Florida Department of Environmental Protection

Chapter 62-345: Uniform Mitigation Assessment Method

Office of Submerged Lands and Environmental Resources
Connie Bersok, Environmental Administrator

UMAM's statutory basis

373.414(18), F. S. directed that the method

- Provide an exclusive and consistent process
- Determine the amount of mitigation needed
- Binding on DEP, WMDs, local governments
- Requires the application of reasonable scientific judgment
- Determine the value of functions provided by wetlands and other surface waters
- Account for different ecological communities in different areas of the state
- Be practicable for use within permitting timeframes

UMAM = Chapter 62-345, F.A.C.

- Adopted and became effective 2/2/2004
- Amended 9/12/2007

UMAM stands for:

- **U**NIFORM – consistent, reliable
- **M**ITIGATION – used only when mitigation is needed
- **A**SSESSMENT - reasonable scientific judgment
- **M**ETHOD – a process

UMAM is comprised of 2 basic parts:

Part I – Qualitative Characterization

- What are you looking at?
- Impact or mitigation site?
- What are the surroundings?
- What type of community is it?
- What would you expect to see in this type of community?

Part II – Quantification of Assessment Area

- How well does the assessment area compare to the optimal community of this type, considering
  - location and landscape support,
  - water environment,
  - and community structure?

Part I

- Provides a frame of reference for the type of community being assessed
- Identifies the functions that will be evaluated

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

Site/Project Name	Application Number	Assessment Area Name or Number	
FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands			
Assessment area description			
Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)		
Functions	Mitigation for previous permit/other historic use		
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)		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):			
Additional relevant factors:			
Assessment conducted by:	Assessment date(s):		

Form 62-345.900(1), F.A.C. [effective date 02-04-2004]

Part II

- Three categories of function
- Numeric Scoring, whole numbers
- Narrative to support the scores, indicators of function

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
Impact or Mitigation	Assessment conducted by:	Assessment date:

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/o pres or current	with
.500(6)(a) Location and Landscape Support		
.500(6)(b)Water Environment (n/a for uplands)		
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community		

Score = sum of above scores/30 (If uplands, divide by 20)	current or w/o pres	with

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

3 UMAM categories of wetland function

- Location and Landscape Support
- Water Environment
- Community structure
- Scored 0 (no function) – 10 (optimal)
  - Current condition
  - "with impact" or "with mitigation"
  - Sum of scores are divided by 30
  - Delta = difference between current and "with"

Then it is all put together

Impact/Loss

Mitigation

Amount (Acres)

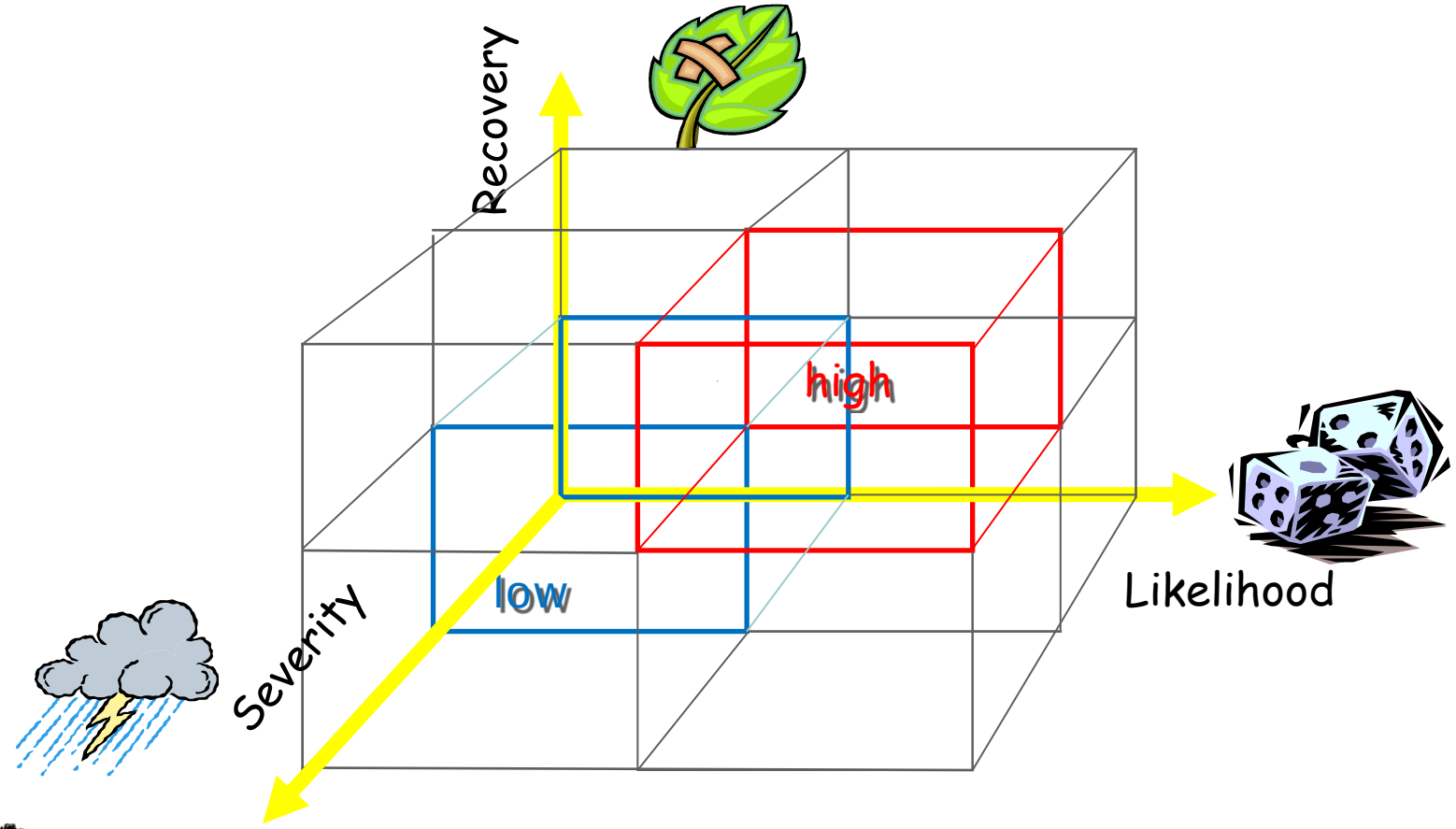
Time lag

Risk

Mitigation Risk and UMAM

- Accounts for the degree of uncertainty that the proposed mitigation will be achieved.
- Risk ranges from 1 – 3, on .25 increments
  - Hydrologic vulnerability
  - Plant community vulnerability
  - Vulnerability to invasive exotic species
  - Water quality vulnerability
  - Secondary impact vulnerability

What is risk?



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Mitigation Time Lag and UMAM

Accounts for the time between when functions are lost at an impact site and when they are fully offset by the mitigation.

- Greater time lag => greater T factor
- T-Factor ranges from 1 – 3.91
- Higher T-factor => greater amount of mitigation

Applies to enforcement action, too, when mitigation is needed

Mitigation and Restoration Plans should reflect ***the best*** of what we know to minimize both risk and time lag.

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Questions about Time Lag

- Does it apply to Preservation? Yes!
- What about Phosphate or heavy mineral mining? No! See 62-345.600(1)(b), FAC and 373.414(6)(b), F.S.
- Is it the same as the 3 – 5 years of monitoring? No, *unless* all the functions are expected to be met by the mitigation at that time

A slight digression on monitoring & mitigation success

Given that the goal of mitigation is to offset the loss of functions incurred by the impacts….

- Does the success criteria reflect that goal?
- Is the intent of the mitigation clear?
- Does the monitoring reflect the success criteria?

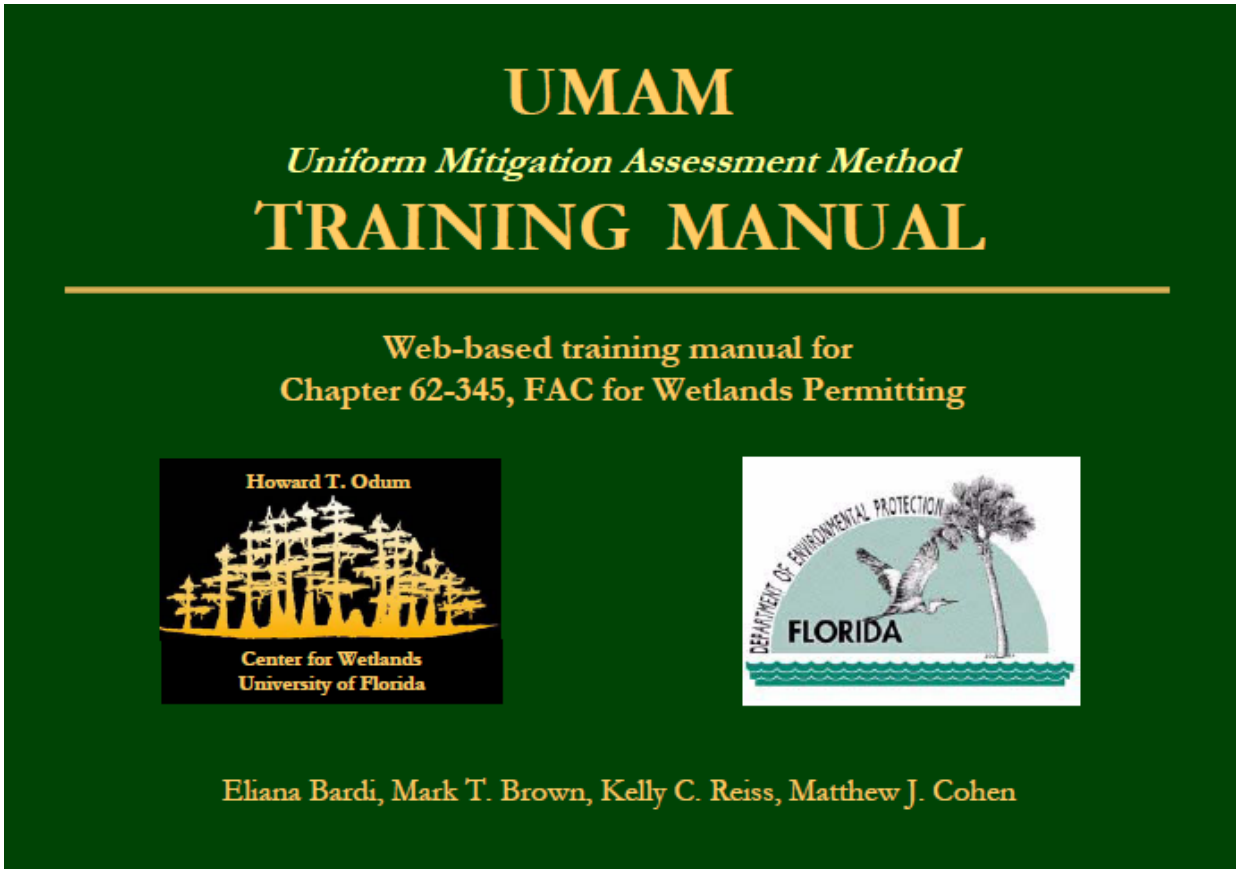
Note: Native communities are not defined by percent survival of planted trees.

