

REFUGE MARSHES: PAST, PRESENT, & FUTURE

PRIME HOOK NATIONAL WILDLIFE REFUGE

*Wetland Restoration Meeting
April 24-25, 2012
St. Jones Reserve
Dover, Delaware*



Establishment of Prime Hook NWR

In 1963, this 10,132 acre refuge was established under the Migratory Bird Conservation Act and Refuge Recreation Act...

*“for use as an inviolate sanctuary,
or for any other management purpose,
for migratory birds.”* (Migratory Bird Conservation Act)

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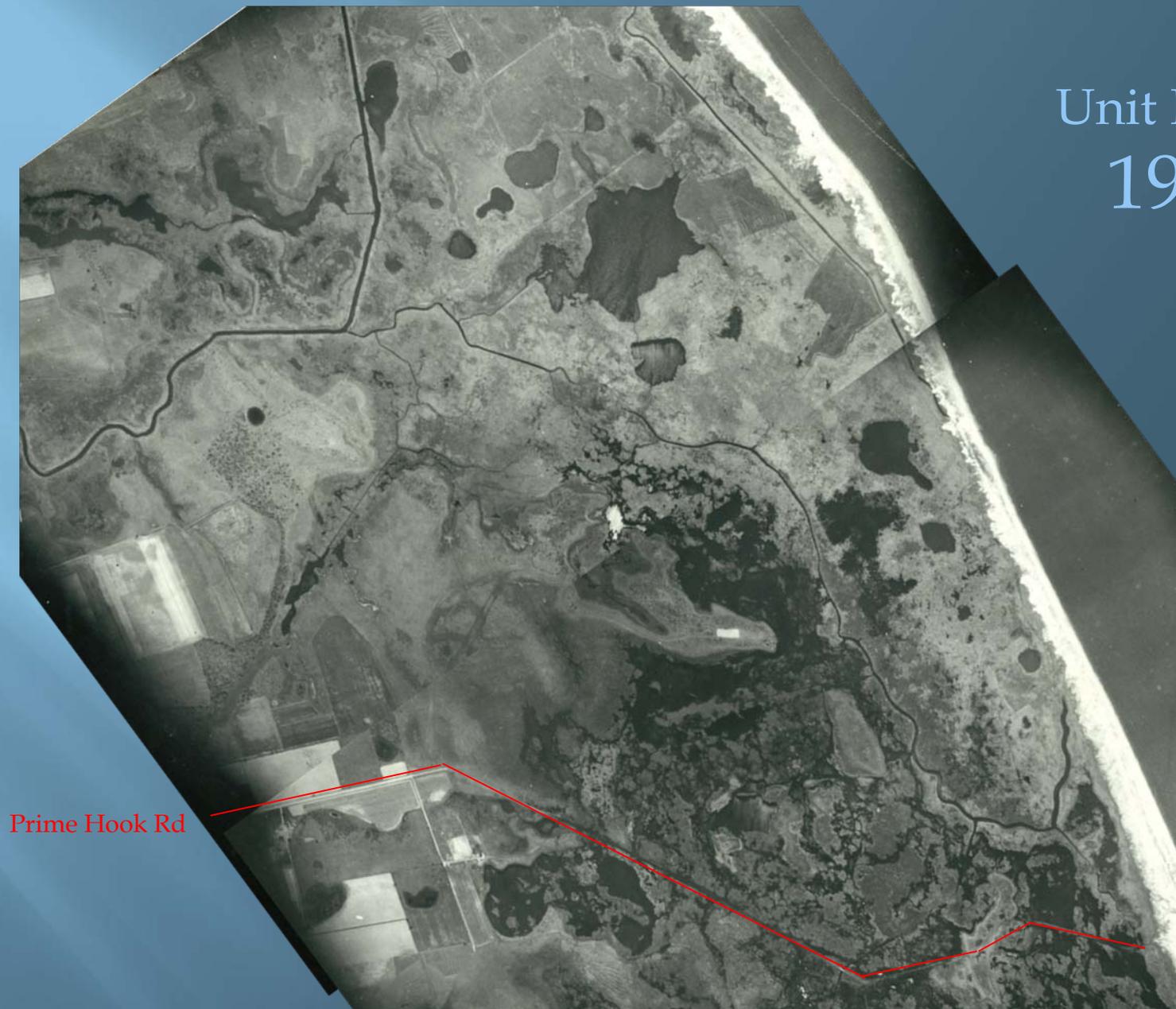
“...suitable for (1) incidental fish and wildlife-oriented development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species...”
(Refuge Recreation Act)

