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Wetland Mitigation Banking: Approaches to Credit Determination

Palmer Hough U.S. Environmental Protection Agency November 2016

What is Wetland Mitigation Banking?

Regulatory-driven environmental market

Permit is required for certain impacts to wetlands and other waters

■ To obtain a permit impacts must be:

- Avoided
- Minimized
- Compensated <u>offset</u> unavoidable wetland losses (debits) by generating credits, helps ensure <u>"no net loss"</u> of wetlands
- Wetland banks generate credits for sale to permit applicants through wetland:
 - Restoration (*preferred*), establishment, enhancement, preservation



Clear and Effective Standards

Describe requirements for identifying, planning, implementing, monitoring, protecting and managing compensation projects, including <u>determining</u> credits

 Balance need for national consistency with need for regional flexibility



Enabling Banking to Function Across Multiple Regions and States



Credit Determination Challenges

Challenge – developing credit allocation procedures that are:

- Science-based
- Principled
- Consistent
- Predictable
- Relatively rapid
- Challenge developing national regulations that allow adequate level of flexibility to address:
 - The enormous ecological variety of wetlands across the U.S. and
 - Differences among states/districts in the level of investment they have made in development of wetland monitoring and assessment tools

Challenge – whatever method is used to determine credits at mitigation banks is also used to determine debits at impact sites

Credit Determination

- Regulations define a credit broadly as:
 - A unit of measure (e.g. a <u>functional</u> or <u>areal</u> measure or other suitable metric) representing the <u>accrual or attainment of aquatic</u> <u>functions</u> at a compensatory mitigation site. Measure of aquatic functions is based on the resources restored, established, enhanced or preserved.
- Areal measures (area-based ratios) simple approach, less resource intensive, but more coarse

Functional measures – more sophisticated approach, more resource intensive, but more precise (*preferred*)

Examples: Credit Determination

- Areal measures (Areabased Ratios)
 - Simple end of spectrum
 - Virginia
 - Blackjack Mitigation Bank
- Functional measures
 - Sophisticated end of spectrum
 - Florida
 - Boarshead Ranch Mitigation Bank





Virginia Example: Areal Measures (Area-based Ratios)



Virginia: Blackjack Mitigation Bank

Type of Action	Mitigation Credit Assigned
Established (created)/Restored Wetlands	1.00 credit for each acre (1:1)
Preserved Wetlands	0.067 credits for each acre (15:1)
Preserved Upland Forest Buffers	0.067 credits for each acre (15:1)

Type of Action	Acres	Ratio	Credits Produced
Established/Restored Wetlands	55.05	1:1	55.05
Preserved Wetlands	1.42	15:1	0.09
Preserved Upland Forest Buffers	45.00	15:1	3.00
Totals	101.47	-	58.14

1 acre = 0.405 hectares

Areal Measures – Other Examples

Figure 5.3: Example Credit Calculation

Activity	Acres	Crediting	Credit Acres
Restoration of historic wetland area	75	1.0 : 1	75.0
Enhancement of severely degraded areas that still meet wetland definition	17	1.0 : 1	17.0
Enhancement of marginally degraded area that still meets wetland definition	з	0.25 : 1	0.75
Adjacent upland restoration	20	0.25 : 1	5.0
Brush removal and burning in fully functioning wetland	5	0	0
Total	1 20		97.75

St. Paul District

Mitigation Activity	Conversion Rate (Area of Activity: Credit)					
Wetlands						
Re-establishment	1:1 to 2:1					
Creation (Establishment)	1:1 to 2:1					
Rehabilitation of altered processes	2:1 to 3:1					
Enhancement of wetland structure	3:1 to 5:1					
Preservation in combination with re-establishment, creation, rehabilitation, or enhancement of wetlands	5:1 to 10:1					
Preservation alone	Case-by-case					
Uplands						
Upland enhancement	3:1 to 10:1					
Upland preservation	8:1 to 15:1					

