The Role of NPS Credits in Meeting Future Demand

Executive Order 52 Advisory Committee
October 14, 2016

Presentation Overview

1. RES & Tellus Agronomics - Background/Introduction
2. Ecological Offset Project Examples
3. NPS Trading in Virginia
   - Opportunity
   - Obstacles
   - Solutions

RES Background/Introduction

Company Snapshot

Overview

- RES is the premier provider of ecological offset solutions in the US
- RES founded in 2007
- In 2014, RES acquired EBX, founded in 1998
- 125 mitigation sites permitted/in process
- Conservation easements protecting roughly 400 sites
- 40,000 restored wetland acres
- 20,000 acres of custom mitigation solutions
- 155 miles of stream restoration
- Reduced over 240 tons of nutrients
- Rehabilitated and preserved over 3,700 acres of endangered species habitats
- 8,000,000 trees planted across operation
- Mitigation solutions supplied in support of over 1,750 federal and state permits

Mission

- *Resource Environmental Solutions develops and supplies ecological offsets to help companies obtain required permits for unavoidable project-related impacts to wetlands, streams and habitats*
- *We help clients proactively manage risk from operations in environmentally sensitive areas by providing proactive project impact analyses, streamlining permitting processes, and limiting liability and regulatory exposure*

Representative Customers

Ecological Solutions Supply

Offsets Available		
Stream	Wetland	Species
Nutrients		Buffer

US Army Corps of Engineers®

Waters of the United States including Wetlands and Streams

CLEAN WATER ACT §401, 402, 404

RIVERS AND HARBORS ACT §10

Threatened and Endangered Species

ENDANGERED SPECIES ACT §7, 10

Success History	
Zero project site failures	Zero site violations or infractions
Achieved all success criteria, performance monitoring and reporting requirements	
78.9% tree survivability	

Solution Delivery Approach

Vertically Integrated

Research & Account Management	Land Identification & Acquisition	Science & Technical Development	Restore, Repair & Revitalize	Solution Delivery
RES conducts extensive research and develops proprietary databases to identify local area demand and target prospective clients for long-term relationships	RES' land-acquisition teams leverage unique market knowledge and experience to identify qualified land; secured via proprietary processes, thus avoiding competitive auctions/listings	Skilled science, engineering and development teams recognized by clients and regulators for designing and developing efficient solutions for complex restoration work	Self-performing restoration capabilities, two state-certified nurseries and a deep subcontractor network enable RES to deliver quality work in a timely manner	Offset credits and mitigation solutions support clients' high priority development plans; delivering certainty, predictability and liability transfer

RES is the only fully integrated ecological offset solutions provider with national scale in the United States, and possesses the unique capability to identify, target and develop emerging client demand and new revenue opportunities

... Enable RES to Achieve Highly Effective Technical and Science-Based Solutions

- ✓ **40,000** wetland acres restored and protected
- ✓ **155** miles of streams restored and protected
- ✓ **3,700** acres of endangered species habitat preserved
- ✓ **10 million** restorative trees planted
- ✓ **79%** tree survival rate
- ✓ *Zero site failures, violations or non-compliance issues*

