



Great Dismal Swamp National Wildlife Refuge

# Success and Challenges of Atlantic White Cedar Restoration

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## Great Dismal Swamp National Wildlife Refuge

**Great Dismal Swamp was established in 1974 . . .**

“ . . . For the primary purpose of protecting and preserving a unique and outstanding ecosystem, as well as protecting and perpetuating the diversity of animal and plant life therein.”



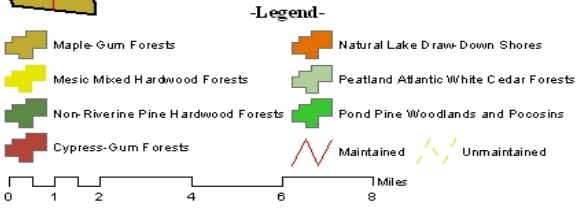
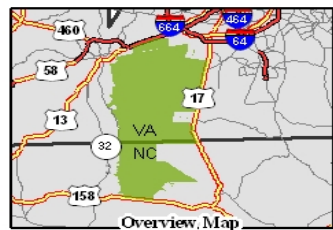
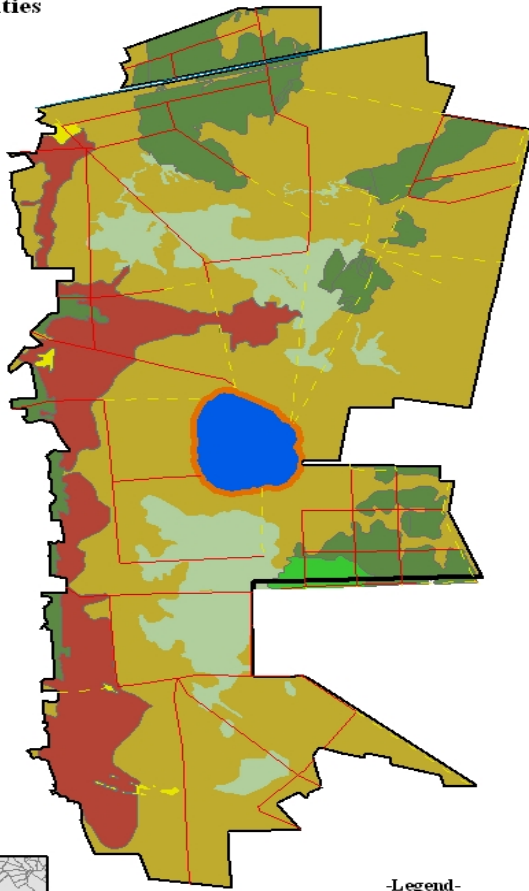




# Great Dismal Swamp National Wildlife Refuge

## The Landscape

Great Dismal Swamp  
National Wildlife Refuge  
Forest Cover Communities





# Hurricane Isabel

- Reached Category 5 status
- Most significant storm to hit NE NC and SE VA since Hurricane Hazel (1954) and the Chesapeake-Potomac Hurricane (1933)
- Lost most AWC in the 3,600-acre pure stands and 8,000-acre mixed forest







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One of the larger “pure” AWC stands, “pre-Isabel” . . .