Key UMAM terms and concepts

- Functional loss (FL) – measure of functions that would be lost or decreased at an impact area.
- Functional gain (FG) - measure of functions that would be gained or increased at a mitigation area, including adjustments for preservation, time lag, and risk.
- In order to ensure no-net-loss of wetland function, FG $\geq$ FL

Don't forget this on-line resource!

http://sfrc.ufl.edu/ecohydrology/UMAM_Training_Manual_ppt.pdf



Seems simple enough, but…

Location? Landscape?

Preservation scoring???

Uplands? Argh!

UMAM 202

- When UMAM is used
- How to evaluate submittals
- Community Type
- Upland mitigation areas
- Preservation and Preservation Adjustment Factor
- Location and Landscape Support

When is UMAM used?

- Mitigation is needed for permit issuance, *and*
- Mitigation has been proposed, *and*
- Proposed mitigation is appropriate to offset impacts.

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UMAM *may* also be used to assess baseline condition for CUP projects.
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When is UMAM not used?

- When there is *no* mitigation needed (currently or anticipated) or proposed, or
- Proposed mitigation is *not* appropriate to offset impacts, or
- Mitigation is for secondary impacts to fish, wildlife, historic resources per 62-345.100(5), or
- Any other provision of 62-345.100(3) applies.

Doesn't UMAM determine appropriateness?

- No! See 62-345.100(4)
- But X.3 Applicants Handbook does! Mitigation is required only to offset the adverse impacts to the wetland functions caused by the regulated activities
- Mitigation proposal *may not always* offset impacts sufficiently to issue a permit
  - OFW significant degradation
  - Listed species habitat
  - Communities not likely to be successfully restored

Mitigation Appropriateness (X.3.1.1)

- Mitigation community is similar to the community to be impacted.
- But if the impact community has been degraded from historic, mitigate the historic community
- Other community types could be OK if still offset the impacts and result in greater ecological value

Mitigation Appropriateness (X.3.1.2) *state-wide except for SWFWMD*

In general, mitigation is best accomplished when located **on-site** or in **close proximity** to the area being impacted.

Off-site mitigation will only be accepted if adverse impacts are offset and the applicant demonstrates that:

(a) on-site mitigation opportunities are not expected to have comparable **long term viability** *or*

(b) off-site mitigation would provide **greater** improvement in **ecological value** than on-site mitigation.

Mitigation Banks *can be* an appropriate off-site mitigation option

Mitigation Appropriateness (3.3.1.2, SWFWMD only)

Mitigation ***can be conducted on-site or off-site*, or** accomplished through the purchase of credits from a ***mitigation bank*, or** through a ***combination*** of approaches, as long as it sufficiently offsets anticipated adverse impacts to wetlands and other surface waters and meets all other criteria for permit issuance.

Off-site mitigation is preferred when:

a. on-site mitigation opportunities are not expected to have **comparable long-term viability** due to such factors as unsuitable hydrologic conditions or ecologically incompatible existing adjacent land uses or future land uses identified in a local comprehensive plan adopted according to Chapter 163, F.S.; or

b. off-site mitigation will provide **greater improvement in ecological value** than on-site mitigation.

Isn't preservation always mitigation?

When a conservation easement is required to *prevent* secondary or cumulative impacts, it *may* or *may not* be appropriate as mitigation or even needed as mitigation. (X.2.7)

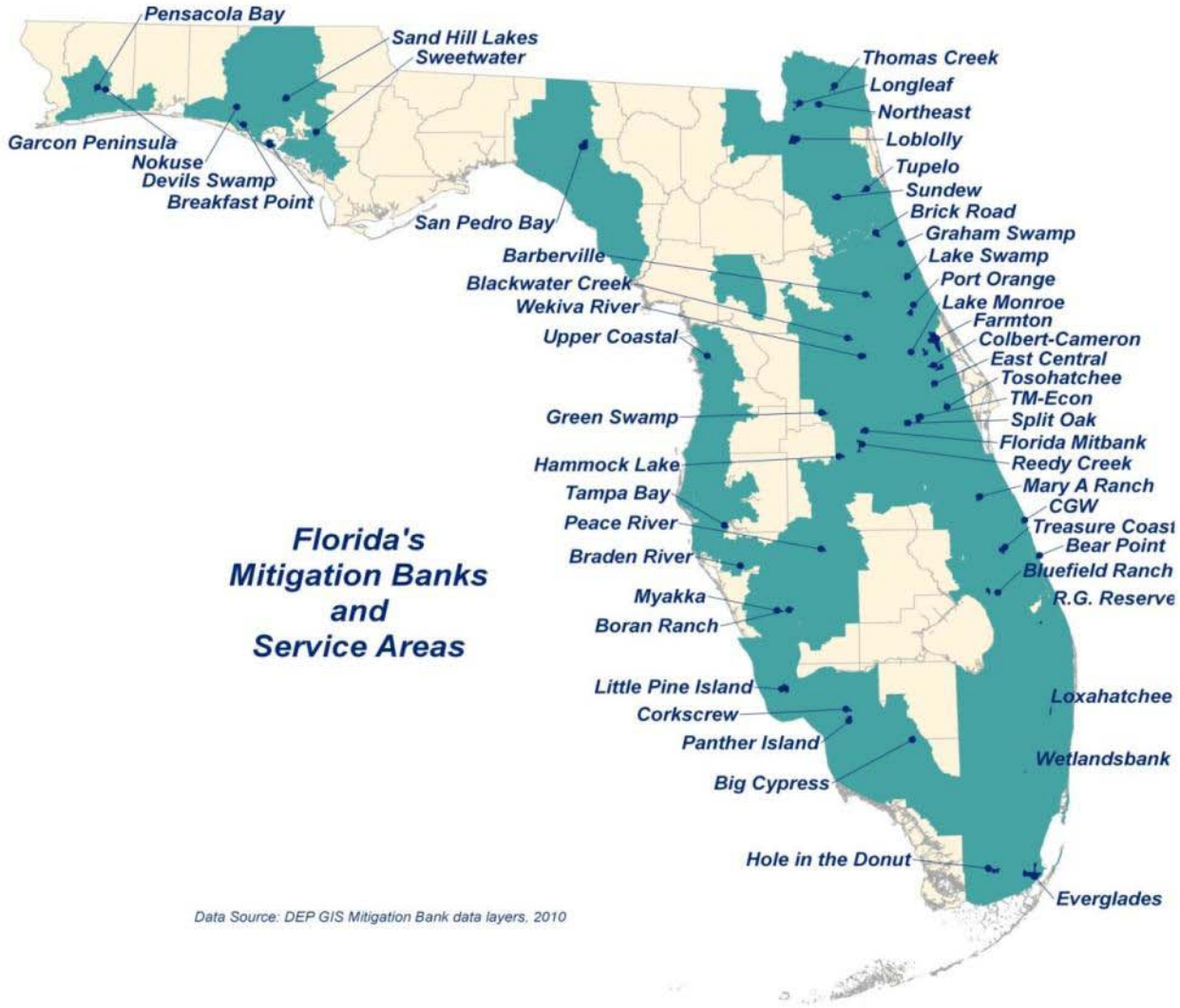
Also, local governments may require areas of land to be preserved as part of their zoning and planning. Is it mitigation? Depends!

A digression on appropriateness

If an applicant can't come up with an appropriate on-site mitigation, then what?

