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# Modified Wetland Rapid Assessment Procedure
# For
# Pine Savanna Wetlands

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This document outlines a modification of the Wetland Rapid Assessment Procedure (WRAP) for the qualitative rating of pine savanna wetlands as discussed by consultants for the Turkey Creek project and an interagency review team on January 26, 2000. The following individuals were present during that field review and discussion: Dana R. Sanders, Sr., PhD., Dana Sanders, Jr., and Bob Dew, Wildlife Biologist, D.R. Sanders and Associates, Inc. (DRSA), Palmer Hough and Haynes Johnson U.S. Environmental Protection Agency (EPA), Bill Bunkley, U.S. Army Corps of Engineers (USACE), Bruce Porter and Randy Roach, Field Biologist, U.S. Fish and Wildlife Service (USFWS), Leah Bray and Jeff Clark Mississippi Department of Marine Resources (DMR), Shawn Clark, E.I., Mississippi Department of Environmental Quality (DEQ), and Tom Roberts, Director of Environmental Assessment, Environmental Management Systems, Inc. (EMS).

The modifications are based, in part, on the *Wetland Quality Rating Scale For Pine Savanna Wetlands* by Dr. Sanders and comments provided by the above referenced review team. This assessment should only be used for pine savanna wetlands, and should not be applied to any other wetland types. The October 1998 version of WRAP as used by the Jacksonville District USACE should be used for other wetland ecosystems.

WRAP is a standardized matrix developed as a rapid, but reliable assessment to evaluate wetlands within limited regulatory time frames. The WRAP matrix establishes a numerical ranking of individual ecological and anthropogenic variables that strongly effect the functionality of a wetland. The numerical output is used to evaluate the current wetland condition, anticipated changes to the wetland system over time, and the anticipated success of the proposed wetland mitigation. WRAP input data consists primarily of field observations and professional experience.

WRAP variables include the following:

| | |
|---|---|
| X | Wildlife Utilization |
| X | Wetland Overstory/Shrub Canopy |
| X | Wetland Vegetative Ground Cover |
| X | Adjacent Upland Support/Wetland Buffer |
| X | Field Indicators of Wetland Hydrology |
| X | Water Quality Input and Treatment Systems |

The matrix can be used to evaluate a wide range of wetland/upland systems such as emergent marsh, wet prairie, hardwood swamp, etc., but it is not intended to compare different wetland community types. However, as with any standardized system, some systems fit the standard better than others. In the State of Florida, minor modifications and revisions to the WRAP scoring to more accurately reflect wetland function under specific circumstances have been ongoing since 1995. The changes proposed for pine savanna wetlands is consistent with modifications that have occurred in Florida, and should be expected when adapting WRAP for use in a new region. Wetland permitting and review is done under the same federal guidelines in both the Jacksonville and Mobile Districts, but there are minor regional differences in the application and process between these Districts and any others in the nation. The use of WRAP will be no different.

Due to the unique nature of pine savanna wetlands it was decided by the review team that modifications to the WRAP variables were justified to better reflect the function of this particular wetland habitat. Three factors have significant impact on pine savanna wetlands: hydrologic alterations, elimination of fire, and silvicultural practices. All three of these factors result in a significant loss of wetland function in pine savanna wetlands, but under the current WRAP matrix this impact cannot accurately be reflected, especially in the Wildlife, Overstory, and Ground Cover categories. The wildlife variable has minor modifications that focus on the objective of the wildlife scoring which is to account for primarily wetland dependant wildlife species, especially those that occur in pine savanna wetlands. The most significant modifications occur within the Overstory and Ground Cover categories. These categories have been changed to account for the presence and abundance of target (pine savanna) vegetative species. The revised WRAP variable matrices are presented below for each of the six categories.

# Pine Savanna Habitat Assessment Variables

## Wildlife Utilization

Score

***Existing Pine Savanna Exhibits No Evidence Of Target Wildlife*** — **0**

- • No evidence of utilization by target wildlife
- X Existing wetland is heavily impacted
- X No habitat for target wetland wildlife species

***Existing Pine Savanna Exhibits Minimal Evidence of Target Wildlife*** — **1**

- X Minimal evidence of utilization by target wildlife
- X Wetland may be located in a residential, industrial, or commercial development with frequent human disturbance
- X Sparse or limited adjacent upland food sources
- X Little habitat for target wetland wildlife species

***Existing Pine Savanna Exhibits Moderate Evidence of Target Wildlife*** — **2**

- X Moderate evidence of utilization by target wetland wildlife
- X Evidence of aquatic macroinvertebrates and/or amphibians
- X Minimal evidence of human disturbance
- X Adequate adjacent upland food sources
- X Adequate protective cover (habitat) for target wetland wildlife species

***Existing Pine Savanna Exhibits Strong Evidence of Target Wildlife*** — **3**

- X Strong evidence of utilization by target wetland wildlife
- X Abundant aquatic macroinvertebrates and/or amphibians present
- X Negligible evidence of human disturbance
- X Abundant adjacent upland food sources
- X Excellent protective cover (habitat) for target wetland wildlife species

The wildlife utilization variable is a measure of observations and signs (i.e. scat, tracks etc.) of target wildlife, primarily wetland dependent species. A list of target wildlife species is provided as Attachment A. This list may be expanded in the future as more information becomes available.