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. . . and after Isabel







# Environmental Assessment for Restoration

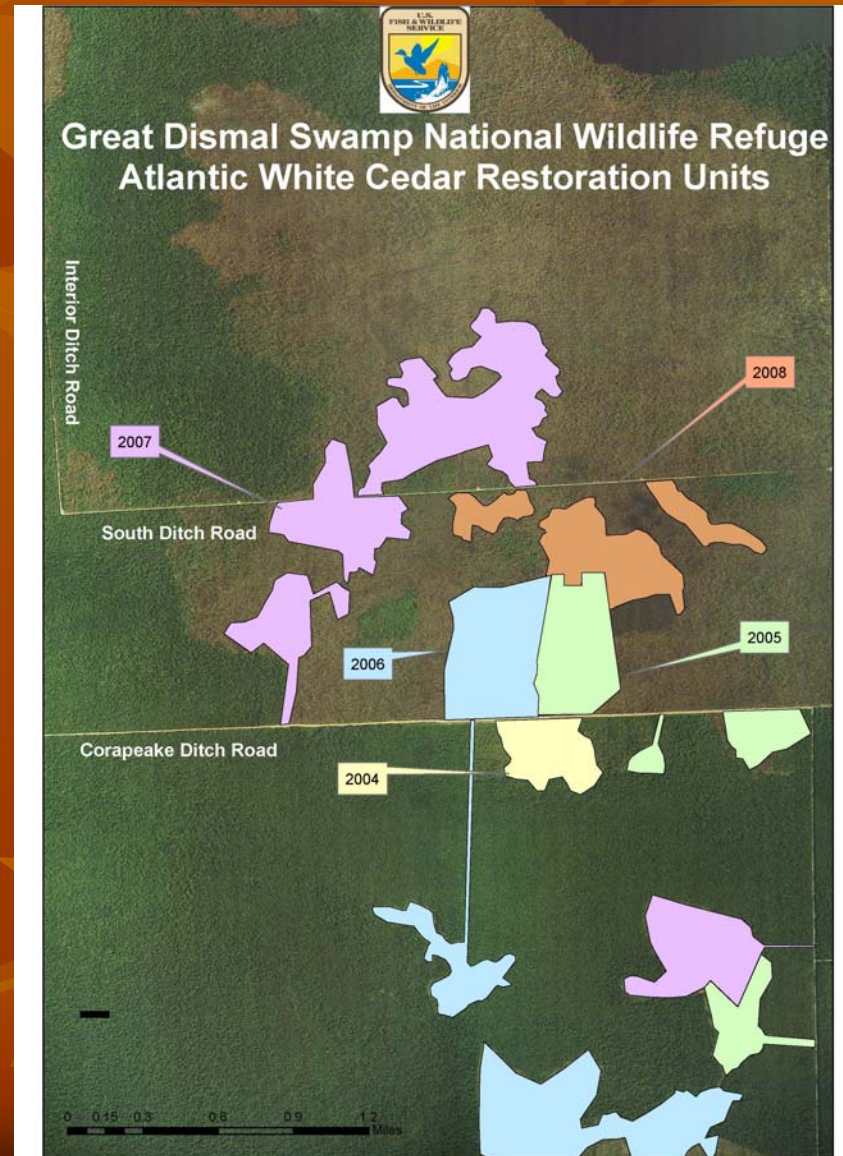
- Started “experimental” salvage work on 60 acres
- EA published in September 2004 for large-scale salvage
- Identified up to 1,100 acres of AWC to be salvaged logged
- Evaluated the project to see if helicopters were an option
- Required specialized equipment and “removal” of competing hardwoods





# Salvage Logging Results

- 1,146 acres
- 6.5 million board-feet AWC removed
- Kept mature trees to provide continuous seed source
- Established monitoring plots to determine regeneration rates
- Reduced fuel load
  - 10,000 tons







# Results - Natural Regeneration

- Began immediately after salvage
- Annual regeneration
- Average 2,500 to 7,000 per acre depending on site conditions
- Competition with red maple and Smilax sp.
- Deer browse







# Seedling Planting and Herbicide Application

- Planted in cut, mixed stands with few seed producers
  - 29,000 on 244 acres
- Planted in burned areas
  - 12,000 on 40 acres
  - 1,000 on 3 acres
- Herbicide application, where needed, after the second growing season
- Herbicide in 40-acre uncut, mixed stand







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# WILDFIRES

Crosscut Fire,  
April 2006

40 acres







# South One Fire

- June 9 - October 7, 2008
- Originated in AWC restoration area
- Human-caused
- 4,844 acres
- 781 of 1,100-acre AWC restoration area
- Killed remaining seed trees
- Burn severity varied



