

Monitoring of natural communities and rare species with limited resources

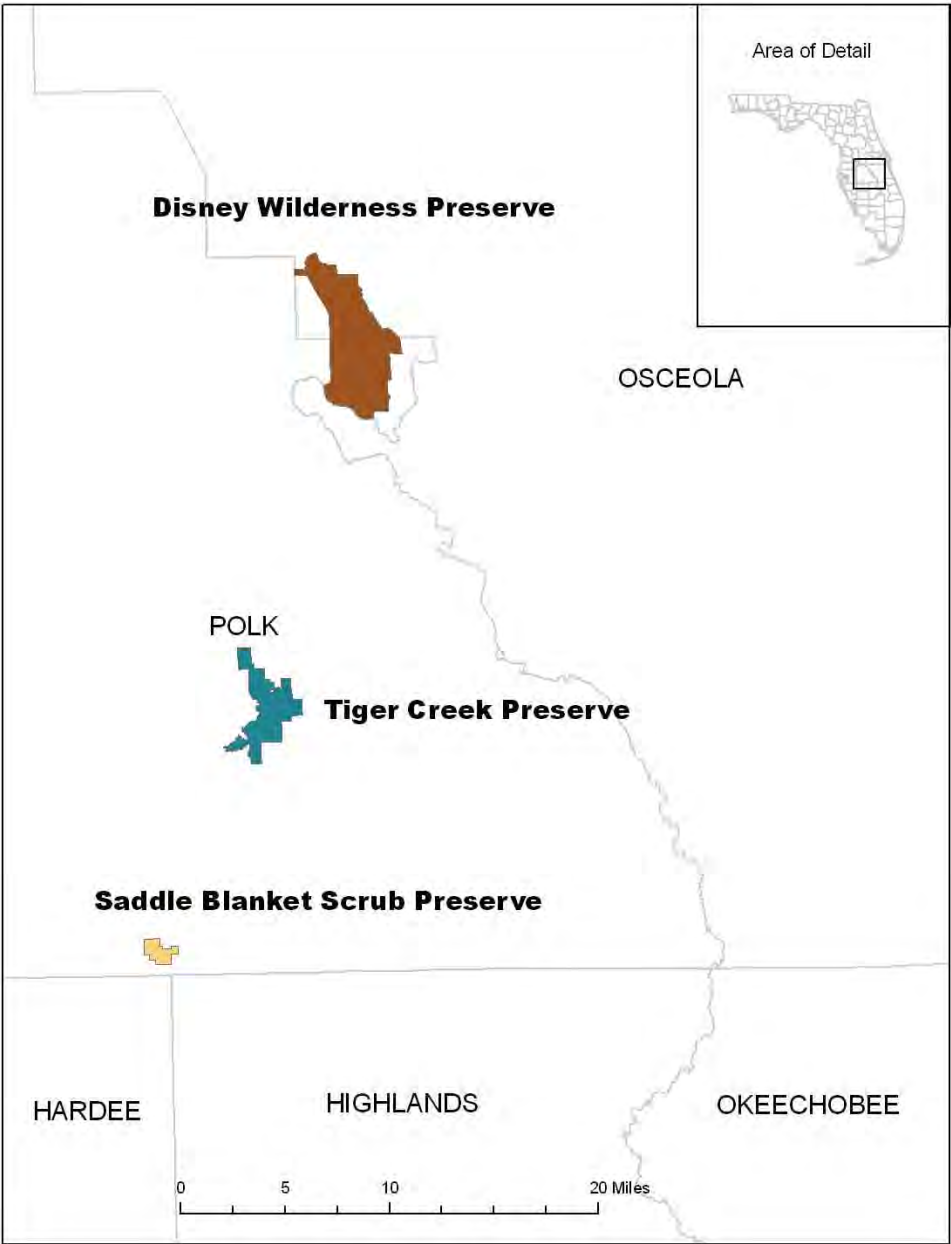


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The Nature Conservancy
Lake Wales Ridge Program &
The Disney Wilderness Preserve

Limited resources = limited time and personnel

Our monitoring relies heavily on GIS/GPS





TNC monitoring goals

Identify management priorities and objectives

Track management success

Catch negative trends

Maintain and enhance viability of rare species populations

Monitoring Priorities and Design

based on available time and resources

ecological objectives

composition and/or structure?

small or large scale?

Monitoring Priorities and Design

if small scale, then will need some type of “sampling”
and walking through the areas

if large scale, then there are ways to capture
information relatively quickly for large areas at
a time

Design monitoring to capture large changes
instead of small

Monitoring Priorities and Design

Timing and Frequency of Monitoring

Follow the management actions (post-burn) or the natural time-frames for change

ex. Longer intervals within communities that change slowly; shorter in those that change quickly

Natural community monitoring for composition, species diversity and/or small scale structure



Fire - effects monitoring



Purpose

The condition of our natural communities – xeric uplands

ground cover structure composition

The density and distribution of rare species and other plants and animals of concern

Track changes following fire

Criteria

Low cost

Requiring few people (1-2)

Unmarked plots

No laying out tapes to delineate plots

Equipment

ArcView 9.2 (or ArcView 3.3)

