

**THE IMPORTANCE OF BIODIVERSITY TO DATAW ISLAND**

**AND**

**THE THREAT POSED BY NON-NATIVE INVASIVE SPECIES**

**SPECIFICALLY**

**CHINESE TALLOW TREE**

**A White Paper presented by the  
The Dataw Island Conservancy**

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Chinese tallow tree leaves and blossom buds

## Opening Statement

Historically, Dataw Island's owners have respected the land and valued the natural, pristine beauty of their island home. Alcoa recognized the uniqueness of this property and deliberately crafted and placed its amenities to blend in and to take advantage of the stunning natural views the island affords. In doing so, Alcoa preserved as many trees as possible realizing, perhaps, that nothing man-made could improve upon nature's creation. This vision continues to pay dividends.

In the Island's marketing polls of new owners, the "natural, pristine beauty of the Island" consistently heads the list of island amenities as to why prospects buy at Dataw.

### **What is Biodiversity and why is it important to Dataw Island?**

Biodiversity is the diversity of life in an area. There are three kinds of biodiversity: Genetic, Species and Ecological.

**Genetic diversity** is the diversity of genes in a species. Species need certain genes, which produce variation, to survive. If the diversity is lacking, the species may die out (in that the species will not be able to adapt).

**Species diversity** is the variety of living organisms (plants and animals) in areas such as rainforests, reefs, deserts, tundra, etc.

**Ecological diversity** is the complexity and richness of an entire ecosystem. Biodiversity increases ecosystem productivity; all of the species in that ecosystem, no matter their size, have a big role. A diverse ecosystem can prevent and recover from lots of disasters. Humans depend on plants and animals for their very survival.

On the other hand, invasive species cause harm to native plants and animals in many ways. When a new and aggressive species is introduced into an ecosystem, it might not have any natural predators or controls. It can breed and spread quickly, taking over an area. Native plants and animals may not have evolved defenses against the invader or they cannot compete with a species that has no predators.

The direct threats of invasive species are:

- ⤴ **preying** on native species
- ⤴ **out-competing** native species for food or other resources
- ⤴ causing or carrying **disease**
- ⤴ **preventing native species from reproducing** or killing their young

The indirect threats of invasive species are:

- ⤴ **Changing food webs:** Invasive species can change the food web in an ecosystem by destroying or replacing native food sources. The invasive species may provide little to no food value for wildlife.
- ⤴ **Altering ecosystem conditions:** Some invasive species are capable of changing the conditions in an ecosystem, such as changing soil chemistry or the intensity of wildfires.
- ⤴ **Decreasing biodiversity:** Invasive species can alter the abundance or diversity of species that are important habitat for native wildlife. Aggressive plant species like Chinese Tallow can

quickly replace a diverse ecosystem with a monoculture of just Chinese Tallow.

Tallow tree's environmental and ecological damage results from acting through "interference competition," meaning it out-competes other species for a resource. Tallow competes with native flora for light, and acts to block their access to this vital resource by growing faster than them and shading them with its leaves. Native plants may then die as a result.

### **What is Chinese Tallow?**

Chinese tallow is an ornamental tree with colorful autumn foliage that can survive full sunlight and shade, flooding, drought and, in some cases, fire. To horticulturalists, this kind of tree sounds like a dream, but to ecologists, land managers and land owners, this kind of tree can be a nightmare, especially when it invades an area and takes over native vegetation.

Chinese tallow (*Triadica sebifera*), a non-native tree from China, is currently transforming the southeastern Coastal Plain. According to the U.S. Forest Service: Even one tallow tree presents a danger of explosive expansion that can hurt local ecosystems. Tallow trees begin producing viable seed after only 3 years. They can spread by root fragments and cuttings, so are quick to invade after a hurricane. Tallow trees grow faster than nearly all indigenous species and quickly create a shade canopy that inhibits growth of native vegetation. Just one tallow tree can produce 100,000 seeds every year (3X more than indigenous species). (Duke, 1983) Nearly all of these seeds are viable and can germinate even after several years. A mature stand can produce 9,921 pounds of seeds per 2.5 acres per year. Trees remain productive for 100 years. (Duke, 1996; Jubunsky, 1993)

Over the last 30 years, Chinese tallow has become a common tree in old fields and bottom land swamps of coastal Louisiana. Several studies by the U.S. Geological Survey's National Wetlands Research Center (NWRC), Lafayette, Louisiana are aimed at understanding the factors that contribute to Chinese tallow tree growth, spread and management.

