The Wetland Restoration Fund

Ryan Calvert and Tom Loftus
Call to Action: Historic Flooding in Houston

• Three “100 year” floods in the last five years
• Hurricane Harvey killed ~90 people,$^1$ damaged over 150 thousand properties,$^2$ left ~40 thousand families in need of temporary housing,$^3$ and caused $125 billion in damages.$^4$

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$^1$Source: Houston Chronicle
$^2$Source: FEMA
$^3$Source: Houston Chronicle
$^4$Source: Federal Reserve Bank of Dallas
Houston Floods Highlight Three Problems

1. Climate change and overdevelopment increasing flood risk
2. Minimal insurance coverage for households and businesses
3. Overdevelopment of natural wetlands accelerates species loss
Wetland Recovery Addresses All Three Problems

According to the National Resource Council, wetland restoration is “the reestablishment of predisturbance aquatic functions and related physical, chemical and biological characteristics”\(^1\)

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Wetland Restoration</th>
</tr>
</thead>
</table>
| 1. Climate change + wetland development  
=> increased flooding | • Restores water absorbing ecosystem  
• Sequesters carbon |
| 2. Lack of flood insurance | • Removes at risk structures / people  
• Lowers premiums for adjacent customers |
| 3. Species loss | • Restores habitat |

But is still underutilized: Since Allison, just 2,400 home buy outs versus >10,000 on 100-year floodplain\(^2\)

**The problem: raising money**

“It’s always a funding issue,” Wade said. “We always have more [opportunities] than funds available.”\(^3\)
Three Challenges Explain the Lack of Funding for Wetland Restoration

1. High cost to purchase and clean up properties
   - Past projects focused on residential properties, which have a higher cost-benefit ratio than commercial
   - $342 million to buyout 3,100 Houston homes since 1985; current budget covers <10% of priority list.¹

2. Hard to monetize undeveloped land

3. Dispersed benefits that are hard to quantify
A Solution to the Financing Challenge

1. Raise equity in a project company

2. Buyout a high risk, low utilization commercial property and restore underlying wetland

3. Secure mitigation credits and recapitalize with a pay-for-performance security

4. Insurance companies and public sector capture flood damage savings
## Allocation of Risk + Returns

<table>
<thead>
<tr>
<th>Required IRR</th>
<th>Sources of Return</th>
<th>Allocated Risk</th>
<th>Risk Mitigants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Equity Providers</strong></td>
<td>5-25% (Forest Trends Report&lt;sup&gt;1&lt;/sup&gt;)</td>
<td>▲ PFP payments ▲ Mitigation credits</td>
<td>▼ Project execution ▼ Mitigation credit size ▼ Counterparty credit risk</td>
</tr>
<tr>
<td><strong>PFP Counterparty</strong></td>
<td>10% (Insurance Co ROA)</td>
<td>▲ Avoided flood damage claims</td>
<td>▼ Flood risk modeling</td>
</tr>
</tbody>
</table>
## The Case for Commercial Properties

<table>
<thead>
<tr>
<th>Pros</th>
<th>Commercial</th>
<th>Residential</th>
</tr>
</thead>
<tbody>
<tr>
<td>▲</td>
<td>One property = material size</td>
<td>▲ Cheaper to demolish</td>
</tr>
<tr>
<td>▲</td>
<td>Large exposures for PFP counterparty + does not benefit competitor customers</td>
<td>▲ Lot of existing public programs to partner with or model after</td>
</tr>
<tr>
<td>▲</td>
<td>Lot of potential sites</td>
<td>▲ Lot of potential sites</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cons</th>
<th>Commercial</th>
<th>Residential</th>
</tr>
</thead>
<tbody>
<tr>
<td>▼</td>
<td>More competition from redevelopers</td>
<td>▼ Need a lot of properties for material size</td>
</tr>
<tr>
<td>▼</td>
<td>More expensive to demolish facilities</td>
<td>▼ If PFP counterparty will only work with its customers, unlikely to get contiguous block</td>
</tr>
<tr>
<td>▼</td>
<td>Greater pollution liability risk</td>
<td>▼ Highly political to buy out homes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Examples</th>
<th>Commercial</th>
<th>Residential</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 135 abandoned car factories in the US</td>
<td>• Harris County Home Buyout Program</td>
<td></td>
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<tr>
<td>• ~36% of commercial properties in Detroit</td>
<td>• Snohomish County Home Buyout Program</td>
<td></td>
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<tr>
<td>• Falstaff Brewery in Galveston</td>
<td>• Blue Acres Home Buyout Program</td>
<td></td>
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</tbody>
</table>

Prefer commercial properties because PFP counterparties will not subsidize competitors’ customers.
Motivation to Participate: Insurance Pay-For-Performance Counterparties

1. ClimateWise group alone = 30+ insurance, reinsurance, and service providers committed to “[reducing] the impact of climate change¹”

2. Adjacent projects suggest appetite
   - Swiss Re insures a coral maintained by hotels in Mexico; pricing tied to upkeep of the reef²
   - United HealthCare gives customers $1,500 credits to complete activities tracked by FitBit³

3. Value proposition of our solution
   - Reduce Franchise Risk: Land recovery buys out existing customers rather than prices them out
   - Addressable Market: Keeps premiums within budget for adjacent customers
   - No Partial Savings Estimates: Land restoration takes damages claims to $0
   - No Project Execution Risk: PFP structure shifts project execution to capital markets

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¹ Source: ClimateWise
² Source: Swiss Re
³ Source: United HealthCare
**Base Case Assumptions**