- ***Continue*** to reduce or eliminate impacts to the point where mitigation is not needed, NGP criteria are met
- Mitigation banks
- ROMA, if you are lucky enough to have one in your region
- Off-site alternatives on public lands

Mitigation Banks and Service Areas



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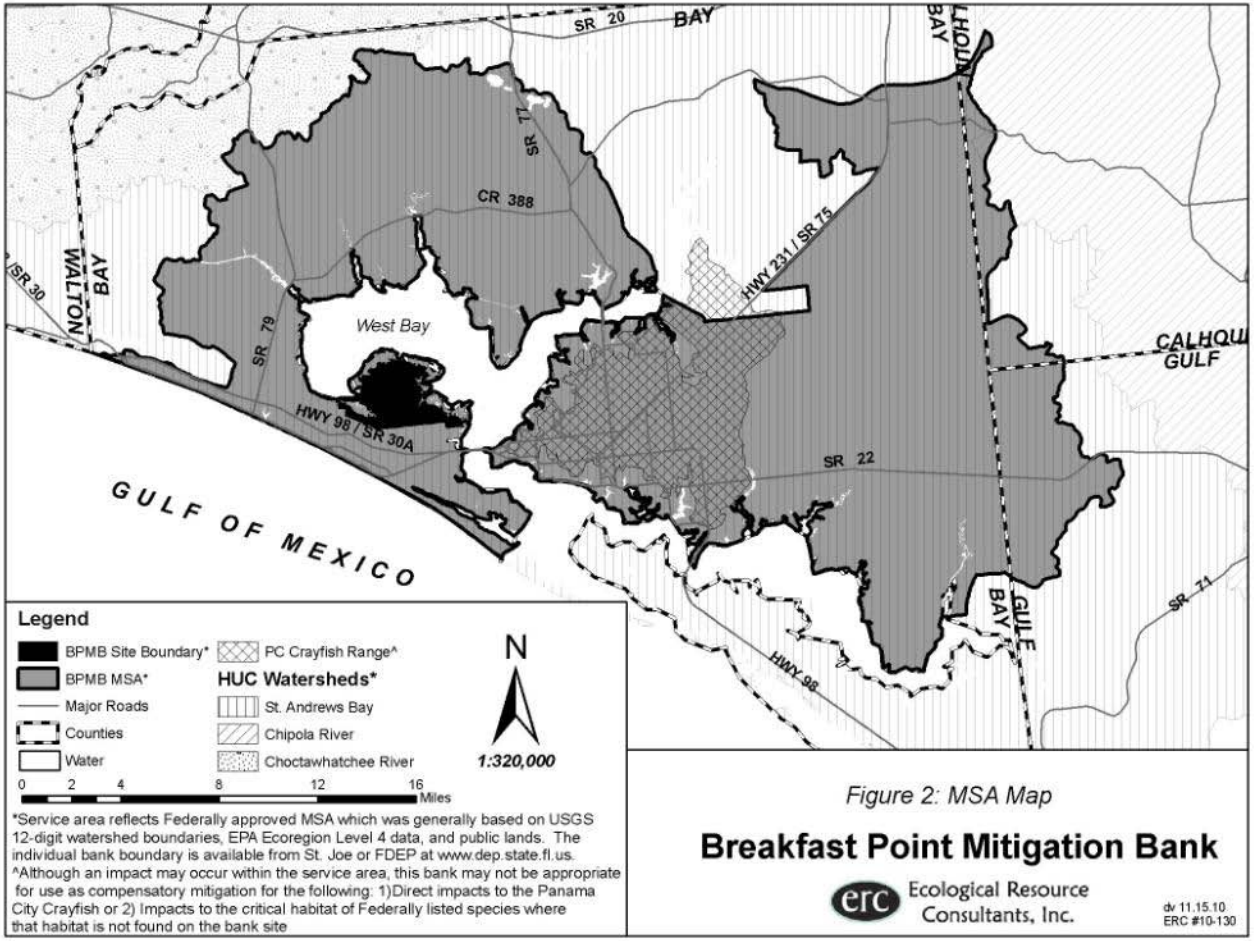
Mitigation Bank Service Areas

Service areas are determined at the time of mitigation bank permitting

Start with the regional watershed in rule

Larger or smaller

MSAs can overlap



Impact needs to be within MSA

OR

- Be 1 acre or less
- Are linear (roadways, pipelines)
- Are partially within the MSA

(373.4136(6)(d), FS)

AND

- The credit types must be appropriate
- The credits must be available

Check with bank permitting agency!

Note the NOTE

Always check for **exceptions** on figures and in the permit language

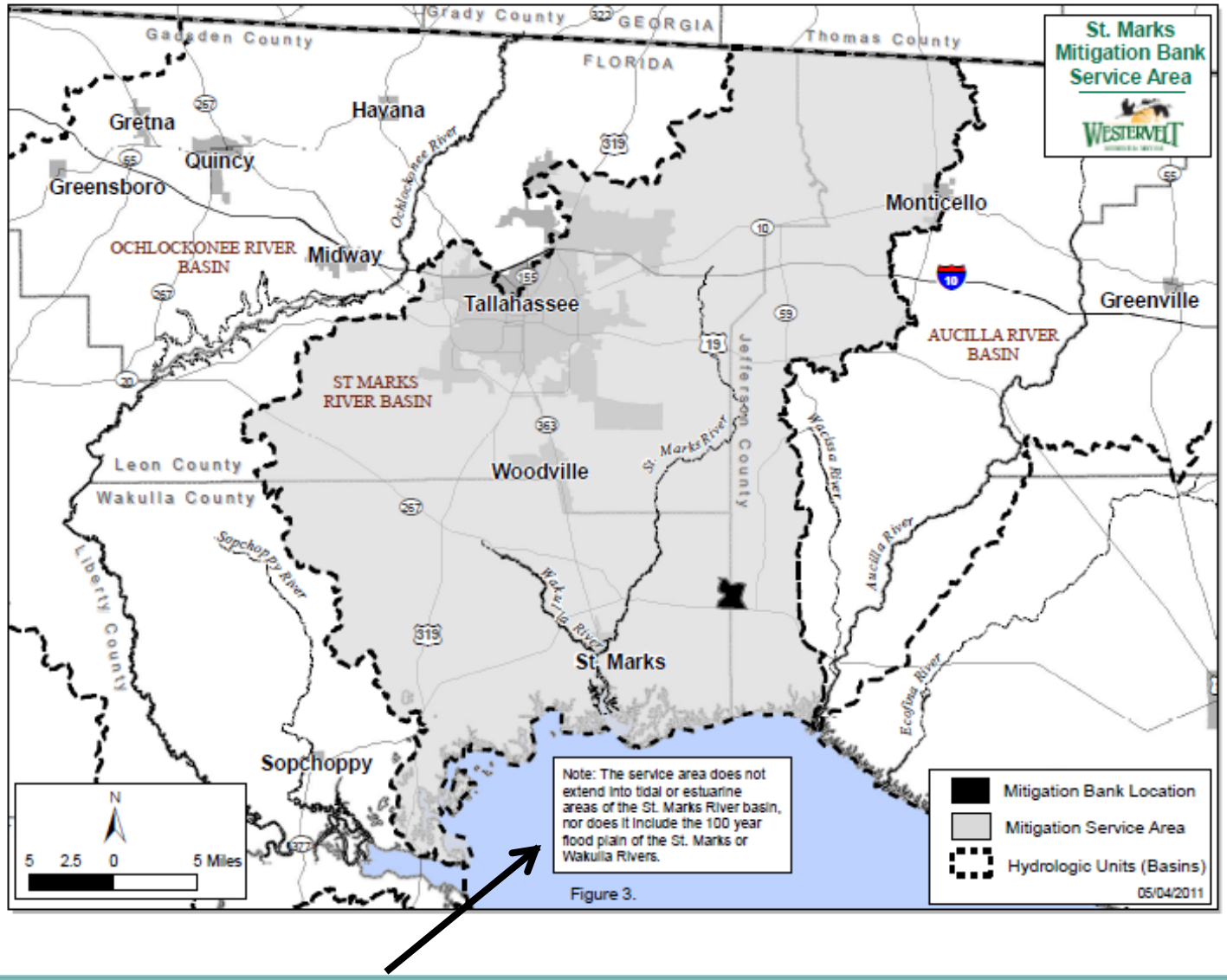


Figure 3.

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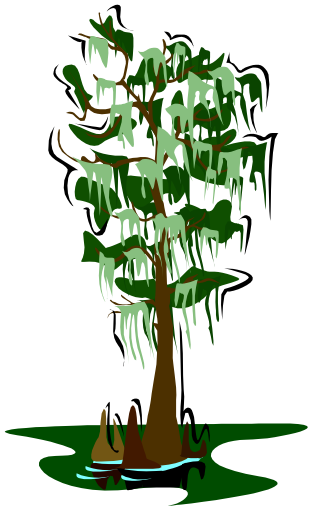
When is the UMAM analysis done?

When the applicant has provided sufficient information for the department to conduct the assessment.