**South One Fire**  
 VA-GDR-080002  
 Briefing Map  
 July 9, 2008  
 4,664 Acres

Div C

Div S

Div T

Div B

Div U

Div A

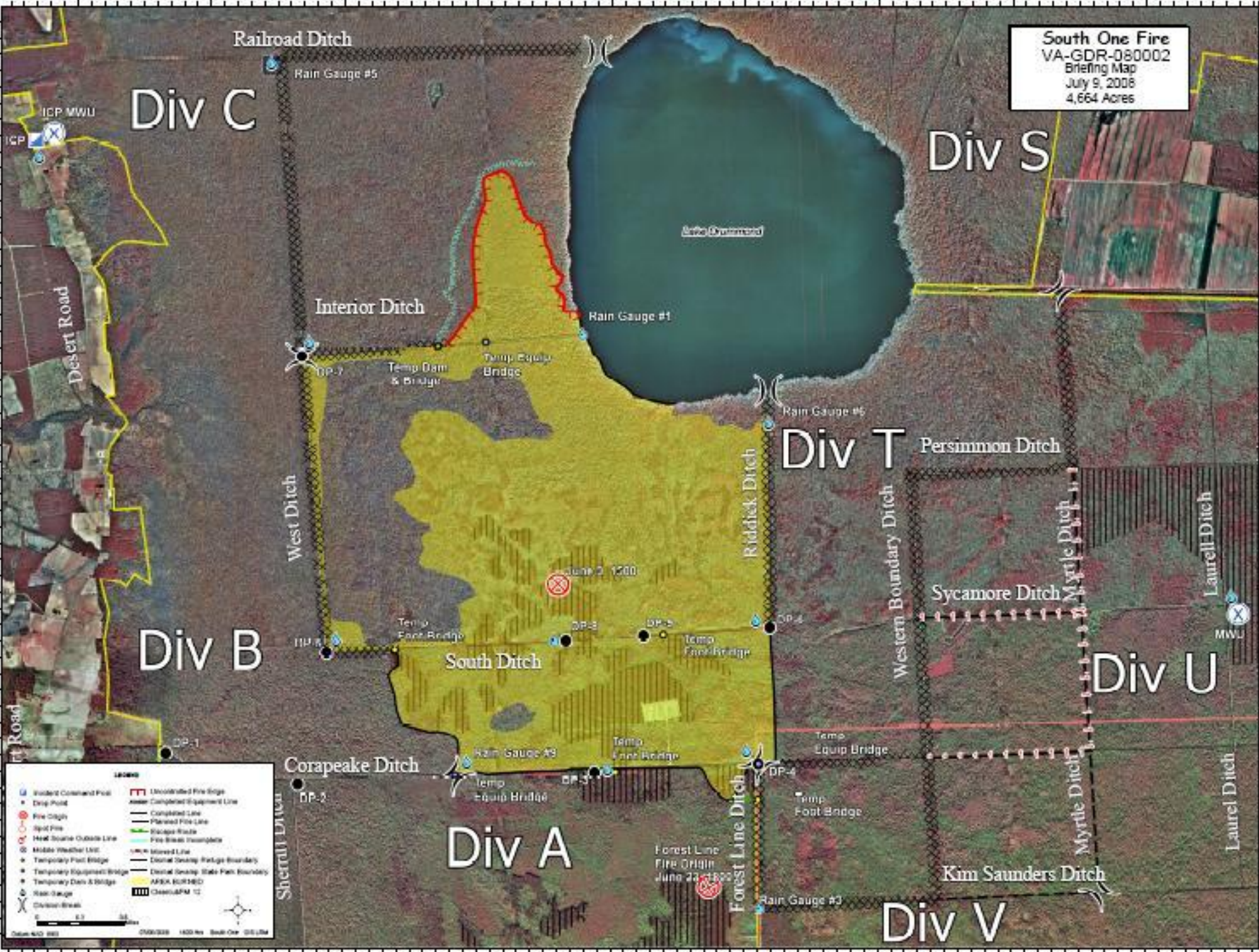
Div V



**LEGEND**

Incident Command Post	Uncontrolled Fire Edge
Drop Point	Completed Line
Fire Origin	Planned Fire Line
Spot Fire	Backstop Width
H2O Source Outside Line	Fire Break Transpare
Mobile Weather Unit	Staked Line
Temporary Foot Bridge	District Group Storage Boundary
Temporary Equipment Bridge	District Group State Park Boundary
Temporary Dam & Bridge	AFDX ECR 160
Rain Gauge	Clear/AFM 12
Division Break	

