Use of Habitat Equivalency Analysis in NRDs



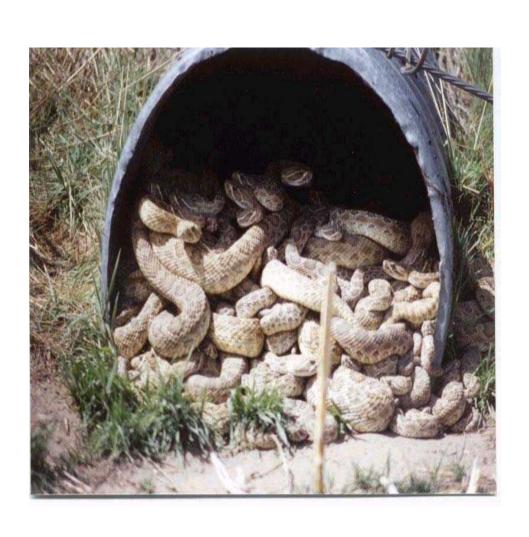
Ralph G. Stahl, Jr. DuPont Company December 4, 2007

HEA - The Good



- · Flexible
- Transparent
- · Inclusive
- Helps focus on restoration
- RelativelySimple

HEA - The Bad



- Inputs
- · Baseline
- Service Loss
- · Dueling HEAs
- Attempt at Precision

Keys to Success

- "Good" HEAs go hand in hand with "Good" cooperative assessments.
 - Involve the right people throughout.
 - Interact and communicate frequently.
 - Develop trust and credibility.
 - Consider all options.
 - Understand the suite of drivers and needs.
 - Focus on getting the job done.
 - Develop and keep to a schedule.

Metrics

- Keep them simple, few in number, short (relatively) in duration.
- Decide on them up front, long before restoration is undertaken.
- Don't get hung up on achieving a numerical goal. Nature does what she pleases.

Example



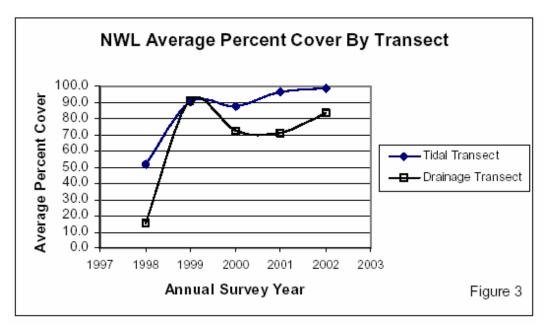
North Wetland under construction

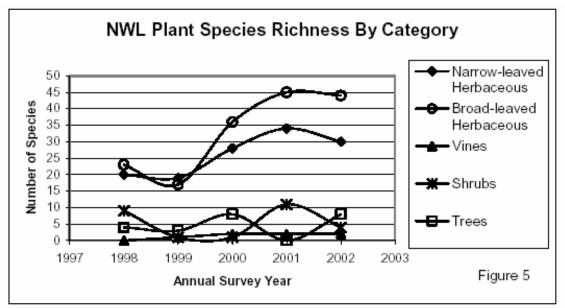
North Wetland ca. 2000



North Wetlands Functional Capacity Units							
	WWA	Planned 1997	Actual 1999	Actual 2001	Actual 2002		
Year	0	1991	2	4	5		
Function			_	·			
Shorebank Erosion Contr	0.09	0.67	0.75	0.75	0.75		
Sediment Stabilization	1.3	2.43	2.32	2.43	2.43		
Water Quality	1.7	1.96	1.92	2.11	2.11		
Wildlife	0.57	1.75	1.67	1.68	2.16		
Tidal Fish	0.6	1.42	1.42	1.42	1.42		

Evaluation of Planned Wetlands - St. Michaels, Maryland





South Wetlands Functional Capacity Units							
	WWA	Planned	Actual	Actual			
		1998	2000	2002			
Year	0		2	4			
Function							
Sediment Stabilization	3.9	7.1	7.11	7.11			
Water Quality	2.9	5.7	6.16	6.16			
Wildlife	1.1	4.3	4.27	5.37			
Tidal Fish	1.2	2.1	2.51	3.92			

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Acres Required					-2.6
Acres of Wetland In	jured				2.43
Year of Initial injury					1981
Remediation Year					1997
Yr NR Begins					1998
Year Natural Recove	ry Complete				2002
Current Year					2003
Year Compensation	 Habitat Const	ruction is o	complete		2006
Percent of Injured Area Services lost			29.20%		
Recovery Function					
Functional form of recovery curve			linear		
Years to complete natural recovery @ injured site				4	
functional form of maturity curve			linear		
Years to full maturity of compensatory habitat			4		
Percent recovery of injured habitat			120.00%		
Relative productivity of created to preinjured habitat			100.00%		
discount rate					3.00%
recovery rate					30.00%
maturity rate					25.00%

Learnings

- · HEA (& REA) can be a good, useful tool.
- Don't force precision where it doesn't exist.
- Not a wholly scientific process can be made rigorous, but seldom worth the extra effort.
- Metrics should be kept simple watch out for personal bias

Discussion