- The applicant does not have to provide either Part I or Part II
- But if Parts I and II are submitted, review and notify applicant of any inadequacy or inaccuracy in application.
- NOT a completeness item

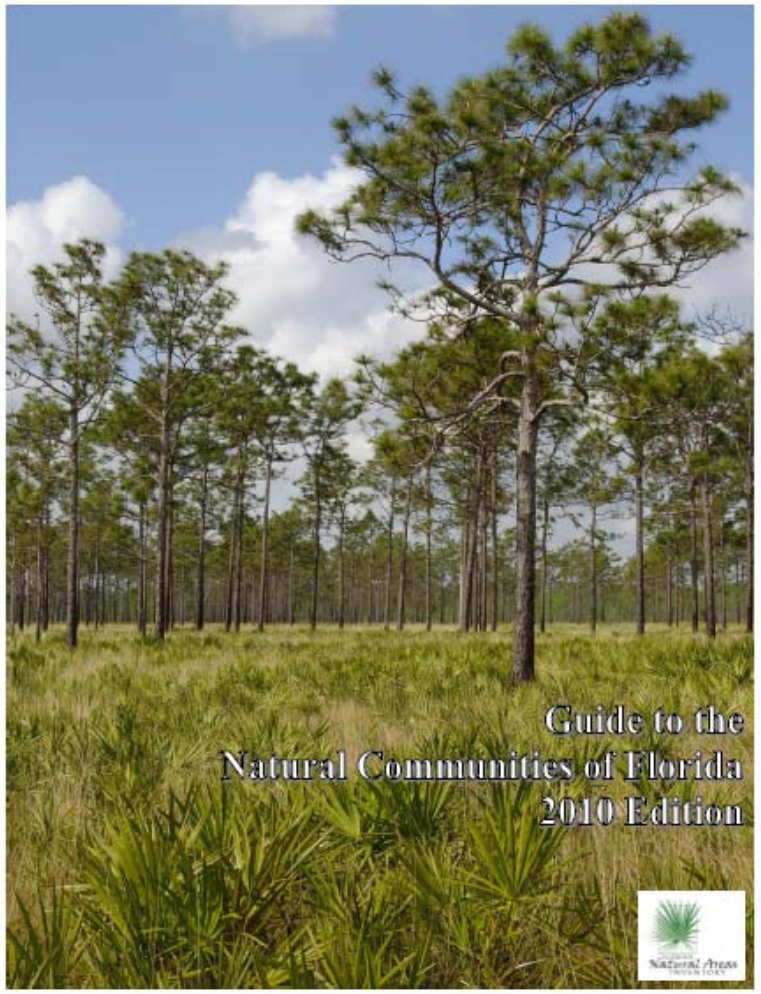
Start with assessment area's community type

- What type of *native or natural* community is the assessment area?
- FLUCCS – on Part I and already provided in ERP, but doesn't provide much *ecological* information, and many of the codes are not native or natural



FNAI Natural Community Guide, 2010

- Provides *ecological information* for each major community type
- Landscape settings
- http://fnai.org/pdf/nc/FNAI_NatComGuide_2010.pdf



Short FNAI description example

PRAIRIES AND BOGS – short hydroperiod; dominated by grasses, sedges, and/or titi.

Seepage Slope (G2/S2) – on or at base of slope with loamy sand substrate; maintained by downslope seepage, usually saturated but rarely inundated; Panhandle and northern peninsula; frequent fire (1-3 years); dense herbaceous community; wiregrass, wiry beaksedges, flattened pipewort, toothache grass, pitcherplants.

Wet Prairie (G2/S2) – flatland with sand or clayey sand substrate; usually saturated but only occasionally inundated; statewide excluding extreme southern peninsula; frequent fire (2-3 years); treeless, dense herbaceous community with few shrubs; wiregrass, blue maidencane, cutthroat grass, wiry beaksedges, flattened pipewort, toothache grass, pitcherplants, coastalplain yellow-eyed grass.

CUTTHROAT SEEP – eastern and western edges of the Lake Wales Ridge in central Florida; dominated by the endemic cutthroat grass.

CALCAREOUS WET PRAIRIE – in central and south-central peninsula on calcareous soils; Gulf hairawn muhly typically dominant with other calcium-loving species.

PITCHERPLANT PRAIRIE – in the Panhandle on wetter soils; dense stands of tall pitcherplants.

Marl Prairie (G3/S3) – flatland with marl over limestone substrate; seasonally inundated (<4 months); southern peninsula; frequent to occasional fire (2-10 years depending on density of herbs); purple muhly, sawgrass (stunted), spreading beaksedge, black bogrush, Florida little bluestem, and/or mixed grasses, sometimes with dwarf cypress.

Shrub Bog (G4/S3) – wetland on organic soil over sand; soil often saturated and mucky, occasionally shallowly inundated; Panhandle to north peninsula; occasional fire (10-20 years); dense stand of shrubs, trees absent or sparse, sphagnum moss common; titi, black titi, fetterbush, large gallberry, laurel greenbrier, pond pine or slash pine.

FNAI example: Marl Prairie in more detail

Description: Marl prairie is a **sparsely vegetated (20-40% cover), graminoid-dominated community found on marl substrates** in South Florida.

It is **seasonally inundated (two to four months)** to a **shallow depth** averaging about eight inches. It occupies large areas at intermediate elevations between marshes or dome and strand swamps with longer hydroperiod of six to twelve months, and pinelands or oak-palm hammocks that are seldom flooded.

In contrast to the longer hydroperiod marshes, with which it has sometimes been confused, marl prairie is a **diverse plant community** which may contain over 100 species, whereas most marsh types have fewer than 20 species.

Marl Prairie example

- Rare species
- Characteristic species
- Geographic range
- Natural processes (fire, hydrology)
- Associated communities
- Exemplary sites
- Crosswalk, references

Everglades National Park (Miami-Dade County)

Know your native communities!

- Be familiar with wetland *and* upland communities in your region
- Know a good field example of each
- FWC - habitat information
- Prepare generic Part I for *your* most common community types

National Key Deer Refuge (Monroe County) Photo by Gary Knight

Freshwater herbaceous communities

- Seepage slope
- Marl prairie
- Wet prairie
- Depression Marsh
- **Basin Marsh**
- Coastal Interdunal swale
- Floodplain marsh
- Slough Marsh
- Glades Marsh

Floodplain Marsh - St. Johns River at Tosohatchee Wildlife Management Area (Orange County)

Basin Marsh

Basin marshes are regularly inundated **freshwater herbaceous wetlands** that may occur in a variety of situations but, in contrast to depression marshes, are not small or shallow inclusions within a fire-maintained matrix community.

Species composition is heterogeneous and can generally be divided into submersed, floating-leaved, emergent, and grassy zones from deepest to shallowest portions; shrub patches may be present within any zones.

Salt Lake Wildlife Management Area (Brevard County)

Characteristic Set of Species: white water lily (*Nymphaea odorata),* maidencane (*Panicum hemitomon)*, sawgrass (*Cladium jamaicense)*, bulltongue arrowhead (*Sagittaria lancifolia),* pickerelweed (*Pontederia cordata),*,sand cordgrass (*Spartina bakeri)*

Basin Marsh –landscape, hydrology

- Occurs in a **variety of isolated or mostly isolated depressions**: fluctuating shorelines of lakes, on the former lake bottoms of "disappearing" lakes, at the head of broad, low basins, and as large deep inclusions within pyrogenic upland communities, or as inclusions in non-pyrogenic communities such as hardwood forests or basin swamps.
- They are regularly inundated with water originating from localized rainfall.
- While water is *generally* not flowing, some basin marshes have outflow, form the headwaters of rivers, such as the St. Johns.
- Throughout Florida and southeastern USA

Basin Marsh – Rare Species

- **Rare plants** include Florida corkwood (*Leitneria floridana),* narrowleaf naiad *(Najas filifolia),* and Mexican tear-thumb *(Polygonum meisnerianum var. beyrichianum)* in northern Florida, plus piedmont jointgrass *(Coelorachis tuberculosa)* and piedmont water milfoil *(Myriophyllum laxum)* from the Panhandle to south-central Florida.
- **Rare animal** species include American alligator *(Alligator mississippiensis),* snail kite *(Rostrhamus sociabilis plumbeus),* black rail *(Laterallus jamaicensis),* Florida sandhill crane *(Grus canadensis pratensis),* numerous species of wading birds, and round-tailed muskrat *(Neofiber alleni)*

Basin marsh – natural processes

Natural fires probably occasionally burned basin marshes at the end of the dry season.

Dense sawgrass and maidencane marshes will burn even when there is standing water.

Frequency of fire varies depending on the hydrology of the marsh and its exposure to fire from surrounding areas.

Natural seasonal and longer-term **fluctuations in water level** are important for maintaining the diversity of marsh vegetation.

If the water level is artificially stabilized, species such as cattail that can tolerate long periods of inundation will tend to dominate.

Basin Marsh – management considerations

Hydrological alteration is the main threat

Ditching and cutting of canals and water table draw-downs for human consumption dampens the natural fluctuations of water levels in the marsh, altering the vegetation.

A **lowered water table** allows shrubby species such as coastalplain willow to invade and shade out the herbaceous vegetation.

Stabilized water levels, along with increased nutrient levels from agricultural runoff, can result in the invasion of exotics, such as water hyacinth (*Eichhornia crassipes)* and Cuban bulrush *(Scirpus cubensis)*.

Fire has been used to control the spread of coastalplain willow in the St. Johns River upper basin marshes after the water levels were lowered by drainage

Basin marsh - Exemplary Sites

- Lake Miccosukee (Leon and Jefferson counties)
- Lake Kissimmee State Park (Osceola County)
- Blue Cypress Lake Conservation Area (St. Lucie County)
- Three Lakes Wildlife Management Area (Osceola and Polk counties)
- Hungryland Wildlife and Environmental Area (Martin and Palm Beach counties)
- Grassy Waters Preserve (Palm Beach County)

Freshwater forested communities

- **Cypress dome**
- Cypress basin swamp
- Cypress strand (So.Fl)
- Floodplain swamp
- Baygall
- Hydric Hammock
- Bottomland hardwoods
- Alluvial Forest

Big Bend Wildlife Management Area
(Taylor County)

Cypress Dome

- An isolated, forested, depression wetland occurring within a fire-maintained community such as mesic flatwoods.
- These swamps are generally small, but may also be large and shallow. The characteristic dome shape is created by smaller trees that grow in the shallower waters of the outer edge, while taller trees grow in the deeper water in the interior of the swamp.

