YELLOW RIVER RANCH RESTORATION

UWRMP Section 5.2.1 Supplement

(Remaining Mitigation Credit Potential)

Last Revision: October 8, 2007

Site Description:

In December, 2005, the NWFWMD acquired the 275-acre Yellow River Ranch parcel for use as mitigation for FDOT wetland impacts. Located on the Yellow River floodplain in Santa Rosa Co., it is 1½ miles east of SR 87 and is bordered on three sides by extensive forested floodplain wetlands acquired in the 1990s by the NWFWMD. A homestead with extensive pasture is adjacent to the northern boundary. Approximately 155 acres of the Yellow River Ranch consists of intact forested wetlands (FLUCCS 615 – Bottomland Floodplain Forest), with the remaining 120 acres consisting of former forested wetlands (FLUCCS 615 – Bottomland Floodplain Forest and FLUCCS 625 – Hydric Pine Flatwoods) that were converted to improved pasture (FLUCCS 211 – Improved Pasture) for cattle grazing operations. As mitigation for current CORPS permits associated with SR 87[1], the NWFWMD is preserving the 155 acres of intact forested wetlands and restoring ~55 acres of the pasture to forested wetlands. Approximately 65 acres of prior-converted wetlands (i.e., the pasture) remain available for restoration and use as mitigation for future impacts.

Restoration:

Conversion from high-quality forested wetlands to improved pasture was accomplished by the removal of forest vegetation (canopy, shrub layer and groundcover), severe hydrologic alteration from ditching and dike construction, and the establishment and maintenance of exotic pasture grasses. Decades of cattle grazing operations followed and ceased only with NWFWMD acquisition. Restoration of the remaining 65 acres of pasture will be consistent with ongoing efforts. Functional wetland lift will be derived from 1) filling in or blocking of drainage ditches, 2) breaching of the dike, 3) eradication of non-native pasture grasses including Bahia grass and other nuisance exotic species, 4) revegetation with bottomland hardwood forest and hydric pine flatwood species including appropriate groundcover, 5) implementation of a growing-season fire regime within restored flatwood areas, and 6) long-term management including control of nuisance and exotic species.

The pasture will be restored as a mixture of bottomland floodplain forest (FLUCCS 615) and, where appropriate, hydric pine flatwoods (FLUCCS 625). For portions of the pasture to be restored as bottomland hardwood forest, vegetation to be planted includes a mixture of Atlantic

[1]CORPS Permit SAJ-2000-02363 (IP-CP), SR 87 from US 98 to Five Forks Road, 5.68-acre impact; CORPS Permit SAJ-2004-2643 (IP-EPS), SR 87 from Five Forks Road to Eglin AFB, 12.07-acre impact.

white cedar, possum haw, black gum, laurel oak, cypress and American elm. Areas targeted for hydric pine flatwoods restoration would be planted with species including slash pine, cypress, myrtle leaf holly, appropriate hydric flatwoods groundcover seed, and possibly wiregrass tubelings. Generally, areas with Bibb-Kinston Association soils will be targeted for restoration as bottomland floodplain forest, whereas areas of Mulat Loamy Fine Sand soils will be targeted for hydric pine flatwoods restoration. Upon completion of restoration activities, long-term ecological management will be implemented seamlessly across the Yellow River Ranch.

Sequence of Restoration Activities—

- Cessation of cattle operations (accomplished with acquisition in 2005).
- Hydrologic restoration.[2]
    - Ditch infill and/or plugs
    - Dike breaches
- Eradication of exotic pasture grasses including Bahia grass and other nuisance exotic species such as Chinese tallow (may require multiple applications of herbicides over multiple growing-seasons).
- Revegetation of forested wetland and flatwood species.
- Implementation of long-term ecological management including exotics control and eventual prescribed fire in restored flatwood areas where/when appropriate.

Planting Specifications – Wetland Hardwood Forest

Scientific Name	Common Name	% of Planting Mix
Chamaecyparis thyoides	Atlantic White-Cedar	25
Ilex decidua	Possom Haw	5
Nyssa sylvatica	Black Gum	20
Quercus laurifolia	Laurel Oak	10
Taxodium ascendens	Cypress	30
Ulmus Americana	American Elm	10

1 gallon-size potted plants will be used; Planting density will be 440 trees per acre; Plant spacing will be on 10' centers.

