Working Towards a Better Coast

Carolina Silvics, Inc.
Managing Natural Resources to Ensure a Brighter Future
Company Background

Carolina Silvics, Inc. was established in 1999 as a forestry and natural resources contracting firm specializing in wetland and stream mitigation planting and maintenance, stormwater planting, and invasive species management.

We pride ourselves in our diverse portfolio, including projects for federal and state agencies, the U.S. military, commercial and environmental construction companies, municipalities, non-profits, and private landowners from the Delmarva Peninsula to Atlanta.
Types of Projects

- **Planting**
  - Reforestation
    - Stream & wetland mitigation sites
    - NIPF landowner sites - pines & hardwoods
  - Stormwater Pond/BMP Planting
    - Native perennial grass, shrubs & trees
  - Marsh Restoration
    - High & low tidal marsh sites
  - Prairie Restoration
    - Daniel Stowe Botanical Garden

- **Invasive Species Inventory & Removal**
  - Mitigation sites
  - U.S. Military Bases
  - Private landowners
Types of Projects

- **Research Assistance**
  - Forest Productivity Cooperatives at VPI & NCSU
  - Forest industry

- **USFS Contract Services**
  - Timber cruising & sale marking

- **Urban Forestry**
  - Inventory & hazard identification

- **Living Shorelines**
  - Marsh toe revetments
  - Offshore sills
  - Native vegetation restoration
Business Challenges

● Ownership changes & growing staff

● **Seasonal based projects**
  ○ Pine/hardwood planting season
    – Dormant season: late November thru early April
  ○ Invasive Plant Control
    – Early growing season: May & June
    – Late Growing Season: late August thru early October
  ○ Stormwater pond/BMP planting
    – Mid growing Season: May thru September

● Cyclical projects
  ○ Occurring only every 2-3 years but require all available manpower while ongoing

● Economic recession
  ○ More competition in the marketplace
  ○ Decrease in project availability
Partnering with the NC Coastal Federation

- Carolina Silvics has worked with NC Coastal Federation for 14 years on the North River Farms wetland restoration project and other marsh projects.

- In 2017, the combination of a slow season with Carolina Silvics and an influx in demand of Living Shorelines began this new business venture.
The Beginning

- We started by prepping bags for construction and helping Coastal Federation employees and volunteers complete construction projects.

- We spent most of the summer helping the Coastal Federation keep up with the demand for living shorelines around Carteret, Onslow & Pamlico Counties.
What NC Coastal Federation Taught Us

● Where to obtain materials

● How to construct the bags

● The best techniques to build a uniform & stable shoreline
  ○ Working with the natural shape of the shoreline
  ○ Following the marsh grass
  ○ Finding and focusing on the problem areas
  ○ Preservation vs. growth?

● In general, how to apply Carolina Silvics’ & the Coastal Federation’s joint ideal of doing what is most environmentally practical for each unique property to the construction of Living Shorelines
Moving Forward

- The demand for living shorelines has exceeded the NC Coastal Federation’s capacity to build them just with volunteers and they are working towards marketing the advantages of living shorelines as a business opportunity.

- Working with the NC Coastal Federation gave us the experience & skills to be able to help landowners directly but a transition had to be made between providing a non-profit service & commercial service.
That Gets Us to...Getting to Business with Living Shorelines

- Shorelines need to be built quicker & more consistently and as a commercial company we can devote time to innovating the process by developing techniques that will result in a quicker turnaround for landowners.

- However, as a business, Living Shoreline construction must be profitable as well as environmentally preferable for it to be a sustainable service.

- Carolina Silvics’ goal is to implement Best Business Practices towards marketing, designing, and constructing Living Shorelines to preserve our water, native plants, sea life, and YOUR property.
Getting to Business with Living Shorelines

We have helped construct twelve Living Shorelines since 2017 in Onslow, Carteret & Pamlico Counties, totaling over 2,000 linear feet.

The map to the left contains green pins which were projects completed through hands on training with the Coastal Federation and blue pins which were completed solely by Carolina Silvics, Inc.
Each Shoreline is Unique & Presents Its Own Challenges
Types of Living Shorelines

There are two types of Living Shorelines Carolina Silvics’ now specializes in constructing:

- **Offshore Sill**
  - Bags are placed off of the shoreline to help rebuild eroded shorelines
  - Sediment fills back in
  - Marsh grass grows in behind for further protection or we can install native marsh grass plugs and containers to speed recovery and supplement existing on-site seed source

- **Marsh Toe Revetment**
  - Bags are placed up against marsh grass shoreline to protect the property from further damage
Offshore Sill
Marsh Toe Revetment
What Goes on Behind the Scenes

- Meet with landowners to discuss their objectives & the different options available to them
- Determine what type of permit will be necessary - General or Major
- Perform property ownership research to determine property lines, ownership information, etc.
What Goes on Behind the Scenes