Pond cypress (*Taxodium ascendens)* typically dominates, but swamp tupelo *(Nyssa sylvatica var. biflora),* may also form pure stands or occur as a co-dominant

Cypress Dome – soils, hydrology

- Formed when poor surface drainage causes water to move downward and dissolve the **limestone bedrock**. These depressions then fill in with peat or marl.
- Derive much of their water through **surficial runoff** from surrounding uplands.
- Water levels naturally fluctuate with seasonal rainfall changes. The **normal hydroperiod** is 180 to 270 days per year. The water is deepest, and stays the longest, near the center of the dome, creating a larger buildup of peat there
- They may also be connected directly to the aquifer, where groundwater influences the hydrological regime, especially during periods of drought. Cypress domes **can recharge** the aquifer.

Cypress Dome – landscape features

Occur **within a suite of pyrogenic** communities: mesic flatwoods, dry prairie, glades marsh, upland pine, wet flatwoods, and sandhill.

Generally have fewer canopy species than other swamp types in Florida due to their **more frequent fire regime and smaller size**.

Classically **circular or elliptical** in shape but can occur in any size or shape, especially if the swamp is shallow

Distinguishing features include their **isolation** (within the landscape) and relatively shallow nature.

Cypress Dome - Management

Anthropogenic alterations or influences include:

- regional water level changes,
- ditching or impounding,
- logging,
- nutrient enrichment,
- invasive exotic species invasion

Conversion of the adjacent uplands to agriculture or development impedes natural fire and alters the hydrology of dome swamps that are left unconverted

Extended hydroperiods can limit tree growth and prevent reproduction. Cypress seeds cannot germinate under water and cypress seedlings may not survive if submerged.

Shortened hydroperiods can permit the invasion of mesophytic species, which can change the character of the understory and eventually allow hardwoods to replace cypress

Cypress Dome –Management, cont'd

- **Fire** is essential for maintaining the structure and the species composition of a dome swamp community
- Cypress have fairly thick**, fire-resistant bark** and are tolerant of light surface fires, but catastrophic fires burning into the peat can kill cypress trees
- The **normal fire cycle** might be as short as three to five years along the outer edge and as long as 100 to 150 years towards the center
- **Without periodic fires**, cypress may become less dominant , bay canopy species increase and peat accumulates
- **Catastrophic fire** can consume muck, lower the ground surface, and transform a dome swamp into a pond, wet prairie, or shrub bog

Cypress Domes – Rare Species

A suite of rare **plant** species includes

- pondspice (*Litsea aestivalis),*
- panhandle spiderlily *(Hymenocallis henryae*),
- small-flowered meadowbeauty *(Rhexia parviflora)* in North Florida, and
- many-flowered catopsis *(Catopsis floribunda)* in South Florida.

Dome swamps also provide critical breeding habitat for **flatwoods salamanders** *(Ambystoma cingulatum* and *Ambystoma bishopi)*

So, why not just call a system "cypress"?

- Is it a dome?
- Is it a So Fl strand?
- Is it part of a floodplain?

  (river or lake)
- Is it in a wet prairie?

Landscape setting, hydrology, functions

Estuarine wetland communities

- **Salt Marsh**
- Mangrove swamp
- Keys tidal rock

Florida Keys Wildlife and Environmental Area (Monroe County)

Florida Keys Wildlife and Environmental Area (Monroe County)

Salt Marsh

Salt marsh is a largely herbaceous community that occurs in the coastal zone affected by tides and is protected from large waves: either by the broad, gently sloping topography of the shore, by a barrier island, or by location along a bay or estuary. The width of the intertidal zone and the salt marsh depends on the slope of the shore and the tidal range.

St. Marks National Wildlife Refuge (Wakulla County) Photo by Amy Jenkins

Salt Marsh Community

Salt marsh may have distinct zones

Saltmarsh cordgrass (*Spartina alterniflora)* dominates the seaward edge and borders of tidal creeks, areas most frequently inundated by the tides.

Needle rush *(Juncus roemerianus)* dominates higher, less frequently flooded areas

Other characteristic species include

Carolina sea lavender (*Limonium carolinianum),*

perennial saltmarsh aster *(Symphyotrichum tenuifolium),*

wand loosestrife *(Lythrum lineare)*

shoreline seapurslane *(Sesuvium portulacastrum)*

Salt Marshes – community structure

The **landward edge** of the marsh may be colonized by a mixture of high marsh and inland species

- sawgrass (*Cladium jamaicense),*
- saltmeadow cordgrass *(Spartina patens),*
- Gulf cordgrass *(Spartina spartinae),* and
- sand cordgrass *(Spartina bakeri)*

Salt-tolerant shrubs often marks the transition to upland vegetation or low berms along the seaward marsh edge

- groundsel tree (*Baccharis halimifolia)*
- saltwater falsewillow *(Baccharis angustifolia)*
- marshelder *(Iva frutescens)*
- christmasberry *(Lycium carolinianum*)

Salt Marshes– soils and landscape

- Salt marsh **soils range** from deep mucks with high clay and organic content in the deeper portions, to silts and fine sands in higher areas. The organic soils have a high salinity and high sulfur content.
- Salt marshes occur along the coast throughout the state, ***except for the high wave energy shorelines*** of Palm Beach, Broward, and northern Dade counties
- Exemplary sites with **very gentle seaward slopes** :
  - Big Bend
  - inland of the mangrove fringe in Collier, Monroe, and Dade counties
  - Indian River Lagoon from Volusia to Martin counties
- The mouths of the St Johns and Nassau Rivers are exemplary for a **high tidal range** marsh

Flooding Frequency and Salinity are key

- Needle rush and saltmarsh cordgrass both tolerate a wide range of salinities, but ….
- Cordgrass is found where the marsh is flooded almost daily, whereas needle rush is found where the marsh is flooded less frequently.
- Saltmarsh cordgrass dominates the low marsh (portion < mean high water level), whereas needle rush occupies the high marsh (portion > mean high water level).
- *Both* species tend to form taller stands along tidal creeks where salinity is lower and shorter stands where salinity is higher.
- No data on natural **fire frequency** in salt marshes; probably occurred sporadically by spreading from uplands. Needle rush re-sprouts vigorously after fire *but*, if burned on an annual basis, it declines and is replaced by upland species

A variation: SALT FLAT or high marsh

- Slightly higher areas within the marsh
- Flooded only by storm tides or extreme high tides and isolated from freshwater influx from the surrounding uplands
- Become **very saline** and desiccated due to evaporation.
- Dominated by species that can tolerate high salinities, consisting of either succulents, such as saltwort (*Batis maritima),* perennial glasswort *(Sarcocornia ambigua)* and bushy seaside oxeye *(Borrichia frutescens*), or short grasses, such as saltgrass *(Distichlis spicata)* and seashore paspalum *(Paspalum vaginatum).*
- May become too saline and desiccated to support much plant cover. Vegetation is very sparse and stunted. Such areas appear on aerial photographs as white patches within the marsh

Salt Marsh Functions, Management

Salt marshes are some of the most **biologically productive** natural communities known.

The base of the food chain is supplied not only by the **rooted plant** matter, but also by **algae** and **detritus** found on the stems of plants, on the sediment surface, and suspended in the water column of pools and tidal creeks.

Commercial marine species that spend all or part of their life cycle in tidal creeks include mullet (*Mugil spp*), blue crabs *(Callinectes sapindus*), oysters *(Crassostrea virginica),* and shrimp *(Penaeus spp).* The smaller minnows and juvenile fish in tidal creeks provide food for many recreationally important, predatory fish, such as tarpon *(Megalops atlanticus),* snook *(Centropomus undecimalis),* red drum *(Sciaenops ocellatus),* and spotted seatrout *(Cynoscion nebulosus).*

Rare Species of Salt Marshes

- The saltmarsh topminnow (*Fundulus jenkinsi*) in tidal channels in western Panhandle and ranges west to Texas.
- The Atlantic salt marsh snake *(Nerodia clarkii taeniata)* is endemic to Volusia County
- The American crocodile *(Crocodylus* acutus)uses salt marsh as well as mangrove swamps.
- Several bird species are dependent on them for their entire life cycle. These include seaside sparrows: MacGillivray's (*Ammodramus maritimus macgillivraii)* in Nassau and Duval counties; Scott's *(A. m. peninsulae)* along the Gulf coast from Pinellas to Franklin County.
- The salt marsh vole (*Microtus pennsylvanicus dukecampbelli)* is known only from salt marshes in the vicinity of Cedar Key, Levy County.

Salt Marsh– Management, threats

- **Historic losses** through diking and flooding, ditching for mosquito control, bulkhead construction, and dredging and filling activities
- ~ ½ of salt marsh fringing Charlotte Harbor and Tampa Bay was lost to development, also impacting adjacent seagrass beds
- Most is on SSL, although some sold to private landowners ≤1960's.
- Currently about 65% of the total area of salt marsh in the state is protected on conservation lands and aquatic preserves.
- **Mosquito impoundment** areas have reduced or eliminated marsh plants, unless opened to tidal flushing
- Pesticides sprayed on marshes to control salt marsh mosquitoes adversely affect the marsh food chain.

Salt Marsh– Management, threats

- **Prescribed burns** have traditionally been used in salt marshes to provide tender shoots as food for geese and other wildlife and to decrease the possibility of wildfires. However, fire can cause destructive peat fires or adversely affect rare bird or other species dependent on the marsh habitat for nesting and foraging

Sea level rise is already affecting salt marsh distribution in at least one portion of Florida. Along the Big Bend coast, sea level rise has led to the invasion of marsh grasses into the lower parts of the hammock islands that dot these marshes.

