Early Rainwater Basin Technical Studies: A Trip Down Memory Lane with Mike and Randy
History

Rainwater Basin Joint Venture

- Concept Plan 1991
- Private landowners central to success
The RWB “Landscape” in the 80’s

- Economic conditions were conducive to land leveling/center pivot development/excavation of reuse pits
- Issues over ground water pumping for WPAs
- Avian Cholera
- CWA Sec. 404 evolving as to treatment of “jurisdictional” extent
- Relationship of USFWS-Corps
- FSA & Swampbuster provisions
- NGPC inventories documenting historic losses and current condition (*NWI just getting started)
- Better recognition of RWB as spring staging area
- Cumulative Impacts/”No net loss”
- NAWMP 1986
- ADID
Section 404 (b)(1) Review Criteria

• The discharge represents the least environmentally damaging practicable alternative

• Compliance with applicable state water quality standards

• Does not jeopardize the existence of Federal listed endangered or threatened species or their habitat

• Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem

• Cause or contribute to significant degradation
Subpart I—Planning To Shorten Permit Processing Time

§ 230.80 Advanced identification of disposal areas

• EPA and the permitting authority may identify sites which will be considered as: (1) Possible future disposal sites, or (2) Areas generally unsuitable for disposal site specification;

• Constitutes information to facilitate individual or General permit processing

• An appropriate public notice of the proposed identification

• The permitting authority should maintain a public record of the identified areas and a written statement of the basis for identification

• *Review the type of activities in the RWB for probability of compliance with the Guidelines (not explicit in the guidance)
General Scoping ?’s

• What are the current economics of wetland conversion and future threats?

• What functions beyond the waterfowl values are being provided by RWB wetlands?

• What are the characteristic RWB plant communities and what is their affinity to soils?

• What are the waterfowl actually doing out there?

• How do we summarize and synthesize this info to provide a rationale for designation and set the stage for future interagency initiatives?
Interagency Goals

• Designate wetlands potentially regulated under Section 404 that may be suitable or unsuitable for fill

• Increase the wetlands data base to support future regulatory policy and wetland management initiatives

• Collect information necessary for making jurisdictional determinations

• Increase public awareness and knowledge of wetland values and functions

• Increase public awareness and knowledge of the Section 404 permit process
Cash Flow Model: Looked at costs of land leveling vs. return on investment

- General decline in profitability of draining and cropping wetlands within the region

- Drainage of semi-permanently flooded wetlands have been generally unprofitable in the past and will be increasingly so in the future

- Temporarily and seasonally flooded wetland basins are most vulnerable

What are the current economics of wetland conversion and future threats?
Project Planning For Environmental Studies

Paleo-GIS
What functions beyond the waterfowl values are being provided by RWB wetlands?

FHWA/W.E.T.: “Adamus Method”

An early Wetland RAM

Looks beyond traditional views of waterfowl & wildlife habitat values

11 Functions for assessment:

- Ground Water Recharge
- Ground Water Discharge
- Flood flow Attenuation
- Sediment Stabilization
- Sediment/Toxicant Retention
- Nutrient Removal/Transformation
- Production Export
- Aquatic Diversity/Abundance
- Wildlife Diversity & Abundance for Breeding
- Wildlife Diversity & Abundance for Migration/Wintering
- Recreation/Uniqueness/Heritage
What are the characteristic RWB plant communities and what is their affinity to soils?

Objectives:
- Provide descriptive info on plant community associations & temporal dynamics
- Evaluate vegetation/soils correspondence from vegetation sampling and mapping data

Methods:
- 47 sites; 272 vegetation samples & 248 species records
- WAO (Hydric Value) and DCA
- Overlay wetland mapping with soil survey data
- * Not published: soil chemistry/extensive temporal vegetation data set
Table 5. Descriptive statistics for Hydric Value (HV) data as grouped by soils for the JUNEVEG and FALLVEG survey data sets.

<table>
<thead>
<tr>
<th>SOIL NAME</th>
<th>NO. OF STANDS</th>
<th>JUNEVEG</th>
<th>FALLVEG</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>MEAN</td>
<td>S.D.</td>
</tr>
<tr>
<td>Butler</td>
<td>6</td>
<td>4.82</td>
<td>.57</td>
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<tr>
<td>Crete</td>
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<tr>
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<tr>
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<td>4.23</td>
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<td>Nord</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Massie</td>
<td>34</td>
<td>7.35</td>
<td>.93</td>
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<tr>
<td>Olbut</td>
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n=136  n=136
Hydric Values Grouped by Soil Series

- **Hydric**
  - Holdrege: 4.23, 5.22
  - Butler: 4.82, 5.83
  - Fillmore: 5.74, 7.09
  - Scott: 6.39, 8.51
  - Massie: 7.35, 8.87

- **Mesic**
  - Dry Mesic: 4.47
  - Mesic: 5.42

- **Dry**
  - Holdrege: 3.29, 4.33, 4.06
FIGURE 2. Generalized Rainwater Basin vegetational zones. Species acronyms are stand dominants with groupings based on hydric value intervals for the combined JUNEVEG and FALLVEG data sets.
Custom wetland mapping using Cowardin et. al. (1979) classification

B & W aerial photography @1:24,000

Looked at intersection of wetland & soil attributes
What are waterfowl actually doing out there?