History of Prime Hook's Marshes

- About 1911 a storm closed the outlets of Prime Hook Creek and Slaughter Creek to the bay.
- Around this time Slaughter Canal was also extended into Unit II.
- In 1930s grid ditching for mosquito control took place.
- Mosquito control managed the water levels until the 1950s.
- Landowners further altered the marsh depending on their objectives (grazing, haying, muskrat trapping, hunting, etc.)
- From 1963-1980 no management occurred by the Service due to public concerns.
- In 1980 the Service proposed the establishment of freshwater impoundments for waterfowl and to control *Phragmites*. By 1988 the installation of 3 water control structures basically eliminated all tidal flow to 4,000 acres of marsh.



Unit II area
1927



Prime Hook Rd

History of Prime Hook's Marshes continued

- As a condition in the state's wetland permit for the installation of the Unit II water control structure in 1988 the dune was to be restored. The 1986 Environmental Assessment acknowledged there would be saltwater intrusion from the Bay.
- The dunes have been restored several times since 1988:
 - 1992 storms
 - 1998 storm
 - 2006 Hurricane Ernesto
 - 2008 Mother's Day Storm
- This was done in an effort to provide freshwater impoundments for waterfowl and to control *Phragmites*.





History of Prime Hook's Marshes continued

The end result was – IT WORKED



History of Prime Hook's Marshes continued

- Waterfowl numbers increased

Chamberlain (1951) – Prime Hook Marshes had a peak of 2,700 birds in the fall of 1950.