**GPS unit with ArcPad with submeter accuracy
ubmeter accuracy**

1-3 people



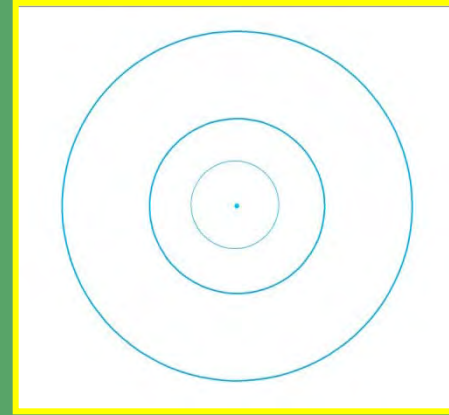
OR



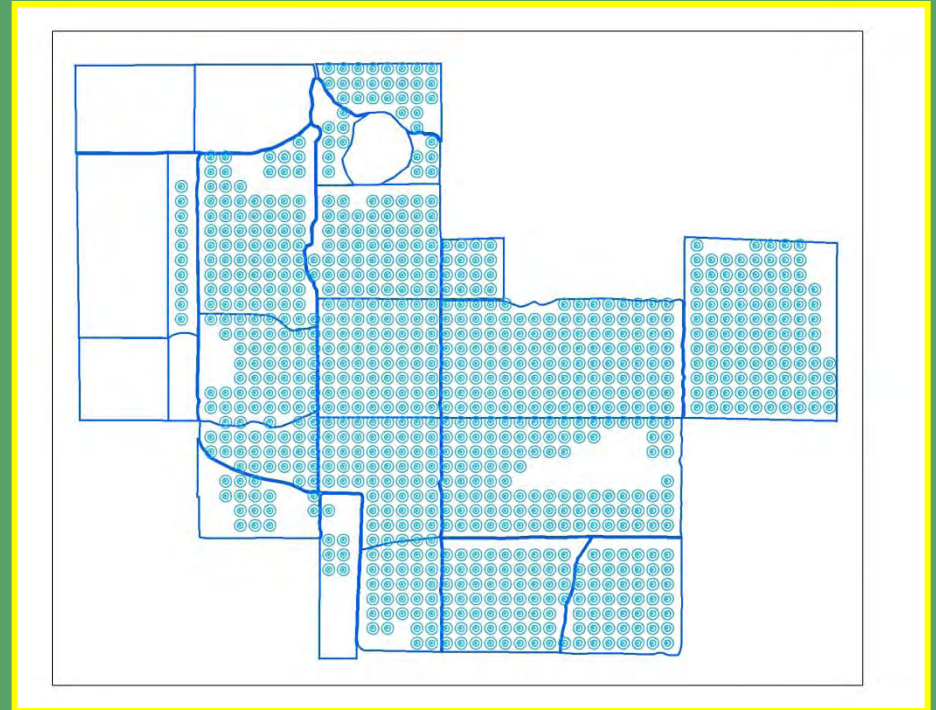
Sampling Design

**3 concentric circular
“virtual” plots**

- 5 m, 10 m, and 20 m radii



**Spaced 50 m apart within
each xeric upland patch**



Measures

Ocular estimates of % covers

hardwoods $> 3\text{m}$ and $\leq 3\text{m}$

herbs, litter, bare ground, and lichens/mosses

palmetto

Mean height of hardwoods and palmetto

$< 1\text{m}$, $1\text{-}2\text{m}$, $2\text{-}3\text{m}$, $> 3\text{m}$

Measures

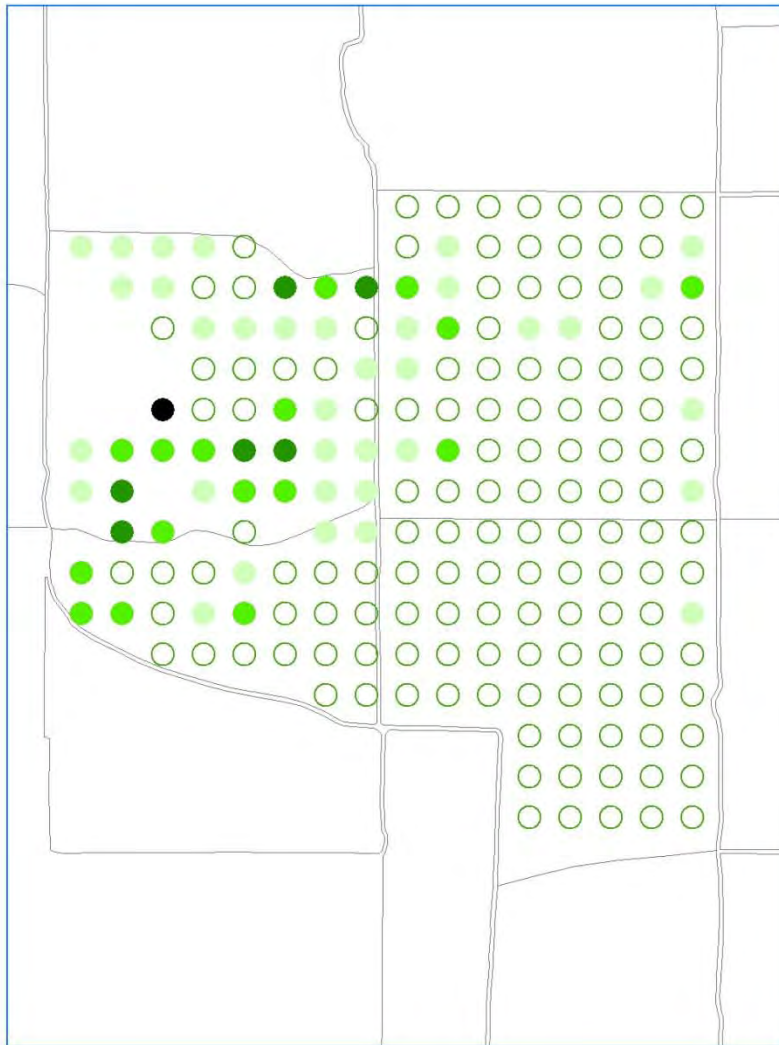
Pine densities within height classes

<1m, 1-3 m, > 3 m

Presence of plant species of concern

Gopher tortoise burrow widths and activity

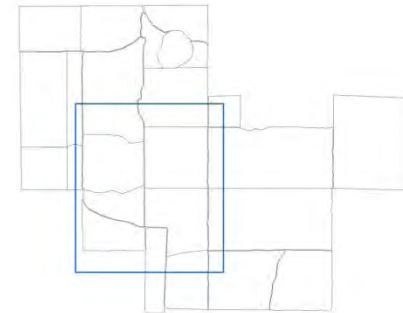
Presentation of results using GIS

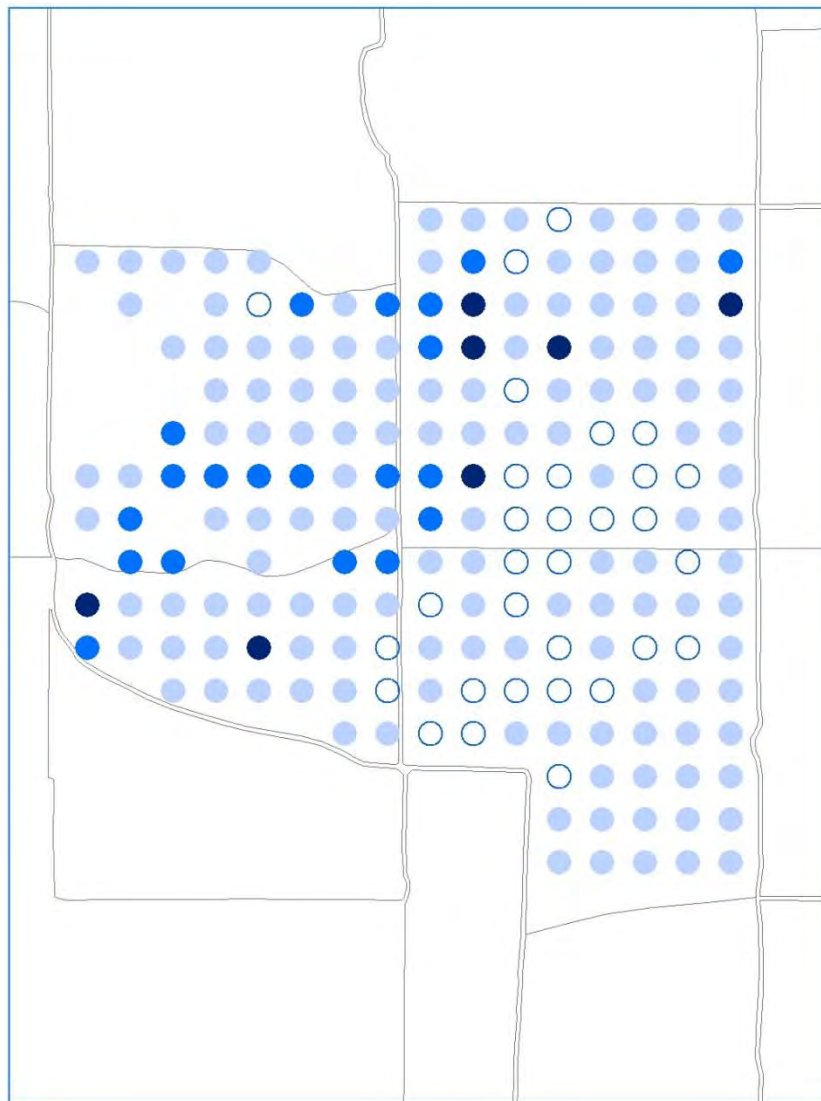


Live Hardwood Cover (>3m)



