Comparison of 3 Created Freshwater Wetland Types Implemented on Saturated Agricultural Land

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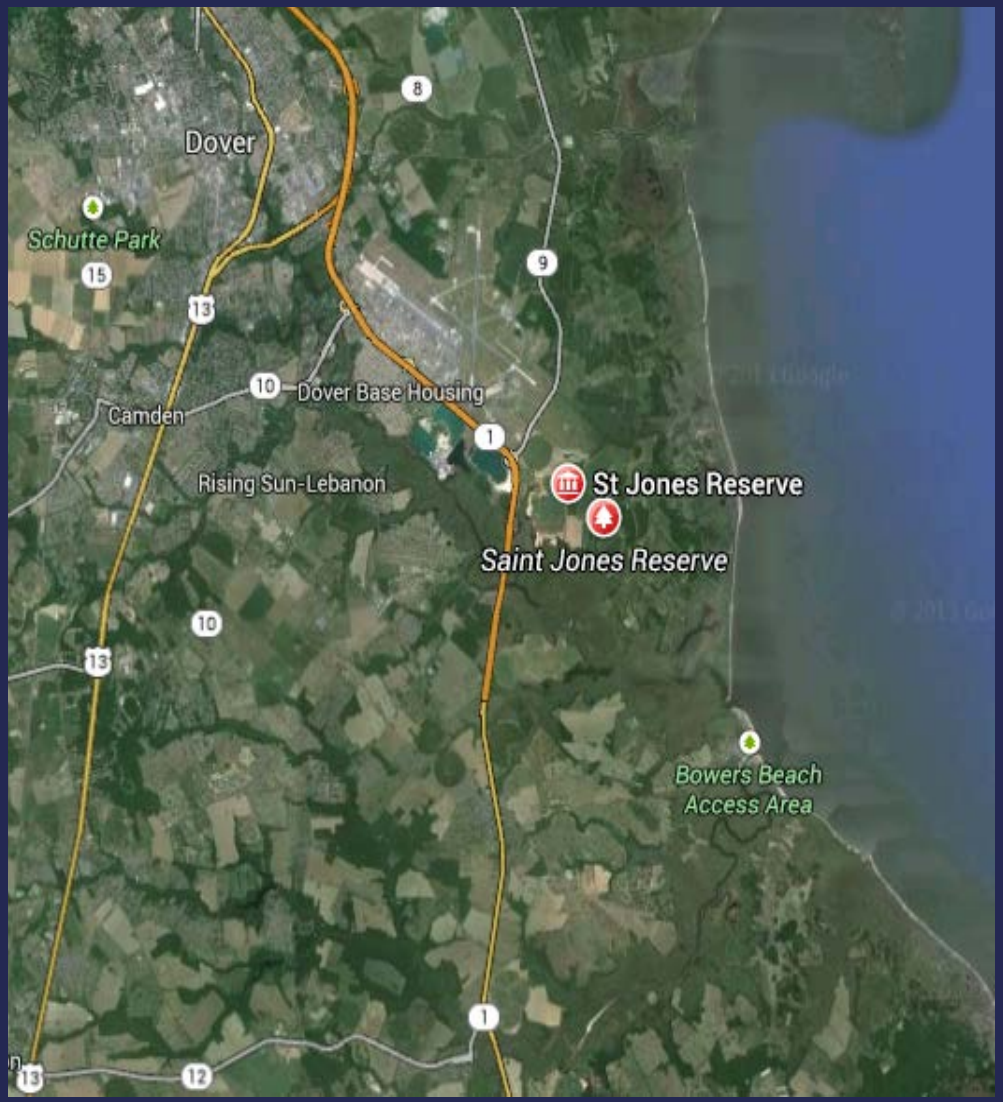
Delaware Coastal Programs

Overview

- History
- Project overview
- Assessment
- Results
- Recommendations / Future work