1975-1984 No Wetland Management Era
Peak Waterfowl Numbers - 5,795

1986-1995 Marsh Rehabilitation Era
Peak Waterfowl Numbers – 54,606

1996-2005 Integrative Wetland Management Era
Peak Waterfowl Numbers - 80,261

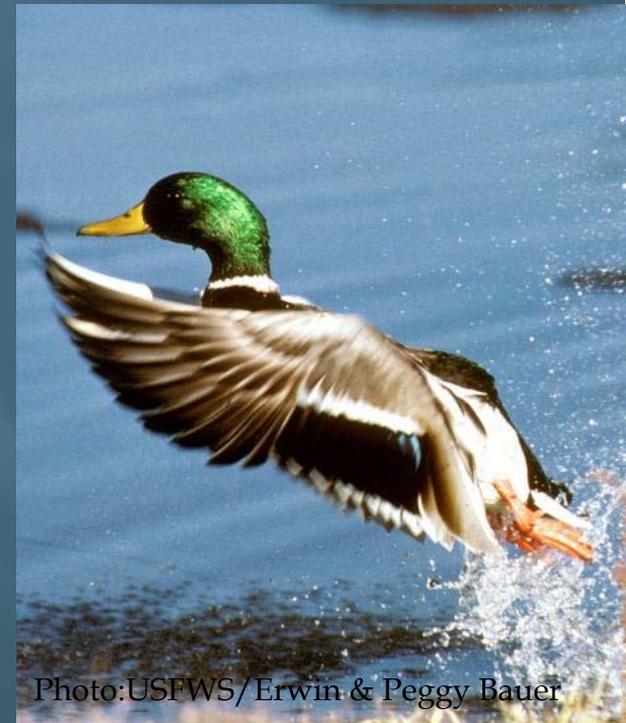


Photo:USFWS/Erwin & Peggy Bauer



History of Prime Hook's Marshes continued



Photo:USFWS/Keith Ramos

- In 2006 Hurricane Ernesto passed near the coast creating an overwash in the Unit I salt marsh just north of Fowler Beach Road.
 - The overwash has rejuvenated the Unit I salt marsh
 - The overwash has provided nesting habitat for oystercatchers and least terns. Piping Plovers visit but have not nested.
- The Service's position has been to allow the overwash processes to proceed naturally in Unit I. This position is consistent with the Service's biological integrity policy.

History of Prime Hook's Marshes continued

In 2008 the Mother's Day Storm (May 12) created overwashes in Unit II. The breaches south of Fowler Beach Road were repaired in October 2008.



History of Prime Hook's Marshes continued

In November of 2009 the dunes were overwashed again in Unit II.



History of Prime Hook's Marshes continued



- In 2010 the Service released an Environmental Assessment to restore the dunes one more time.
 - The Service recognized this as a temporary solution. We proposed to hold the line until an analysis of management options and strategies could be developed and put in place.
 - Permitting and litigation delayed the action until September 2011.
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- This action was consistent with the Service's Biological Integrity Policy as it states "we will, first and foremost, maintain existing levels of biological integrity, diversity, and environmental health at the refuge scale. Secondly, we will restore lost or severely degraded elements of integrity, diversity, and environmental health at the refuge scale...."
 - Prior to the repair, Hurricane Irene had greatly reduced the sediment available on-site for the work. The repair was done, but lasted only a matter of days.

A Refuge's Dilemma

Freshwater marsh vs. Salt marsh vs. Open water



A Refuge's Dilemma cont'd

Freshwater marsh vs. Salt marsh vs. Open water

- Prime Hook's 4,000 acres of impoundments represents 40% of the total 10,000 acres of impoundments in Delaware.
- Potential for **significant reduction in waterfowl numbers** at Prime Hook. The impoundments were built for a reason and were very successful.
- **A loss of 50% to 85% of our shorebird habitat.** The water management in our impoundments provided the mudflats utilized by the shorebirds.
- The shoreline is eroding and exposing the peat. The loss of sand means the loss of horseshoe crab spawning habitat. The reduction in HSC spawning means the reduction of shorebird numbers such as red knots.

A Refuge's Dilemma cont'd

Freshwater marsh vs. Salt marsh vs. Open water

- Radar research done in 2010 clearly showed how important Prime Hook's forests are to landbirds during the migration.
- We currently have 125 to 150 acres dead, dying or stressed due to the saltwater intrusion. We are losing this critical habitat.