When Tallow invades, it eventually monopolizes an area, creating a forest without native animal or plant species. This tree exhibits classic traits of non-native invaders: it is attractive so people want to distribute it; it has incredible resiliency; it grows quickly and in a variety of soils: and it is resistant to pests.

In the coastal prairie of Louisiana and Texas, Chinese tallow can grow up to 30 feet and shade out native sun-loving prairie species. The disappearance of prairie species is troublesome because less than 1% of original coastal prairie remains, and in Louisiana, less than 500 of the original 2.2 million acres still exist. Associated animal species are dramatically affected by such habitat modifications. Attwater's prairie chicken, once abundant in the coastal prairie of Texas and Louisiana, is near extinction due to loss of habitat. Other bird species dependent on coastal prairie habitat are dickcissels, mottled ducks, and a large number of neotropical migratory songbirds including five critically imperiled species. Data indicates that a dramatic decline has occurred over the past 25 years in grassland bird species (Knopf, 1994).

Tallow reproduces and grows quickly and can cause large-scale ecosystem modification. (Bruce, et al, 1995), (Jubinsky & Anderson, 1996) For example, when it completely replaces native vegetation it has a negative effect on birds by degrading the habitat. (Randall & Marinelli, 1996) Besides shading out

grasses, it can also be potentially harmful to humans and animals because of its berries and plant sap that contain toxins. There is some concern its leaves may shed toxins that change the soil chemistry and make it difficult for other plants to grow.

### **What is the position of other organizations regarding Chinese Tallow?**

The tallow tree is listed as a “severe threat” by the South Carolina Exotic Pest Plant Council. The Nature Conservancy has designated Chinese tallow as one of the “ten worst alien plant invaders” in the United States. It is considered a damaging species by the U.S. Dept. of Agriculture, the U.S. Geological Survey of the Dept. of Interior and the So. Carolina Department of Health, Environment and Conservation. Beaufort County recently relaxed its "12-inch rule" with regard to Tallow trees. Now anyone can remove this tree regardless of its size without applying for a permit. They are highly invasive and can quickly eliminate or prevent native species from growing in an area. Chinese Tallow has been declared "illegal" in 4 states: Texas, Mississippi, Louisiana, & Florida where it is banned from importation or sale.

Closer to home, in 2005, Callawassie Island Property Owners Association (CIPOA) initiated a mandatory removal program. The CIPOA Ecology Committee conducts a yearly survey and cleanup of Tattlow trees. Spring Island has a removal program as does City of Beaufort (in Crystal Lake Park).

### **How did Chinese tallow come to America?**

The Chinese tallow tree (*Triadica sebifera*), also called Florida Aspen, Chicken tree and Popcorn Tree, is native to Asia. It was reportedly introduced to the U.S. by Benjamin Franklin in 1772 (Randall & Marinelli, 1996). Its common name comes from the waxy tallow derived from the white covering of the seed that has been used historically to make soap and candles. It has been cultivated in China for at least 14 centuries as a seed crop and as an ornamental. In the early 1900's, the Foreign Plant Introduction Division of the U.S Department of Agriculture introduced it to Gulf Coast states to establish a local soap industry (Flack & Furlow, 1996)

### **How far has Chinese tallow spread in the United States?**

It has spread from Texas and Louisiana east along the Gulf Coast, through Florida, Georgia, South and North Carolina and has now been located in California.

### **How do Chinese tallow's characteristics make it such an aggressive invader?**

Chinese tallow has the ability to reach reproductive age in as little as 3 years and to remain productive for at least 60 years. It does not seem to have a preference for disturbed areas over undisturbed areas and can grow in a variety of places. It can also grow in both full sunlight and shade. It is more tolerant of salinity and flooding than quite a few other native species. It grows in subtropical to warm climates but is hardy and is able to stand a few degrees of frost. It is able to thrive in the U.S. and is resistant to native insects. In addition, it is somewhat resistant to fire.

### **How is Chinese tallow spread?**

It has separate pollen and seed-bearing flowers, and seeds can be spread by birds, by wind and by moving water. Hurricanes can disperse root fragments over large areas where they can root and grow. Bush hogging or clear cutting of properties invites an invasion of Tallow trees also. Chinese tallow has been cultivated in nurseries and is sold as an ornamental tree used for landscaping; however it is now classified as a nuisance species in four states (Texas, Louisiana, Florida, & Alabama and can no longer be sold by retailers in those areas. However, there are numerous online gardening websites that offer seeds for sale and will ship anywhere.