Nurseries Enhance Mitigation Offerings

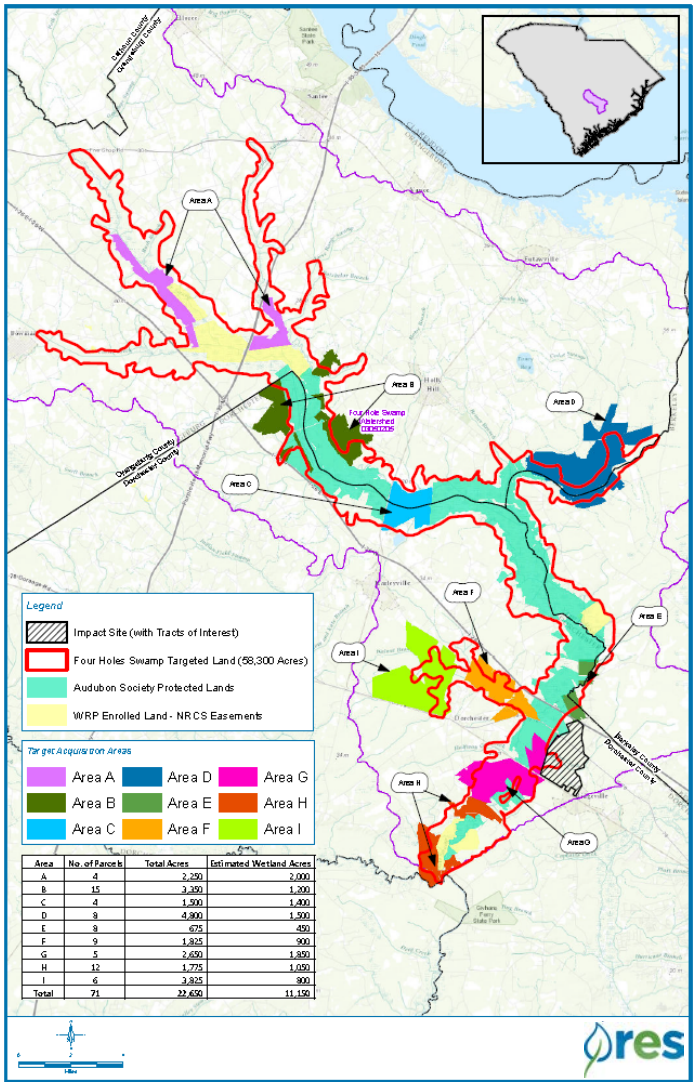
- Significant cost savings over purchasing vegetation from third parties
- Location in Eighty Four, Pennsylvania and Terrebonne Parish, Louisiana
- Allows RES to plant more mature trees and to achieve success criteria more consistently and quickly
- Over 2 million restoration stems grown, supplied and planted
- DNA-fingerprinted species grown and propagated to fulfill regulatory agency needs
- Leading supplier for successful coastal restoration projects including dune, marsh, estuarine, emergent marsh, and barrier island restoration

