Wetland Service Markets: Banking and Management Lessons from the US

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What is wetland

- Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water.

- Wetlands must have one or more of the following three attributes: **Hydrology**, **Hydrophytes**, and **hydric soils**.
Type of wetlands

- **Marshes**
  - Tidal
  - Nontidal
    - Wet meadows
    - Vernal pools
    - Prairie potholes
    - Playa lakes

- **Swamps**
  - Forested Swamps
  - Bottomland Hardwoods
  - Shrub Swamps
  - Mangrove Swamps

- **Bogs**
  - Northern Bogs
  - Pocosins

- **Fens**
Service of wetlands

- Flood Mitigation
- Storm damage protection
- Water quality improvement
- Habitats for wildlife
- Recreation
- Education

Global value of wetland ecosystems at $14.9 trillion
Ramsar Convention

- An intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and sustainable use of wetlands and their resources.
- Signed in Ramsar, Iran, in 1971
- 160 Contracting Parties
- 1,929 sites designated for the Ramsar List of Wetlands of International Importance
- Total surface area: 75.2 million acres
The Convention uses a broad definition:

“Whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters.”
Wetlands in China

96,200,000 acres (38,480,000 ha) wetlands in China

Types

- Coastal/Marine
- Rivers
- Lakes
- Marshes
- Artificial
Waterfowls
Wetland conservation

- **550 Wetland nature reserves**
- **100 wetland parks**
37 Wetlands of International Importance, 13 million acres.
Zhalong Wetland Reserve
Hometown of Red-crowned Crane

Qiqihaer
Heilongjiang Province, Northeast China
Qinghai Birdisland Reserve

Gangcha,
Qianghai Province,
Southwest China
Zhangjiangkou Mangrove Reserve

Zhangjiang Estuary
Fujian Province,
Southeast China
Wetland restoration

- Return reclaimed croplands to wetlands
- Enhance degraded wetlands
- Restore former wetlands
- Emigrate ecologically
Quanzhou Bay Mangrove Reserve

1,000 acres mangroves have been restored since 2000.

- Quanzhou City
- (Fujian Province, Southeast China)
Xixi national Wetland Park

Hangzhou City, Zhejiang Province, East China
Wetland Challenges in China

- Great loss
- Degradation
- Overuse
- Pollution

Min River Estuary

Before

Now
Lake Gucheng in Downstream of Yangtse River

Late 1970’s

Late 1990’s
Wetland losses in the past 50 years

- 50% decrease
- 45% decrease
- 36.78% decrease
- 136,750 square kilometers lost in the Yellow River Delta.
- 50% decrease
- 219 million hectares lost in coastal wetlands.
What can we do?

How to balance development and protection?
Wetlands in the US

Twenty-two states have lost at least 50 percent of their original wetlands. Seven states—Indiana, Illinois, Missouri, Kentucky, Iowa, California, and Ohio—have lost over 80 percent of their original wetlands. Since the 1970's, the most extensive losses of wetlands have been in Louisiana, Mississippi, Arkansas, Florida, South Carolina, and North Carolina.

FROM FIELD CONCEPT TO GUIDANCE (1995)

1st banks - 1976-1981
Series of project impacts

1981 - US F&WS Mitigation Policy Guidance
Earlier mitigation…in advance

EPA-Army Mitigation MOA - 1990
Way to achieve effective mitigation

Bush Domestic Policy Council - 1991
Interest in entrepreneurial approach

1993 - White House Wetlands Plan & Joint EPA-Army Memo
Watershed principles & approach

1991 - ISTEA
For series of small impacts

Natl WMB Study - 1992-96
Learn from early bank experiences

How did we get here?

Up to 30 years experience

Bob Brumbaugh the CORPS
Wetland-related laws and regulations

**Fedural**
The Army Corps of Engineers (Corps) under the **Clean Water Act** and Rivers & Harbors Act
The U.S. Natural Resources Conservation Service under the federal Farm Bill
EPA under the Environmental Quality Act
Coastal Zone Management ACT

**State**
The Oregon Department of State Lands (DSL) under the **State Removal-Fill Law**
The Oregon Department of Forestry under the Forest Practices Act
Oregon Department of Environmental Quality

**Local**
Some city and county land use ordinances
Mitigation

- require a 3-Phase Process

1. Avoidance
2. Minimization
3. Compensation
Mitigation

- Basic Methods:
  - Creation
  - Restoration
  - Enhancement
  - Preservation
A wetland mitigation bank is a wetland area that has been restored, established, enhanced or preserved, which is then set aside to compensate for future conversions of wetlands for development activities.
How it works