[2] "Yellow River Ranch Hydrologic-Hydraulic Study" (NWFWMD – June, 2007) is available for review at http://NWFMWDwetlands.com.

Planting Specifications – Hydric Pine Flatwoods		
Scientific Name	**Common Name**	**% of Planting Mix**
Pinus elliottii	Slash Pine	80
Taxodium ascendens	Cypress	15
Ilex myrtifolia	Myrtle Leaf Holly	5
Aristida stricta var. berichiana	Wiregrass	100 (Understory)
Variable	Wet Flatwood Species	N/A
For Slash Pine, Cypress, and Myrtle Leaf Holly, 1 gallon-size potted plants will be used, planting density will be 110 trees per acre, and spacing will be on 30' centers. For Wiregrass, tubelings will be planted on 3-6' centers. Herbaceous wet flatwood seed will be spread at a rate of 2-3 lbs. per acre.		

Success Criteria:

- Nuisance vegetation ≤ 5% cover of site.
- Exotic vegetation ≤ 1% cover of site.
- Tree density of 352-440 trees/acre in bottomland restoration areas and 88-110 trees/acre in hydric pine flatwood restoration areas after five years.
- Native groundcover and shrub layer species appropriate for natural community type trending toward increase in diversity and coverage.

Monitoring:

Monitoring protocols necessary to ensure effective preservation, enhancement and restoration are described in Chapter 11.0 of the UWRMP. Monitoring may be conducted by NWFWMD staff or qualified consulting firms. Monitoring will be conducted for five years after initiation of restoration activities or per CORPS / MRT conditions. Specific monitoring proposed for at this site follows.

1. UMAM reassessment 5 years and 10 years after initiation of restoration.
2. Annual 15+ minute pedestrian surveys; number of survey paths to be determined in field.
3. Permanent 360^{o} photographic stations; number of photo-points to be determined in the field.
4. Vegetation transects, quadrats or similar quantitative sampling methods may be conducted annually if specified by CORPS / MRT.

Functional UMAM Units:

