

Characterizing non-native, invasive plant abundance in post-Katrina Louisiana

Sean Anderson¹, John Lambrinos², Katie Brasted³ & ESRM 492 (2007 & 2008) students¹

¹ESRM Program California State University Channel Islands, ²Oregon State University, ³Woodlands Trail and Park
e-mail: sean.anderson@csuci.edu web: www.faculty.csuci.edu/sean.anderson/



For the past two years my ESRM 492: *Service Learning in New Orleans* classes from California State University Channel Islands spent Spring Break touring and working in the greater New Orleans area. We investigate the drivers of wetland loss, factors contributing to the Katrina-spawned devastation, and help with recovery efforts. As part of each trip we spend three-four days in and around Woodlands Trail and Park (Belle Chasse, LA) documenting Katrina impacts. Our on-going site assessment is the first detailed documentation of this former well-functioning cypress-tupelo forest since Hurricane Katrina struck the region in 2005. This assessment provides important baseline conditions with which to evaluate the effectiveness of subsequent management efforts in the region. These initial efforts are only our first foray into invasive species management in Plaquemines Parish. We have already begun planning to return with future Service Learning classes to continue being of whatever help we can be to those managers working towards effective conservation of Gulf Coast resources.



Woodland Trail and Park

Located 10km (6.5 mi) from downtown New Orleans, the Woodland Trail and Park covers approximately 600 hectares of bottomland hardwood forest in Plaquemines Parish. It is the southernmost large stand of cypress-tupelo forest in this region of Louisiana. This parish land was largely ignored for the last several decades. Pressure to develop the land (spurred by the conversion of neighboring land into golf courses and residences) spurred the incorporation of the *Woodlands Trail and Park 501(c)(3)* in 2001. This community-based effort seeks to establish a permanent urban greenways that incorporate educational, historical and recreational components around a core nature trail.

Two 9.7km (6.8mi) trails and associated wooden bridges were destroyed along with essentially the entire forest canopy by Hurricanes Katrina and Rita in 2005. Treefalls and other hurricane debris prevented limited trail access until 2007. Trail clearing/repair consumed all funds leaving none left for environmental impact assessment.



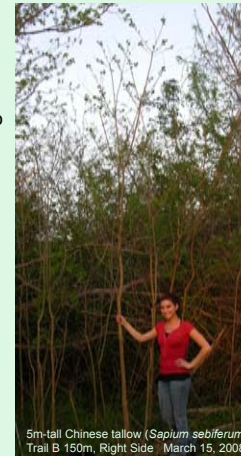
Woodland Trail and Park Location

Methods

We were asked to document the existing state of the invasion of three woody species of concern: *Sapium sebiferum* (Chinese tallow), *Melia azederach* (Chinaberry), and *Ligustrum sinense* (Chinese privet). Our basic sampling approach was designed to provide data useful for subsequent control efforts for these species. As our surveys constituted initial, baseline data we wanted to make sure we documented the distribution of potentially important non-target species which may be of use in explaining dynamics of these invaders in the coming years (*i.e.* blackberry).

We conduct our surveys relative to the existing trail network:

- transect stops every 50m down trail
- 32m-long transects run perpendicular to the trail at each stop with 0.25m² quadrats deployed in the trail center (0m) and 1, 2, 4, 8, and 16m to trail right and to trail left
- within each quadrat we record stem density, understorey (<1.5m in height) cover, overstorey (>1.5m in height) cover, max canopy height, and (in 2008) max height of invaders
- to date we have identified 31 plant species in our more than 500 quadrats sampled each year



Documenting Wetland Loss



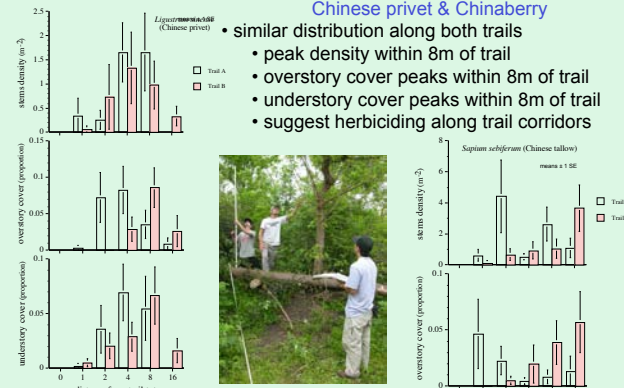
Note the dramatic increase in blackberry and other opportunistic woody species over the past year. The pink flagging tape right of center in each image was the same piece deployed in 2007.

Interim Results

Our focal invader species are generally common throughout the site and all of southern Louisiana. While they have established themselves, their vegetative growth has been suppressed by the often very thick blackberry canopies that have developed across much of this landscape post-Katrina. Our fears began to manifest themselves in Spring of 2008 with a massive increase in the density and height of invaders, particularly Chinese tallow. Most tallow trees were <1m in height in 2007 whereas we commonly encountered individuals ≥2m in 2008, with some exceeding 5m in height! Time is running out to suppress these invaders and prevent a conversion of our bottomland hardwood forest into something resembling a southeast Asian bamboo forest.

Question: Are invasives more abundant near trails?

Chinese privet & Chinaberry



Chinese tallow

- similar distribution along both trails
 - peak density within 8m of trail
 - overstorey cover peaks within 8m of trail
 - understorey cover peaks within 8m of trail
 - suggest herbiciding along trail corridors
- distribution trail-specific
 - density and cover do not necessarily correlate with trail openings
 - herbiciding along trail corridors is unlikely to prove efficacious

A note about Louisiana's vanishing wetlands...

California and Louisiana represent two extreme examples of wetland loss in the United States. California has the unfortunate distinction of being the state with the highest proportion of wetland loss (91% lost over the past 200 years). Louisiana claims a similarly embarrassing mantle as the state with the largest quantity of absolute wetland loss (492,100 hectares during the 20th century alone). Currently an average of 21.3 hectares of coastal Louisiana wetlands are lost daily. No single factor is to blame for this erosion of our national heritage. Rather a synergistic combination of factors are conspiring to rapidly degrade these communities. Chief among these stressors are 1) reduced sedimentary inputs from the channelization of the Mississippi River, 2) subsidence associated with oil & gas extraction, 3) vegetation diebacks from saltwater intrusion following over pumping of coastal aquifers, 4) fragmentation of remnant wetlands by linear waterways, roads, and development, and 5) altered ecosystem structure and function due to the expansion of non-native, invasive species. Unless major restoration efforts are undertaken immediately, we stand to lose virtually all coastal salt marsh in southern Louisiana over the next century.

Acknowledgements

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