Objectives:

- Increase the understanding of habitat needs during spring migration
- Evaluate the relative function of each wetland type for waterfowl
- Document importance of RWB

Methods:

- Aerial/Ground Census (Average of 70 sites/year)
- Activity Time Budget (n=31)
  * Behavioral Categories: Loafing, locomotion, feeding, courtship, alert
- Observations over 6 week period
Table 4. (Cont.) Proportion of day spent in each activity in wetland with differing water regimes.

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<th>Temporary</th>
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* P < .05 was considered to be significant.
Underlining indicates areas where significant differences occur.
N Number of birds included in data set.
Proportion of Day Spent in Each Activity (All Dabblers)

- Temporary
- Seasonal
- Semipermanent

- Feeding
- Locomotion
- Loafing/Comfort
- Courtship
- Alert
Figure 6. Proportion of waterfowl species feeding by wetland type.
Expansive Discussion of:

- The RWB Value as Spring Staging Habitat
- Literature Review of Waterfowl Values by Water Regimes
- Ecological Factors and Human Activities Affecting Wetland Values and Waterfowl
- Special Concerns
Rationale for designations based on Technical Studies

Recoded NWI for public record (Class I – IV)

Reviewed probable regulated activities in RWB with their respective “permitability”

Provided recommendations for future wetland protection & information needs

How do we summarize and synthesize this info in providing a rationale for designation and set the stage for future inter-agency initiatives?
1. Regulatory

- Determine feasibility of advanced 404(c) veto action
- Develop general permits for minor discharges and enhancement/restoration projects
- Review nationwide permits in light of study findings for possible modification or revocation
- Develop permit processing MOA w/standardized review criteria
- Develop joint agency enforcement plan
- Develop monitoring plan for permit compliance

2. Wetland Management

- Additional wetland acquisition by federal, state and private organizations
- Support of Rainwater Basin Joint Venture under the North American Waterfowl Management Plan
- Establish acknowledgement program for individuals and others demonstrating leadership in wetlands protection
- Establish private lands extension program for technical assistance to landowners

3. Public Outreach

- Develop additional wetlands functions and values information to enhance public awareness
- Develop 404 information outreach programs to local agencies and organizations
- Develop joint communication strategies with agricultural agencies and organizations to better serve the affected landowner

4. Information Needs

- Develop and implement a mapping and information data base to centralize permit data and individual wetland data necessary to support the identified regulatory actions and wetland management initiatives
- Develop and implement a hydrology model for wetland restoration and impact analysis
- Initiate an archive of historical aerial photography and schedule monitoring for wetland trend analysis
<table>
<thead>
<tr>
<th>THEME</th>
<th>Then</th>
<th>Now</th>
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<td>Technology/Data Availability</td>
<td>Paleo-GIS</td>
<td>Decision Support Systems, Scenario Planning, Restorable Wetland Index</td>
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<td>Hydrology</td>
<td>WHAM</td>
<td>Modeling, Watershed Restoration</td>
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<tr>
<td>Vegetation</td>
<td>What is out there?</td>
<td>Management Orientation: Moist Soil Management &amp; Invasive Species</td>
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<tr>
<td>Waterfowl</td>
<td>Census &amp; Time Budget</td>
<td>Local and Landscape Variables, Energetics, Avian Community Structure</td>
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<td>Wetland Functions</td>
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<td>HGM Playa Models/NeWRAM</td>
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<td>Economics</td>
<td>Conversion Costs of Land Leveling</td>
<td>Working Landscapes and Ecosystem Services</td>
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<tr>
<td>Public Involvement</td>
<td>Poor: Nobody wants to be regulated!</td>
<td>Seminars, newsletters, landowner involvement/tech assistance</td>
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<td>Partnerships</td>
<td>Limited to Agencies</td>
<td>Extensive Public &amp; Private, Academic Community</td>
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<td>Science and the Application</td>
<td>General Characterization</td>
<td>Sediment Studies &amp; Vegetation Response, Pollinators, Avian Guilds</td>
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