Urban/Suburban Center

Impacted Wetland

Mitigation Transaction $$$

Property Development that Impacts Wetlands

Regulatory Authority

Permit To Impact

Permit to Operate Mitigation Bank

Wetland Mitigation Bank

Rural Area
Advantages

- Regulatory authority
- Management instrument

- Banker
  - Interest in Environmental Trading

- Permittee
  - Save time and money
“Why should I be concerned about the environment? I never go there.”
Mitigation Banks Create Market Value
Approved* Mitigation Banks in Corps Bank Database (RIBITS), 8 May 2010

* Includes Sold Out, Suspended, & Terminated

Brumbaugh & Martin (IWR) & Williams (ARA, Inc.)
Case study - West Eugene
Credit sale

Annual Credit Sales, 1994 – 2010
## West Eugene New Bank Credit Release Schedule

<table>
<thead>
<tr>
<th>Release</th>
<th>Percentage (running total)</th>
<th>Performance Standards to be met</th>
<th>Year Expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>13%</td>
<td>Approval of Mitigation Bank Instrument</td>
<td>2011</td>
</tr>
<tr>
<td>Two</td>
<td>5% (20%)</td>
<td>Initial grading and seeding/planting and reporting of as-buils.</td>
<td>2013</td>
</tr>
<tr>
<td>Three</td>
<td>Up to 10% (30%)</td>
<td>1st growing season performance standards</td>
<td>2014</td>
</tr>
<tr>
<td>Four</td>
<td>Up to 10% (40%)</td>
<td>2nd growing season performance standards</td>
<td>2015</td>
</tr>
<tr>
<td>Five</td>
<td>Up to 10% (50%)</td>
<td>3rd growing season performance standards</td>
<td>2016</td>
</tr>
<tr>
<td>Six</td>
<td>Up to 10% (60%)</td>
<td>4th growing season performance standards</td>
<td>2017</td>
</tr>
<tr>
<td>Seven</td>
<td>15% or up to a cumulative total of 75%</td>
<td>5th growing season performance standards</td>
<td>2018</td>
</tr>
<tr>
<td>Eight*</td>
<td>25% (100%)</td>
<td>Approval of long term management plan and stewardship agreement by co-chairs; plan is executed/signed by steward</td>
<td>On or before 2018</td>
</tr>
</tbody>
</table>
Credit sales during 2010

<table>
<thead>
<tr>
<th>Description</th>
<th>Purchase Date</th>
<th>Credits in Transaction</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit balance on January 1, 2010</td>
<td></td>
<td></td>
<td>21.75</td>
</tr>
<tr>
<td>Credits requested for certification during year</td>
<td></td>
<td>0.00</td>
<td>21.75</td>
</tr>
<tr>
<td>Uncertified credits removed from inventory</td>
<td></td>
<td>0.00</td>
<td>21.75</td>
</tr>
<tr>
<td>Credits sold in 2010</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City of Eugene PW Airport</td>
<td>April 2010</td>
<td>(0.72)</td>
<td>21.03</td>
</tr>
<tr>
<td>Eugene Water &amp; Electric Board</td>
<td>May 2010</td>
<td>(0.50)</td>
<td>20.53</td>
</tr>
<tr>
<td>City of Eugene PW Airport</td>
<td>July 2010</td>
<td>(2.98)</td>
<td>17.55</td>
</tr>
<tr>
<td>Subtotal of credits sold in 2010</td>
<td></td>
<td>(4.20)</td>
<td></td>
</tr>
<tr>
<td>Credit balance as of December 31, 2010</td>
<td></td>
<td></td>
<td>17.55</td>
</tr>
</tbody>
</table>
West Eugene

Summary:

- Provide mitigation credits to private and public entities for development impacts of wetland.
- Develop and implement restoration and enhancement plans for local wetland communities.
- Win-win model
Conclusion

What I learn from the US:

- **Legislation**
  - Goal: “no net loss” “sustainable use”

- **Cooperation**
  - Among of Departments
  - Business and environment
  - Public and private

- **Mitigation**

- **Education**
How it works in China

Supervise
Laws
Protect
Manage
Mitigate
Impact
Service
Supervise
educate
Permit
Thank you for your attention

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Question?