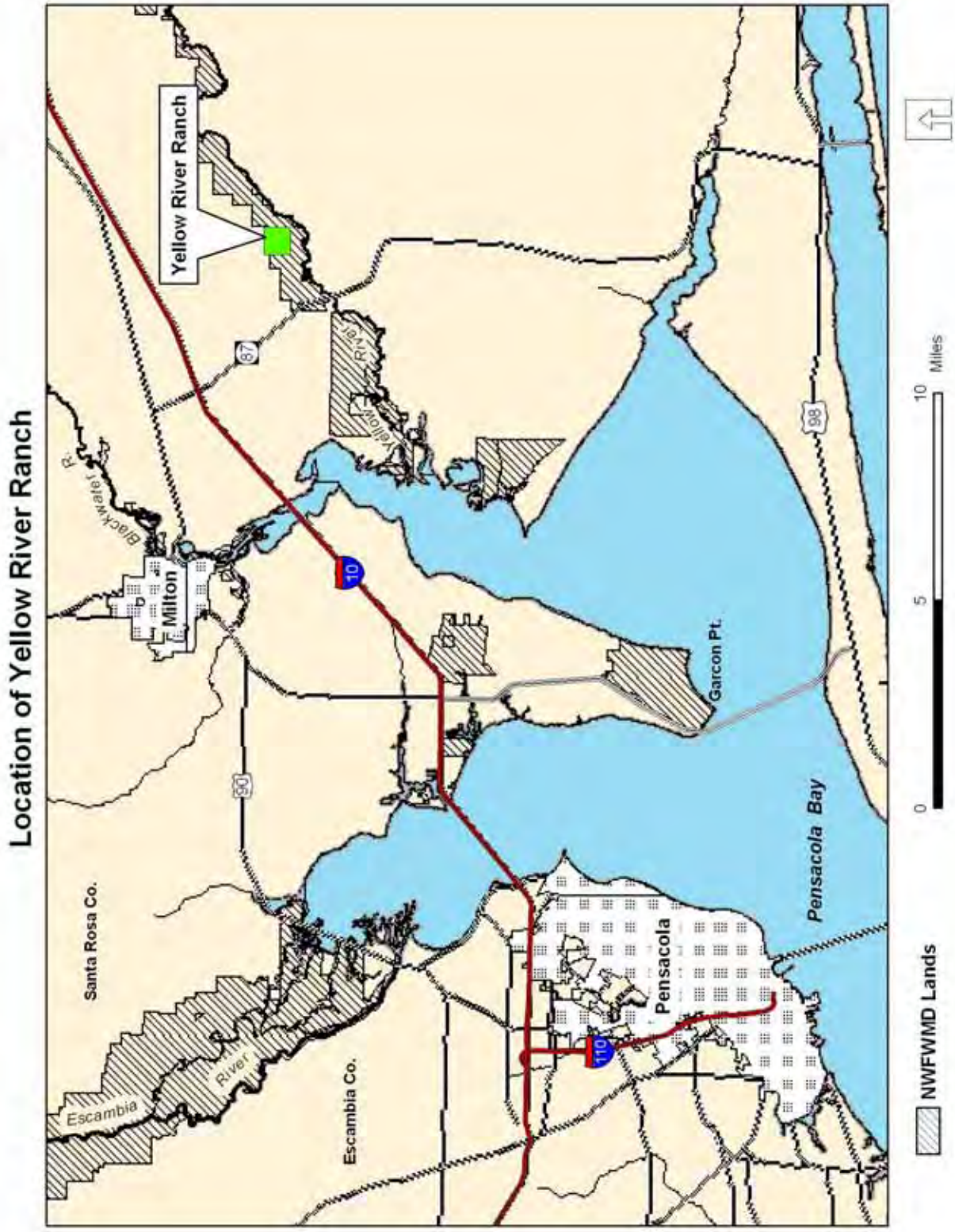
The CORPS / MRT (Panama City, Quarterly UWRMP Meeting, 9/26/07), in discussion with the NWFWMD, determined that 34.65 UMAM wetland credits will be generated by restoration of the remaining 65 acres of improved pasture.

Long-term Management:

