

SECTION 5b - Wetland Function Weighting

WETLAND FUNCTION WEIGHTING

The “importance” or “value” of a given wetland function is a very different concept than the “capacity” of the function. Wetland functional assessment methodologies such as HGM and WRAP are used to evaluate changes in the capacity of wetland functions. The relative importance of the measured changes is not addressed in HGM. In other words, the HGM approach stops short of valuing the capacity of the function being evaluated. Unfortunately, trading in individual functional capacities is not practical; thus a single unit of trade is needed for mitigation crediting and debiting. In WRAP, the capacities of each function are averaged to produce a single output. Taking the average, however means that each of the factors is of equal importance. This approach can be refined. The Florida MBRT has devised a method to incorporate public interest considerations into the relative weighting of the wetland functions included in a given assessment methodology, with respect to use in mitigation banking.

WEIGHTING ASSIGNMENT GUIDANCE: This is a method through which relative weights can be assigned to wetland function. The Development Team proposes the following list of criteria to consider in a matrix form. As the MBRT considers the items on the list they can numerically score relative weights. This list is not inclusive and additional items could be added, as warranted. At a minimum, the following weighting criteria should be considered:

- Established Watershed Issues
- Benefits to Important Adjacent Areas
- Threatened or Endangered Species
- Scarce Habitats
- Special Considerations

The MBRT should consider the following issues or questions to help rank the weight for a given function for a given polygon. Some of these criteria will apply to all polygons within a bank or impact site, while others may be specific to a particular polygon. The weighting of each WRAP variable should be done before WRAP is calculated in the field.

Below are the five descriptors used to calculate weighting. Rather than developing two weighting criteria, one for the bank and one for the impact site, the Florida MBRT combined them. With reference to weighting on the impact site, do not use the Threatened and Endangered Species descriptor. If listed species are affected by the project, the Federal agency will initiate section 7 consultation, in accordance with the Endangered Species Act of 1973, as amended, with the U.S. Fish and Wildlife Service.

Established Watershed Issues: The bank/project will result in identifiable ecological benefits/detriments to established watershed issues recognized to be critical to the watershed of the project. Such issues should be identified in publicly sanctioned plans. For example:

- SWIM plans
- The Reedy Creek/Lake Marion Creek Watershed Conservation Project
- National Estuary Program Comprehensive Conservation and Management Plans
- Strategic Habitat Conservation Area in the GAP analysis
- Aquifer Recharge Area

(Note: This weighting factor is scored a zero when a watershed plan has not been developed for the particular area or when a perceived benefit is not critical to the established plan.)

Benefits/Detriments To Important Adjacent Lands: The bank/project will result in identifiable ecological benefits/detriments to adjacent lands or waters of regional importance such as a State/National Park, State/National Forest, SWIM water body, OFW, AP, refuges and lands managed for conservation.

Threatened and Endangered Species: The establishment of the mitigation bank improves the status of federal and/or state-listed threatened or endangered species, or federally listed candidate species. Simply protecting or conserving a site which currently exhibits use by listed species, where the status of that species will not be identifiably improved, will be considered as maintaining the status-quo. For projects which affect a federally threatened or endangered species, this issue will be handled in accordance with section 7 of the Endangered Species Act. Do not use this descriptor on the impact site.

Scarce Habitats: The bank area contains (or will contain) ecological features considered to be unusual, unique or rare in the region and which are of sufficient size. (The project site will result in the loss of ecological features considered to be unusual, unique or rare in the region and which are of sufficient size.) Expansion or restoration of habitats which have been extensively lost in a region will generally be given greater consideration for this parameter.

Special Considerations: This criteria is reserved for other circumstances which may be considered important in the weighting of WRAP variables.

Weighting Criteria Worksheet: Following is a self-explanatory worksheet. Except for threatened and endangered species, a simple yes or no question is asked. A yes is scored 3 and a no is scored 0. The scoring for threatened and endangered species is further refined into increments of 0, 1, 2, and 3 according to the relative benefit that the mitigation bank will provide. However, if justifiable, other weighting criteria may also be scored in increments of 0, 1, 2, and 3.

**WEIGHTING CRITERIA WORKSHEET FOR MITIGATION BANKS
IN FLORIDA**

Established Watershed Issues	Score
Yes 3 No 0	
Benefits to Important Adjacent Areas Yes 3 No 0	
Threatened and Endangered Species Increases population of one or more listed species 3 Meets identified tasks within a recovery plan for listed species or increases the population of one or more candidate species..... 2 Attracts listed species to the site 1 Maintains status quo 0	
Scarce Habitat Yes 3 No 0	
(Special Consideration) 3 0	

In order to determine the relative weighting numbers for the six WRAP variables, the following matrix example uses the polygon A2 referred in step 3, section 5f (Creekview example).