## Pine Savanna Overstory/Shrub Canopy Strata

Score

***Closed Overstory/Shrub Canopy Strata*** — **0**

X Percent areal cover of either tree/shrub stratum 75% or greater

X Heavy encroachment of upland/transitional tree/shrub species

***Moderate Closure Of The Overstory/Shrub Canopy Strata*** — **1**

X Percent areal cover of either tree/shrub stratum 50% or greater but less than 75%

X Moderate natural recruitment of overstory tree/shrub species

***Minimal Closure Of The Overstory/Shrub Canopy Strata*** — **2**

X Percent areal cover of both tree/shrub stratum 20% or greater but less than 50%

X Some natural recruitment of overstory tree/shrub species

***Open Overstory/Shrub Canopy Strata*** — **3**

X Percent areal cover of both tree/shrub stratum between 0% and 20%

X Negligible natural recruitment of overstory tree/shrub species

## Vegetative Ground Cover of Pine Savanna Species

Score

***Negligible Target Ground Cover Vegetation Present*** **0**

X Percent areal cover of target vegetation $\leq 10\%$
X Prominent woody vine stratum
X Target pine savanna herbaceous species rarely occurring
X Extreme natural recruitment of undesirable species

**Minimal *Target Ground Cover Vegetation Present*** **1**

X Percent areal cover of target vegetation $< 50\%$ but greater than 10%
X Prominent woody vine stratum between 10% and 20%
X Minimal number of target herbaceous pine savanna species present

***Moderate Target Ground Cover Vegetation Present*** **2**

X Percent areal cover of target vegetation 50% or greater but $< 70\%$
X Prominent woody vine stratum $\leq 10\%$
X Moderate number of target herbaceous pine savanna species present

***Abundant Target Cover Vegetation Present*** **3**

X Percent areal cover of target vegetation 75% or greater
X No woody vine stratum
X Abundant number of target herbaceous pine savanna species present

The vegetative ground cover variable is a measure of the presence, abundance, appropriateness and condition of ground cover vegetation within the wetland. A list of target herbaceous pine savanna species is provided as Attachment B. This list may be expanded in the future as more information becomes available.

## Adjacent Upland/Wetland Buffer

| | | Score |
|---|---|---|
| | ***No Adjacent Upland/Wetland Buffer*** | **0** |
| X | Buffer is non-existent (i.e. development) | |
| | ***Adjacent Buffer Averages 30 Feet or Less, Containing Undesirable Plant Community*** | **1** |
| X | Less than 30 feet average width | |
| X | Provides some cover, food source, roosting | |
| X | Not connected to wildlife corridors | |
| X | Greater than 300 feet but has greater than 75% invasive or nuisance plant species | |
| | ***Adjacent Buffer Averages >30 Feet But <300 Feet, With a Predominantly Desirable Plant Community*** | **2** |
| X | >30 feet average width | |
| X | Contains desirable plant community provides cover, food source, & roosting | |
| X | Portions connected to contiguous offsite wildlife corridors | |
| X | Greater than 300 feet but has less than 75% nuisance/undesirable plant species | |
| | ***Adjacent Buffer Averages >300 Feet, With a Predominantly Desirable Plant Community*** | **3** |
| X | >300 feet wide average width | |
| X | Contains predominately desirable plant species that provide cover, food source, & roosting | |
| X | Connected to contiguous offsite wildlife corridors | |

## Wetland Hydrology

Score

0

*Hydrologic Regime Severely Altered*

X Wetland hydrology severely altered

X Hydroperiod inadequate to support wetland plant species for the target community

X Strong evidence that upland plants are encroaching into the historical wetland area

Significant die-off of target plant species due to an increased or decreased hydroperiod

X In organic soils, there is substantial soil subsidence

1

*Hydrologic Regime Inadequate to Maintain a Viable Wetland System*

X Site hydroperiod inadequate to maintain the target wetland plant community

X Succession of wetland plant species to transitional/upland plant species. Target vegetation stressed or dying from too much or too little water.