Photo:USFWS/Dave Menke

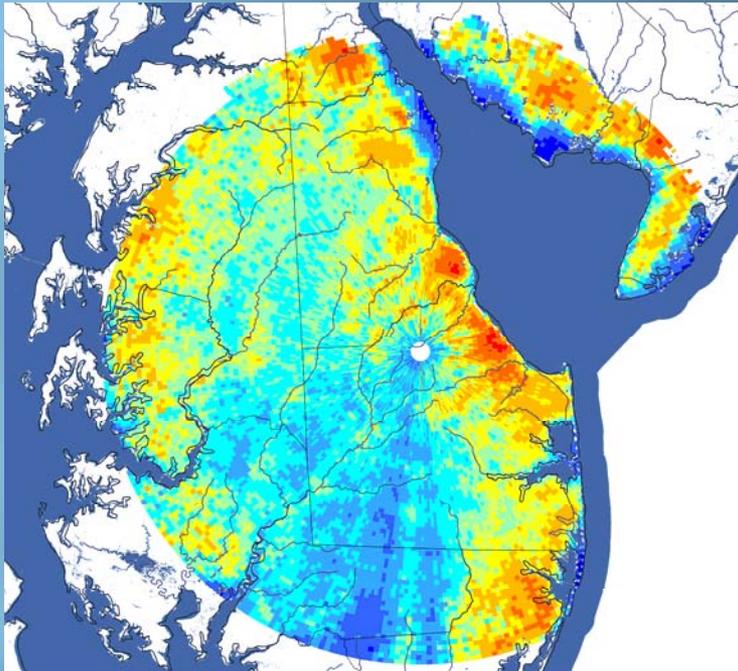


Photo:USFWS/Donna Dewhurst

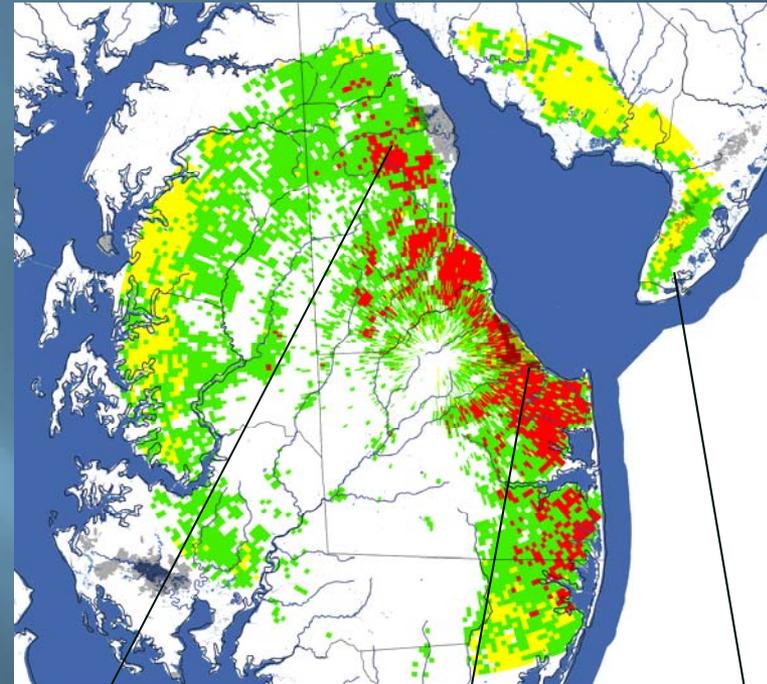


Photo:USFWS/Frank Miles

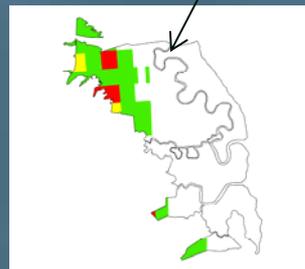
Radar study



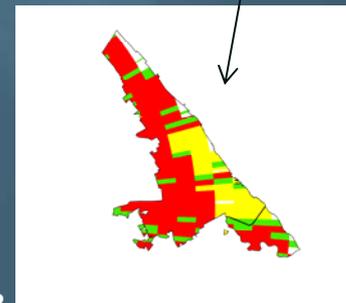
KDOX, Dover, DE (30 nights)



-  "Hotel" - consistently high bird density (>75th % of reflectivity & <25th % of variability)
-  "Fire escape" - high bird density and high daily variability (>75th % of reflectivity & >75th % of variability)
-  "Convenience store" - above median bird density (>50th % of reflectivity)



Bombay Hook NWR



Prime Hook NWR



Cape May NWR

A Refuge's Dilemma cont'd

Freshwater marsh vs. Salt marsh vs. Open water

- Invasive species such as Japanese stilt grass and *Hydrilla* have been either eliminated or severely set back due to the saltwater intrusion. *Phragmites* has been set back in the higher salinity areas.
- Saltmarsh may be able to keep up with sea level rise or it may slow the landward migration.
- Saltmarsh specialist birds are declining and are a resource of concern.
- Saltmarsh is relatively easy to maintain and is cost-effective.
- Anadromous fish will benefit with increased habitat.
- If the overwash habitats remain unvegetated, they may provide critical bird nesting habitat.
- Vegetated marsh provides storm surge and flood protection.
- Sequesters Carbon more effectively than freshwater marsh