Scale: 0 0.1 0.2 Miles  
 Date: 6/22/08 080002 1420 hrs. Scale: 1:25,000











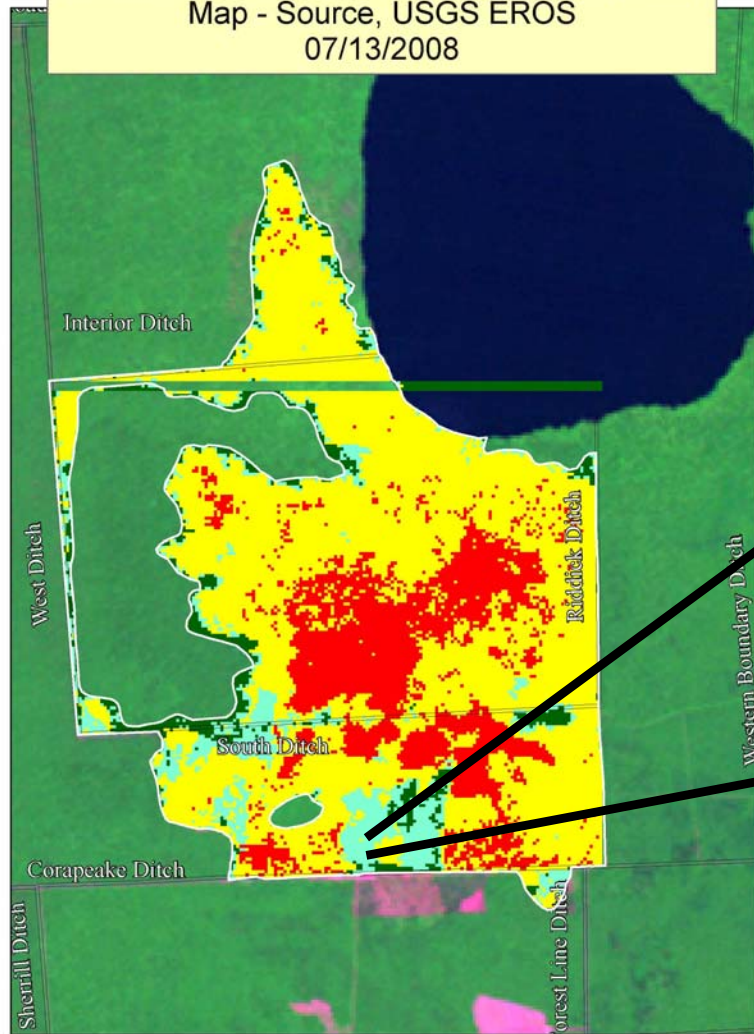




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# Burn Severity Analyses

Burned Area Reflectance Classification (BARC)  
Map - Source, USGS EROS  
07/13/2008



