Lygodium microphyllum sporophyte development from soil samples collected in hydric habitats

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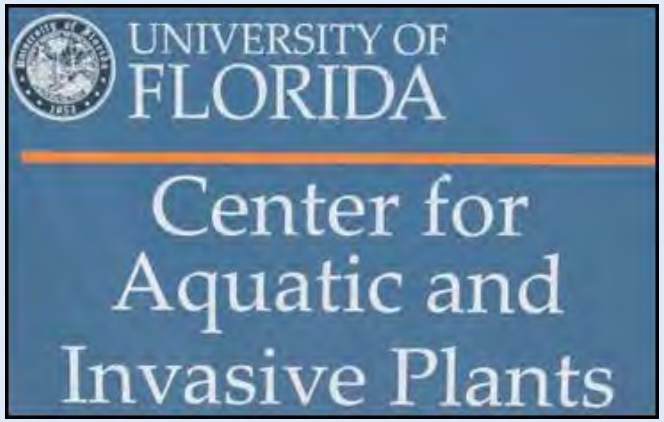
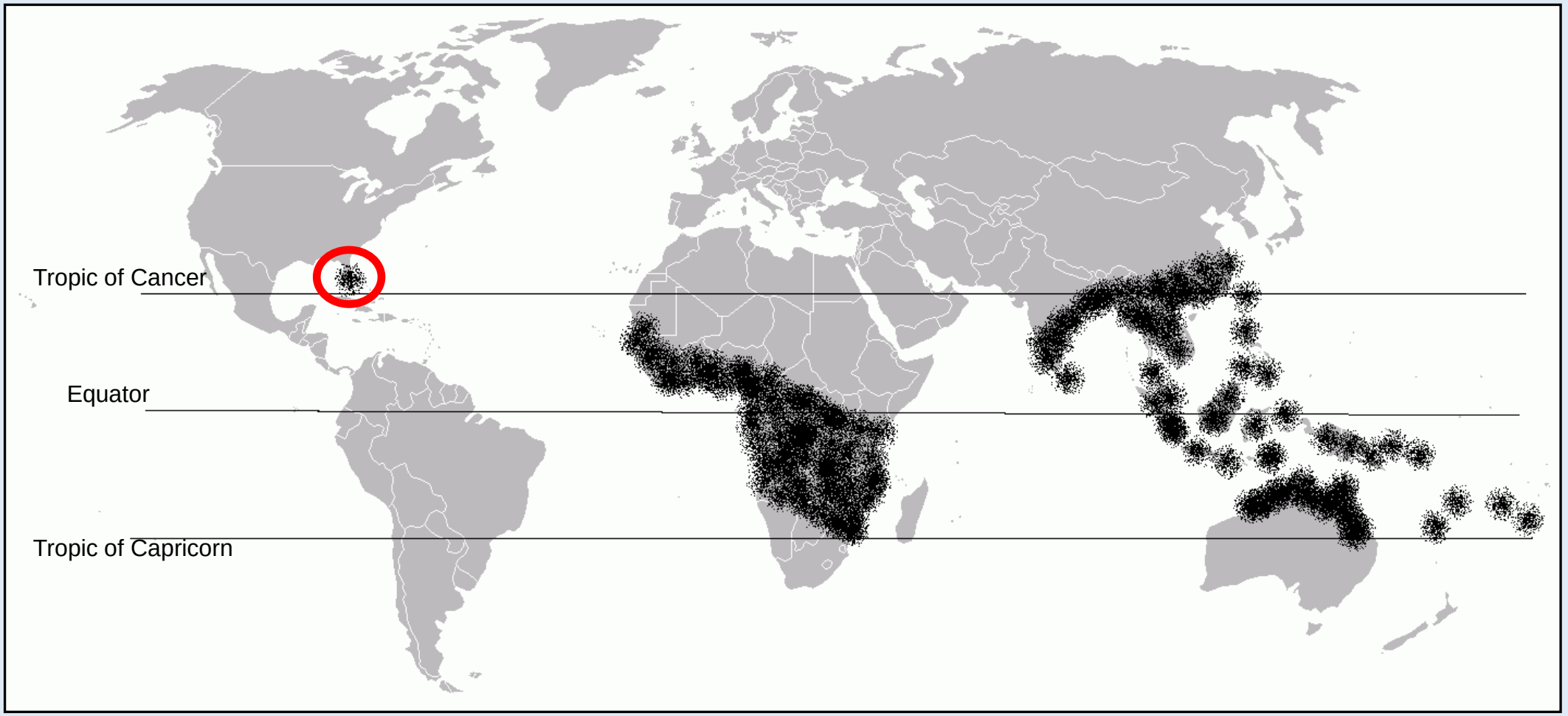