Critical Path Solutions

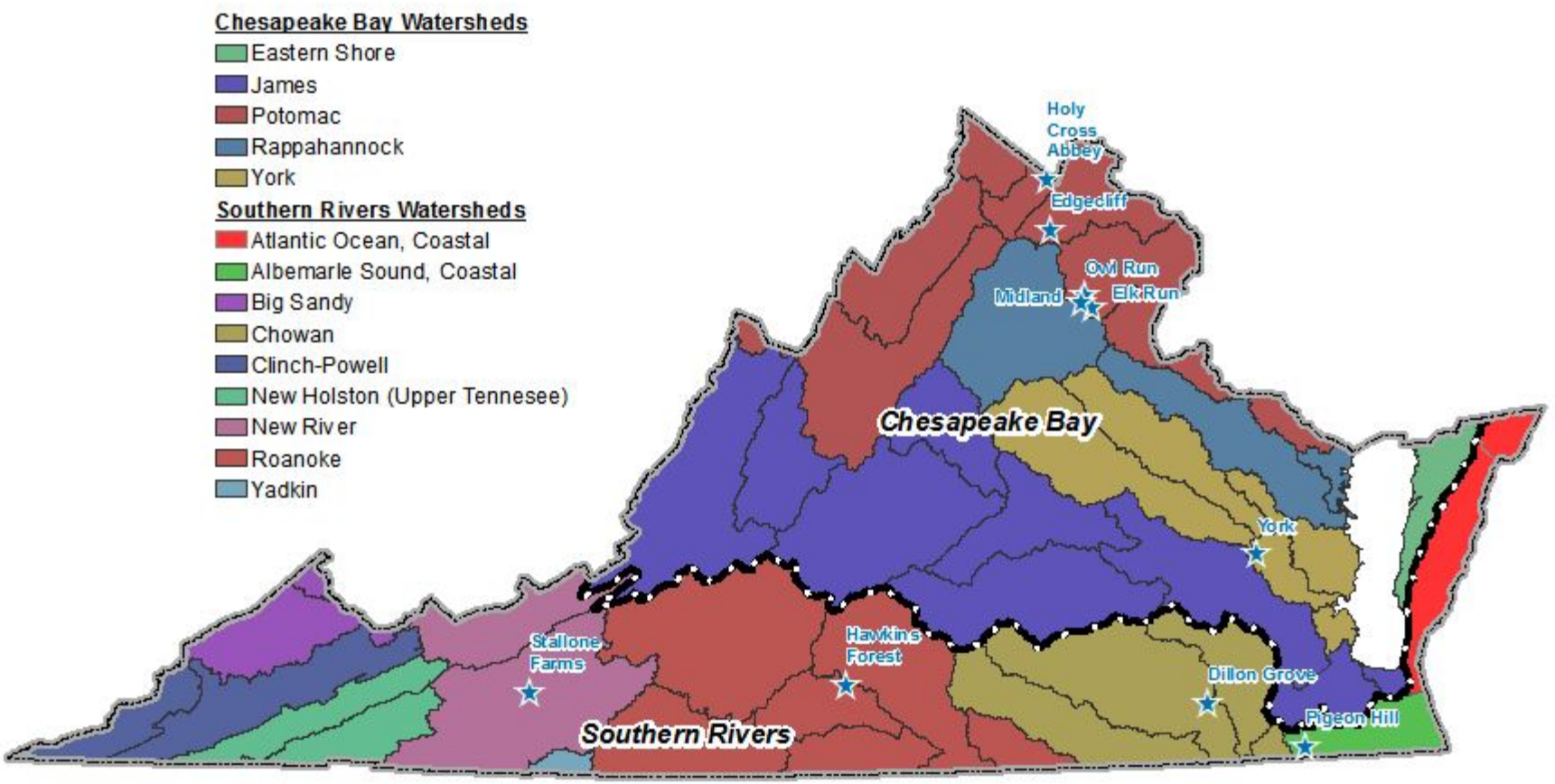
16,000 acre The Francis Beidler Forest (RAMSAR site no. 1773) - one of only two sites in South Carolina, 37 sites in the United States, and 2,000 sites globally which have been designated by the RAMSAR Convention as "Wetlands of International Importance"

Approximately 2,497 acres of property to be permanently protected in the Dean Swamp and Walnut Branch sub-watersheds, tributaries defined as critical priority areas needing protection by the National Audubon Society.

A 1,677 acre forested tract, located at the headwaters of Dean Swamp, will be donated to SC-DNR for the benefit of the local community, and managed under a long-term plan to restore the native long-leaf pine eco-system in the uplands.



