

Altman Tract Wetland Avoidance, Minimization, and Mitigation

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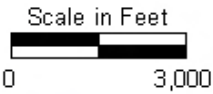
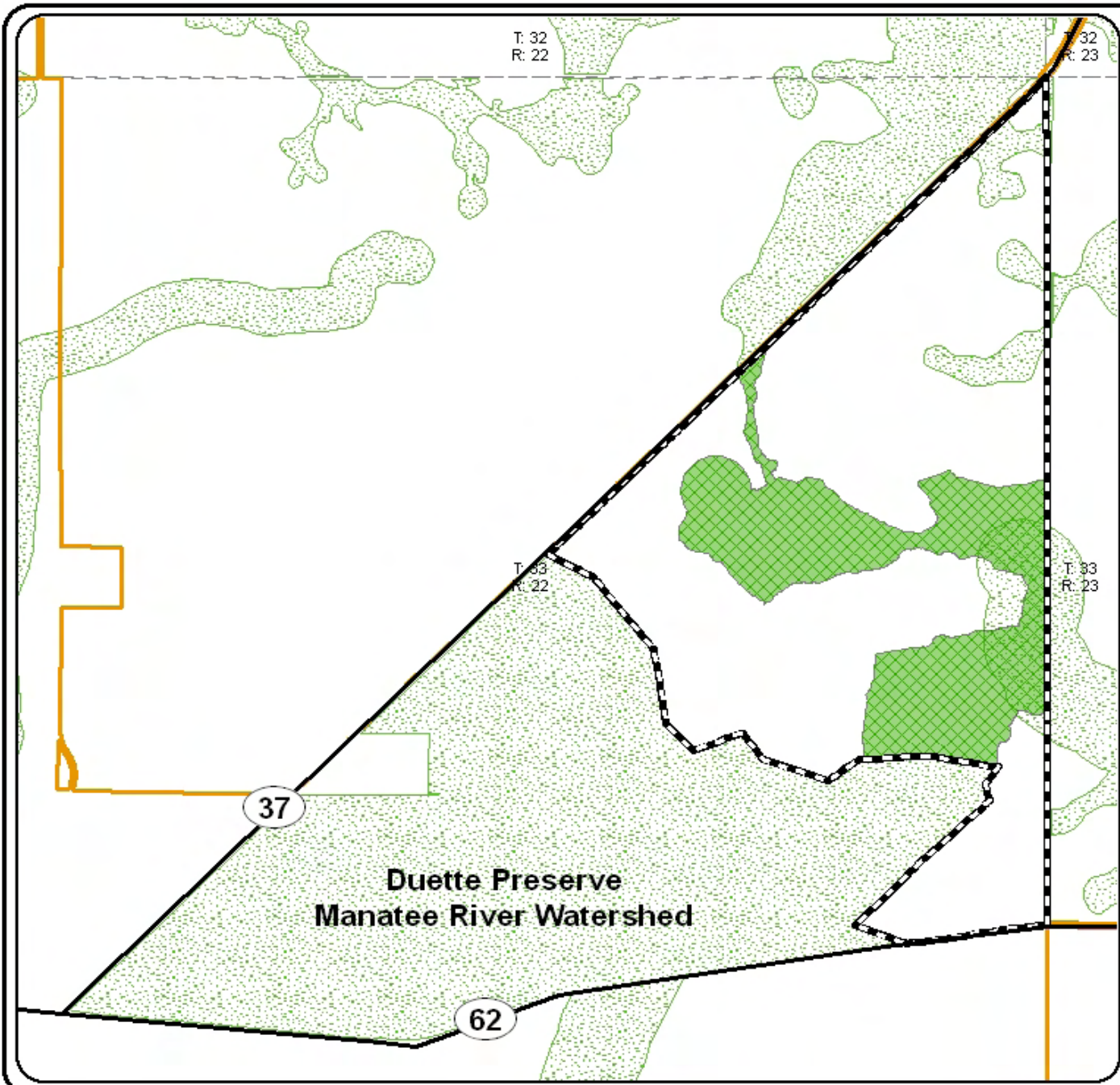
Resource Driven Mine Plan

- **Considers wetland and mineral resources**
- **Balances reserve extraction and protection of ecological resources**
- **Keeps the primary waterways intact**
 - **Central Marsh**
 - **Horse Creek**
- **Considers restorability of wetland functions and systems**
- **Considers wetland position relative to nature corridors and mining logistics**

Avoid/Minimize Impacts: Protection

Protection of major resources that provide the foundation for maintaining the wetland functions

- Protect the spine of the ecosystem
 - **Central Marsh and its main flow way**
- Protect large blocks of habitat versus piecemeal avoidance of individual wetlands
- Protect habitat mosaics representative of the site's ecological complexity (wetland/upland mosaics)
- Protect wildlife and hydrologic corridor connections to offsite preserves and streams