□ Burn Unit Boundaries

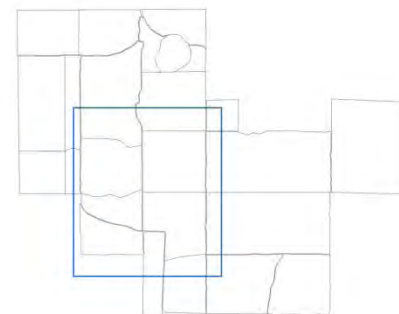


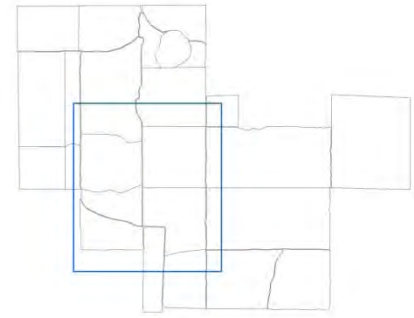
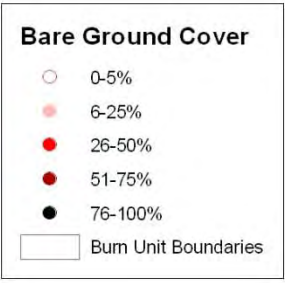


Mean Height (Hardwoods and Palms)

- <1 m
- 1-2 m
- 2-3 m
- >3 m

□ Burn Unit Boundaries



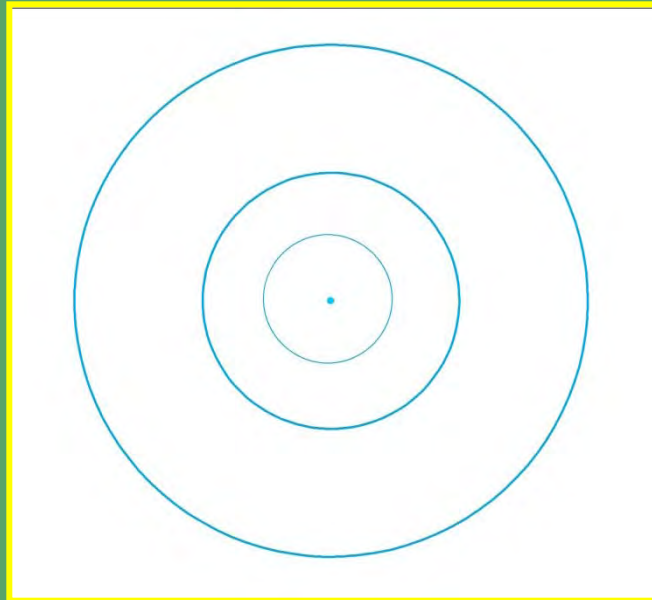


Create the plots

Create grid of points using ArcView

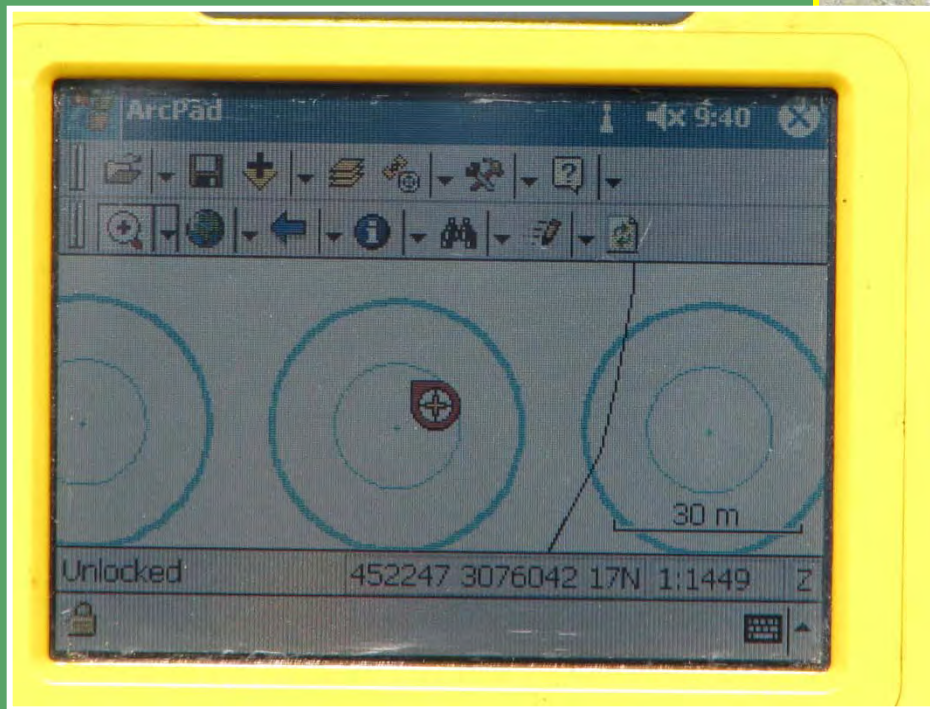
Buffer points at 5, 10, and 20 meters

Download center points and plots to data logger



Navigate to the plots

Find and mark
the center point



Data collection – 5 m plot

Estimate % covers:

herbs and graminoids

bare ground

litter

lichens/mosses

Using cover classes

0-5%,

6-25%

26-50%

51-75%

76-100%



Data collection – 10 m plot

Estimate % covers

hardwoods $> 3\text{m}$ and $\leq 3\text{m}$
palmetto

Using cover classes

0-5%

6-25%

26-50%,

51-75%

76-100%



Data collection – 10 m plot

Count pines by species
 ≤ 1 m and 1-3 m tall

Use GPS to determine
edges of plots



Data collection – 10 m plot

Record each species of concern present



Avon Park Harebells (*Crotalaria avonensis*)



Scrub rosemary (*Ceratiola ericoides*)

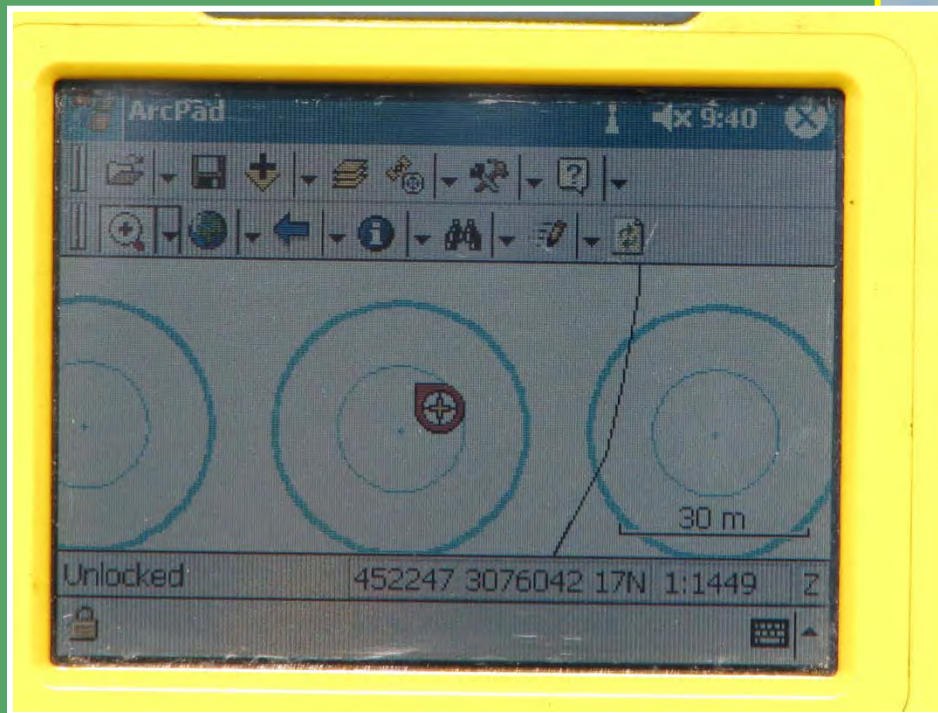
Data collection – 10 m plot

Record width of each gopher tortoise burrow and activity (Active or Inactive)