Introduction (*Lygodium microphyllum*)

- Common name: Old World climbing fern
- First recorded in 1958 - two sites in southern Florida
- Covered > 48,000 ha within 50 years
- Expanded range into northern Florida - 2010
- Spreads by wind blown spores (60 µm)
- Indeterminate growth (horizontally and vertically)
- Out-competes and smoothers native vegetation
- Highly pyrogenic, altering fire regimes in wetland habitat
- Priority invasive species in Florida

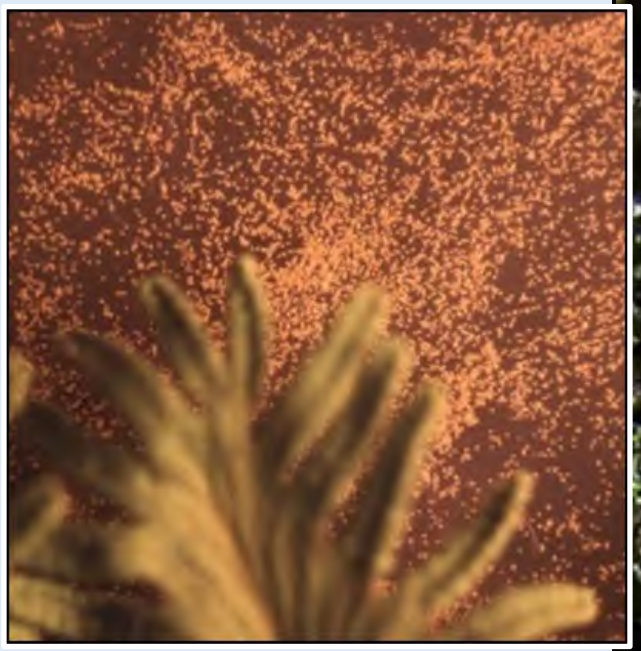
Lygodium microphyllum range



Includes temperate regions of Northern India, China, and Australia

(Pemberton, 1998)