**Once Chinese tallow is established, is it hard to get rid of?**

Chinese tallow is very hard to get rid of. Trees are chopped down, roots are dug up and removed and herbicides are used, but the aggressive seedlings continue to return, sometimes for years. Fire can hold the tallow at bay when the tree density is low, but since tallow can suppress fuel species, fire can go up to a stand and then go out from lack of fuel leaving the tallow relatively unharmed. Tallow can re sprout if top-killed as well as root at some distance from the original stem.

**Where are these trees found on Dataw Island?**

Tallow trees are found all over Dataw Island. They are located on our golf courses, common grounds, on owner-occupied lots and undeveloped properties. The Dataw Island Conservancy conducted a Tallow tree survey of all properties fronting on Dataw Drive between Gleason's Landing and Oak Island Roads on May 20th and again on June 3rd, 2014. Results were as follows:

	<u>Number of Trees</u>		
	<u>&lt;4" dia.</u>	<u>&gt; or = 4" dia.</u>	<u>All diameters</u>
<b>Undeveloped Lots</b>	<b>109</b>	<b>124</b>	<b>233</b>
<b>DIC/DIOA*</b>	<b>1</b>	<b>4</b>	<b>5</b>
<b>Home Properties</b>	<b>4</b>	<b>3</b>	<b>7</b>
<b>Total</b>	<b>114</b>	<b>133</b>	<b>245</b>

**\* Includes sales office parking lot, walkways and easements for utilities**

From this survey, we can estimate that there are thousands of Tallow trees on Dataw Island and that the geographic distribution will be roughly in the same proportions as listed above. Note that 95% are located on undeveloped lots and that 54% of trees in the survey area are greater than 4" in diameter.

**How are these trees removed?**

Tallow is susceptible to herbicides if properly applied.

**TRICLOPYR (GARLON 3A, GARLON 4)** – Triclopyr is a widely used herbicide for invasive plant control, primarily woody brush and trees. Triclopyr has little to no activity on grassy weeds. This herbicide controls plants by disrupting the normal hormone balance. Specifically this herbicide targets auxins, causing uncontrolled growth in susceptible plants. At rates used in most situations, triclopyr does not possess soil activity. Garlon 3A is formulated as a salt, with 3 lbs of active ingredient per gallon. This formulation is less volatile than Garlon 4, but does not penetrate as effectively and therefore is not as effective as Garlon 4 at comparable rates. Garlon 4 is formulated as an ester with 4 lbs of active ingredient per gallon and has greater volatility. This formulation should not be used where there is a significant potential for off-target spray drift.

Tallow tree has overtaken much of Parris Island, for example, and the Clemson School of Forestry is conducting a major, Federally-funded study of removal alternatives on Parris Island.

Heading the study is Lauren Pile, a PhD candidate at the Clemson School of Forestry. Ms. Pile is currently President of the South Carolina Exotic Pest Plant Council. Early last year, The Conservancy invited Ms. Pile to speak at the Community Center about her work on Parris Island. She has been a consultant to the Conservancy on our Tallow tree project. With her help, we have developed an

effective program to control the spread of Chinese Tallow tree here on Dataw.

## **The Plan**

The Dataw Island Conservancy program seeks to control the spread of Chinese Tallow by identifying, measuring and mapping all Tallow trees on the Island, establishing, geographically, ten "Tallow Tree Management Areas" (TTMA), then systematically eliminating all Tallow trees in that TTMA. The Conservancy realizes that this will take several years to accomplish and require community education on the subject to encourage full community acceptance.

Large trees can be cut around trunk with an axe and herbicide (Garlan 3A or 4) applied to cuts; tree and root system will gradually die (approx. 6 weeks). Dead trees should be removed if there is a safety issue. In most cases, on undeveloped lots, dead trees can remain until the properties are developed.

Small trees can be cut at ground level, their stumps sprayed and the trunks removed to a designated area in Dataw's recycle yard for pickup. It is not advisable to grind these trunks and spread the mulch, All parts of the Tallow tree contain toxins that change the soil chemistry, making it difficult for native species to survive.

Private homeowners and lot owners can be responsible for removing Tallow trees from their own property. The Dataw Conservancy will provide assistance to residents wishing to kill trees on their property. The herbicide used is very powerful and care needs to be taken in applying it to minimize peripheral damage to humans and surrounding vegetation.