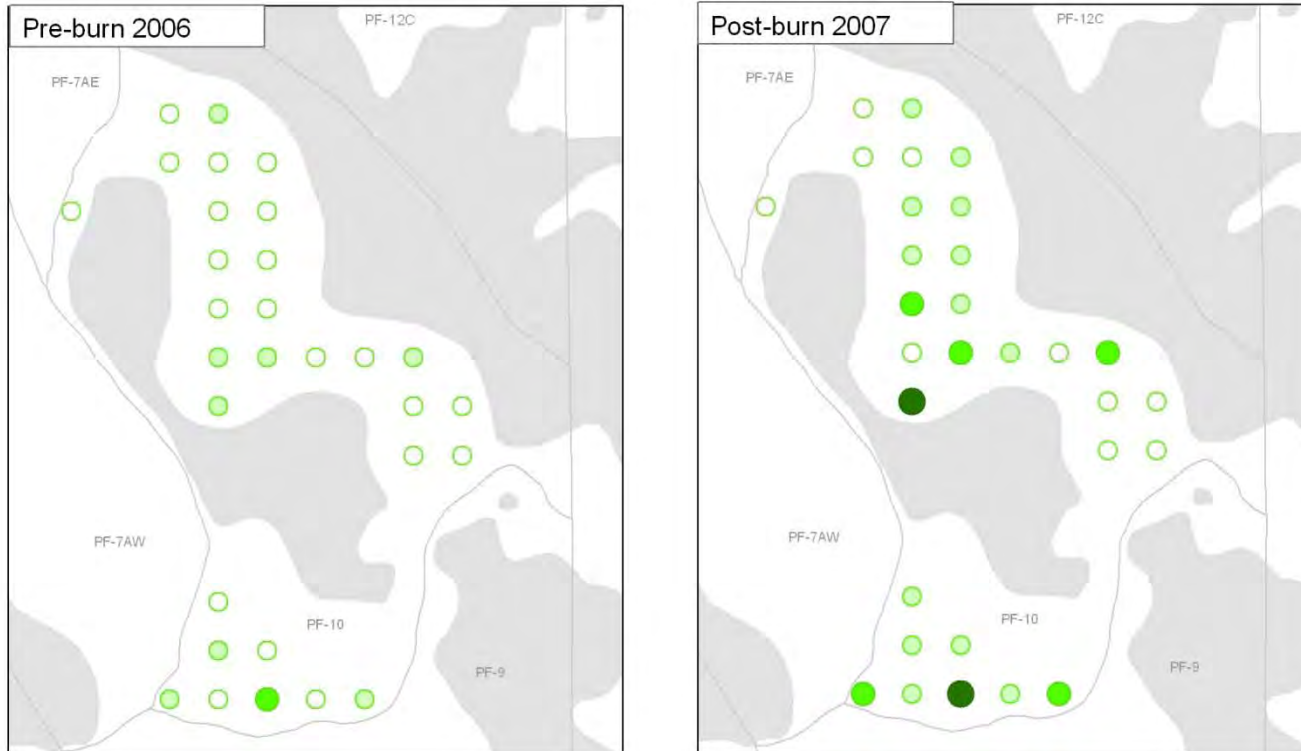
Data collection – 20 m plot

Count the number of pines >3m tall by species



Display data

TCP Pfund 10 Fire Effects Monitoring - Herb/graminoid percent cover



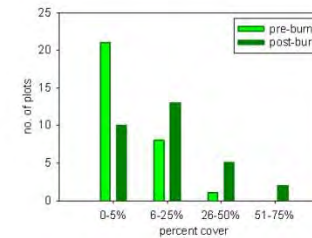
Legend

burn unit
wetland

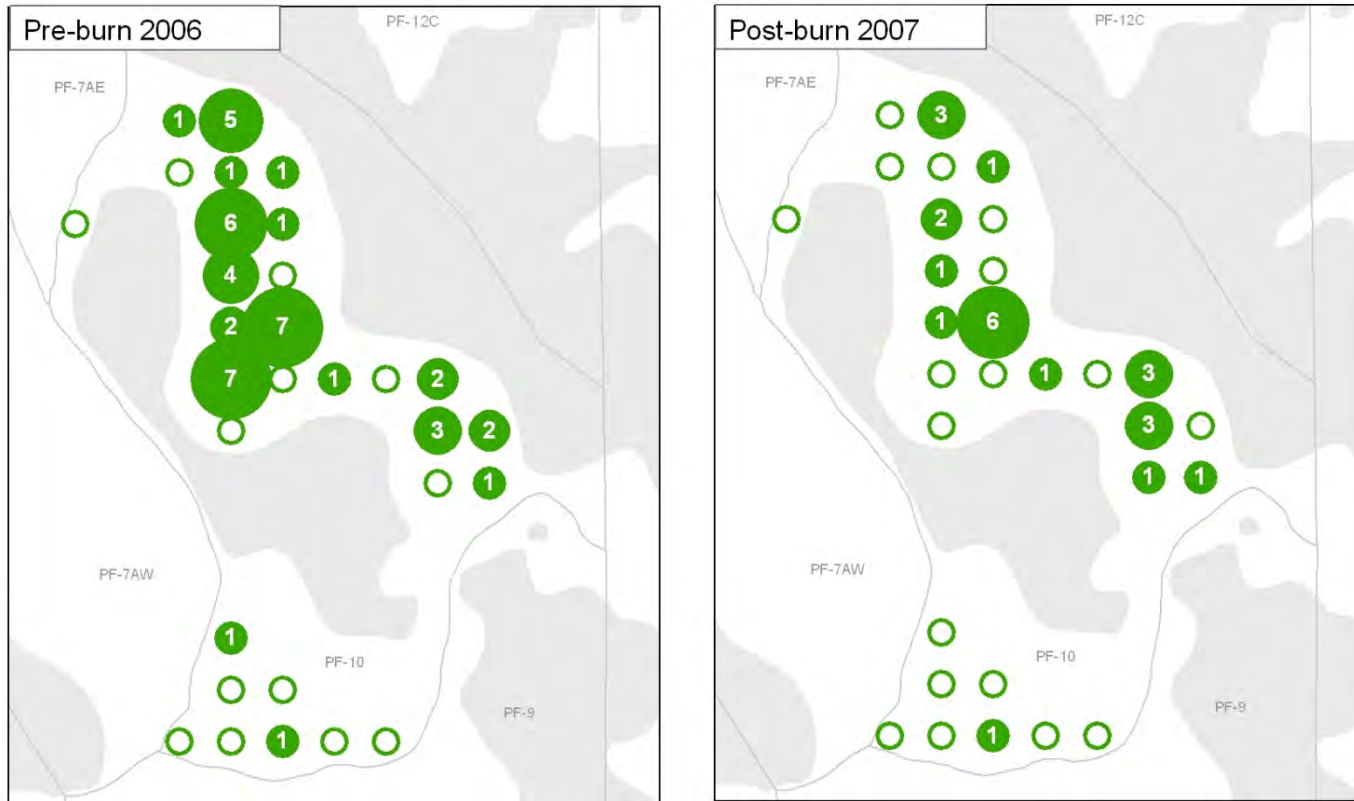
Fire Effects Data

herb/graminoid cover

- 1-5%
- 6-25%
- 26-50%
- 51-75%



TCP Pfund 10 Fire Effects Monitoring - number of longleaf pines >3m tall