WEIGHTING CRITERIA MATRIX

Weighting Criteria	WU	VO	VG	AB	HY	WQ
Established Watershed Issues	3	NA	0	3	3	0
Benefits to Important Adjacent Areas	3	NA	0	0	3	3
Threatened or Endangered Species	1	NA	0	1	1	0
Scarce Habitats	0	NA	0	0	0	0
Special Considerations	0	NA	0	0	0	0
Total:	7	NA	0	4	7	3

KEY: WU = Wildlife Utilization
 VO = Vegetation-Overstory
 VG = Vegetation-Ground Cover
 AB = Adjacent Upland Buffer
 HY = Hydrology
 WQ = Water Quality

As presented in the hypothetical example Weighting Criteria Matrix above, the MBRT has determined that:

- o Established Watershed Issues: Applies to Wildlife Utilization and Hydrology variables.
- o Benefits to Important Adjacent Areas: Applies to Wildlife Utilization, Hydrology, and Water Quality variables.
- o Threatened and Endangered Species: Applies to Wildlife Utilization, Adjacent Upland Buffer and Hydrology variables.
- o Scarce Habitats: Does not apply (there are no scarce habitats on the site).
- o Special Considerations: No Special Considerations apply.

The Florida MBRT believes that each of the six WRAP variables should have an equal minimum weight. In other words, each weighting factor will have two components. A fixed “**minimum weight**” component that is automatically given to each variable and an “**assigned weight**” component which the MBRT determines. Each of these components will comprise 50 percent of the total weight. The **assigned weight** formula is now:

$$\text{Weight}_{WU} + \text{Weight}_{VO} + \text{Weight}_{VG} + \text{Weight}_{AB} + \text{Weight}_{HY} + \text{Weight}_{WQ} = 0.5$$

Based on the total scores from the Weighting Criteria Matrix, the following equation is derived:

$$7x + 0x + 4x + 7x + 3x = 0.5$$

(For this example, VO was not applicable; therefore, only five variables were used in the calculation for the assigned weight.)

Solving for x: $21x = 0.5$, so $x = 0.024$

Therefore, plugging 0.024 back into the weighting formula for these five variables gives the following **assigned weights**:

Assigned Weight WU = $7 \times 0.024 = 0.168$
Assigned Weight VO = NA
Assigned Weight VG = $0 \times 0.024 = 0.000$
Assigned Weight AB = $4 \times 0.024 = 0.096$
Assigned Weight HY = $7 \times 0.024 = 0.168$
Assigned Weight WQ = $3 \times 0.024 = 0.072$

Remember, once the MBRT calculates these assigned weights, the **minimum weight** must be added to each of the **assigned weights** to bring the **total weights** to 100%. For this example, one WRAP variable was dropped, VO; therefore the **minimum weight** is 0.1 ($.5/5=0.1$) [if all six variables were used, then the minimum weight would be 0.083 ($.5/6=0.083$)].

Total Weight WU = $0.1 + 0.168 = 0.268$
Total Weight VO = NA
Total Weight VC = 0.1
Total Weight AB = 0.196
Total Weight HY = 0.268
Total Weight WQ = 0.172

Prior to integration of these **total weights**, the following must be done with the “pure” WRAP variable scores (for each bank polygon):

- 1) The WRAP individual variable scores, both “with” and “without bank” are each divided by the maximum score attainable (3.0) in order to express in a percentage. Example: WU (with bank) = $2.5/3.0 = 0.83$; WU (without bank) = $1.0/3.0 = 0.33$. The “with” and “without” scores were taken from the example in Section 5f.
- 2) The difference of these scores is the unweighted WRAP “delta” (do for each of the five variables). Example: WU $\Delta = 0.5$

The **total weights** are then applied with the WRAP functional assessment as follows:

- 3) The “delta” for each WRAP variable is multiplied by the **total weight** (sum of the assigned weight and the minimum weight of 0.1, as used for this example) to calculate the weighted WRAP “delta”. Example: $WU=0.5 \times .268=0.134$

VARIA BLE	UNWEIGHTED WRAP DELTA	TOTAL WEIGHT	WEIGHTED WRAP DELTA
WU	.5	.268	.134
VO	NA	NA	.NA
VG	.5	.1	.05
AB	.833	.196	.163
HY	.667	.286	.191
WQ	.333	.172	.057
SUM			.595

- 4) The sum of the six weighted WRAP variable deltas is then multiplied by the polygon acreage to calculate total “credits” available in that polygon (Temporal Lag multiplier has been left out here for simplicity).

Example: 10 acres (polygon A2) $\times 0.595= 5.95$ credits

- 5) Finally, the credits available in each polygon are summed to calculate the total credits available in the mitigation bank.

Please refer to the **Creekview Mitigation Bank** example in Section 5f of this document for a step by step evaluation simulation for WRAP, including use of this weighting approach.

WHEN WEIGHTING FACTORS ARE NOT APPLICABLE: After reviewing the Weighting Criteria, the MBRT may elect not to apply any weighting factors at the mitigation bank or impact site. In this case, the WRAP scores will be the only basis in establishing credits and debits. See WRAP scoring methodology in Section 5a.