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BA in Biological Sciences  
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**Current Project Description:**

*Imperata cylindrica*, a rhizomatous alien invasive grass, is one of the most troublesome weed species in the world. It is well spread throughout the southeastern United States and covers more than 500,000 ha in Florida. Studies in the Southeast have shown that this grass can replace native understory, alter fire regime, and change soil hydrology, pH and nutrient availability in pine forests. However, the implications of diversity and the effects of invasion on productivity and nitrogen dynamics of juvenile pine forests remain unknown.

**Objectives (list them):**

1. To understand the proposed mechanisms for invasion
2. To understand the role of diversity (both functional and species richness) and species identity on a community's resistance to invasion by *I. cylindrica*
3. To compare how *I. cylindrica* and native vegetation competition affect:
  - Nitrogen pools
  - Growth and productivity of *Pinus taeda*
  - Physiological function of *Pinus taeda*

**Brief Description:**

In a mesocosm experiment, with a randomized block design I tested the role of species richness, functional diversity and species identity in a native community's resistance to invasion by *I. cylindrica*. I established communities consisting of five common Florida sandhill understory species including a shrub, *Ilex glabra*, two grasses, *Aristida beyrichiana* and *Andropogon virginicus*, and two forbs, *Chamaecrista fasciculata*, and *Pityopsis graminifolia*. Following community establishment the invasive was introduced. Invasion success was measured by cover and biomass of *I. cylindrica* in each mesocosm. Plant biomass, cover and root morphology were used to explain native species resistance.

In Santa Rosa County, Florida, I conducted a 27-month study to compare the impacts of *I. cylindrica* and native vegetation competition on nitrogen pools and *Pinus taeda* seedling productivity. One-year-old pine seedlings were planted in five plot replications of three treatments: 1) vegetation free (VF) 2) native (NC) competition and 3) *I. cylindrica* (IC) competition. <sup>15</sup>N labeled fertilizer was used to trace the movement of

nitrogen in both invaded and uninvaded plots. Productivity of pines was determined with biomass measurements as well as gas exchange measurements.

### Project Pictures