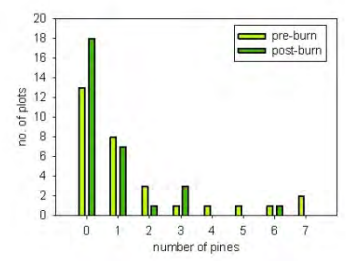
Legend

- burn unit
- wetland

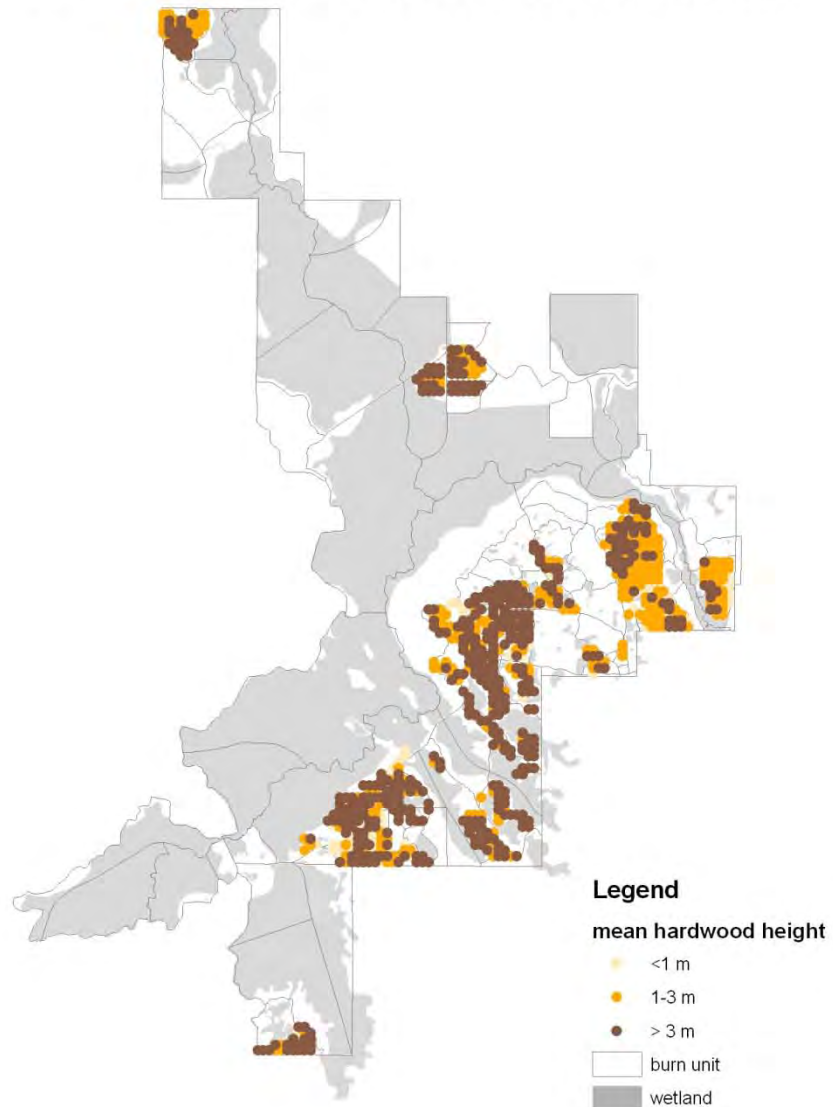
Fire Effects Data

- plot with no longleaf pines > 3m tall
- plot with one or more longleaf pines
is the number of pines within the plot

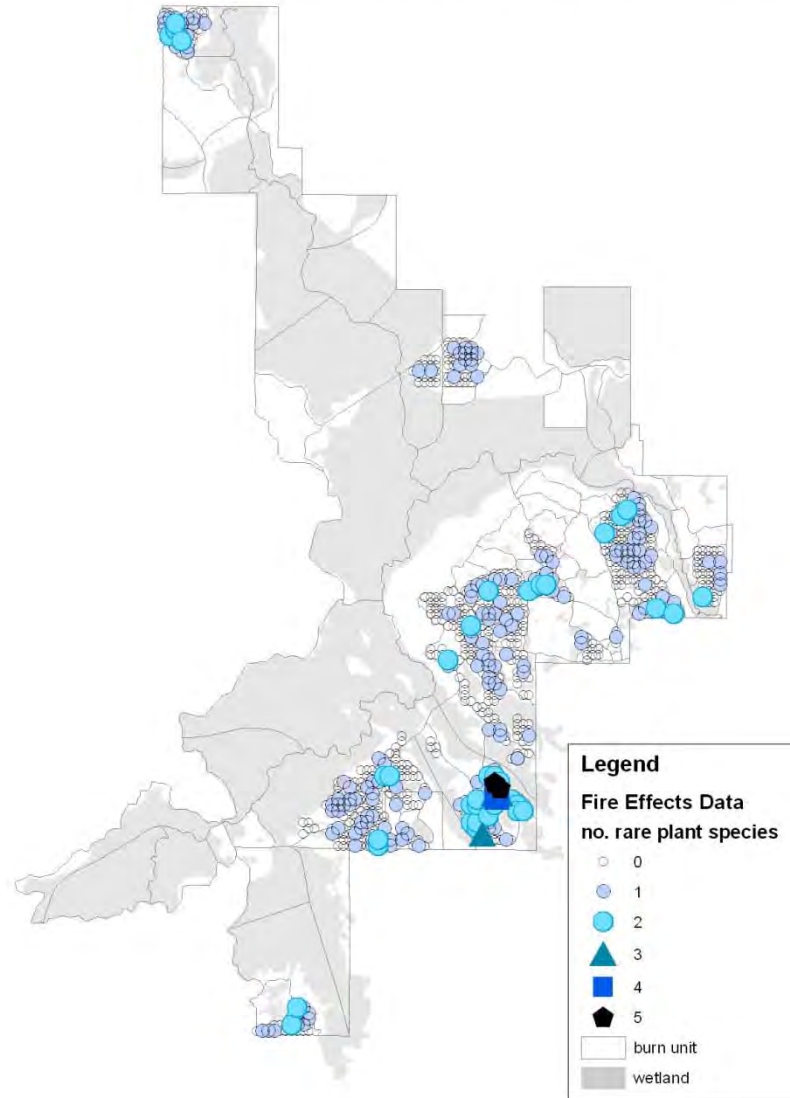
Totals
pre burn 46
post burn 24



TCP Fire Effects Monitoring - Mean height of hardwoods



TCP Fire Effects Monitoring - rare plant species



Ways to make this method less labor intensive or cheaper?