Marine communities

- Coral Reef
- Mollusk Reef
- Octocoral Reef
- Sponge Bed
- Worm Reef
- **Seagrass bed**
- Algal bed
- Unconsolidated substrate
- Consolidated substrate (hardbottom)

Hardbottom (or Consolidated substrate)

Expansive, relatively open areas of subtidal, intertidal, and supratidal zones which lack dense populations of sessile plant and animal species.

These communities may be inhabited by sessile, planktonic, epifaunal, and pelagic plants and animals but house *few* infaunal organisms (i.e., animals living within the substrate)

Hardbottoms are important in that they form the foundation for the development of other Marine and Estuarine Natural communities when conditions become appropriate.

They are easily destroyed through siltation or placement of fill, and deliberate removal by actions such as blasting

Hardbottom (or Consolidated Substrate)

Three kinds of Consolidated Substrate Communities:

- **Coquina -**limestone composed of broken shells, corals and other organic debris. It occurs primarily along the east coast, in marine areas in the vicinity of St. Johns and Flagler Counties.
- **Limerock** substrates - outcrops of sedimentary deposits consisting primarily of calcium carbonate. It is more widespread than coquina substrate and can be found in a patchy distribution from north Florida to the lower-most keys.
- **Relic reefs -** the skeletal remains of formerly living reefs - are more limited in distribution than limerock outcrops but more common than coquina substrate.

Seagrass communities

- The three most common species of seagrasses in Florida are turtlegrass (*Thalassia testudinum),* manateegrass *(Syringodium filiforme),* and shoalweed *(Halodule wrightii).*
- Nearly pure stands of any one of these species can occur, but mixed stands are also common.
- Halophila may be intermingled with the other seagrasses, but species of this genus are considerably less common than turtlegrass, manateegrass and shoalweed.
- Wigeongrass *(Ruppia maritima*) occur primarily in areas of lower salinity, although may be found in mixed beds.

Seagrass community structure

- May be found as small patchy beds, or if conditions allow, can form large meadows.
- Attached to the seagrass leaf blades are numerous species of *epiphytic algae and invertebrates*. Together, they serve as **important food sources** for manatees, marine turtles, and many fish.
- Very high primary productivity

Seagrass community functions

- Dense seagrasses serve as **shelter or nursery** grounds for many invertebrates and fish.
- The dense blanket of leaf blades **reduces the wave-energy** on the bottom and **promotes settling of suspended particulates**. The settled particles become stabilized by the dense roots and rhizomes of the seagrasses. Thus, seagrass beds are generally areas of **soil accumulation**.

Seagrass communities limiting factors

- Seagrass beds occur most frequently on **marl, muck or sand**, although they may also occur on other unconsolidated **substrates**.
- Seagrasses are found in waters with **temperatures** ranging from between 20° and 30°C (68°-86°F).
- Seagrasses occur most frequently in areas with **moderate current velocities**, as opposed to low or high velocities, and **moderate wave energy.**
- The water must be fairly **clear** because turbidity blocks essential light necessary for photosynthesis.
- Seagrass beds are also highly **vulnerable to oil** spills. Even low concentrations of oil are known to greatly reduce the ability of seagrasses to photosynthesize.

Seagrass Threats and Management Issues

Natural Threats

Storm wave energy can uproot

High rains decrease salinity, cause shift in populations

Climate change – natural or not? – changes in water temperature

Anthropogenic

Dredging to create channels

Prop scarring

Dock shading

Runoff, esp in high rains decrease clarity, decrease salinity

What if the site is not a native community?

- What about artificial wetlands or water bodies, such as borrow pits ("lakes") or canals?
- Use community with most analogous functions as a reference

What about areas that are not a native community?

Wetlands altered by:

- hydrologic action (draining, lower ground water table, impounding, increased runoff)?
- Agriculture or silviculture?
- Fire suppression?
- *Historic community type* at that location shall be used as reference

More Applicant's Handbook insights

X.2.2.3 (a) Condition..

…areas ***impacted by activities in violation*** of a District or Department rule, order, or permit adopted or issued pursuant to Chapter 373, F.S., or Part VIII of Chapter 403, F.S. (1984 Supp.) as amended, will be evaluated as if the activity had not occurred.

X.2.3.7

Where previous impacts to a wetland or other surface water are ***temporary in nature***, consideration will be given to the inherent functions of these areas relative to seasonal hydrologic changes, and expected vegetative regeneration and projected habitat functions if the use of the subject property were to remain unchanged.

Historic Community – key tools

- On-site evidence of soils, remnant plant community
- Aerial photos, pre-alteration
- Local knowledge
- No need to go back to pre-Columbian!

Pitcher plants and wire grass under shrubs & planted pine are signs of former wet prairie

Virtually all of the USA has been altered….

Pine flatwoods → Planted Pine

Logged, fire suppresion → Mature Mixed Hardwoods

Does that mean you can't simply characterize the system in front of you?

No!

If the area is currently a **self-sustaining, native community**, call it as you see it. And score it accordingly.

Assessing Preservation – the basics

- Use the 3 indicators of function
- Compare "without preservation" to "with preservation"
- Delta is multiplied by Preservation Adjustment Factor (PAF) which considers
  - Management activities
  - Ecological and hydrological relationship
  - Scarcity of habitat
  - Proximity to national & state parks, preserves
  - Extent and likelihood of impacts

The Nuances of Preservation

- When preservation is not mitigation
- When mitigation consists of preservation in addition to creation, restoration or enhancement
- When mitigation is Preservation only
- How to develop and assess the "without preservation" vision

Conservation Easement ≠ Mitigation

- A conservation easement may be required by a local government to meet *zoning* rules
- A conservation easement may be required to *prevent* secondary or cumulative impacts
- If a proposed conservation easement is not needed or not appropriate to *offset* impacts, it is not mitigation.

Preservation as Mitigation

Preservation of important ecosystems can provide an improved level of protection over current regulatory programs (x.3.2.2 a)

Preserve means: to keep safe from injury, harm, or destruction **:** protect

a **:** to keep alive, intact, or free from decay

b **:** maintain

(Merriam-Webster dictionary)

When the mitigation assessment area is preservation in addition to creation, restoration, or enhancement

- Assess the area under **current condition** and the "with" vision to determine the ecological lift
- Do NOT apply the Preservation Adjustment Factor
- The benefits provided by the preservation are considered in the "**with**" vision and in **risk**

What benefits can preservation provide?

- Forested mitigation areas can have mature canopy, protected from timbering, agriculture, clearing, or development (esp. in uplands)
- Shoreline communities without otherwise exempt docks
- Decreased risk and vulnerability to direct impacts (62-345.6009(2)(b))

When the only action for a mitigation assessment area is preservation

- Assess the area under the "without preservation" vision and the "with" vision to determine the delta, *and*
- Apply the Preservation Adjustment Factor
- Of course, include risk and time lag, too, in the final delta determination

With Preservation vs Without Preservation

- The proposed development will impact edges of a few cypress domes
- The mitigation proposal is to place a good quality, intact cypress dome in a conservation easement
- Currently the surrounding area (to be developed) is mesic flatwoods with minor cattle grazing.
- So, how do you assess this preservation?

Without preservation

Is NOT the same as
Without project
Or
Current condition

The “without preservation” scenario:

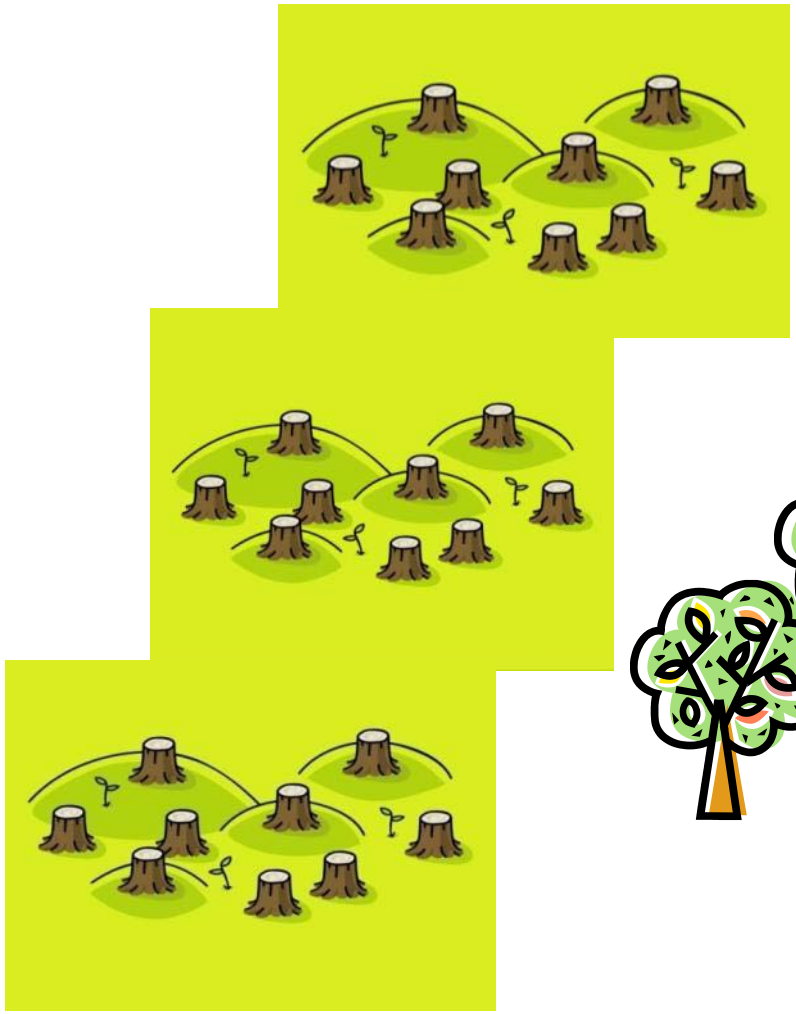
The "with preservation" scenario:

