Texas Land Trends

Texas A&M Institute of Renewable Natural Resources
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Value of Rural Lands

- Rural working lands play an unseen yet critical role in water/food sustainability and national/energy security.
- *Effective* conservation will require innovative solutions to sustaining private rural working lands.

Presentation Outline:
- Changes in human demographics
- Changes in land uses/values
- Linkage to critical issues — water
- Perspective in Way Forward

*Water conservation starts where the first rain drop falls*
Texas Land Trends – *The Data*

- Trends in land use (1997-2012)
- Primary datasets used
  - County Appraisal District
  - USDA NASS Census of Ag
- Relationships among
  - Land Value
  - Land Ownership
  - Land Use
- *Working Lands* – farms, ranches, family forests, wildlife (e.g., 1D, 1D1)
Changing Texas

171 Million Acres...

- 5% PUBLIC
- 95% PRIVATE
- 17% DEVELOPED
- 83% RURAL

...142 Million Acres

Private Working Lands

Population: 26 Million...

- = 250,000
- = Rural (10%)
- = Landowners (<1%)
Texas Population

- 1997 – 19 Million
- 2012 – 26 Million
- 36% increase
- 500,000/year
- 65% of increase occurred within *Top Ten Populated Counties*
Working Land Loss

- 1997 – 143 Million acres
- 2012 – 142 Million acres
- Loss ~1 Million acres
Working Land Loss

1997-2007

Land Loss 1997-2012

2007-2012
Working Land Loss – Future?
Oil and Gas

- **Game Changer**—Texas is leading crude oil production state in part to 3 large shale gas plays
  - Barnett, Haynesville and Eagle Ford
- U.S. oil production expected to exceed that of Saudi Arabia by 2017
- Eagle Ford Shale Story
  - $87B in revenue (2014)
  - Since 2014, natural gas production has *doubled* and oil production has increased 6X.
Oil and Gas

Oil & Gas Market Value
1997

Oil & Gas Market Value
2012

Millions ($)
- < 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100 - 250
- 250 - 500
- 500 - 750
- 750 - 1,000
- 1,000 - 2,000
- > 2,000
Night Time Illumination
Oil and Gas – *Eagle Ford Shale*

- Landsat 1993-2014 - CDA
- Estimated increase:
  - 23,000 well pads
  - 84,000 acres
  - 65% of construction occurred 2011-2014
Farm and Ranch Proceeds - *Driver*

Net Farm and Ranch Proceeds by Ownership Size, 2012

Annual Profits/Acre ($)

- $758

Operation Size (Acres)

Economic Loss = Predictor of Land Conversion?
Ownership Size - Acres

- Ownership size = fragmentation
- Increase (500K acres) of <100 acre farms
- Decrease (4M acres) of 100-2000 acre farms
- Increase (400K acres) of >2000 acre farms

Acres Change By Size Class (1997-2012)
Ownership Size – *Number*  

**1997-2012**

<table>
<thead>
<tr>
<th>Size Class</th>
<th>Number of Farms/Ranches</th>
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<tbody>
<tr>
<td>1-100</td>
<td>25,790</td>
</tr>
<tr>
<td>100-500</td>
<td>-1,927</td>
</tr>
<tr>
<td>500-1000</td>
<td>-2,204</td>
</tr>
<tr>
<td>1000-2000</td>
<td>-1,236</td>
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<tr>
<td>2000+</td>
<td>213</td>
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Ownership Size – Distribution

Proportion of Farms <500 Acres in Size 2012

Proportion of Farms >2,000 Acres in Size 2012
Working Land Loss – *Future*? 

<table>
<thead>
<tr>
<th>Year</th>
<th>Working Lands</th>
<th>Economic Growth</th>
<th>Human Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>144.0</td>
<td>143.0</td>
<td>25.0</td>
</tr>
<tr>
<td>2002</td>
<td>143.0</td>
<td>142.0</td>
<td>22.0</td>
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<tr>
<td>2007</td>
<td>142.0</td>
<td>141.0</td>
<td>20.0</td>
</tr>
<tr>
<td>2012</td>
<td>141.0</td>
<td>140.0</td>
<td>18.0</td>
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<tr>
<td>2017</td>
<td>139.0</td>
<td>138.0</td>
<td>16.0</td>
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<tr>
<td>2022</td>
<td>137.0</td>
<td>136.0</td>
<td>14.0</td>
</tr>
</tbody>
</table>

- Weak Economy
Way Forward

- Land conversion and fragmentation continues. Linked population size, land value, ownership size.
- How do we secure future energy, water, food, and ecosystem services from a dynamic but shrinking land base?
- Continued or new support of:
  - 1D and 1D1
  - Market-driven, incentive-based programs
  - Communicating the public benefit of private lands
Texas Water Demand – *Key Challenge*

- Water use today - 18 MAF
- Water use by 2060 - 22 MAF
- Cities need more water
Implementing the State Water Plan

- State water plan expected to generate 9 million acre-feet/year
- Implementation Costs = $53 billion
  - Up from $30.7 billion in 2007
Water Challenge

- Competing interests, common resource
- Increase of people = increase in demand
- “Mega-Listings” of candidate species.
- Potential social and economic impacts huge
- Listing based on “best scientific data available” – standard not well defined.
Why “Land” Matters?

“Water conservation starts where the first rain drop falls”.

-President Lyndon B. Johnson
Water Conservation 101

“Water conservation starts where the first rain drop falls”.

- President Lyndon B. Johnson
No Land, No Water?

- What loss in infiltration capacity occurs in conversion from ranch to subdivision? Assumptions:
  - Average Rainfall – 35 inches/yr
  - 2.92 ac-ft from Rainfall/acre
    - 75% infiltration (good cover) = 2.19 ac-ft
    - 15% infiltration (impervious) = 0.44 ac-ft
  - 1.75 ac-ft Difference in Land Type on a per acre basis

- **Carrizo-Wilcox Aquifer** – 5,734 acres of farm/ranch land lost annually

- $\approx 10,000$ ac-ft in infiltration capacity lost annually

- Land conservation lower cost?
Land Conservation as Water Strategy?

- Should we consider the value of land conservation as a viable, cost-effective water strategy?
- Research and policy analyses needed.
- Strategy in State Water Plan?

“Yesterday is not ours to recover, but tomorrow is ours to win or lose”.

-President Lyndon B. Johnson

44K ac-ft annually
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http://irnr.tamu.edu/

http://txlandtrends.org/

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