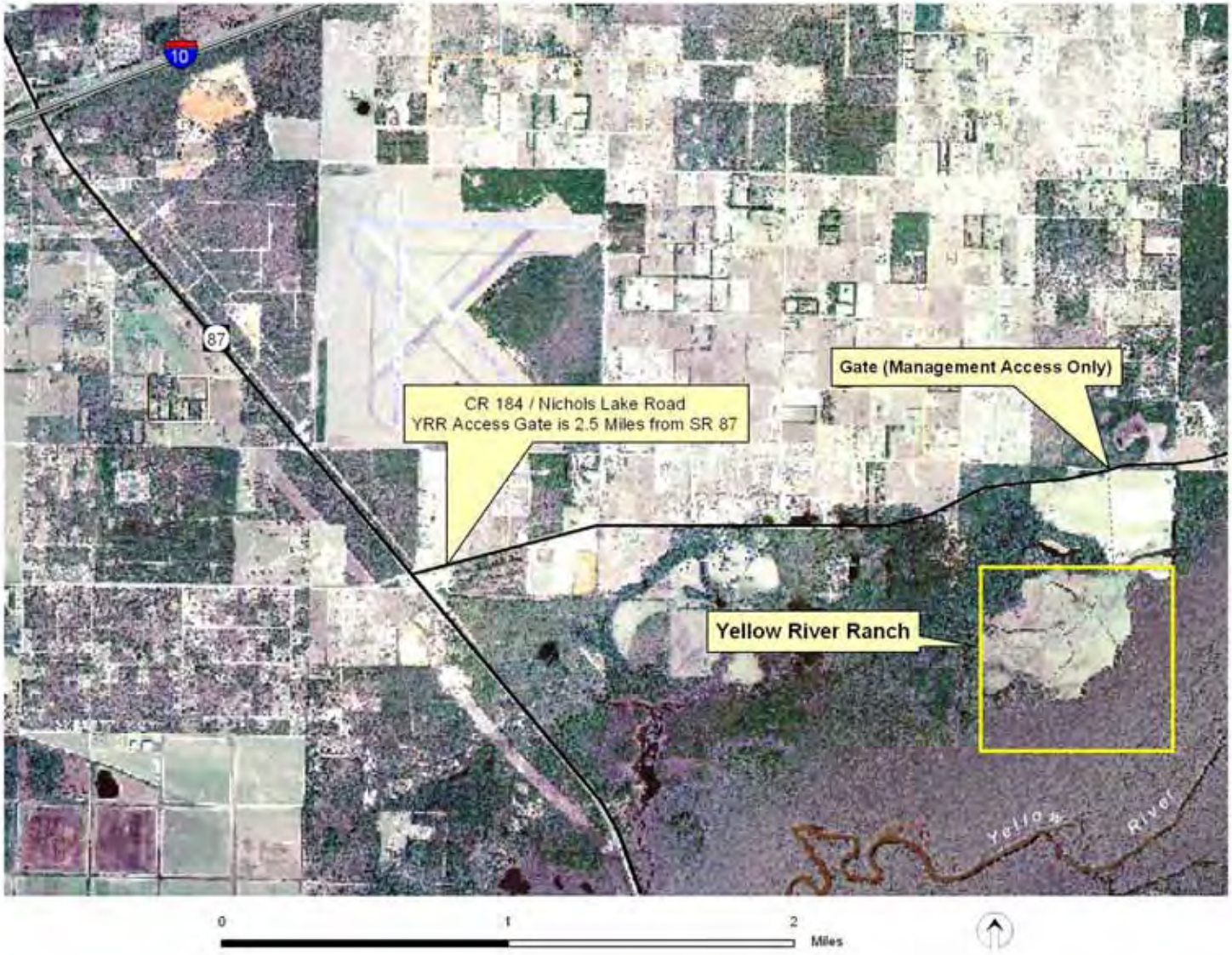
The NWFWMD is responsible for ensuring the perpetual management of mitigation lands. Florida Statutes sections 373.1391(1)(a) and 373.59(3) mandate the ecological management and restoration, to the extent practicable, of lands owned by the NWFWMD. Mitigation lands owned by the NWFWMD will be managed in perpetuity for ecological integrity in accordance with the "Management Policies for Water Management Areas of the Northwest Florida Water Management District" (NWFWMD 1998). Long-term management is described in the UWRMP Chapter 11.

Annual Status Reports:

Annual status reports will be generated for five years following initiation of restoration activities and posted at http://www.nwfwmdwetlands.com. A summary status report for all mitigation projects, including cost accounting, will also be provided annually to the CORPS / MRT if requested.


Location of Yellow River Ranch
Yellow River Ranch
Milton
Blackwater R.
Yellow R.
Santa Rosa Co.
Escambia
River
Escambia Co.
Pensacola
Garcon Pt.
Pensacola Bay
10
87
90
98
110
0
5
10
Miles
NWFWMD Lands