- 2,600 acres purchased
- $57k per acre cost to acquire and restore land based on research from Michigan State's Center for Community and Economic Development (total capex of $148 million)
- One year demolition and clean up period
- $654 per year per acre in mitigation credit revenue (total credit revenue of $1.7 million per year)
- PFP counterparty avoids 150% of restoration capex every five years based on loss avoidance studies quoted in the Houston Chronicle
- PFP counterparty pays out $230 million at completion of the restoration project

**Base Case Results**

- PFP counterparty IRR = 14%
- Equity provider IRR = 16%
Beyond Houston: Scaling Up Wetland Restoration
More Than A Houston Problem

• US Global Change Research Program’s Climate Science Special Report predicts 50-300% increases in heavy precipitation events due to climate change by the end of the century¹

• As of 2012, 50% of the world’s wetlands had been lost due to human activity since 1900²

• Only 42% of Florida homes in “hazard zones” have flood insurance³

• Over 1/3 of endangered species rely on wetlands for survival⁴

• Over the past century, only about 600 wetland restoration efforts have been undertaken⁵
Introducing The Wetland Restoration Fund

The Wetland Restoration Fund (manages project)

- Wetland Restoration Project #1
  - Conservation Finance
  - Capital Markets

- Wetland Restoration Project #2
  - Conservation Finance
  - Capital Markets

- Wetland Restoration Project #3 ...
  - Conservation Finance
  - Capital Markets
**Action Plan**

1. **Houston area pilot project**
   - Leverage existing network and initial research/conversations
   - Deep bench of potential public sector partners

2. **Establish The Wetland Restoration Fund ("WRF")**
   - Issue GP equity and manage restoration projects
   - Capitalized by conservation finance capital markets, impact investors, traditional infrastructure investors

3. **Expand geographic footprint along US Gulf Coast**
   - Leverage learnings from Houston pilot to restoration of the same ecosystem
   - Houston area network should be relevant in adjacent geographies, especially in Texas and Louisiana

4. **Expand geographic footprint to wetlands around the globe**
The Team

**Founding Members**

- **Ryan Calvert**
  - Former senior project development officer managing a carbon project and distributing energy efficiency and renewable energy loans at XacBank in Ulaanbaatar, Mongolia
  - Pursuing an MBA/MS joint degree with a focus on energy and climate change
  - Undergraduate degree in economics from University of Pennsylvania

- **Tom Loftus**
  - Former analyst for Citibank energy lending group
  - Pursuing an MBA with a focus on corporate finance and energy markets
  - Undergraduate degree in mathematical economics from Rice University

**Advisors**

- Zach Knight, Co-Founder and Managing Partner, Blue Forest Conservation
- Alicia Seiger, Deputy Director, Steyer-Taylor Center for Energy Policy and Finance, Stanford University
- Kayode Atoba, Ph.D. Candidate, Center for Texas Beaches and Shores, Texas A&M University

**Key Conversations**

- Amory Lovins, Chief Scientist, Rocky Mountain Institute
- Houston Recovery Office
  - Marvin Odum, Chief Recovery Officer
  - David Benson, Assistant chief recovery officer
  - Niel Golightly, Chief of Staff
Appendix
Our Solution Addresses Financing Challenges

High cost to purchase and clean up properties

- Funding shifted from public sector to deeper capital markets - $3.1 billion of conservation finance dry powder in 2016

Hard to monetize undeveloped land

- Combines parties interested in flood mitigation with those who are legally obligated to finance mitigation projects
- Monetizes flood damage savings for insurance companies

Hard to quantify and dispersed benefits

- Only expected damage claims savings and quantifiable credits used for pricing
- Other benefits (species conservation, CO2 sequestration) exist but not priced
Mitigation Credits

- **Mitigation Credits**: Unit of trade awarded by ecosystem regulators in exchange for the preservation of the ecosystem under consideration. Credits are then sold to businesses that need credits in order to disturb the ecosystem or to other entities interested in preservation.¹

- **Mitigation Bank**: The parcel of land in the relevant ecosystem that gets preserved. A certain number of mitigation credits will be assigned to a mitigation bank by the ecosystem regulator and will be released for sale over an establishment period (usually 10-12 years) subject to performance requirements.¹

- Credit sales (including prices) are bi-lateral negotiations between mitigation bank owner and credit purchaser

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1. These details may vary depending on specific regulations and requirements of the ecosystem and its regulators.
The Market for Mitigation Credits

1. Large, liquid, and regulation protected market
   - $3.6 billion in annual transaction volume\(^1\)
   - 2000% growth in mitigation bank transactions since 1995\(^2\)
   - “Compensatory mitigation” required for “unavoidable adverse impacts” under the US Clean Water Act\(^3\)

2. Credits support mitigation banking as a business

Sample Transaction: Pineywoods Mitigation Bank\(^4\)
   - 19,079 acre parcel; 13,000 approved as a bank
   - $85 million in potential credit revenues
   - Located just outside Harvey flooding range

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\(^1\) Estimated flooded areas observed by satellite as of Aug. 31

EarthBalance

Ecosystem Investment Partners

Land and Water Resources, Inc.
Motivation to Participate: Federal Government

- Houston Recovery Office estimates $6 to $1 PV to cost ratio for Harris County home buyouts
- Resiliency projects require maintenance and have a finite useful life
- Restored ecosystems have public good benefits (clean air, clean water, species preservation, etc)

“Dallas Rep. Hensarling pushing for overhaul of federal flood insurance program”
- The Dallas Morning News (August 2017)

“National Flood Insurance Is Underwater Because of Outdated Science”
- Scientific American (March 2018)
Credit Suisse defines conservation finance as “a mechanism through which a financial investment into an ecosystem is made – directly or indirectly through an intermediary – that aims to conserve the values of the ecosystem for the long term.”