- Tract Boundary
- Mosaic_Property
- Proposed Conservation Easement
- Integrated Habitat Network/ Duette Preserve
- Township_Range
- County Roads
- State Roads

**FOUR CORNERS MINE
ALTMAN TRACT
SECTIONS 1,11,12,13,14 & 24
T33S R22E
FIGURE 23
PROPOSED CONSERVATION
EASEMENT**

Path: G:\projects\2004_0149\maps\con_eas_e_duette.mxd
by: jpm 9/24/2005
revised on 8/25/2007 by jmc

Avoid/Minimize Impacts: Restorability

Wetlands slated for mining only if their functions can be restored

- **Mined wetlands occupy less desirable positions for habitat corridors**
- **Mined wetlands occupy more desirable areas for mineral recovery**
- **Preserve most forested wetlands because these take longest to reclaim**
- **Mine most herbaceous wetlands because these take the shortest time to reclaim**
 - **Most common type in Florida**

Avoid/Minimize Impacts: Results

- **335 acres of wetlands avoided and preserved**
- **192 acres of uplands avoided and preserved**
- **Less than 18 acres of forested wetlands to be mined**
- **375 acres of herbaceous wetlands to be mined**

Recovery of Function

Key functions, especially of herbaceous wetlands, are restored quickly after initial revegetation.

- **Vegetation species and cover**
- **Wading birds and fish colonization**
- **Water quality functions**
- **Flood attenuation functions**

Wetland Mitigation Techniques

Diversity

- Topsoiling and/or dense planting
- Supplemental mulching, planting and seeding
- Transitional zones

Zonation

- Computerized hydrology modeling
- Laser guidance systems for precise contouring
- GPS-guided placement of plants and soil amendments

Aggressive measures in nuisance species management

These advances assure

- diverse vegetation
- wildlife colonization
- habitat zonation
- water quality transformations