TABLE 1 - RECOMMENDED COMPENSATORY MITIGATION RATIOS FOR DIRECT PERMANENT IMPACTS

Mitigation	Restoration ¹	Creation	Enhancement	Preservation
Impacts	(re- establishment)	(establishment)	(rehabilitation)	(protection/ management)
Emergent Wetlands (ac)	2:1	2:1 to 3:1	3:1 to 10:12	15:1
Serub-shrub Wetlands (ac)	2:1	2:1 to 3:1	3:1 to 10:12	15:1
Forested Wetlands (ac)	2:1 to 3:1	3:1 to 4:1	5:1 to 10:12	15:1
Open Water (ac)	1:1	1:1	project specific ³	project specific
Submerged Aquatic Vegetation (ac)	5:1	project specific ⁴	project specific⁵	N/A
Streams ⁶ (lf)	2:17	N/A	3:1 to 5:1°	10:1 to 15:1%
Mudflat (ac)	2:1 to 3:1	2:1 to 3:1	project specific	project specific
<i>Upland</i> ¹⁰ (ac)	<u>≥</u> 10:1 ¹¹	N/A	project specific	15:112

New England District

Washington State

Source: WAC 173-700-313 and 173-700-318

Florida Example: Functional Measures



Florida: Boarshead Ranch Mitigation Bank

- Used Florida Uniform Mitigation Assessment Method (UMAM) to determine credits at bank
 - Designed to assess any type of wetland impact and mitigation
 - Provides standard procedures across State of Florida



Web-based training manual for Chapter 62-345, FAC for Wetlands Permitting





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UMAM: http://sfrc.ufl.edu/ecohydrology/UMAM Training Manual ppt.pdf

Applying UMAM

- Divide site into Assessment Areas (AA)
- Evaluate each AA based on 3 functional measures from 0 to 10 (10=minimally impacted)
 - Location/landscape support
 - Water environment
 - Community structure
- Evaluate both "current condition" and "with-mitigation"
- Delta = with-mitigation current condition
- Adjusted Delta = Delta(Time Lag x Risk)
- Credits = Adjusted Delta x Area

AA 2-002 Wetland Restoration

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





Florida: Boarshead Ranch Mitigation Bank

UMAM Summary Table (Revised 12/20/15)