Protection of the natural character of Dataw Island is in the Conservancy's mission statement and, therefore, we deem this a most worthy project for us to undertake.

Last June, 2014, the Conservancy met with the ARB and presented its case for elimination of Tallow trees. We asked that the ARB amend its Guidelines to prohibit the inclusion of Tallow trees in landscape plans for new homes and require the removal of Tallow trees by builders when they clear a lot for new construction. In response to our request, ARB revised the landscaping requirement in to include a prohibition on Tallow trees in landscaping plans submitted for approval.

A subsequent meeting and presentation to the Common Grounds Committee in 2014 was held to advise them of our plans.

Christi Henry should take care of Common Grounds and Brian Hollingsworth should take care of the golf courses. In fact, Brian and Christi already have removal programs in progress.

The Dataw Island Conservancy Board has met with Brian and Christi to discuss the Tallow tree removal program and we all concur on the general approach.

We also asked the ARB for suspension of the "over 4 inch approval rule" only for Tallow tree killing and removal. Given that there are, literally, thousands of these trees on Dataw, we felt that the filing of thousands of applications for exemption would be an overwhelming burden to place on the ARB, the Conservancy, the residents and property owners. In June 2015, ARB issued a waiver from having to obtain ARB approval to remove tallow trees of any size.

Beaufort County passed an invasive tree species ordinance that lists the Chinese Tallow tree in December 2014. Removal of an invasive tree species 12 inches diameter or greater requires a tree removal permit except when located on a single-family developed lot outside of a required buffer.

## **In conclusion**

The Conservancy Board, its founders and supporters all believe very strongly in the concept of stewardship. Dataw Island is truly a special place. Those of us that live, work and play here often comment on its pristine, natural, forested beauty, pure fresh air and crystal clear waters. It is so important that we not only enjoy what we have here but respect the ecology which makes it possible. We all have an obligation to preserve and protect this environment for future generations of retirees.

As the population of the Island grows over time it is the mission of the Dataw Island Conservancy to maintain that critical balance between the needs and wants of the Island's human inhabitants and the flora and fauna which surrounds them and makes Dataw Island "No Ordinary Place"!

## **DATAW ISLAND COVENANTS, CODES AND RESTRICTIONS**

### **ARTICLE X - ARCHITECTURAL STANDARDS AND USE RESTRICTIONS**

*10.01 Purpose. In order to preserve the natural setting and beauty of the Development, to establish and preserve a harmonious and aesthetically pleasing design for the Development, and to protect and promote the value of the Development, the Lots, Dwellings, Multifamily Areas, and all improvements located therein or thereon shall be subject to the restrictions set forth in this Article X, Every grantee of any interest in the Development, by acceptance of a deed or other conveyance of such interest, agrees to be bound by the provisions of this Article X.*

**The Dataw Island Conservancy** was created jointly, in 2012, by the DIOA and the DIC Boards.

The Conservancy's mission, stated in its Bylaws is to *"assist in the preservation of Dataw Island's character by permanently conserving, maintaining and managing the natural areas and habitats and to encourage an appreciation of and interest in the Island's natural resources"*.

It is organized and operated exclusively for charitable and educational purposes, and will take on the responsibility for guiding the community to safeguard our precious legacy of clean water, native vegetation, abundant wildlife and scenic views enjoyed by all. As neighbors on this Island of Friends, the Conservancy has a special responsibility to protect and preserve these resources, not only for the benefit of current residents but for the enjoyment of generations to come.

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*Invasive Plant Atlas of the U.S. - Chinese Tallow tree*

North Carolina State University - *Invasive Exotic Plants of the Southeast*

North Carolina State University - North Carolina Cooperative Extension  
*Chinese Tallow tree - Going Native for Wildlife with Native Plants*

University of Florida, Center for Aquatic and Invasive Plants

University of Florida, Institute of Food and Agricultural Sciences - *Natural Area Weeds - Chinese Tallow*

Texas Invasives Database - *Triadica Sebifera* - [www.texasinvasives.org](http://www.texasinvasives.org)

Mississippi State University, GeoResources Institute - *Invasive Plant Atlas of the MidSouth*

Florida Fish and Wildlife Conservation Commission - *Chinese Tallow - Weed Alert*

Global Invasive Species Database - World Conservation Union. Invasive Species Specialist Group

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