RES Nutrient Solutions



Tellus Agronomics Background/Introduction

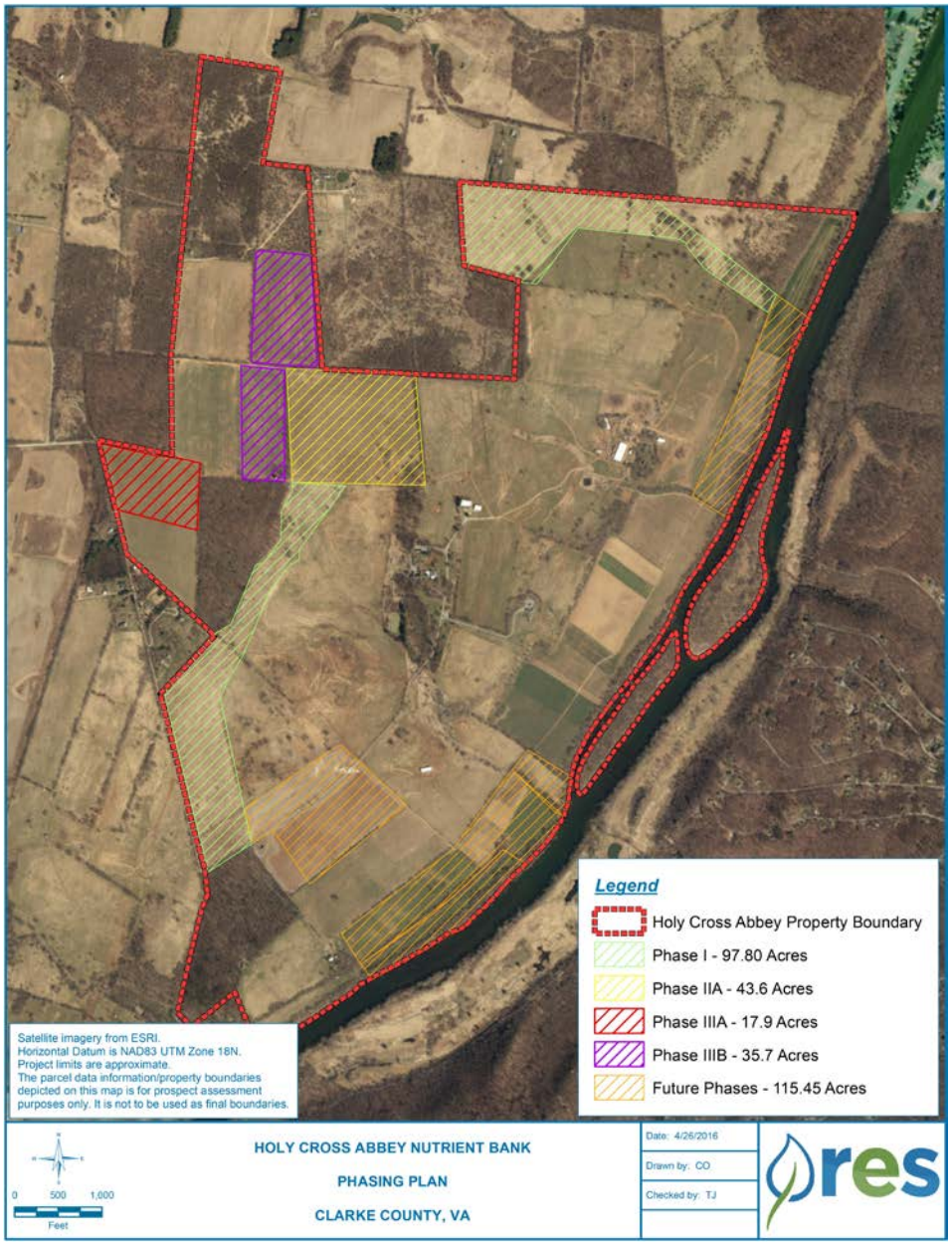
TELLUS™ AGRONOMICS

Overview

- Tellus is a leading provider of precision conservation in Virginia
- Service over 75,000 acres of Agricultural Operations
- 44,000 acres of Resource Management Plans developed
- 40,000 acres of Nutrient Management Plans developed annually
- $2M+ EQIP and $1M+ VACS Contracts managed annually
- 10,000 soil, plant, and manure tests taken annually

Project Examples

Land Conversion



Land Conversion

Buffer Establishment/Preservation

Stream Restoration

Stream/Wetland Restoration

Post Construction

Stream constructed with erosion control mats in place. This site was a degraded cattle pasture in the central valley of the watershed prior to restoration

One Year After

The stream is now functional and stable and herbaceous vegetation has begun to establish itself

Turnkey Offset Delivery

Cattail Creek Restoration Project
Howard County, MD

- 14+ wetland acres
- 6,000+ linear feet stream
- 64 Acres of Impervious Surface Credit
-
- TN, TP, TSS Removal