X In organic soils, there is evidence of soil subsidence

2

*Hydrologic Regime Adequate to Maintain a Viable Wetland System*-**External Features May Affect Wetland Hydrology**

X Wetland hydroperiod adequate, although conditions present which possibly interfere with or influence the hydroperiod (i.e. canals, ditches, swales, berms, etc...)

X Target community healthy, although there may be some signs of improper hydrology.

X In organic soils, there is little evidence of soil subsidence

3

*Hydrologic Regime Adequate to Maintain a Viable Wetland System*

X Target vegetation healthy, and exhibit no stress from an improper hydroperiod

X Wetland not adjacent to external feature which could affect the hydroperiod

X Wetland exhibits a natural hydroperiod

X In organic soils, there is no evidence of soil subsidence

## Water Quality Input and Treatment

The scores for the adjacent land use types are as follows:

| *Adjacent Land Use Category* | *Score* |
|---|---|
| Open space/natural undeveloped areas | 3.0 |
| Silviculture | 2.5 |
| Unimproved pasture/rangeland | 2.5 |
| Citrus grove | 2.0 |
| Sugarcane | 2.0 |
| Low density residential | 2.0 |
| Low intensity commercial | 2.0 |
| Institutional | 2.0 |
| Railroad | 2.0 |
| Single-family residential | 1.5 |
| Recreational | 1.5 |
| Golf course | 1.5 |
| Moderately intensive commercial | 1.5 |
| Highways | 1.0 |
| Industrial | 1.0 |
| Mining | 1.0 |
| Multi-family residential | 1.0 |
| Improved pasture | 1.0 |
| Row crop | 1.0 |
| Race Track | 1.0 |
| Land clearing (little or no vegetation remaining ) | 1.0 |
| High intensity commercial | 0.5 |
| Dairy and feedlot | 0.0 |

The scores for treatment systems are as follows:

| Pre-Treatment Category | Score |
|---|---|
| Natural undeveloped area | 3.0 |
| Berms which prevent runoff from entering wetland | 2.5 |
| Wet detention with swales | 2.5 |
| Wet detention with dry retention | 2.5 |
| Combination grass swales with dry retention | 2.0 |
| Turbidity during construction | 1.5 |
| Wetland system is part of treatment | 1.5 |
| Grass swales only | 1.0 |
| Dry retention only | 1.0 |
| No treatment | 0.0 |

# ATTACHMENT A

## LIST OF TARGET ANIMAL SPECIES FOR PINE SAVANNA WETLANDS

### Birds

| | |
|---|---|
| Agelaius phoeniceus | Red-winged blackbird |
| Aimophila aestivalis | Bachman's sparrow |
| Ardea herodias | Great blue heron |
| Bubulcus ibis | Cattle egret |
| Buteo jamaicensis | Red-tailed hawk |
| Butorides striatus | Green heron |
| Capella gallinago | Common snipe |
| Casmerodius albus | Great egret |
| Charadrius vociferous | Killdeer |
| Circus cyaneus | Northern harrier |
| Colaptes auratus | Common flicker |
| Colinus virginianus | Northern bobwhite |
| Falco sparverius | American Kestrel |
| Geothylpis trichas | Common yellow throat |
| Grus Canadensis | Sandhill crane |
| Passerculus sandwichensis | Savannah sparrow |
| Pooecetes gramineus | Vesper sparrow |
| Progne subis | Purple martin |
| Sayornis phoebe | Eastern phoebe |
| Sialia sialis | Eastern bluebird |
| Spiza americana | Dickcissel |
| Spizella pusilla | Field sparrow |
| Sturnella magna | Eastern meadowlark |
| Turdus migratorius | American robin |
| Tyrannus tyrannus | Eastern kingbird |
| Zenaida macroura | Morning dove |

## Amphibians

| | |
|---|---|
| Acris gryllus | Southern cricket frog |
| Hyla cinera | Green tree frog |
| Manculus quadridigitatus | Dwarf salamander |
| Rana sphenocephala | Southern leopard frog |

## Reptiles

| | |
|---|---|
| Agkistrodon piscivorus | Cottonmouth |
| Anolis carolinensis | Green anole |
| Crotalus horridus | Canebrake rattlesnake |
| Nerodia fasciata | Banded water snake |
| Terrapene carolina | Eastern box turtle |
| Thamnophis sauritus | Eastern ribbon snake |
| Thamnophis sirtalis | Common garter snake |

## Mammals

| | |
|---|---|
| Sigmodon hispidus | Cotton rat |
| Sylvilagus aquaticus | Swamp rabbit |
| Sylvilagus floridanus | Eastern cottontail |
| Vulpes vulpes | Red fox |