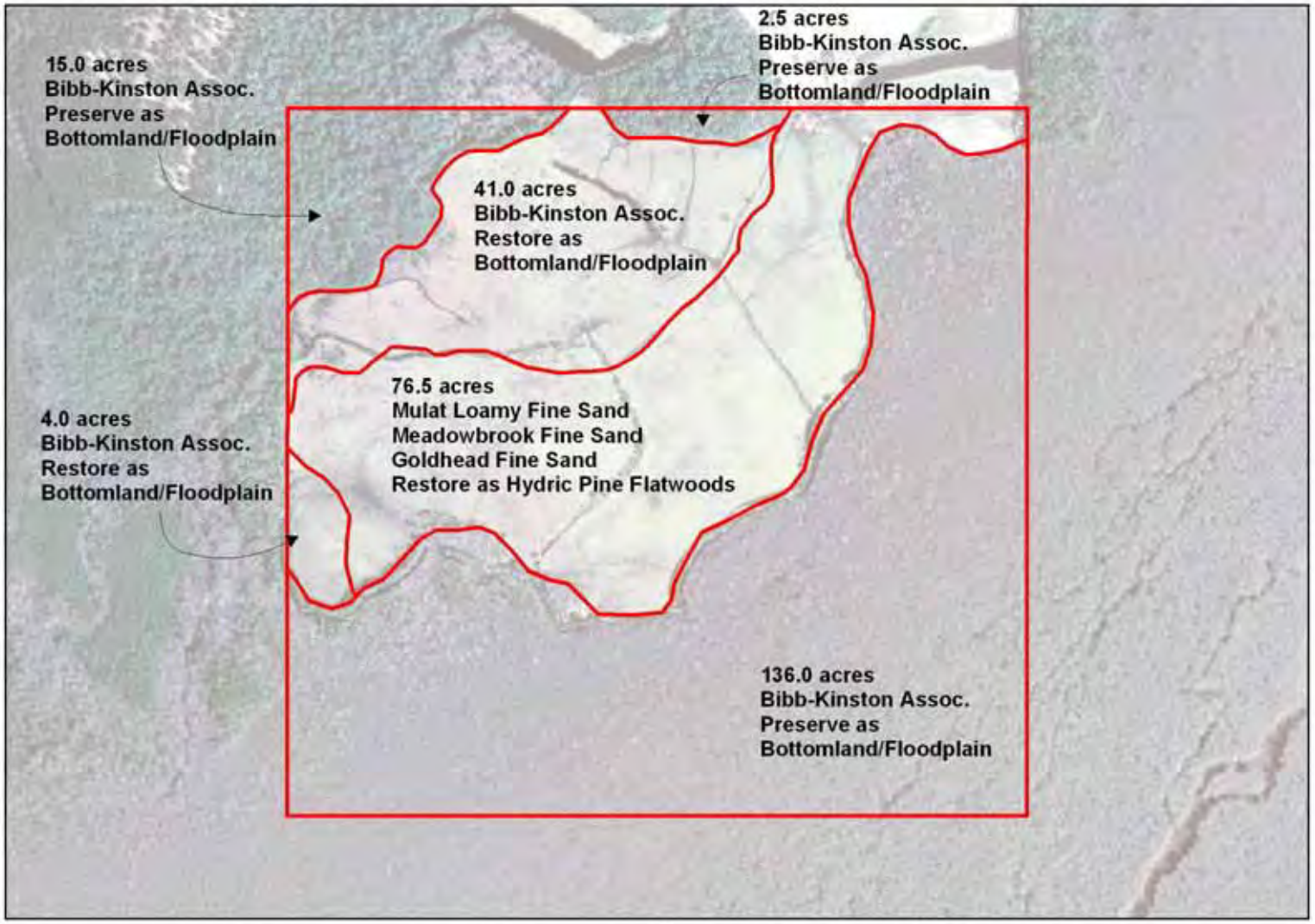
Directions to Yellow River Ranch



Yellow River Ranch - 2004 DOQ

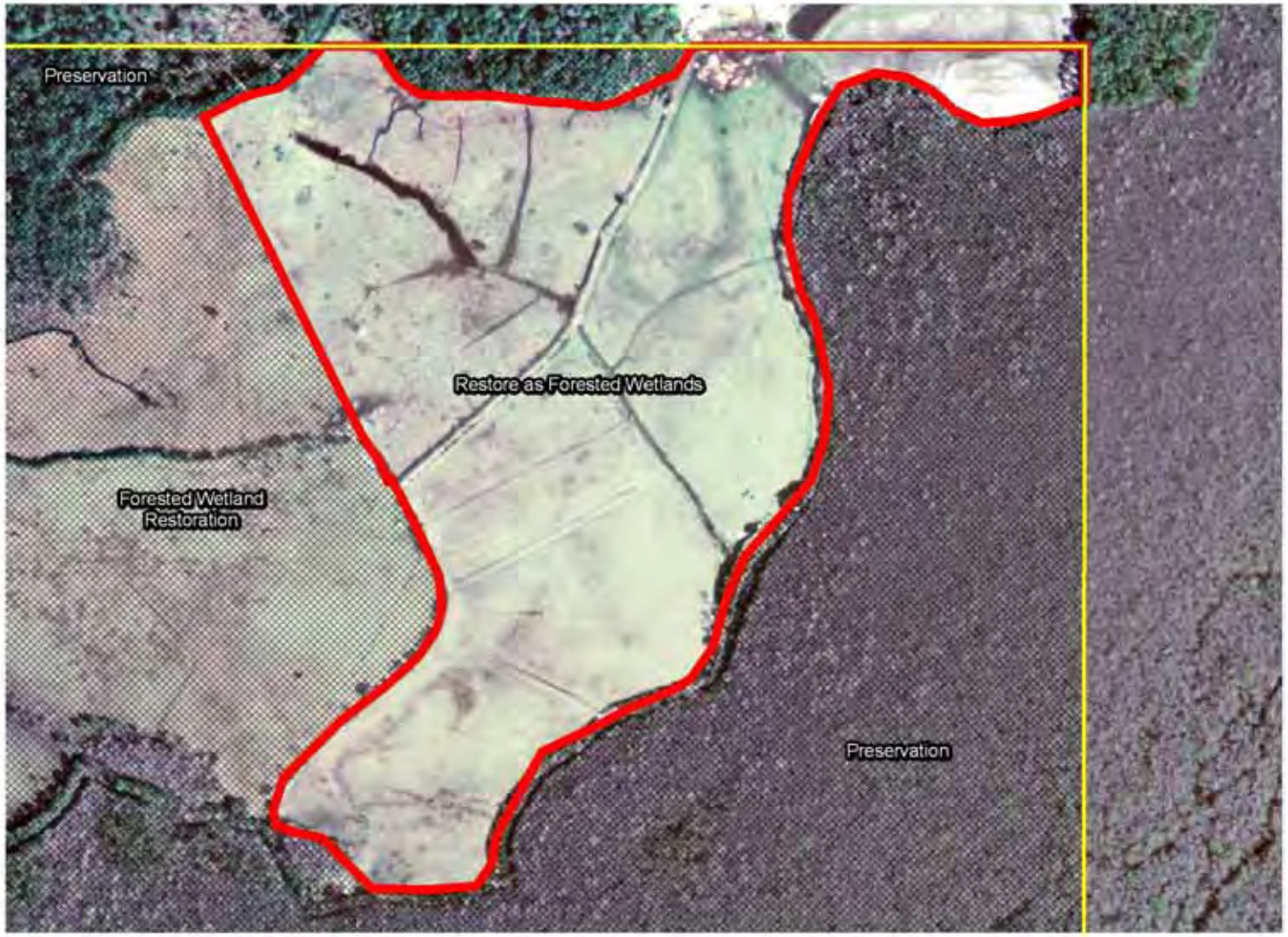
Yellow River Ranch - 1949 B&W Aerial

Yellow River Ranch - Soils and Restoration Plan*



*On-site Conditions May Alter Actual Boundary Between Bottomland/Floodplain and Hydric Pine Flatwood Restoration Polygons

Yellow River Ranch - Remaining Mitigation Area



Area with Remaining Mitigation Credit Potential (~65 Acres)

0 0.1 0.2 Miles

CORPS / MRT inspecting Yellow River Ranch pasture and dike (9/25/07)

Yellow River Ranch Soils[3]

Bibb-Kinston Association. These are floodplain soils subject to frequent flooding. Natural vegetation consists of "gum, bay, cypress, juniper, oak, and a few scattered longleaf pine. The dense understory consists of tit, wax myrtle, ferns, and other water-tolerant shrubs" (NRCS, 5/1980).

Goldhead Fine Sand. Typical tree species includes slash pine, loblolly pine, longleaf pine, and blackgum with cypress occurring in the wettest places. The understory includes inkberry, waxmyrtle, pineland threeawn, pitcher plants, and bracken fern (NRCS, 7/1999).

Meadowbrook Fine Sand. Typical vegetation includes mixed stands of slash pine, loblolly pine, and longleaf pine with live laurel, and water oaks, blackgum, sweetgum, red maple and cypress in wetter areas. The understory includes gallberry, waxmyrtle, wiregrass, pitcher plants, and bracken fern (NRCS, 7/2007).