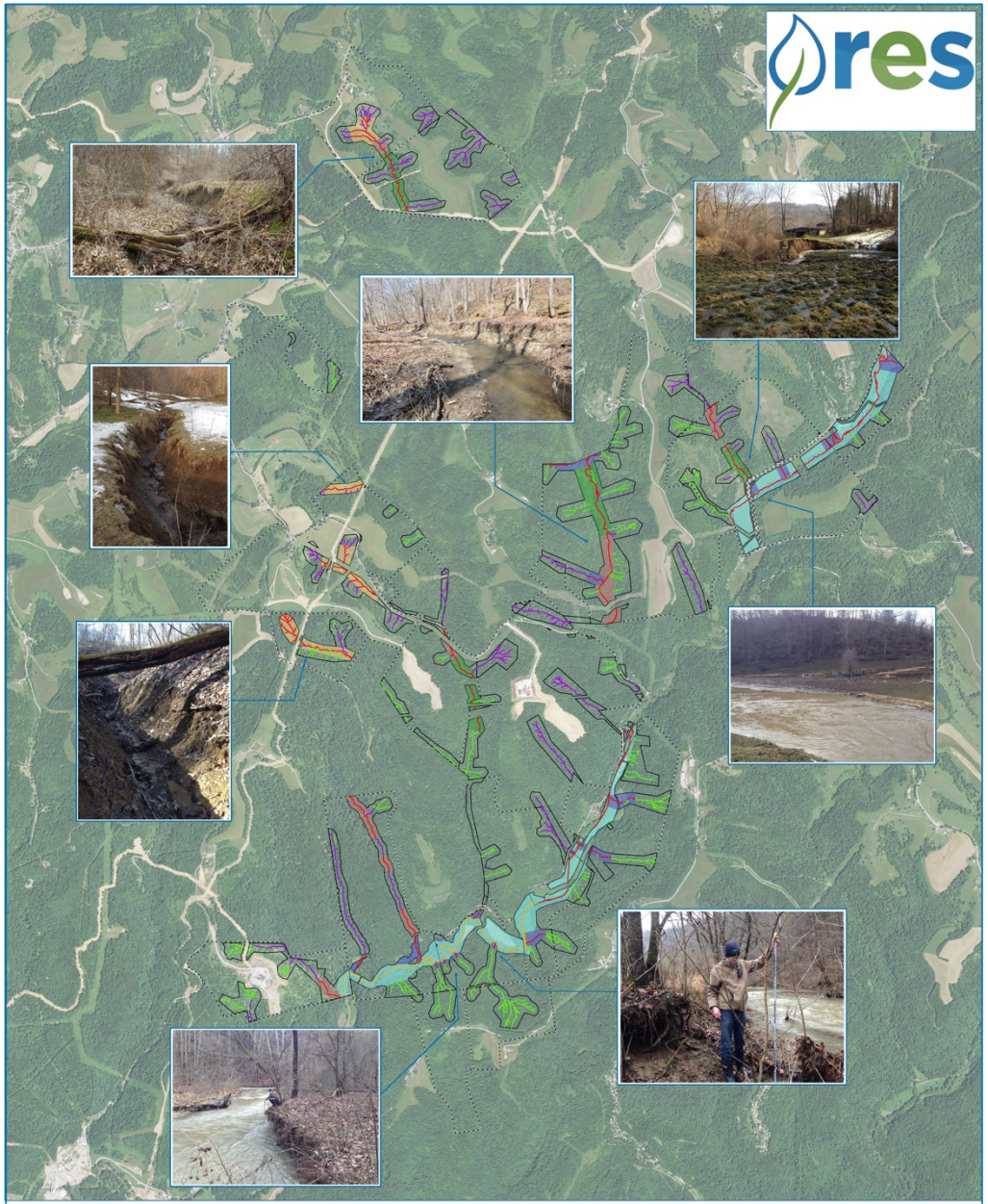
Eroding bank showing soil profile

Cattle in creek

Vertical bank collapse and overwidening caused by unrestricted cattle access

Stream/Floodplain Restoration (Landscape Scale)

- 40+ parcels assembled
- 533 acres of Riparian resources
- Stream Restoration on 150,168 linear feet (28+ miles)
- 54 acres Wetland Restoration
- Immediate protection of critical habitat and over 900 potential roosts for both the endangered Indiana bat and threatened Northern long-eared bat