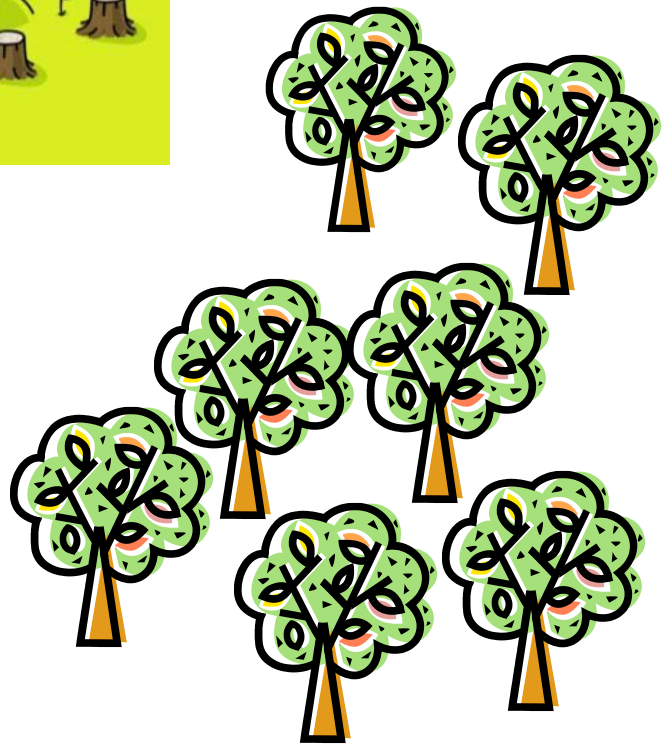
So, how would this be scored?

Without Preservation	With Preservation
LLS = 2	LLS = 2
WE = 7	WE = 7
CS = 5	CS = 6
14/30 = .46	15/30 = .5

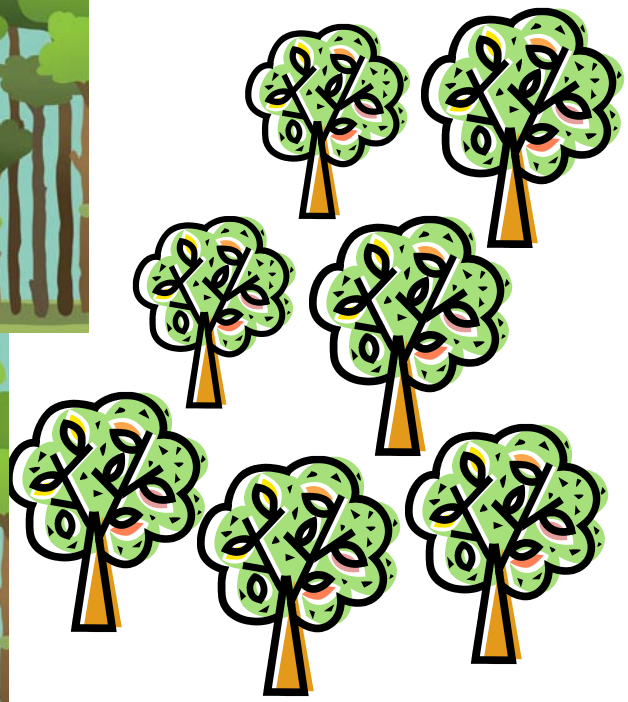
Delta = 0.04

Preservation in a different setting: "without"





Preservation with greater lift potential



So, how would this be scored?

Without Preservation	With Preservation
LLS = 4	LLS = 5
WE = 5	WE = 6
CS = 4	CS = 8
12/30 = .40	19/30 = .63

Delta = 0.23

Improved quality and quantity discharge an habitat support to downstream; hydrology on site slightly improved; near normal community structure with minor changes/impacts due to ranchette/upland use.

About that Preservation Adjustment Factor

PAF shall be scored on a scale from **0 (no preservation value)** to **1 (optimal preservation value)**, on one-tenth increments, based on 5 considerations.

Each of the 5 consideration shall be evaluated and value assigned based on relative significance and applicability.

Keep track of these consideration scores! Attach to UMAM Part II sheet(s).

(62-345.500(3)(a) and June 15, 2011 memo)

PAF considerations

1. The extent to which **proposed management** activities within the preserve area promote natural ecological conditions such as fire patterns or the exclusion of invasive exotic species.
2. The **ecological and hydrological relationship** between wetlands, other surface waters, and uplands to be preserved.
3. The **scarcity of the habitat** provided by the proposed preservation area ***and*** the degree to which **listed species** use the area.

PAF considerations, cont'd

4. The **proximity** of the area to be preserved **to areas of national, state, or regional ecological significance:** national or state parks, Outstanding Florida Waters, and other regionally significant ecological resources or habitats, such as lands acquired or to be acquired through land acquisition programs for environmental conservation, and whether the areas to be preserved include corridors between these habitats.

5. The **extent and likelihood of potential adverse impacts** if the assessment area were not preserved.

Uplands can be part of a mitigation plan

- Upland **preservation** may be appropriate as mitigation
- Upland **restoration and enhancement** may also be appropriate mitigation
- In these cases, start with identifying the native community type of the uplands

Uplands as mitigation

Identify the functions that the uplands provide to the fish and wildlife of the associated wetlands.

If there *are no* associated wetlands or other surface waters, go back to the question –

Is this appropriate as mitigation?

Upland mitigation assessment

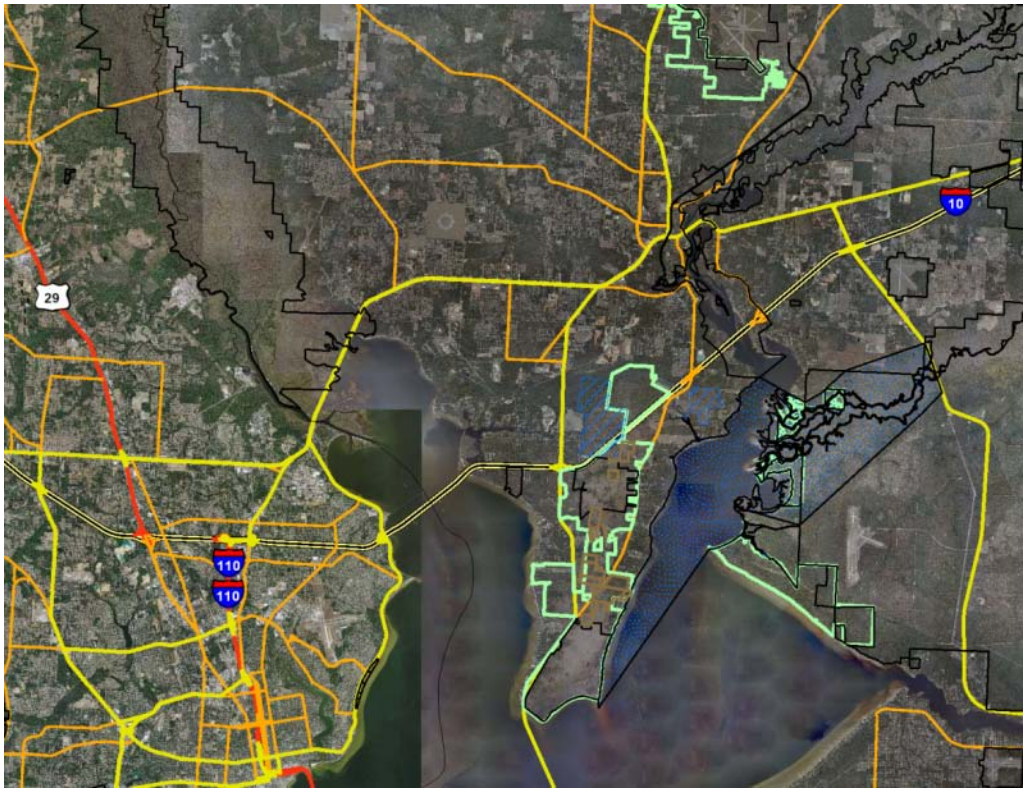
The functions previously identified are considered and accounted for when **scoring the upland** in Part II

Ie - Mesic Flatwoods next to basin marsh provide habitat for gopher frogs, in the gopher tortoise burrows. The current condition is fire suppressed with few gopher tortoises. Prescribed fire will improve this habitat for both the tortoise and the frog.