Reclaimed Wetland "W" Four-Corners AC-4



Deep Marsh
Zone

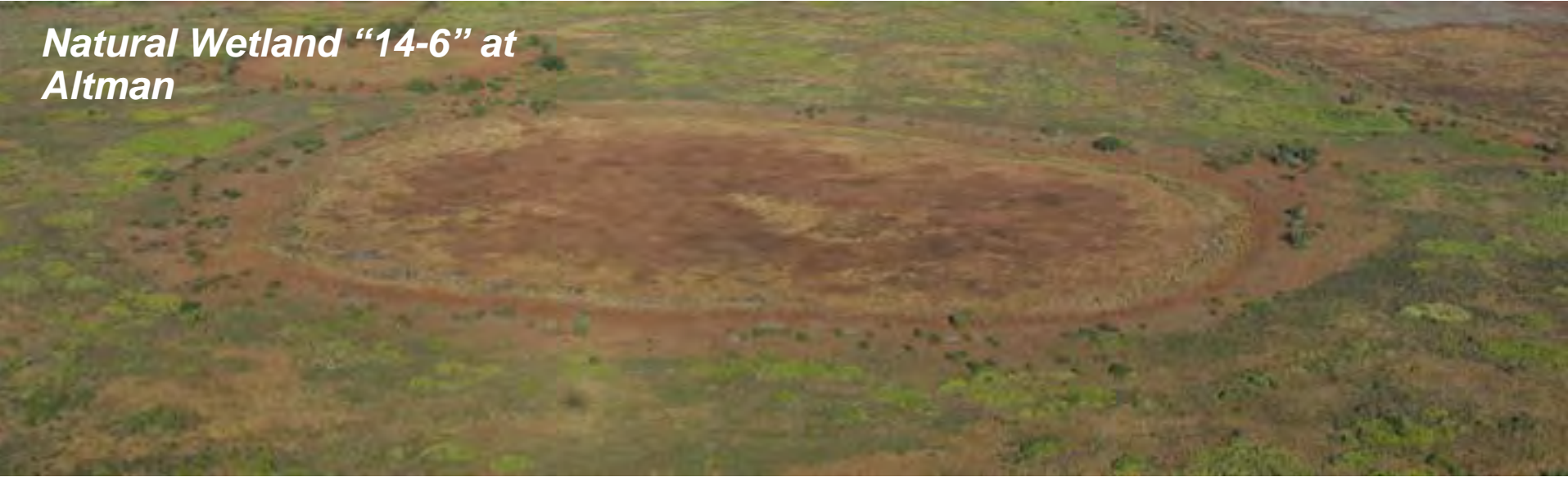
Shallow
Marsh Zone

Upland Zone

Wet Prairie
Zone

Wetland Zonation Comparisons

Natural Wetland "14-6" at Altman



Reclaimed by Mosaic, Wetland "X" at AC-4



Wet Prairie Zone



Interior Zone Comparisons

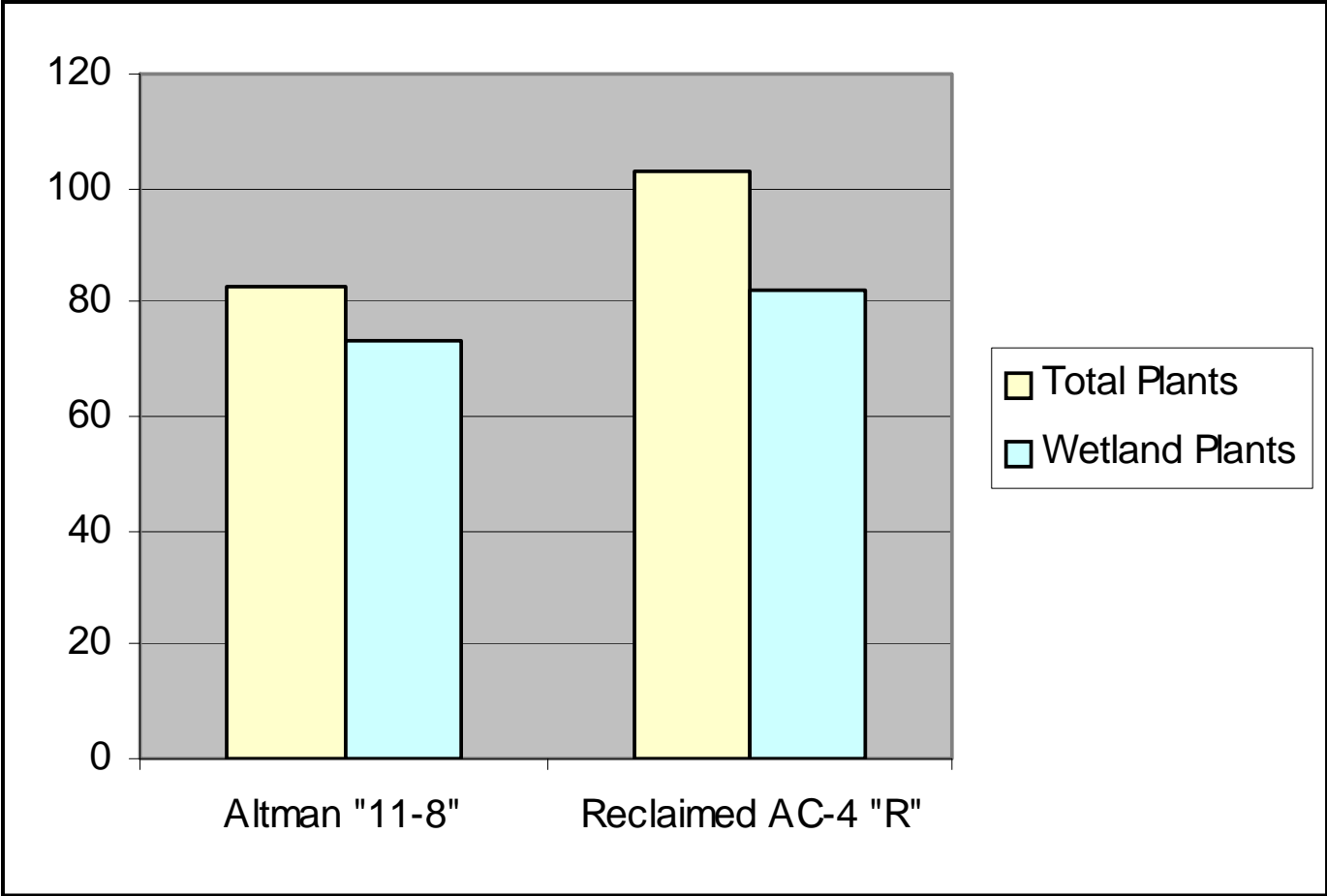


*Natural Wetland at
Altman*



*Reclaimed by Mosaic,
Wetland "X" at AC-4*

Plant Diversity Comparisons



Summary

- **Total avoidance not practicable**
- **Minimization developed by**
 - **multiple experts**
 - **multiple regulatory programs**
 - **administrative hearing**
 - **Avoids 25% of property & 46% of wetlands**
- **Protects the spine of the ecosystem**
- **Avoids large blocks of the property**
- **Protects important habitat corridor**
- **Mitigation based on robust technology**
- **Only restorable wetlands to be mined**
- **Balances ecological and mineral resources**

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