Increase distance between plots

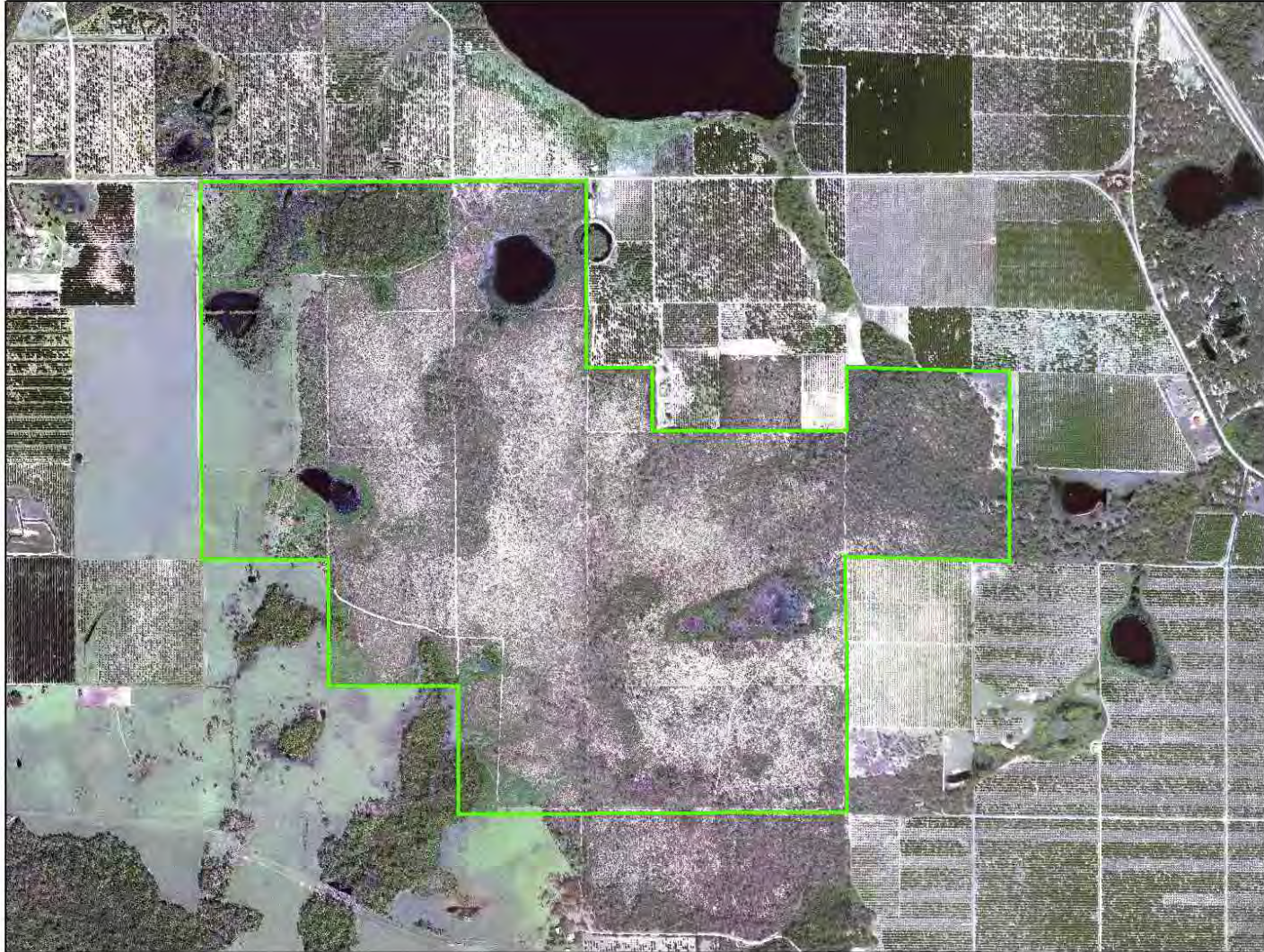
Randomly place plots during each monitoring period