A Refuge's Dilemma cont'd

Freshwater marsh vs. Salt marsh vs. Open water

- Open water provides little to no wildlife value (especially migratory birds). The reductions in waterfowl populations and /or habitat from freshwater to salt marsh are expected to be even worse if the Unit or Units go to open water, or even if they are overtaken by *Phragmites*.
- No vegetation means no spawning/nursery habitat for fish.
- Wave action and saltwater intrusion continue to march landward further impacting forests and early successional habitats on the refuge, not to mention neighboring farmland.
- The potential for increase flooding and damage to facilities (roads).

Unit I



Unit II



The Comprehensive Conservation Plan

- Required by the Refuge Improvement Act
- Satisfies NEPA with the development of an EIS
- Requires the refuge to look at a range of options for the management of the refuge including hunting, fishing, wildlife observation and habitat management



What are the alternatives?

Re-Establishing Freshwater impoundments

- Requires beach replenishment
 - \$7+ million initial price tag with recurring costs every five to 10 years. The recent Lewes project had a \$1.45 million mobilize/demobilization cost with a \$13/cu yd cost for sand

- The refuge is losing water management control at the water control structures.

- Policy Conflict

What are the alternatives? cont'd

Salt/Brackish Marsh Restoration

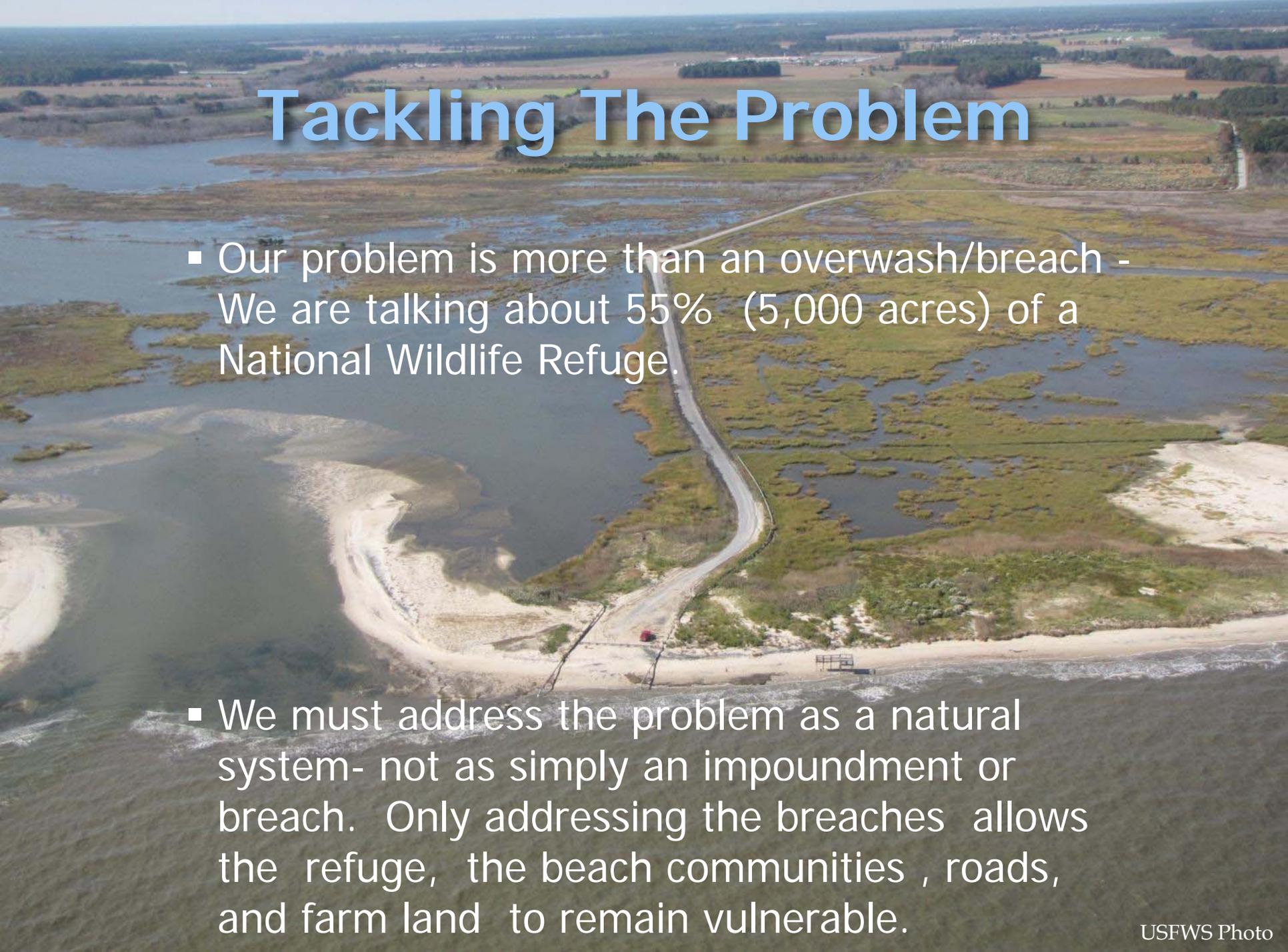
- ❑ Requires dredge spoil – 7" to 10" across unit II and III.
- ❑ Hydrological restoration
 - Need to allow the marsh to drain
 - Need to establish tidal channels
 - Can we drain the marsh?
 - The units remain tidally restricted
 - Hypersalinity issues
- ❑ Costs are unknown
 - Initial cost will be high but should be self-sustaining
- ❑ Restores ecosystem services
 - Storm surge and flood protection
 - Sequesters Carbon
 - Habitat