Life Cycle

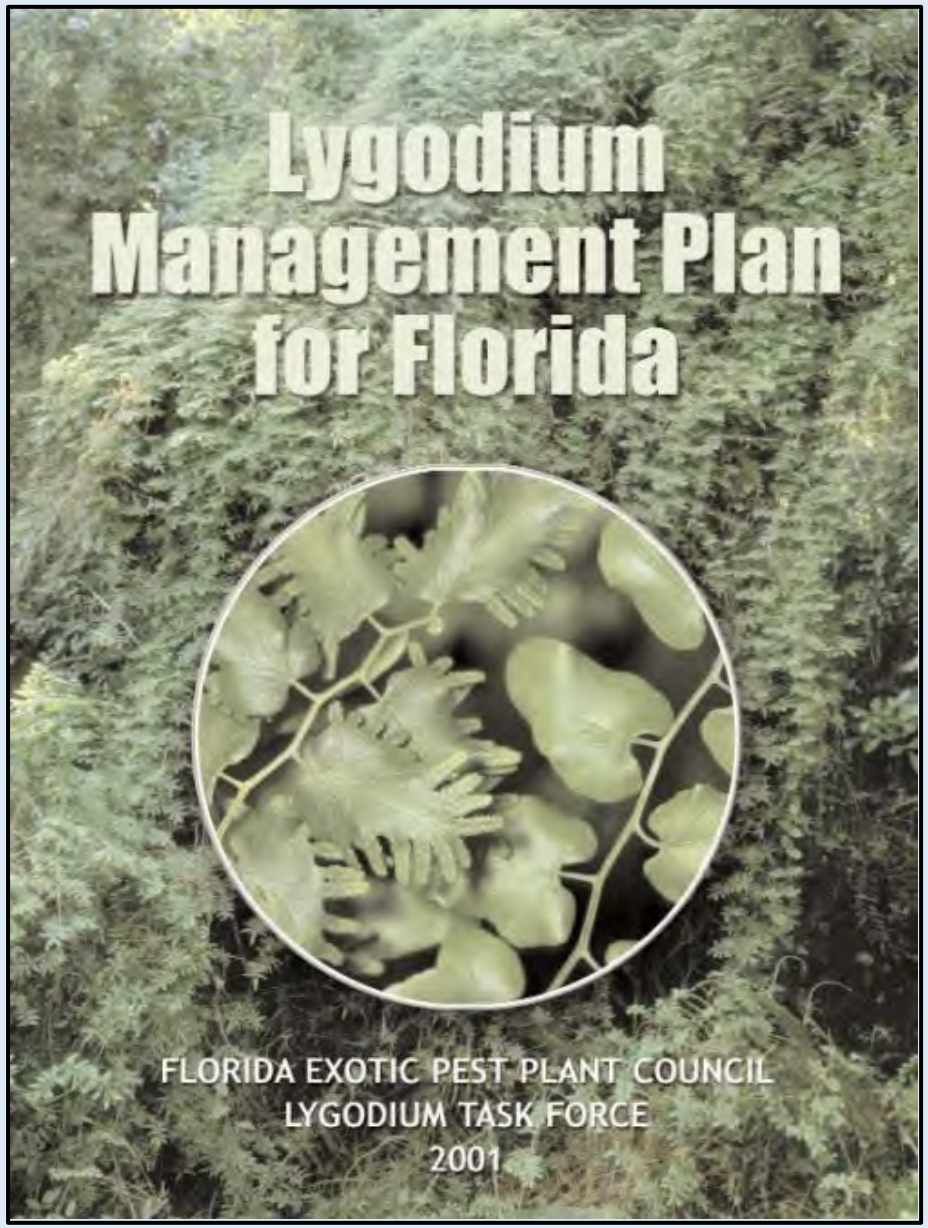


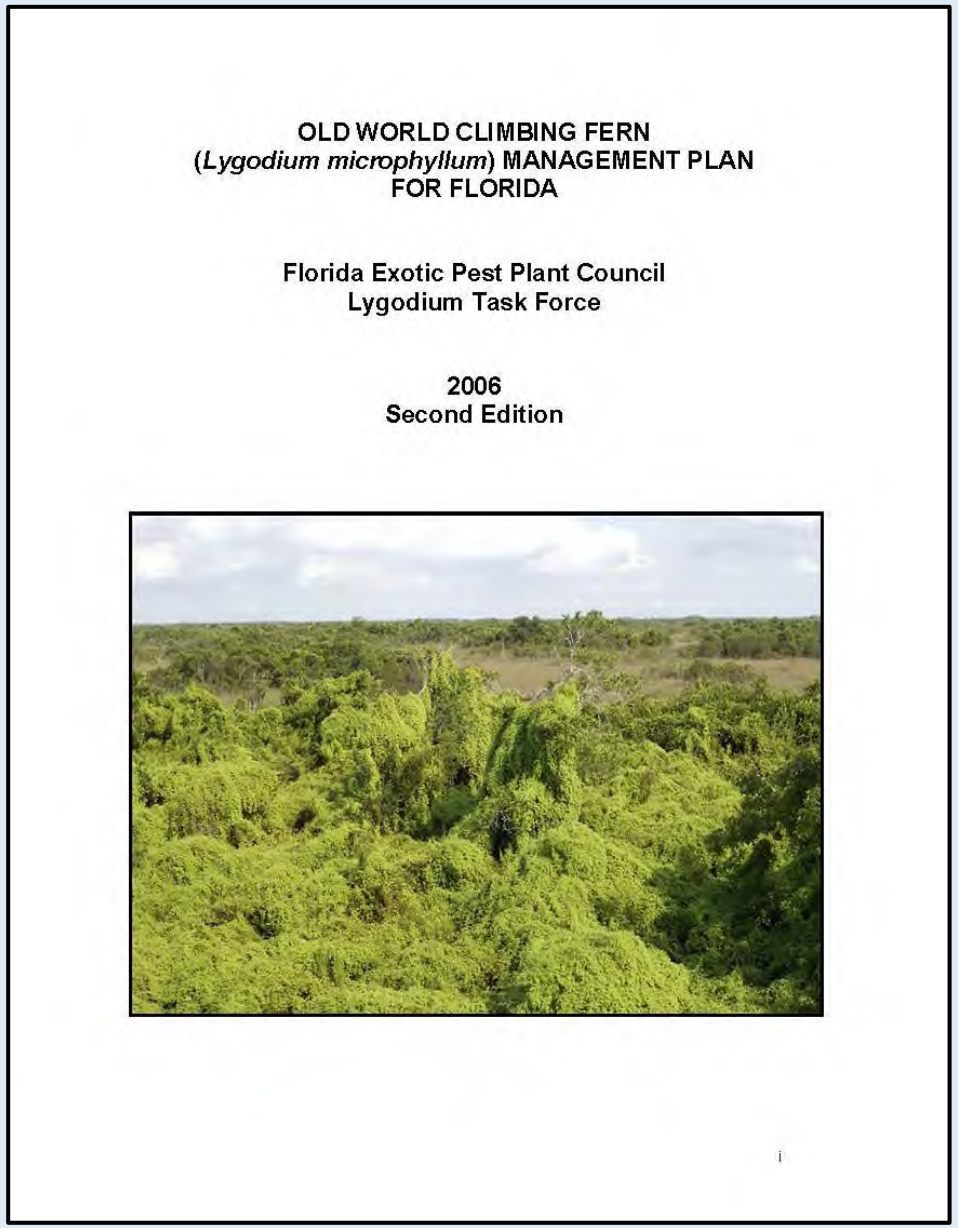
Maple Swamp

Cypress Swamp

Northern Everglades Tree Island

Two management plans written in 5 Years




OLD WORLD CLIMBING FERN
(*Lygodium microphyllum*) MANAGEMENT PLAN
FOR FLORIDA

Florida Exotic Pest Plant Council
Lygodium Task Force

2006