Incorporate into other field surveys

Natural community monitoring where large-structure is the primary concern



Saddle Blanket Scrub Preserve



GIS scrub habitat assessment for the Florida-scrub jay

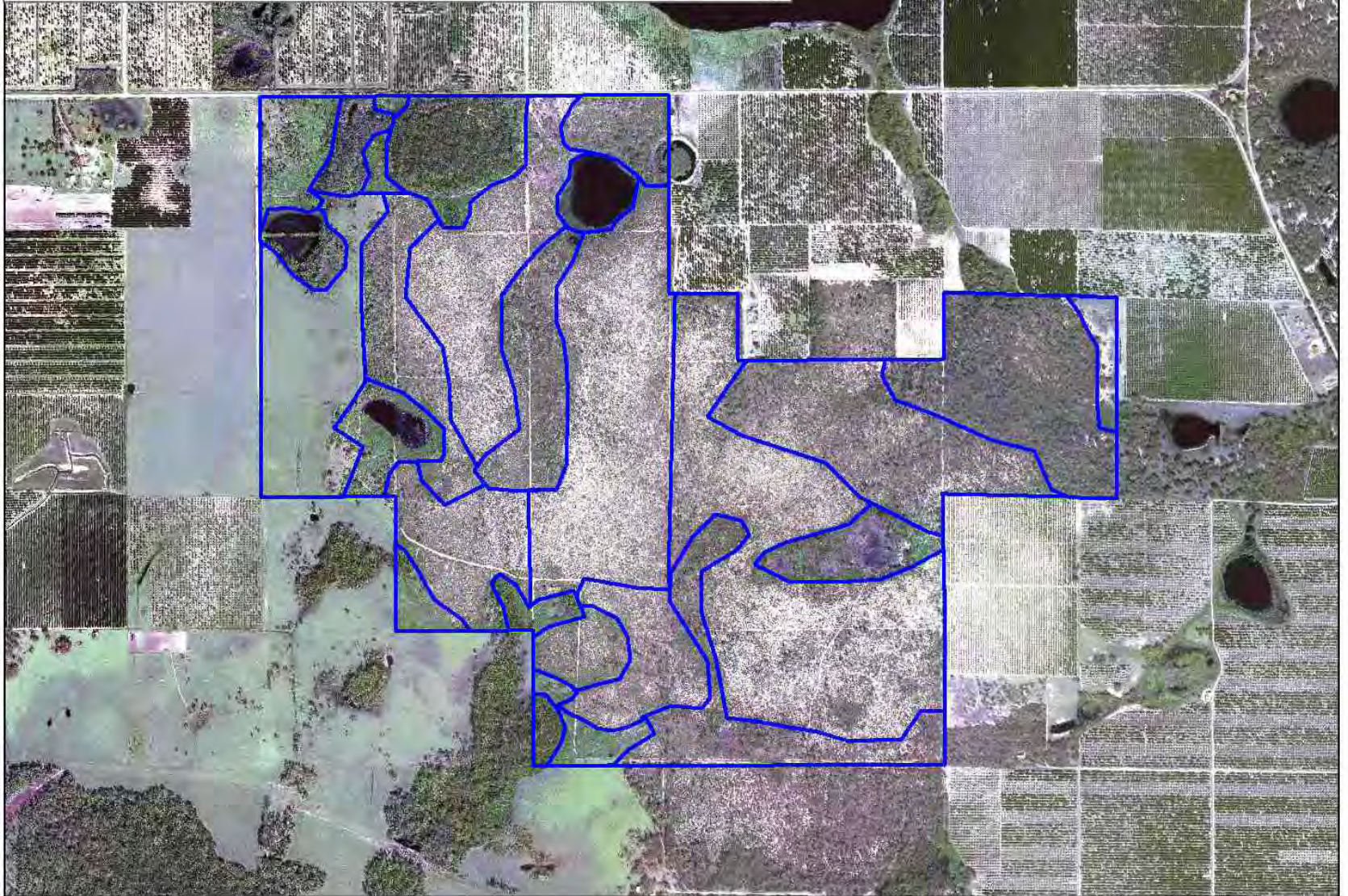
Optimal scrub-jay habitat

Mean shrub height of 1-2 m

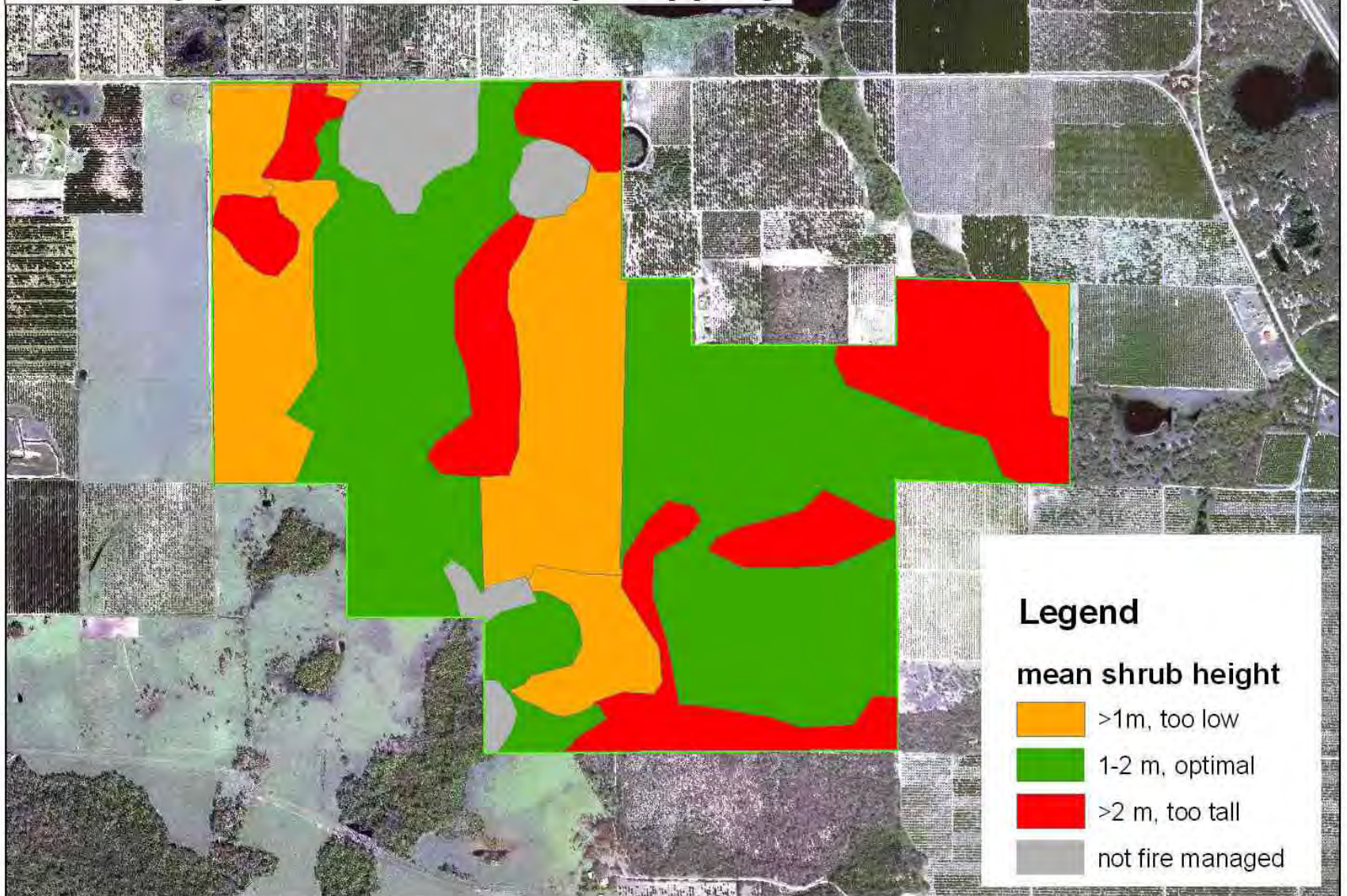
Tree canopy of < 10% cover



Saddle Blanket Scrub Preserve Scrub-jay habitat suitability mapping



Saddle Blanket Scrub Preserve Scrub-jay habitat suitability mapping



Requirements

GIS (ArcGIS or other)

Aerial imagery

Walk through or driving around large areas

Natural community monitoring for large-scale structure

Photomonitoring`



HU 1 1994



HU 1 2008



HU 5 2004



HU 5 2010



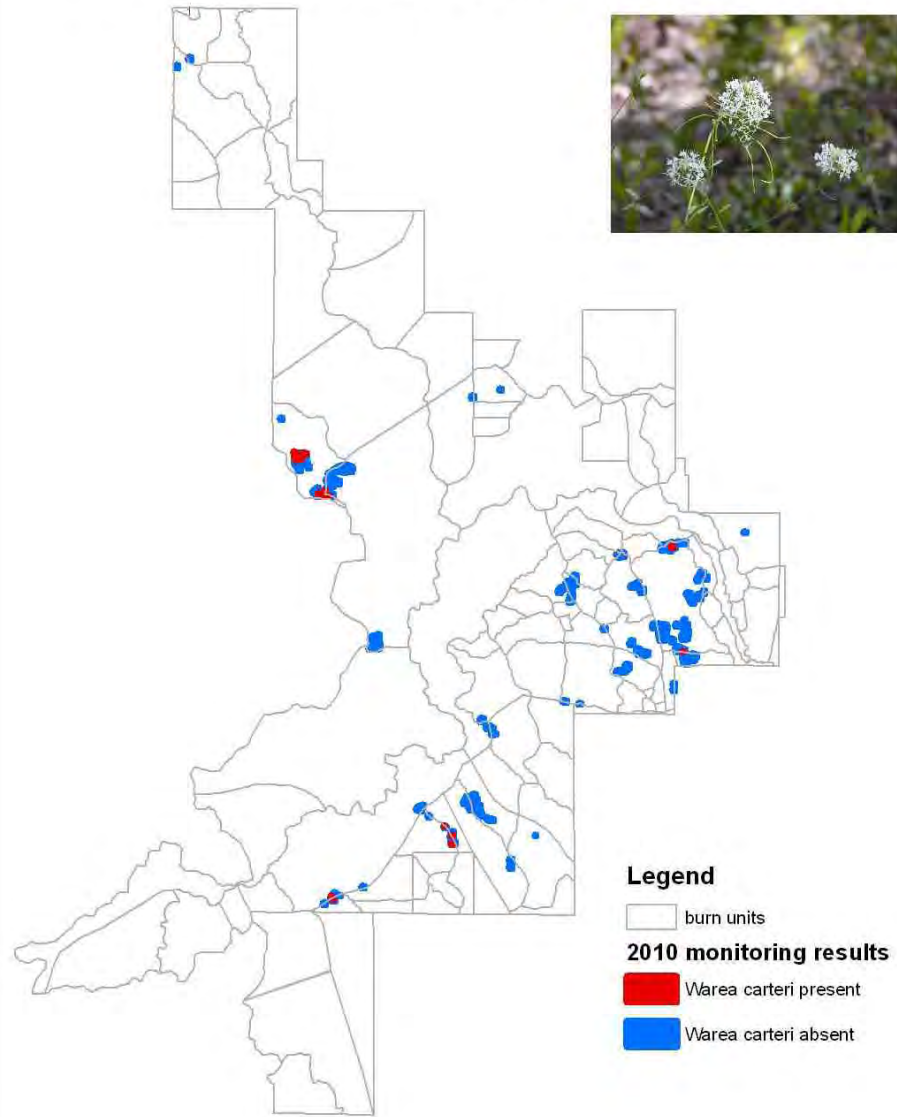
Requirements

Marked permanent points (GPS)