# ATTACHMENT B

# LIST OF TARGET PLANT SPECIES FOR PINE SAVANNA WETLANDS

## Plants

| | |
|---|---|
| Aletris aurea | Golden colic-root |
| Aletris lutea | Yellow colic-root |
| Andropogon glomeratus | Bushy bluestem |
| Aristida affinis | Longleaf three-awn grass |
| Asclepias longifolia | Longleaf milkweed |
| Bartonia paniculata | Twining screwstem |
| Burmannia capitata | Southern burmania |
| Calopogon pallidus | Pale grass - pink |
| Calopogon tuberosus | Tuberous grass - pink |
| Carex elliottii | Elliott's sedge |
| Carphephorus pseudoliatris | Bristle-leaf chaffhead |
| Ctenium aromaticum | Toothache grass |
| Dichromena colorata | Starbrush white-top-sedge |
| Dichromena latifolia | Giant white-top-sedge |
| Drosera capillaries | Pink sundew |
| Drosera tracyi | Tracy's sundew |
| Eleocharis tuberculosa | Long tubercle spikerush |
| Erigeron vernus | Early white-top-fleabane |
| Eriocaulon compressum | Flattened pipewort |
| Eriocaulon decangulare | Ten-angle pipewort |
| Eryngium integrifolium | Blue flower coyote thistle |
| Eupatorium leucolepis | White-bract thorough-wort |
| Juncus trigonocarpus | Red-pod rush |
| Lachnanthes caroliniana | Carolina redroot |
| Lachnocaulon anceps | White-head bogbutton |
| Lophiola Americana | Golden-crest |
| Ludwigia hirtella | Hairy seedbox |
| Ludwigia linearis | Narrow-leaf seedbox |
| Ludwigia linifolia | Southeastern seedbox |

| | |
|---|---|
| Ludwigia pilosa | Hairy seedbox |
| Lycopodium alopecuroides | Foxtail clubmoss |
| Lycopodium carolinianum | Slender clubmoss |
| Lycopodium prostratum | Feather-stem clubmoss |
| Panicum longifolium | Panic grass |
| Panicum verrucosum | Warty panic grass |
| Paspalum praecox | Early paspalum |
| Pinguicula lutea | Yellow butterwort |
| Platanthera nivea | Snow orchid |
| Pogonia ophioglossoides | Rose pogonia |
| Polygala cruciata | Cross-leaf milkwort |
| Polygala lutea | Orange milkwort |
| Polygala ramose | Low pinebarren milkwort |
| Proserpinaca pectinata | Comb-leaf mermaid-weed |
| Rhexia lutea | Yellow meadow-beauty |
| Rhexia mariana | Maryland meadow-beauty |
| Rhexia petiolata | Ciliate beakrush |
| Rhynchospora baldwinii | Baldwin's beakrush |
| Rhynchospora cephalantha | Clustered beakrush |
| Rhynchospora chapmanii | Chapman's beakrush |
| Rhynchospora ciliaris | Ciliate beakrush |
| Rhynchospora fascicularis | Fasciculate beakrush |
| Rhynchospora gracilenta | Slender beakrush |
| Rhynchospora microcephala | Capitate beakrush |
| Rhynchospora oligantha | Few-flower beakrush |
| Rhynchospora plumose | Plumed beakrush |
| Rhynchospora rariflora | Few-flower beakrush |
| Rhynchospora stenophylla | Chapman's beakrush |
| Sabatia macrophylla | Large-leaf rose-gentian |
| Sarracenia alata | Yellow trumpets |
| Sarracenia psittacina | Parrot pitcher-plant |
| Scleria ciliata var. elliottii | Fringed nutrush |
| Scleria Georgiana | Georgia nutrush |
| Solidago stricta | Willow-leaf goldenrod |
| Tofieldia racemosa | Coastal false-asphodel |
| Tridens ambiguous | Pinebarren tridens |
| Utricularia subulata | Zigzag bladderwort |
| Vernonia gigantean | Tall ironweed |

| | |
|---|---|
| Viola lanceolata | Lance-leaf violet |
| Viola primulifolia | Primrose-leaf violet |
| Viola septemloba | Southern coast violet |
| Xyris baldwiniana | Baldwin's yellow-eyed-grass |
| Xyris caroliniana | Carolina yellow-eyed-grass |
| Xyris drummondii | Drummond's yellow-eyed-grass |
| Xyris fimbriata | Fringed Yellow-eyed-grass |
| Xyris stricta | Pineland yellow-eyed-grass |
| Zigadenus densus | Crow-posion |
| Zigadenus glaberrimus | Atlantic deathcamas |