Second Edition

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Cursory information existed on spore viability and sporophyte development from soil samples

Objectives

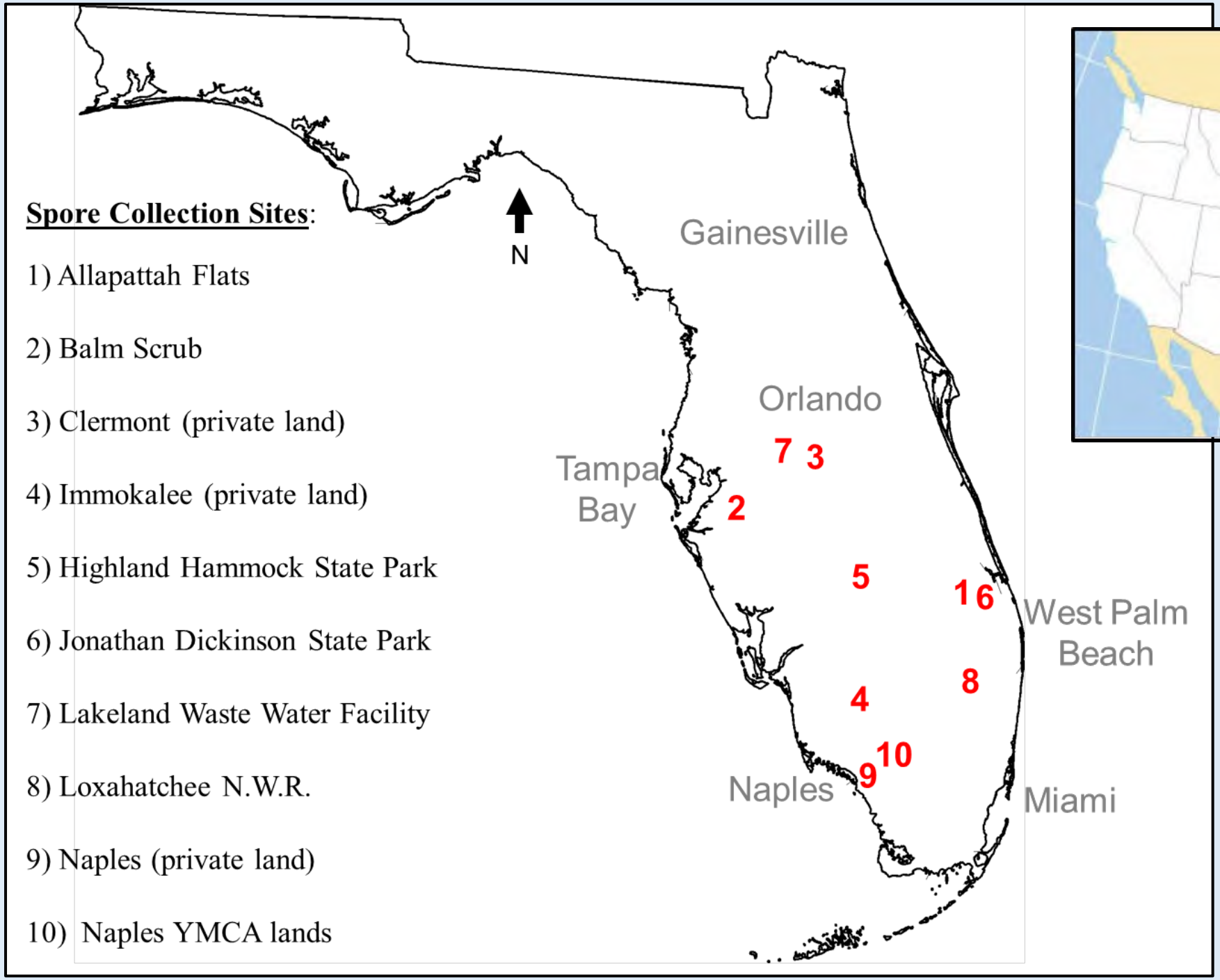
- Evaluate *Lygodium microphyllum* sporophyte development from soil samples collected in untreated sites at 0, 6, and 12 months