Location and Landscape support

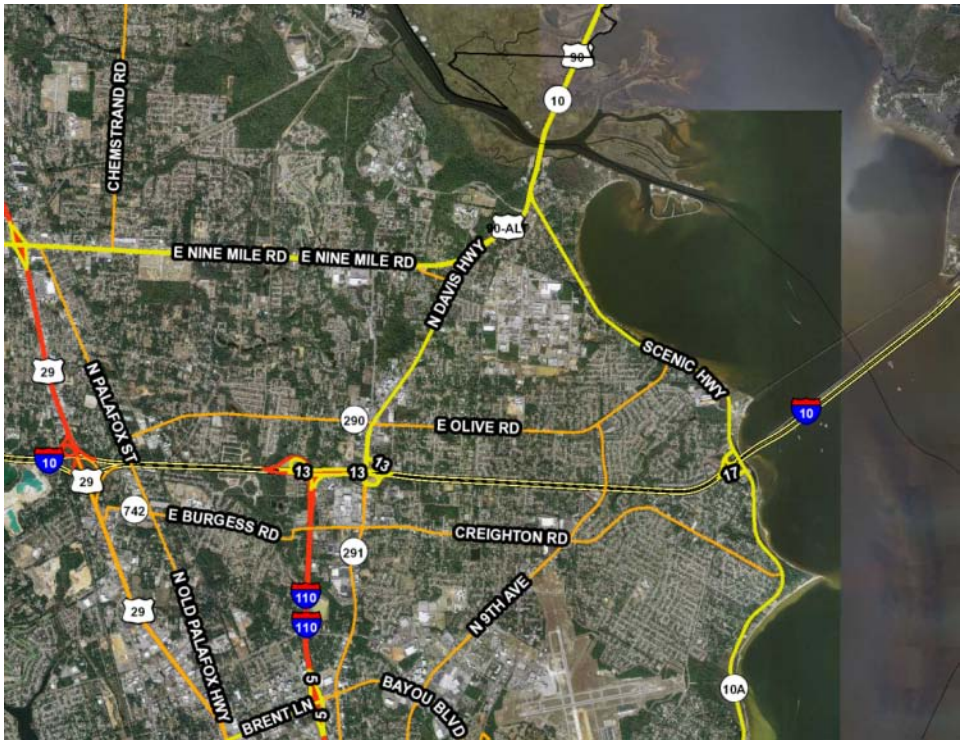
…While the geographic location of the assessment area does not change, the ecological relationship between the assessment area and surrounding landscape may vary from the current condition to the “with impact” and “with mitigation” conditions.

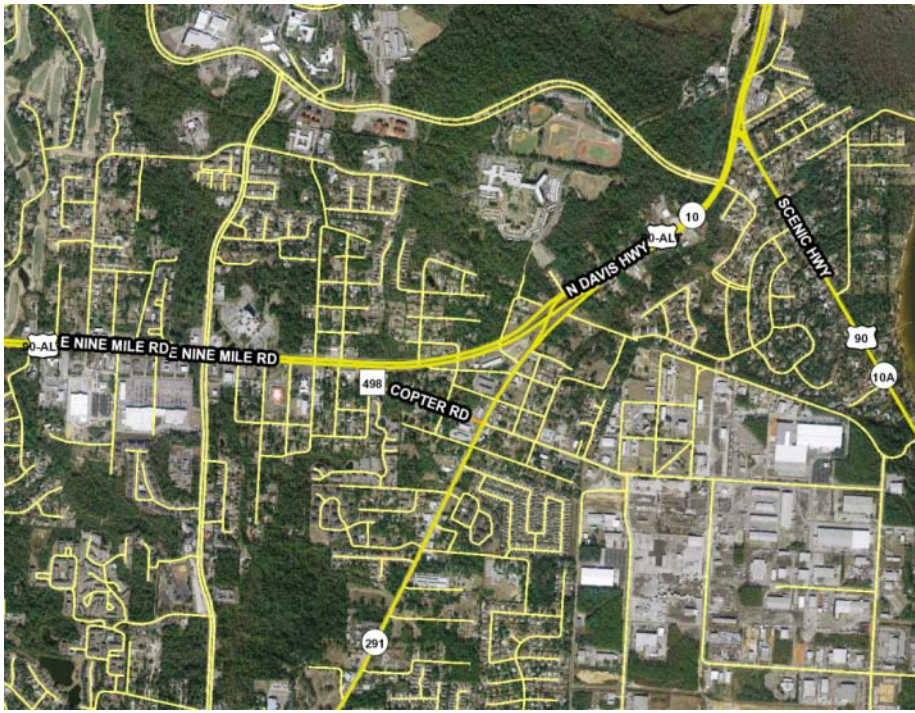
A lot depends on scale



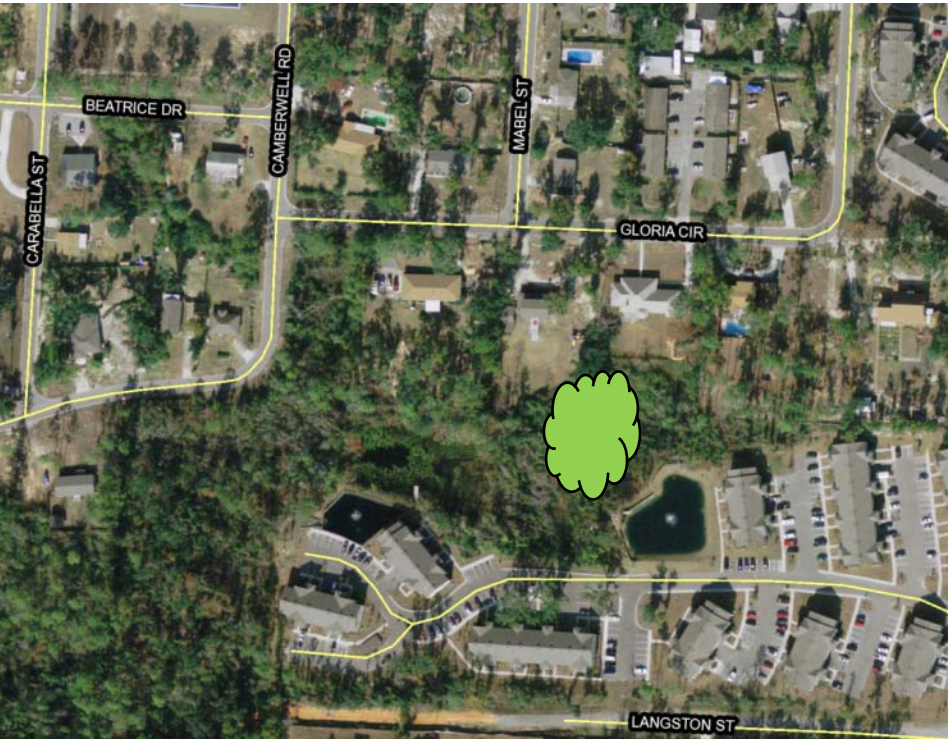
- Escambia/Santa Rosa counties
- Escambia, Blackwater Rivers
- Blackwater River State Park
- Yellow River Marsh Aquatic Preserve
- Yellow River Marsh Preserve State Park

Take a Closer look -





Site specific location and landscape setting



Habitat outside the aa?

Invasive sp. in proximity?

Wildlife barriers or distance limitations?

Adj. land use has no adverse impacts?

Any hydrologic impediments?

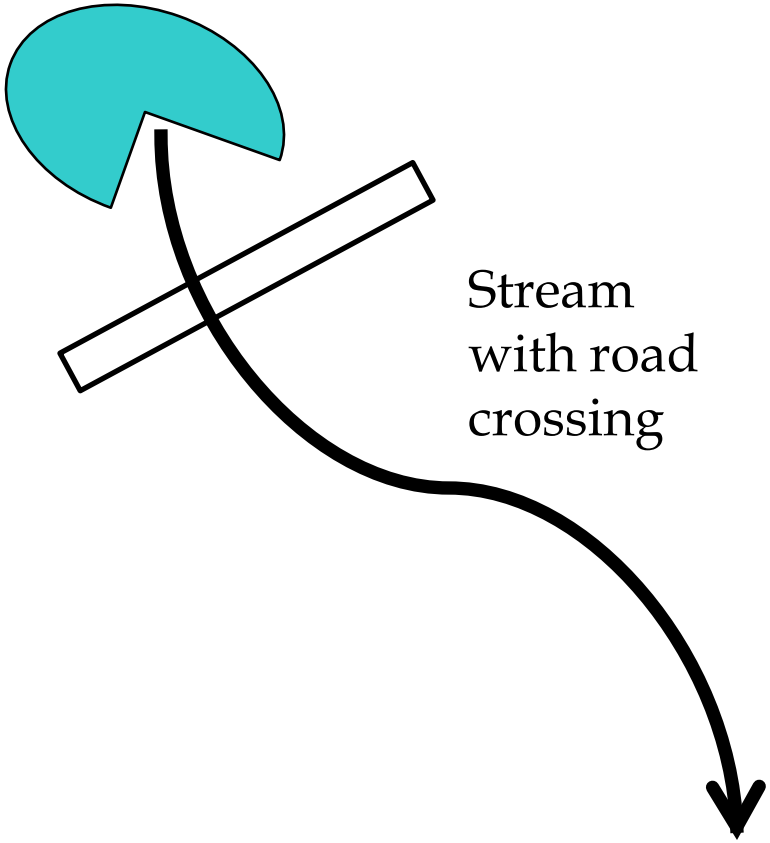
Hydro connected habitats?

When scoring landscape support

- Stand inside the assessment area and look to the outside
- Upstream, up-hill
- Downstream, down hill

Score the wetland or upland for its setting (support it receives) *and* its contribution (support to downstream)

Basin Swamp/headwaters restoration



Basin swamp – current condition

Basin swamp is in the right location as headwaters to provide support to fish and wildlife, hydrology in downstream

However, limited by on-site drainage, habitat loss

It is *also* limited by downstream impediment (road crossing)

Mitigation will restore on-site hydrology and community structure

Basin swamp "with mitigation"

- Functions that benefit downstream fish & wildlife improved, but the roadway crossing is still a barrier.
- Hydrologic benefits improved, but again, roadway crossing still an impediment.
- Result in Location and Landscape Support lift because the location allows on-site improvement to support adjacent (in this case, downstream) communities.
- However, even optimal on-site hydrology and optimal community structure cannot yield an optimal LLS due to the road crossing, in addition to upland scenario.

Questions?

References

DEP website UMAM:
Information and Training

http://www.dep.state.fl.us/water/wetlands/mitigation/index.htm

Fish and Wildlife
Conservation Commission

http://myfwc.com/wildlifehabitats/

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