Mulat Loamy Fine Sand. Typical natural vegetation is slash and longleaf pine, gallberry, waxmyrtle, pineland threeawn, dwarf huckleberry, and bluestems. Wetter areas contain baldcypress and pitcher plants (NRCS, 9/2002).

Appropriate vegetation targets would include:

Bibb-Kinston Association—floodplain and bottomland forest with cypress and tupelo.
Goldhead Fine Sand—pine flatwoods.
Meadowbrook Fine Sand—hydric pine flatwoods.
Mulat Loamy Fine Sand—hydric pine flatwoods.

[3] Mapping of soils occurring at the Yellow River Ranch is from the Soil Conservation Service (SCS) Soil Survey of Santa Rosa Co., FL, (May 1980), and an undated GIS soils coverage of Santa Rosa Co. Soil properties were obtained from the 1980 SCS Soil Survey of Santa Rosa Co. and updated data obtained from various online NRCS (formerly SCS) reports.

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Yellow River Ranch	**Not Applicable**	**Polygon A (Prior Conversion Wetland)**

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
211 - Improved Pasture (Current) **615 - Bottomland (Restored)**	**---**	**Mitigation**	**25 Acres**

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Pensacola Bay System	**III**	**None**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Part of Yellow River floodplain swamp. NWFWMD-owned lands border three sides of Yellow River Ranch. A homestead with extensive pasture borders the northern side.

Assessment area description

Former floodplain forest converted to improved pasture. Wetlands impacts include removal of forest trees, native shrub and groundcover, extensive ditching, obstruction of natural flooding by construction of a dike, erosion associated with cattle grazing operations, and establishment of exotic pasture grasses.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Yellow River Water Management Area; Eglin AFB.	**Typical**

Functions	Mitigation for previous permit/other historic use
Water quality; water storage; floral and faunal habitat.	**None for this polygon. 210 acres of Yellow River Ranch previously used as mitigation for permitted SR 87 impacts (SR 87 road segments from US 98 to Eglin AFB).**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Oak, southern and eastern toad. Southern cricket frog, box turtle, green anole, corn snake, black racer, yellow rat snake. Deer. Pigmy and eastern diamondback rattlesnake, American Kestral, pine warbler, amphiumas, striped crayfish snake, spring peeper, tiger salamander, white ibis, wood duck turkey, otter cotton mouse racoon.	**Black Bear, American Kestral, White Ibis**

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Deer tracks.

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
CORPS / MRT with NWFWMD Staff	**9/25-26/07**

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Yellow River Ranch	**Not Applicable**	**Polygon A (Prior Conversion Wetland)**
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	**CORPS / MRT and NWFWMD Staff**	**9/25-26/07**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

		w/out mit	with mit
.500(6)(a) Location and Landscape Support	**Current** - Existing pasture does not meet federal criteria for jurisdictional wetland. **With Mitigation** - Restored forested wetlands provide habitat and water quality benefits to hydrologically connected forested wetlands.	0	9
.500(6)(b)Water Environment (N/A for Uplands)	**Current -** Existing pasture does not meet federal criteria for jurisdictional wetland. **With Mitigation -** Appropriate hydrologic regime restored by infilling of blocking of ditches, breaching of dike, and reestablishement of forest cover.	0	8
.500(6)(c)Community structure Vegetation and/or Benthic Community	**Current -** Existing pasture does not meet federal criteria for jurisdictional wetland. **With Mitigation -** Reestablishment of floodplain forest and hydric pine flatwoods, and eradication of exotic species.	0	9

Score = sum of above scores/30 (if uplands, divide by 20)	w/out mit	with mit
	0.00	0.87

Delta = [with - w/out]
0.87

If preservation as mitigation
Preservation adjustment factor = N/A
Adjusted mitigation delta = N/A

If mitigation / restoration
Time Lag Factor (16-20 years) = 1.68
Risk factor = 1.25

For impact assessment areas
N/A

olygon Acreage = 25	
For mitigation assessment areas	
Mitigation Credits [(Delta / (Time Lag * Risk)) * Acres] =	**10.317**

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Yellow River Ranch	**Not Applicable**	**Polygon B (Upland Conversion)**

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
211 - Improved Pasture (Current) **625 - Hydric Pine Flatwoods (Restored)**	**---**	**Mitigation**	**40 Acres**

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Pensacola Bay System	**III**	**None**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Part of Yellow River floodplain swamp. NWFWMD-owned lands border three sides of Yellow River Ranch. A homestead with extensive pasture borders the northern side.