● Contact neighbors to inform them of the project & obtain their approval

● Prepare maps and schematics of the proposed project

● Apply for the permit, meet with the permitting officials to explain the project if necessary & obtain the permit

● Finally, obtain materials and construct oyster bags
Positive Permitting Changes for Offshore Sills

Recent changes to the permitting process for offshore sills in NC has made acquiring a permit much quicker and easier

- **General CAMA General Permit Under Section .2700**
  - Allows for sill to be placed 30 feet waterward of normal high water or 5 feet waterward of existing wetlands, whichever is greater
  - Must leave a gap in the sill every 100 feet
  - Requires: project map, written project plan & adjacent property owner approval

- **Efficiency improvements help contractors & landowners complete projects quicker**
  - Paperwork required for the permit submittal is much less than for the previously required CAMA Major Permit
  - Agency turnaround now takes about a week vs. months previously
Challenges of Transitioning Living Shorelines to a Business

- **Obtaining materials & preparing bags in large quantity**
  - All shells are recycled and come from NC-based seafood markets and restaurants
  - Only a few organizations offer the material needed as substrate to hold the shells together
  - Long-distance hauling can be more expensive than the raw material
  - Bag preparation labor had to be outsourced to keep up bag supply ahead of demand

- **Transportation**
  - Getting thousands of bags on-site
  - Using different methods to transport bags once on-site
    - UTV/Gator
    - By hand
    - Beach cart/wheelbarrow
    - Canoe
    - Truck & trailer
Challenges of Transitioning Living Shorelines to a Business

● Minimizing our footprint
  ○ Construction must not damage the structural integrity of the shoreline
  ○ Movement of people and equipment on-site must not create erosion or otherwise damage the site
  ○ Impact on native vegetation must be minimized

● Pricing
  ○ Price must be affordable and appealing to the landowner while turning a profit that makes the service sustainable
  ○ Price must be flexible to accommodate uniqueness of sites

● Maintenance
  ○ Some shifting or loss of bags from the top layer is common after the initial build before oysters settle and grow on the structure
  ○ Storms have the ability to impact the shoreline before it is fully established
Durability Against Major Storms

There is no doubt that rising sea waters and larger/stronger hurricanes are ravaging our coast. Evidence of this is visible through eroding shorelines and degrading habitats. Our Living Shorelines have proved to protect landowners’ properties by withstanding major storms such as Hurricanes Florence and Dorian.

As you can see from the photos above, Hurricane Florence did some minor damage, but the structural integrity of the Living Shoreline was not impacted.
Living Shoreline Price vs Hard Stabilization

- Bulkheads usually run over $135 per foot
  - More expensive to repair
  - Take a lot of damage during storms
  - Accelerate erosion on adjacent beaches/shorelines

- Starting price for bagged Living Shorelines is $75 per foot
  - Have had incredible durability after and during large storms
  - Price will increase depending on degree of damage and type of Living Shoreline
Living Shoreline Price vs Hard Stabilization

- **Riprap Revetments** start at $90/foot
  - Concrete is a cheaper option but may not withstand strong storm events and high wave energy
  - Granite is more durable but usually costs twice as much

- **Breakwaters** start at $90/foot
  - Requires Major CAMA Permit
  - Engineer usually designs the structure
  - Generally more expensive due to the volume of stone needed.

The chart above represents the difference in prices of a bulkhead (red), Riprap Revetment/Breakwater (yellow) vs a Living Shoreline (blue) over certain distances.
Marketing Strategies

● References
  ○ Organizations such as the NC Coastal Federation will reference interested parties towards Carolina Silvics, Inc and other organizations
  ○ Magazine and newspaper publications

● Coastal Federation Open Houses
  ○ The Federation occasionally will host an open house for vendors and the public to attend so that they can learn about different strategies for preserving their properties

● “Keeping up with the Joneses”
  ○ Most interest comes from adjoining neighbors
  ○ They see their neighbor doing it and would like to do the same thing
Goals to Work Towards

- Decrease our initial cost so that Living Shorelines can become more affordable
- Invest in new materials and technologies
  - No more plastic mesh bags
- Improve our methods for preparing construction material
  - Get away from manual techniques and implement mechanical means for making bags
- Develop a better strategy for installing Living Shorelines
- Develop marketing techniques that will not only raise public awareness but increase the number of projects
- Branch out to other areas of the NC coast and maybe even other mid-Atlantic States as well.
Questions?
Created By:

- Mary-Margaret Mckinney: President
  - mary-margaret@carolinasilvics.com
- Josh Merritt: Field Ecologist
  - josh@carolinasilvics.com
- Grainger Coughtrey: Field Ecologist
  - grainger@carolinasilvics.com