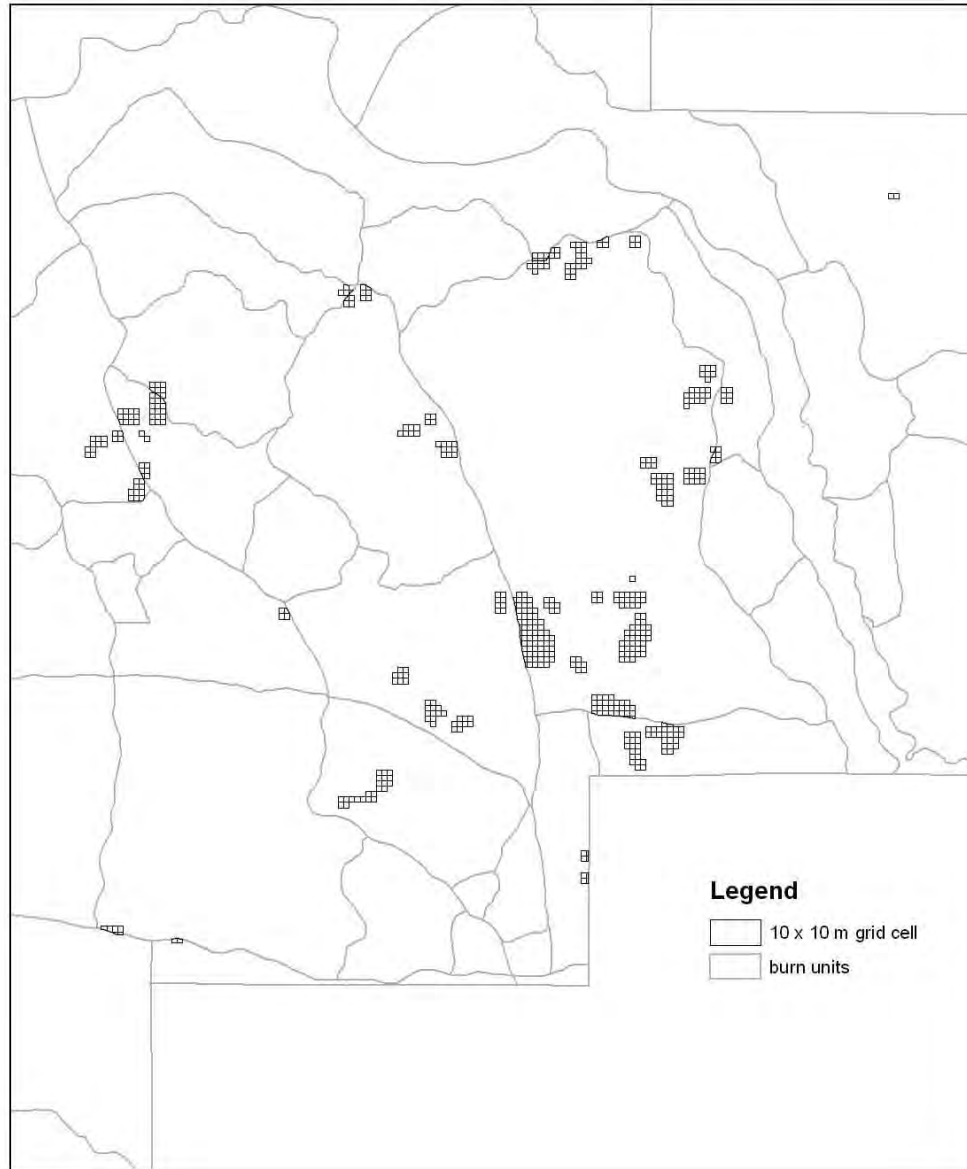
Fixed camera height, angle, and direction (tripod, level, and compass)

Board for quality control

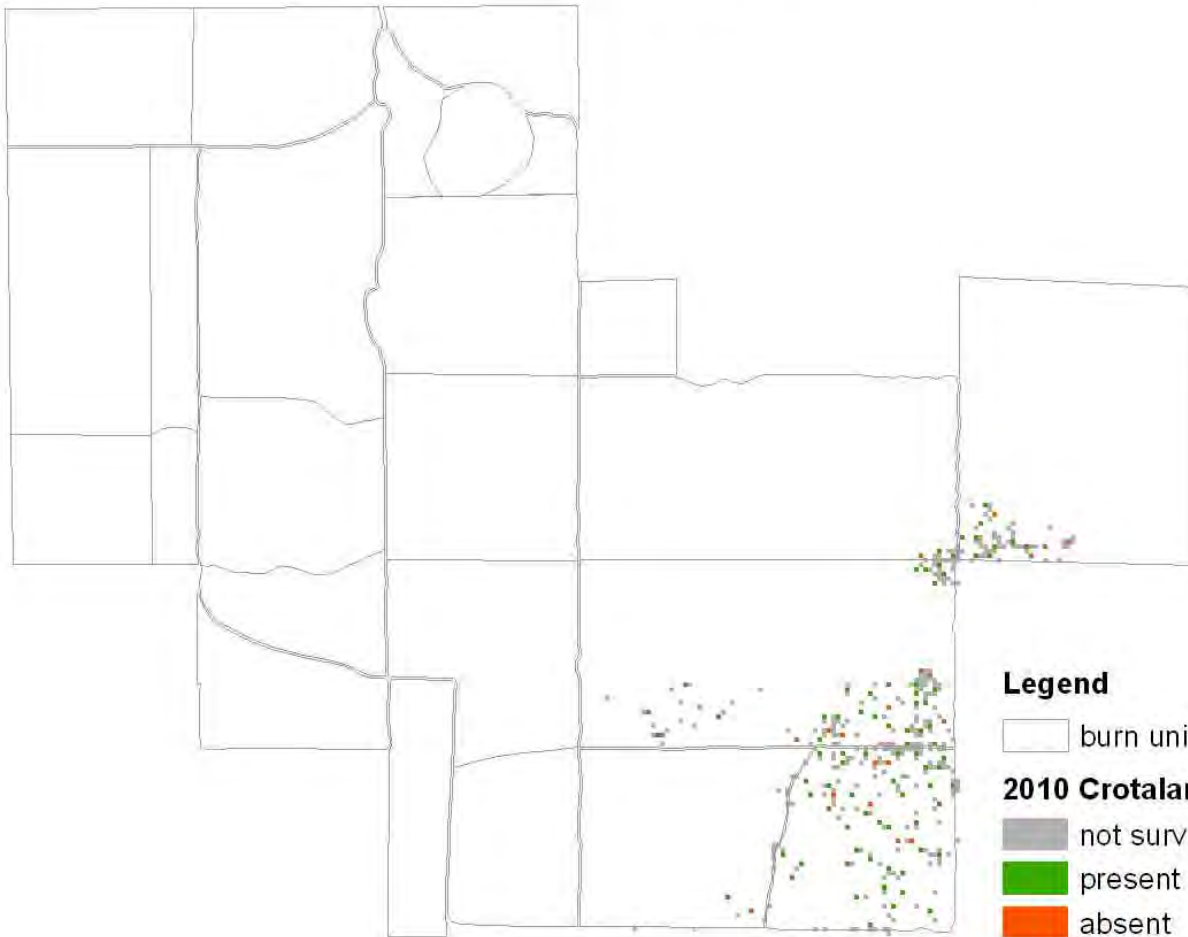
Warea carteri monitoring at Tiger Creek Preserve



Warea carteri monitoring design at Tiger Creek Preserve



Crotalaria avonensis monitoring at Saddle Blanket Scrub Preserve



Crotalaria avonensis monitoring at Saddle Blanket Scrub Preserve