AA ID	Acres	Mitigation Activity	CC loc	With loc	CC water	With water	CC comm	With comm	CC sum	With sum	Time Lag	Risk	Delta	RFG	FG
1-002	6.36	Herbaceous Wetland Preservation	7	0	9	7	7 7	7 3	0.70	0.77	1.017	1	0.07	0.065552278	0.42
1-005	3.50	Forested Wetland Preservation		E B	9	5	8 8	5 8	0.80	0.83	1.017	1	0.03	0.032776139	0.12
1-004	223.95	Forested Wetland Preservation	E	1	9 1	9	9 9	9 9	9 0.87	0,90	1.017	1	0.03	0.032776139	7.34
1-004a	9.26	Forested Wetland Preservation (buffer)	E	1	в	9	9 8	9 9	0.87	0.87	0.000	0.00	0.00	0.000000	0.00
1-027	4.97	Forested Wetland Enhancement	8	1	9 3	6	e 7	7 5	0.70	0.80	1.478	1.25	0.10	0.054127199	0.27
1-029	219.3	Forested Wetland Enhancement	8	1	9	8	9 8	B 1	0.80	0.90	1.070	1.25	0.10	0.074794316	16.40
1-029a	15.04	Forested Wetland Enhancement (buffer)	E	6	B	8	9 8	в 9	0.80	0.87	1.070	1.25	0.07	0.049862877	0.75
2-001	11	Herbaceous Wetland Restoration	0		9	0	9 (0 9	0.00	0.90	1.070	1.25	0.90	0.673148841	7.40
2-002	22.4	Herbaceous Wetland Restoration	0)	9	2	9 (5 5	0.00	0.90	1.070	1.25	0.90	0.673148841	15.08
2-003	72.92	Herbaceous Wetland Creation	0	1	9	0	9 (9	9 0.00	0.90	1.070	1.5	0.90	0.560957367	40.91
2-005	66.81	Herbaceous Wetland Enhancement	6	i (9	7	9 (5 5	0.63	0.90	1.070	1.25	0.27	0.199451508	13.33
2-006	4.11	Forested Wetland Enhancement	E	£ .	0	в	9 8	8 (0.80	0.90	1.070	1.25	0.10	0.074794316	0.31
2-043	26.68	Forested Wetland Enhancement	6	i. 1	9	7	9 6	5) (s	0.63	0.90	1.478	1.25	0.27	0.144339197	3.85
2-043a	7.26	Forested Wetland Enhancement (buffer)	6		8	7	9 6	5 5	0.63	0.87	1.478	1.25	0.25	0.126296797	0.92
2-044	2.25	Herbaceous Wetland Enhancement	e	5	9	7	8 9	5 5	0.60	0.75	1.070	1.25	0.13	0.099725754	0.22
2-046	2.64	Forested Wetland Preservation	7	e	0	7	7 3	8 1	0.73	0.80	1.017	1	0.07	0.065552278	0.17
2-047	44.85	Open Water (no credit)	0	1	0 0	0	0 (0 (0.00	0.00	0.000	0.00	0.00	0.000000	0.00
3-001	15.42	Herbaceous Wetland Enhancement	e	5	9	7	9 6	5 1	0.63	0.90	1.070	1.25	0.27	0.199451508	3.08
3-002	31.08	Herbaceous Wetland Restoration		8 I	9	0	9 (5 5	0.00	0.90	1.070	1.25	0.90	0.673148841	20.92
3-003	18.06	Herbaceous Wetland Creation	0	1	9)	0	9. (0 9	0.00	0:90	1.070	1.5	0.90	0.560957367	10 13
3-019	9.83	Herbaceous Wetland Enhancement	6	i 1	в	9	9 6	5 8	0.70	0.85	1.070	1.25	0.13	0.099725754	0.98
3-020	9.09	Open Water (no credit)		E	0	0	0 (0 0	0.00	0.00	0.000	0.00	0.00	0.000000	0.00
4-001	2.44	Herbaceous Wetland Enhancement	1	6	9	6	9 1	3 (0.53	0.90	1.070	1.25	0.37	0.274245824	0.67
4-002	3.47	Herbaceous Wetland Creation	0	5	9	0	9 (2 5	0.00	0.90	1.070	1.5	0.90	0.560957367	1.95
4-025	7.08	Open Water (no credit)	1.0	£	0	0	0 0		0.00	0.00	0.000	0.00	0.00	0.000000	0.00
4-026	1.18	Herbaceous Wetland Enhancement	1	t - 1	9 8	5	5 (5 8	0.60	0.75	1.070	1.25	0.15	0.099725754	0.12
4-027	1.75	Herbaceous Wetland Enhancement	7	r -	9	6	6 6	5 9	0.63	0.90	1.070	1.25	0.17	0.124657199	0.22
4-025	3.03	Herbaceous Wetland Creation		2	9	0	9 (2 5	0.00	0.90	1.070	1.5	0.90	0.560957367	1.70
4-029	1.63	Herbaceous Wetland Enhancement	1	6 1	9	3	9 1	1 9	0.37	0.90	1.070	1.25	0.53	0.398903017	0.65
5-001	4.05	Herbaceous Wetland Enhancement	E	1	9	8	9 3	5 5	0.63	0.90	1.070	1.25	0.27	0.199451508	0.81
5-002	55.04	Forested Wetland Creation	1.0	3	9	0	9 (o s	0.00	0.90	1.478	1.5	0.90	0.405953992	22.34
5-003	18.29	Protested Wetland Preservation		£	9	9	9 9	9 1	9 0.87	0.90	1.017	1	0.03	0.032776139	0.00

Conclusions

- Important to have clear and effective national standards for all aspects of mitigation projects, including credit determination
 - Standards must balance need for national consistency with need for regional flexibility
 - Not a single approach to credit determination that will work nationwide
 - Credit determination approaches are not static, regularly updated/revised
- Successful in creating large wetland banking program, most banks sponsored by private sector
 - Over 2,600 credit transactions at mitigation banks in 2015
 - \$1.3 \$2.2 billion spent annually by permittees on wetland/stream compensation credits, including bank credits

 Next steps – updating inventory of credit/debit determination methodologies nationwide

For more information about wetlands mitigation in the United States:

https://www.epa.gov/cwa-

404/mitigation

ribits.usace.army.mil