What are the alternatives? cont'd

Passive Management

- ❑ “Let Mother Nature run its course”
- ❑ Conversion to open water could lead to loss of up to 5,000 acres of wetlands (does not include loss of uplands)
- ❑ Loss of Ecosystem Services with value totaling \$53 million
 - ❑ Value of ecosystem services for wetlands = \$10,600 / acre / year (Southwick Associates 2011 report)
 - ❑ Does not include economic benefit of outdoor recreation
- ❑ Natural wetland recovery not impossible, but could take decades or hundreds of years (if sea level rise doesn't preclude completely)

Tackling The Problem

An aerial photograph of a coastal wetland area. A road runs through the center, flanked by marshy land. The water is dark and appears to be overflowing or eroding the surrounding land. The background shows a mix of green fields and brownish areas, suggesting a mix of natural and agricultural land. The sky is clear and blue.

- Our problem is more than an overwash/breach - We are talking about 55% (5,000 acres) of a National Wildlife Refuge.
- We must address the problem as a natural system- not as simply an impoundment or breach. Only addressing the breaches allows the refuge, the beach communities , roads, and farm land to remain vulnerable.

Administrative Procedures

- The Comprehensive Conservation Plan
 - The first critical step in a series of environmental compliance procedures
 - Satisfies the National Environmental Policy Act and Refuge Improvement Act through the development of environmental impact statement
- Restoration Plan development
- Permits
 - 404 Wetland Permit
 - State Permits (wetland and shoreline)
 - Federal Consistency
- Additional Environmental Assessments may be needed

What is the Status of the CCP?

- ❑ Notice of Availability Published in Federal Register (May)
- ❑ Open for 60 day public review – (May/June)
 - Planning on 6 public meetings
 - Presentations at local civic organizations
 - Open House
- ❑ Evaluation of Public Comments and any changes to CCP are made – 30 days
- ❑ Final CCP - 30 Day public review
- ❑ Record of Decision (ROD) published in November/December

ANY QUESTIONS?