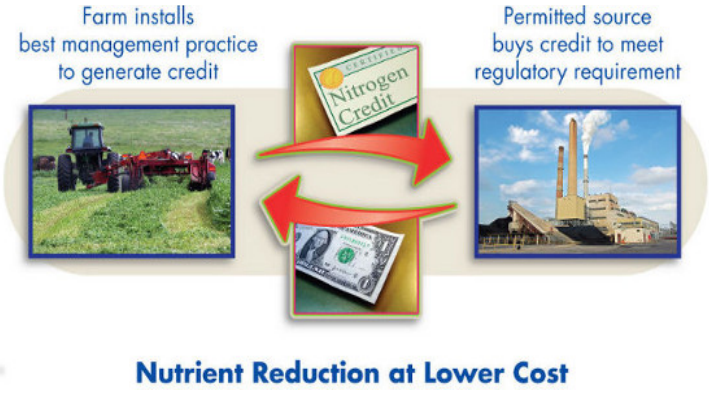


ENVIRONMENTAL BUSINESS JOURNAL - 2015 AWARD WINNER - ENVIRONMENTAL BUSINESS INTERNATIONAL
2015
BUSINESS ACHIEVEMENT AWARD WINNER

NPS Trading: Opportunity

Opportunity

- Elegant Solution / Complex Problem
- Policy Framework Already in Place
- Motivated Sellers *AND* Buyers
- Build Upon Virginia Program's Success
- Apply Lessons Learned From Outside of Virginia:
  - Clean Water Services
  - City of Medford
  - Rahr Malting
  - Minnesota Sugar Beet Coop
  - EPRI Ohio River Basin



Obstacles

- Trading Eligibility / Baseline
- BMP Selection
- Whole Tract Requirement
- Credit Generation Calculations
- Hyper Conservatism
- Level Playing Field
- Geographic Limitations
- Misguided Opposition

Solutions

- Numeric vs. Practice-Based Baseline
- Improved Credit Calculation Framework
- Flexibility
- Integrated solutions
- Enhanced Trade Ratios through Monitoring and Verification

Solutions: Numeric Baseline Eligibility

- **Practice-Based**
  - Pros:
    - Simplified Qualification Standard
  - Cons:
    - Limits Operational Options for Eligibility
    - Limits Credit Generation

- **Numeric Eligibility:**
  - Pros:
    - Greater Flexibility in Operational Management
    - Increased Credit Yield
  - Cons:
    - Must Determine Nutrient Load by Field (modeling)

Solutions: Enhanced Crediting Framework

Currently:

- Practice-Based Eligibility
  - NMP
  - SCP
  - Cover Crop
  - 35ft Riparian Buffer
  - Stream Exclusion
- 3 Approved BMPs
  - Continuous No-Tillage
  - Early Planted Cover Crops
  - 15% Nitrogen Reduction on Corn
- Default Credit Calculation
  - Look-Up Tables from 2008 Guidance

Desired:

- All CBP-Approved BMPs
- Site-Specific Credit Calculation
- Enhanced Modeling Tools
  - Numeric Eligibility
  - Increased Selection of CBP-Approved BMPs
- Streamlined Procedure for Proposing New or Modified BMP Enhancements

Solutions: Overcoming Uncertainty

- Why Uncertainty Ratios are Necessary:
  - Site-specific variation in BMP efficiencies
  - Uncertainty in BMP performance
  - BMP verification

- CBP BMP Approval Process
  - Operational Variability Accounted For:
    - *Best professional judgment, using scientific panels, was used to discount effectiveness estimates to reflect the variability of operational systems. Site specific conditions considered include soils, hydrology, lag times, scale, land use change, species composition, BMP age and maturity and climate and temporal effects*[1]

1. "Developing Best Management Practice Definitions and Effectiveness Estimates for Nitrogen, Phosphorus, and Sediment in the Chesap
Simpson and Sarah Weammert of University of Maryland Mid-Atlantic Water Program, 2009.

Solutions: Overcoming Uncertainty

- 2:1 Trade Ratio
  - Adjustment Through Verification and Monitoring
  - Discovery Farm Concept
  - Permanent vs Term BMPs
- Exceptions to Geographic Barriers
- Layered Conservatism
- Adoption of New BMPs
- Adjustment of BMP Efficiency Values

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