- Estimate sporophyte development of *Lygodium microphyllum* from soil samples collected in treated and untreated sites (range - 0 to 24 months)
  - Herbicide treatment and prescribed fire

Methods

- Soil samples were collected from 10 sites in Central and Southern Florida:

  1) Untreated sites (n = 72 at 0, 6, and 12 months)
  2) Ground foliar herbicide treated and untreated sites
     (n = 42 at 0, 6, 12, 18, and 24 months post-trt)
  3) Aerial herbicide + burn and untreated sites
     (n = 51 at 12 months post-trt)
  4) Cut and spray, band spray, and untreated sites
     (n = 25 at 12 months post-trt)



Spore Collection Sites

Untreated Site

Aerial Herbicide Treated Site

Ground Foliar Herbicide Treatment

Untreated site
> 50 m away from
L. microphyllum

Northern Everglades Tree Islands

Aerial Herbicide + Prescribed Burn

Untreated

Cut and Spray

Band Spray

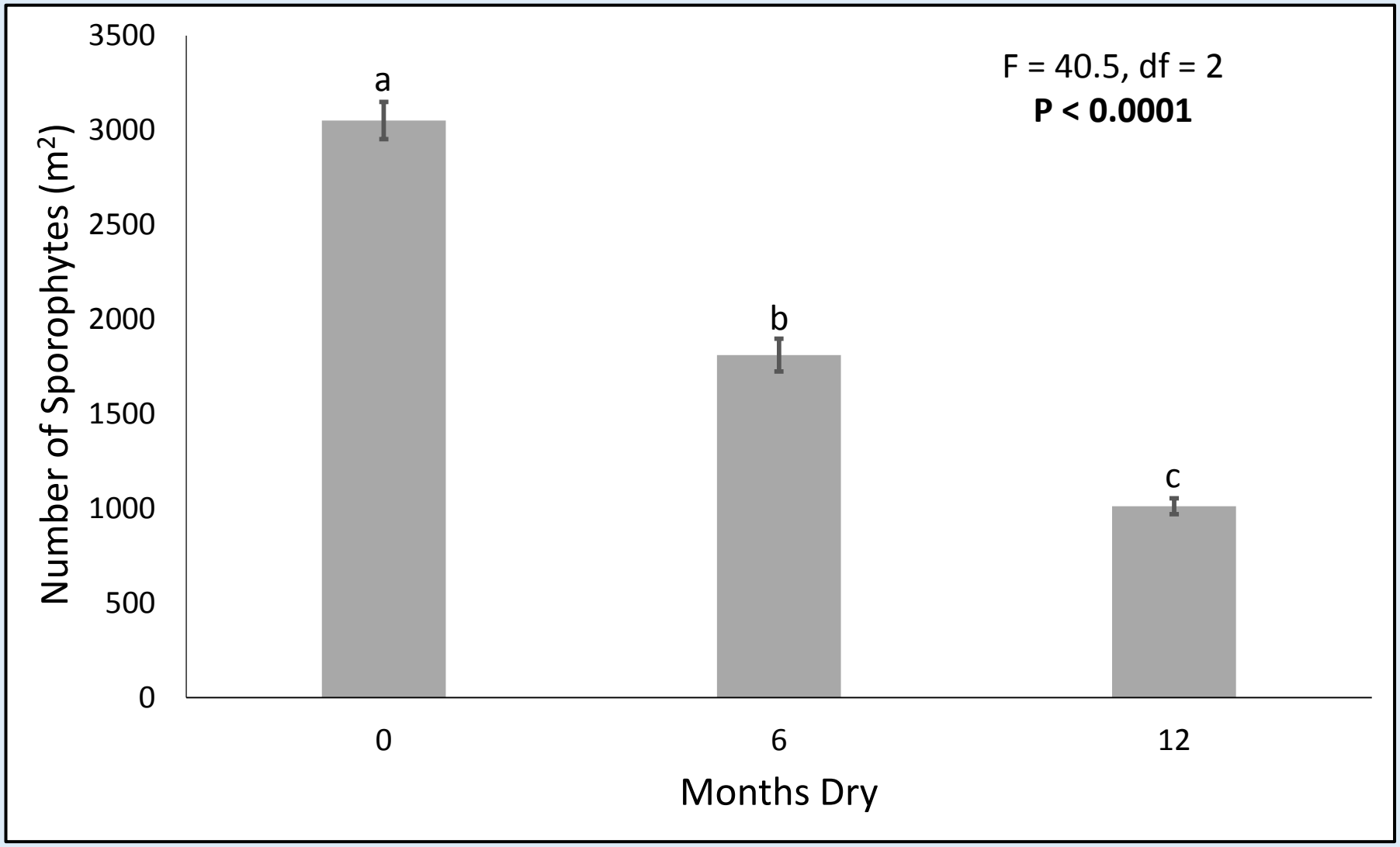
Soil Samples

Methods (cont.)