Assessment area description

Improved pasture. Impacts include removal of natural vegetation cover including trees, shrub and groundcover, extensive ditching, obstruction of natural flooding by construction of a dike, erosion associated with cattle grazing operations, and establishment of exotic pasture grasses.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Yellow River Water Management Area; Eglin AFB.	**Typical**

Functions	Mitigation for previous permit/other historic use
Water quality; water storage; floral and faunal habitat.	**None for this polygon. 210 acres of Yellow River Ranch previously used as mitigation for permitted SR 87 impacts (SR 87 road segments from US 98 to Eglin AFB).**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Oak, southern and eastern toad. Southern cricket frog, box turtle, green anole, corn snake, black racer, yellow rat snake. Deer. Pigmy and eastern diamondback rattlesnake, American Kestral, pine warbler, amphiumas, striped crayfish snake, spring peeper, tiger salamander, white ibis, wood duck turkey, otter cotton mouse racoon.	**Black Bear, American Kestral, White Ibis**

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Deer tracks.

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
CORPS / MRT with NWFWMD Staff	**9/25-26/07**

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Yellow River Ranch	**Not Applicable**	**Polygon B (Upland Conversion)**
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	**CORPS / MRT and NWFWMD Staff**	**9/25-26/07**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

		w/out mit	with mit
.500(6)(a) Location and Landscape Support	**Current** - Existing pasture does not meet federal criteria for jurisdictional wetland. **With Mitigation** - Restored hydric pine flatwoods provide habitat and water quality benefits to hydrologically connected forested wetlands.	0	9
.500(6)(b)Water Environment (N/A for Uplands)	**Current -** Existing pasture does not meet federal criteria for jurisdictional wetland. **With Mitigation -** Appropriate hydrologic regime restored by infilling of blocking of ditches, breaching of dike, and reestablishement of forest cover.	0	8
.500(6)(c)Community structure Vegetation and/or Benthic Community	**Current -** Existing pasture does not meet federal criteria for jurisdictional wetland. **With Mitigation -** Restoration of hydric pine flatwoods and eradication of exotic species.	0	9

Score = sum of above scores/30 (if uplands, divide by 20)		
	w/out mit	with mit
	0.00	0.87

Delta = [with - w/out]
0.866667

If preservation as mitigation
Preservation adjustment factor = N/A
Adjusted mitigation delta = N/A

If mitigation / restoration
Time Lag Factor (5 years) = 1.14
Risk factor = 1.25

For impact assessment areas
N/A

lygon Acreage = 40	
For mitigation assessment areas	
Mitigation Credits [(Delta / (Time Lag * Risk)) * Acres] =	**24.327**

Yellow River Ranch
UMAM Credit Assessment - September, 2007

DO NOT ENTER DATA ON THIS PAGE.
ENTER SCORES ONLY ON INDIVIDUAL POLYGON PAGES

Polygon	Acres	L1	L2	W1	W1	C1	C2	W/Out Score	With Score	Raw Delta	Time Lag	P Factor	Risk	Adjusted Delta	UMAM Credits
A	25	0	9	0	8	0	9	0.00	0.87	0.87	1.68	1	1.25	0.413	10.317
B	40	0	9	0	8	0	9	0.00	0.87	0.87	1.14	1	1.25	0.608	24.327
	65														34.645

L1 = Location and Landscape Support - Without Mitigation
L2 = Location and Landscape Support - With Mitigation
W1 = Water Environment - Without Mitigation
W2 = Water Environment - With Mitigation
C1 = Community Structure - Without Mitigation
C2 = Community Structure - With Mitigation

Raw Delta = w/mit score - without mitigation score

P = Preservation Factor (assumption is that preservation polygons are enhanced by buffer restoration)

Adjusted Delta = Raw Delta / (Time Lag * Risk)

UMAM Credits = Acres * Adjusted Delta