History

- Located on Kitts Hummock Road
- Alvin G. Wilson
- DNERR Owned/Maintained



Bay Rd
John Dickinson
Plantation
St Jones Reserve
1
Saint Jones Reserve
Bay Rd

Project Overview

- Partnership between:
  - Delaware National Estuarine Research Reserve (DNERR)
  - Kent County Conservation District (KCD)
  - Natural Resources Conservation Service (NRCS)
  - Ducks Unlimited (DU)
  - Richard Wilson
  - Delaware Department of Natural Resources and Environmental Control (DNREC)
- Demonstration Area
- Natural Resource Conservation Service (NRCS)
  - CP9 - Shallow water area for wildlife

Project Overview

- 12 Acres - each wetland is <1 acre
- October 2003 - 10 Year Follow-up
- Provide habitat for wildlife for resting, feeding, and reproduction
- Bore test to determine location
- 12-18 inches deep
- 3 distinctly different designs

Wetlands

- Design 1
  - o > 70% open water
  - o One or two hummocks
  - o No trees or stumps

Wetlands

- Design 2
  - o 50%-70% open water
  - o Sparse amount of trees
  - o Few random hummocks

Wetlands

- Design 3
  - 40%-50% open water
  - Numerous hummocks and trees
  - Irregular shoreline
  - Dead trees and stumps

Wetlands

- Planted with millet and an annual rye
- A mix of perennial grasses applied between wetlands

Assessment

- DERAP (Delaware Rapid Assessment Procedures)
  - Habitat/Plant Community
  - Hydrology Stressors
  - Buffer Stressors
- DECAP (Delaware Comprehensive Assessment Procedures)
- Protocols are made for natural wetlands
- Assess the condition of the wetland compared to a minimally disturbed depression wetland

Delaware Wetlands

Purify Provide Protect

http://de.gov/delawarewetlands

Results

- DERAP
  - Index of Wetland Condition: 51
    - Severely stressed
  - Immature forest age
  - Invasive species
  - Buffer stressors:
    - Dirt road
    - Row crops
    - Mowed area

Minimally or Not Stressed	Moderately Stressed	Severely Stressed
> 73	< 73 and ≥ 57	<53 and ≥ 37
	<57 and ≥ 53	< 37

Results

- Immature Forest
  - o 75%-80% forested
  - o <15 years old
  - o Most common species
    - Sweetgum (*Liquidambar styraciflua*)
    - Loblolly Pine *(Pinus taeda)*

Results

- Invasive Species
  - Site 1: 36%
  - Site 2: 22.5%
  - Site 3: 23%
  - Most Common
    - Phragmites (*Phragmites australis*)
    - Japanese Honeysuckle (*Lonicera japonica)*
    - Sheep's Sorel (*Rumex acetosella)*

Results

- Buffer stressors
  - Dirt road
  - Row crops
  - Mowed area

Results

- DECAP
  - o Index of Wetland Condition:
    - 5 Variables
      - o Hydrology, Biogeochemistry, Plant Community, Habitat, and Landscape
  - o DECAP scale is watershed dependent
  - o Scores
    - Site 1: 37
    - Site 2: 35
    - Site 3: 62

Results

- 3 different designs produce similar results
  - Design 1: Landscape score was highest
  - Design 2: Lowest scores on all variables
  - Design 3: Highest scores on all variables except landscape

Results

- Design 3
  - o If it looks like a duck and quacks like a duck, it's a duck..... or is it?
  - o While Design 3 is the most ecologically sound design
    - Also benefits from:
      - o Better position on property
      - o Better buffer area
      - o Less exposure to invasives and upland influence

Saint Jones Reserve

Recommendation/Future Work

- Regular follow-up with DECAP protocols
- Compare this restored wetland to other restored wetlands
- Relate DECAP results to watershed
- Determine any effect of the nearby agricultural activities

Acknowledgements

- DNREC, Watershed Assessment Section
  - Alison Rogerson
  - Andy Howard
  - Matthew Jennette
- USDA, Natural Resources Conservation Service
  - Thomas Wiltbank
  - Merrill Vanderwende

United States Department of Agriculture
NRCS Natural Resources Conservation Service

Delaware Wetlands
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