0.75 0.375 0 0.75 Miles







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# Ground Truthing



Low Burn Severity



Moderate Burn Severity



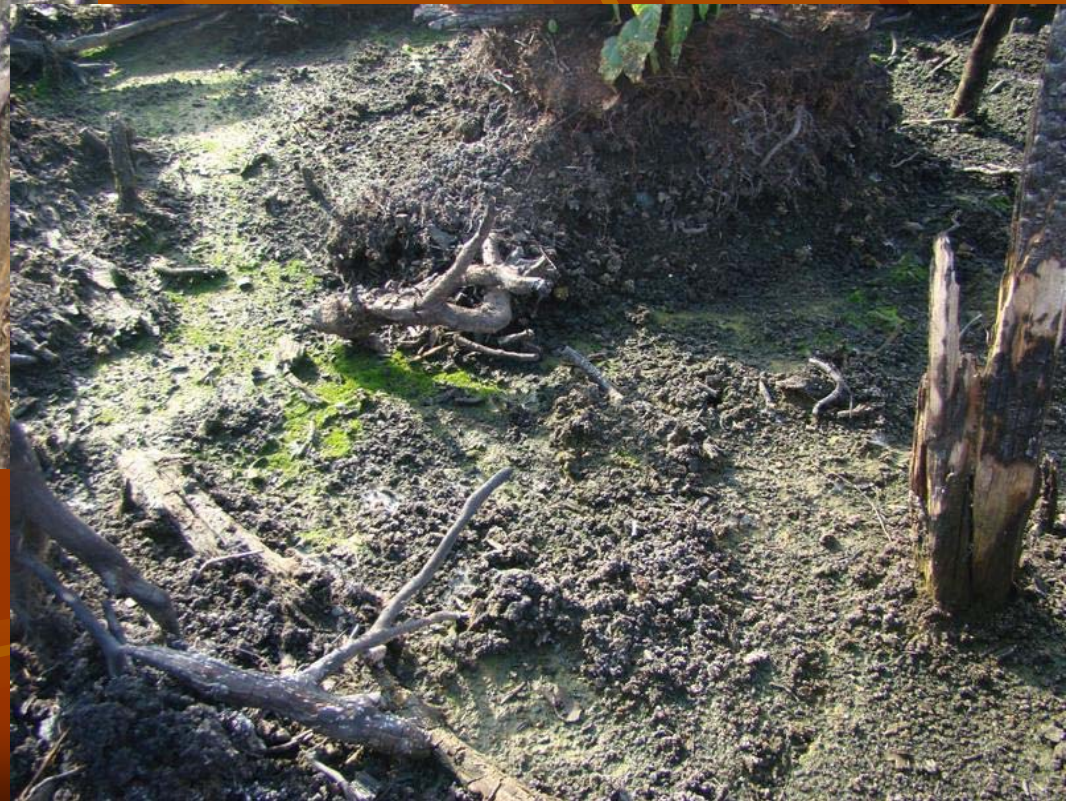


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# Ground Truthing



High Burn Severity

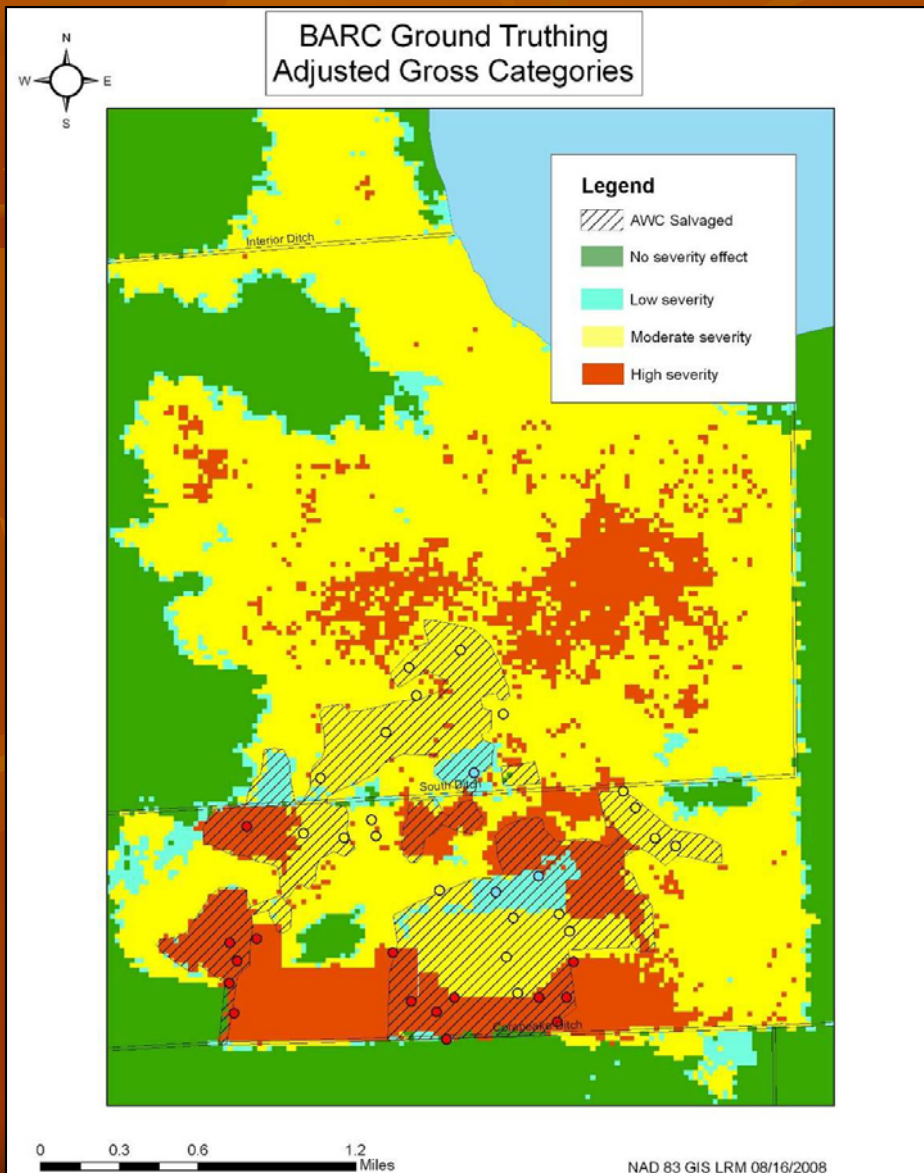






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# Adjusted Burn Severity



Two-day workshop with soil scientists, hydrologists, ecologists, and foresters to determine information needs, predict impacts, and prepare rehabilitation plan.





# What Does the Future Hold?

- AWC seedlings survived !!
- Burn severity better than initially envisioned; however, most seed source is likely gone
- Rehabilitation plan calls for plantings, herbicide application, and monitoring
- Refuge Habitat Mgmt. Plan to define goals and objectives for determining success







**QUESTIONS?**