- Soil samples maintained in greenhouse under natural photoperiod (10-14 hr sunlight) and 50% shade
  - Watered to field capacity daily
  - Temperature range of 21-37 °C
- Sporophyte development counted weekly for 6 months following potting
- Data analyzed with t-test, ANOVA, or Friedman's test at $P < 0.05$

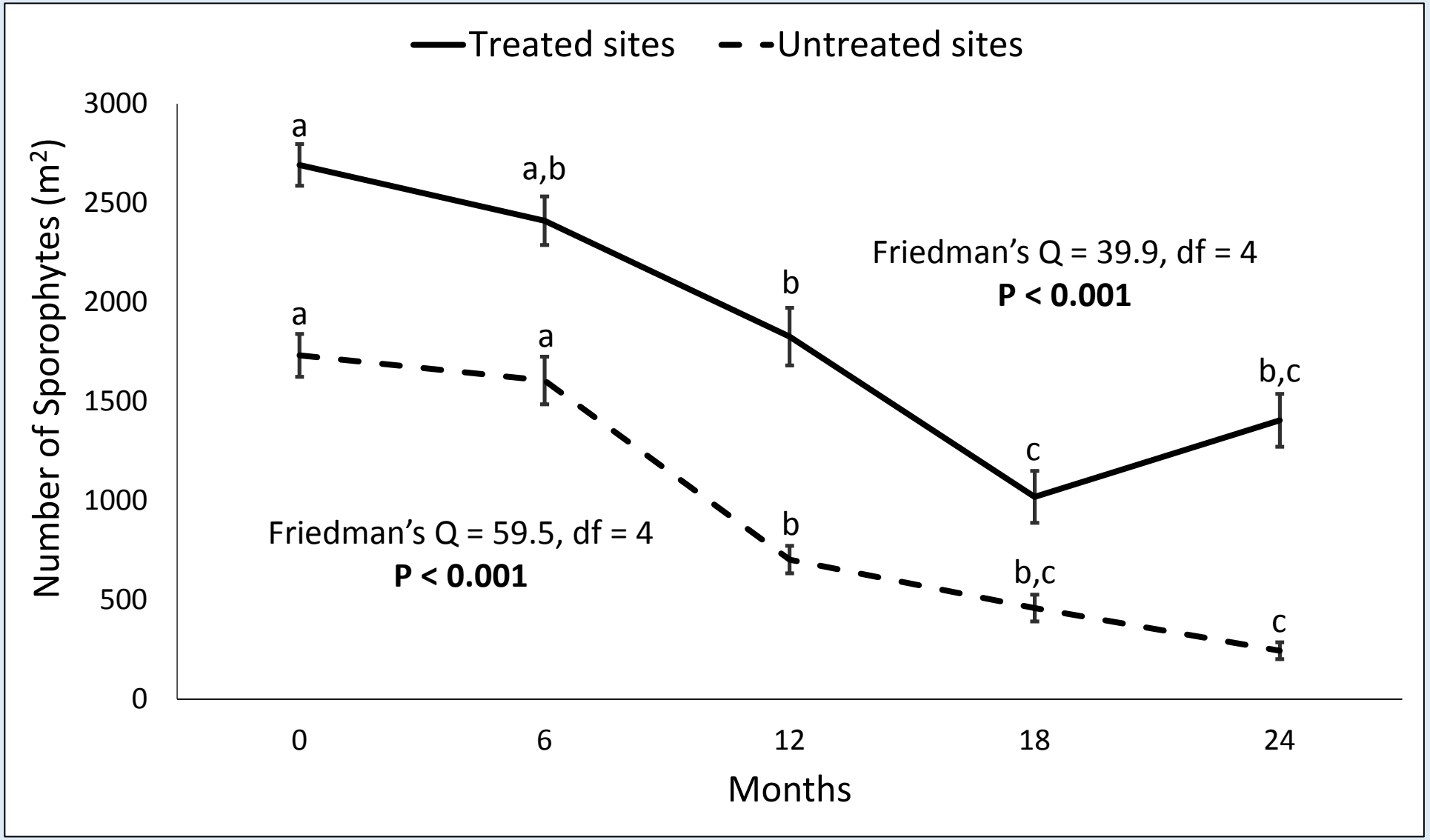
Results

Sporophyte development from soils in untreated sites

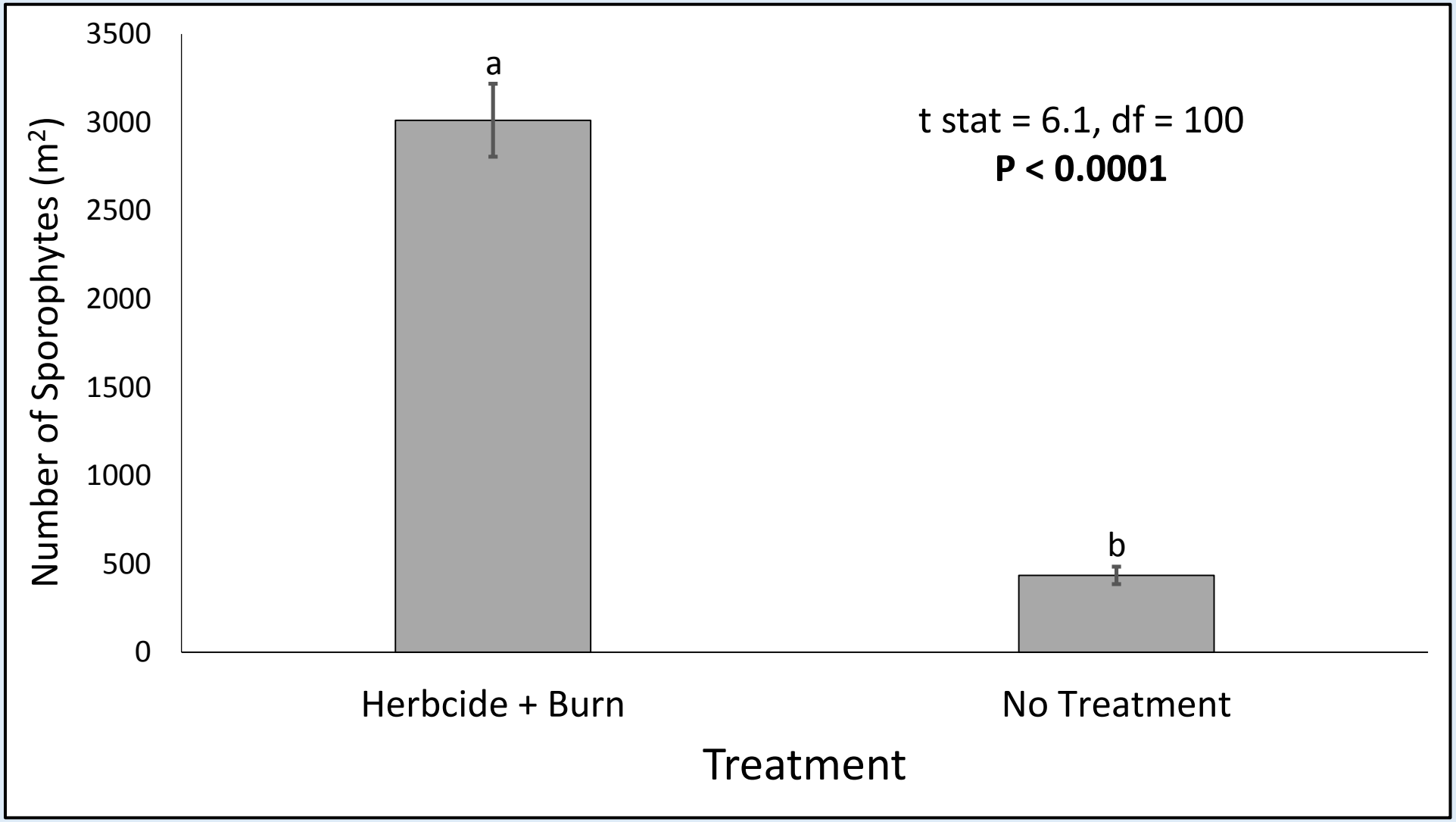


67% loss of viability from 0 to 12 months

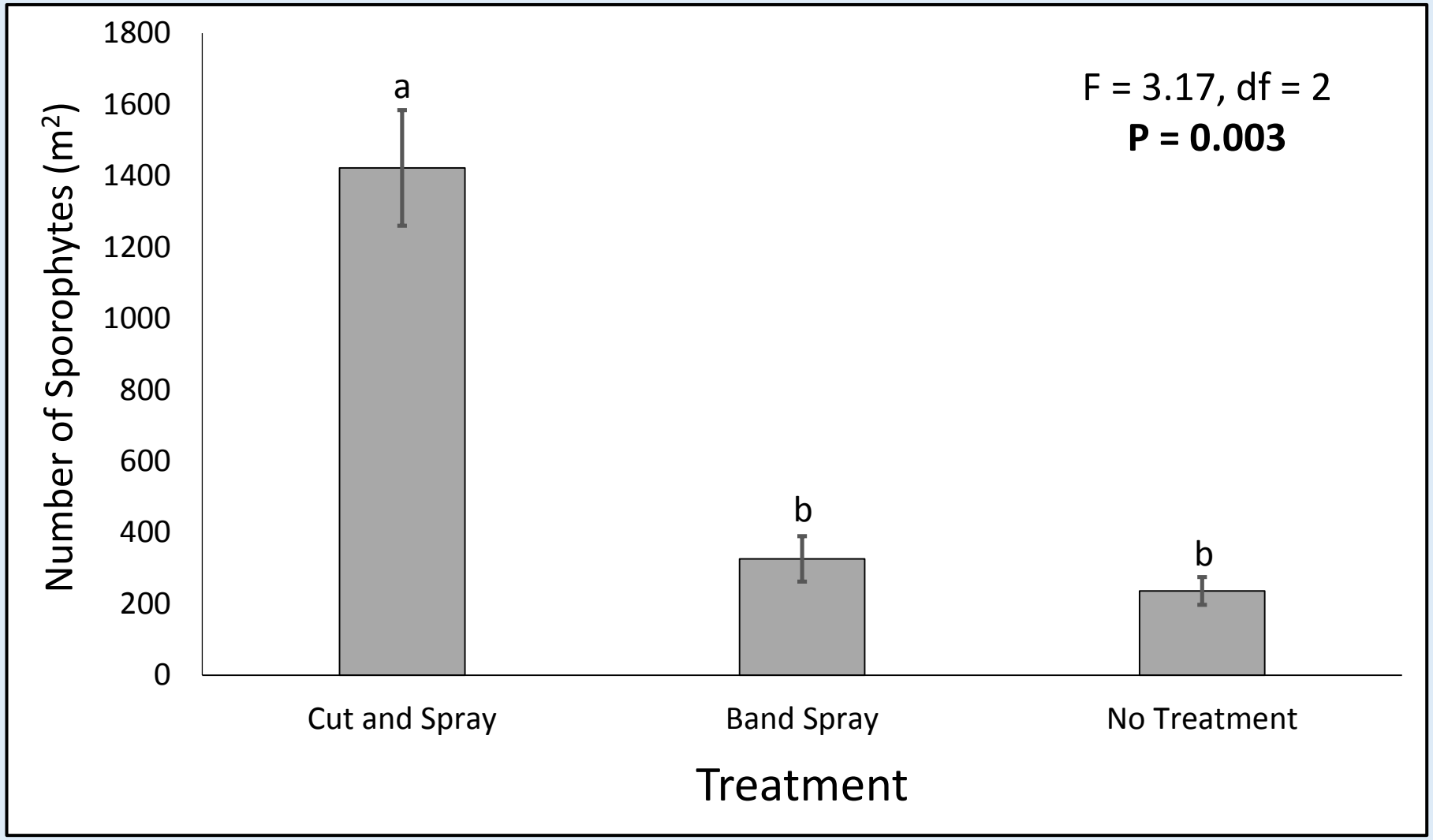
Sporophyte development from foliar herbicide treated and untreated sites



Sporophyte development from herbicide + burn and untreated sites at 12 months post treatment



Sporophyte development from cut and spray, band spray, and untreated sites at 12 months post treatment



Conclusions

- *Lygodium microphyllum* sporophyte development decreased by 67% from 0 to 12 months in soil samples.

- Sporophytes were found at higher densities (1400-3000 m^2) in treated sites compared to untreated sites (250-700 m^2) from 0 to 24 months post treatment.

- These results indicate that disturbance from treatments open up habitat for wind-blown *Lygodium microphyllum* spores to invade.

Conclusions (cont.)

- A systematic landscape treatment approach will be needed to reduced the numerous spores produced by *Lygodium microphyllum*.

- Selective herbicide treatment combined with biocontrols represents the best option for long-term control.

Acknowledgments

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  - Dr. Kenneth Langeland
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Questions

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SEE EXCEL FILE:

ALL DATA SUMMARIZED up to 24 months