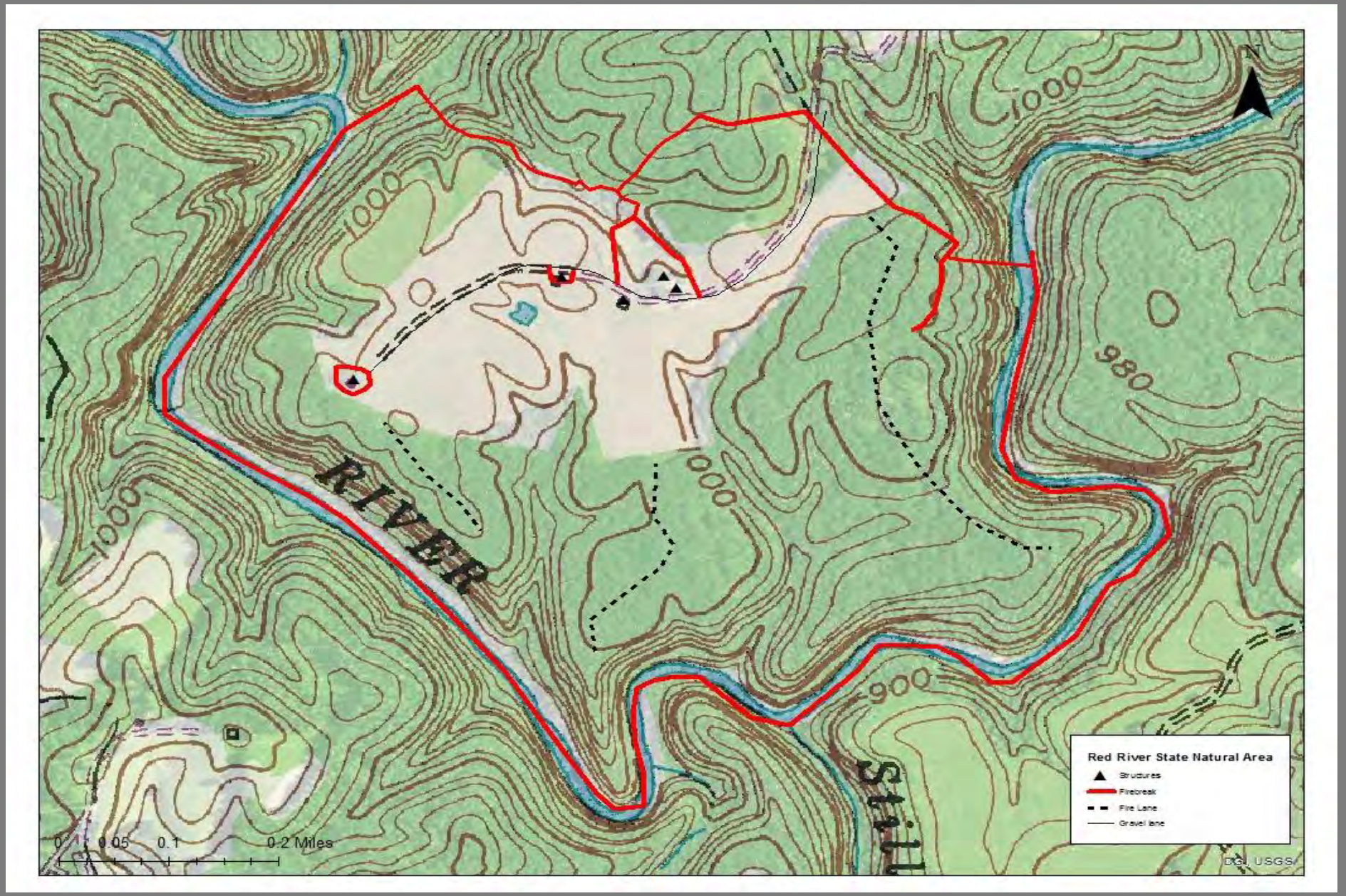
Treated Re-sprouts in upper management unit

Cleared undesirable re-sprouts mid slope in area where *Helianthium canadense* is found

September 2018


MAY 2019

Red River State Natural Area (300ac)



Monitoring Program

Objectives:

- Immediate effects of treatment on vegetation structure.
- Long term effects of treatments on abundance/size classes/growth rate of shortleaf pine and stand structure/stem density/composition
- Effect of treatments on ecological community with particular attention to selected conservative herbaceous species dependent on shortleaf pine barrens habitats
- Include photo monitoring

Moving Forward

- Continue to work on expanding the brush management units
- Implement Rx Fire on short return intervals to develop herbaceous layer
- Monitor for invasive species
- Allow monitoring to inform management decisions
- Increase Fire Capacity-
  - 3 Employees will complete KY Certified Burn Boss training Feb 2020
  - Looking into utilizing cabinet employees to increase crew size
  - Utilize current and new partnerships

- Facilitate and inform pine barrens restoration on other public lands

Challenges

- Staffing and Funding
- Need for local genotype seed sources
- Land protection and acquisition
- Pine Beetle
- Scale