Texas Land Trends

Texas A&M Institute of Renewable Natural Resources
Roel R. Lopez
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.*

“*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 PEOPLE
Changing Texas

171 Million Acres...

- 5% PUBLIC vs
- 95% PRIVATE

- 17% DEVELOPED vs
- 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
Texas Rural and Urban Populations

- Urban Population
- Rural Population

<table>
<thead>
<tr>
<th>Year</th>
<th>Urban Population</th>
<th>Rural Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>60%</td>
<td>40%</td>
</tr>
<tr>
<td>1980</td>
<td>90%</td>
<td>10%</td>
</tr>
<tr>
<td>2015</td>
<td>90%</td>
<td>10%</td>
</tr>
</tbody>
</table>
Landowner Demographics

- In 2007, the average farmer – 57 years old; average forest landowners – 65 years old.
- During the next two decades, the U.S. will witness the largest intergenerational transfer of rural lands in its history.
Landowner Demographics

- Future private landowner?
- Younger generation less tied to the land.
- Concerns - estate taxes on holdings
- Buyers/developers who want to make a better return on their investments than farming or ranching can provide.
CHANGING...PLACES
Working Land Loss

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

Total Working Lands

<table>
<thead>
<tr>
<th>Year</th>
<th>Acres (Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>143.5</td>
</tr>
<tr>
<td>2002</td>
<td>143.0</td>
</tr>
<tr>
<td>2007</td>
<td>142.5</td>
</tr>
<tr>
<td>2012</td>
<td>142.0</td>
</tr>
</tbody>
</table>
Working Land Loss – *Future*?
The Good....
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 ($) - 1997:
- < 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100 - 250
- 250 - 500
- 500 - 750
- 750 - 1,000
- 1,000 - 2,000
- > 2,000

Millions ($) - 2012:
- < 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

1992

2012

Increase 1993-2012
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
The Bad....
Market Value - *Driver*

**Market Value 1997**

**Market Value 2012**

$Per Acre$

- 1 - 1,000
- 1,000 - 2,000
- 2,000 - 3,000
- 3,000 - 4,000
- 4,000 - 5,000
- > 5,000
Farm and Ranch Proceeds - *Driver*

Net Farm and Ranch Proceeds by Ownership Size, 2012

Economic Loss = Predictor of Land Conversion?
The Ugly....
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*

<table>
<thead>
<tr>
<th>Size Class</th>
<th>Number of Farms/Ranches</th>
</tr>
</thead>
<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>
</tr>
<tr>
<td>2000+</td>
<td>213</td>
</tr>
</tbody>
</table>

1997-2012
Ownership Size – *Distribution*

Proportion of Farms <500 Acres in Size 2012

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

[Graph showing changes in working lands, population, and weak economy over time.]
Water Demand and State Plan

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

- Water use today - 18 MAF
- Water use by 2060 - 22 MAF
- Cities need more water
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 does conversion from ranch to subdivision have on *potential* infiltration capacity?

**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** – ≈5,700 acres of farm/ranch land lost annually

- ≈10,000 ac-ft in potential 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?
 Is “Land Infrastructure” as important as city infrastructure?
 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
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
Promoting Private Lands Stewardship through Research, Education, and Policy.

http://irnr.tamu.edu/
http://txlandtrends.org/

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CHANGING... PERSPECTIVES
Presentation Outline

- Private lands in the U.S. undergoing significant changes (e.g., >1 acre of farmland lost/minute).
- Most lands in U.S. are privately-owned (64%) and play an unseen yet critical role in water/food sustainability and national/energy security.
- **Effective** conservation will require engagement with private landowners
- Challenges with *Changing Perspectives and Landowner demographics*
Changing Texas

171 Million Acres...

Population: 26 Million...

...142 Million Acres
Private Working Lands

5% PUBLIC vs
95% PRIVATE

17% DEVELOPED vs
83% RURAL

\[\text{\#} = 250,000\]

\[\text{\#} = \text{Rural (10\%)}\]

\[\text{\#} = \text{Landowners (<1\%)}\]
The Data...
Family Forests by the Numbers

East Texas
- Acres: 6,107,000
- Ownerships: 75,000
- Average size: 81.4 ac
- Owners: 160,000

West Texas
- Acres: 35,983,000
- Ownerships: 292,000
- Average size: 123.4 ac
- Owners: 498,000
Landowner Demographics

- In 2007, the average farmer – 57 years old; average forest landowners – 65 years old.
- During the next two decades, the U.S. will witness the largest intergenerational transfer of rural lands in its history.
Landowner Demographics

- Future private landowner?
- Younger generation less tied to the land.
- Concerns - estate taxes on holdings
- Buyers/developers who want to make a better return on their investments than farming or ranching can provide.
Landowner Demographics

- Absentee ownerships  
  - 45% of ownerships
- Part of farm  
  - 42% of ownerships
- New ownerships (<10 yrs)  
  - 25% of ownerships
Size of Family Land Holdings in Texas

- 10-49: 60%
- 50-99: 20%
- 100-499: 10%
- 500+: 0%
Reasons for Owning Land – East Texas

- Legacy: 90%
- Beauty: 70%
- Nature: 60%
- Investment: 50%
- Water: 40%
- Wildlife: 30%
- Home: 20%
- Family: 10%
- Farm: 5%
- Privacy: 2.5%
- Timber: 5%
- Recreation: 2.5%
- Hunting: 2.5%
- Cabin: 1.25%
- Firewood: 1.25%
Landowner Average Age
Operator Years on Current Operation

2012

Average Years
- <17
- 18 - 20
- 21 - 23
- >23
Absentee Operators (Ratio)
Absentee vs. Resident Landowners

1997
- Absentee Landowner: 38%
- Resident Landowner: 62%

2002
- Absentee Landowner: 33%
- Resident Landowner: 67%

2007
- Absentee Landowner: 32%
- Resident Landowner: 68%

2012
- Absentee Landowner: 31%
- Resident Landowner: 69%

The chart shows the percentage of operators who are resident landowners from 1997 to 2012, with a steady increase in resident landowners over the years.
Female Operators (Ratio)
Minority Operators (Ratio)
## Landowner Ethnicity (Number of Operators)

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>2007</th>
<th>2012</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>6,124</td>
<td>8,551</td>
<td>39.6%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>20,351</td>
<td>23,689</td>
<td>16.4%</td>
</tr>
<tr>
<td>White</td>
<td>236,568</td>
<td>235,449</td>
<td>-0.5%</td>
</tr>
<tr>
<td>Other</td>
<td>4,686</td>
<td>4,782</td>
<td>2.0%</td>
</tr>
</tbody>
</table>
## Landowner Ethnicity (Number of Acres)

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<th>2007</th>
<th>2012</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>561,693</td>
<td>900,870</td>
<td>60.4%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>5,142,720</td>
<td>6,612,971</td>
<td>28.6%</td>
</tr>
<tr>
<td>White</td>
<td>104,554,595</td>
<td>112,741,530</td>
<td>7.8%</td>
</tr>
<tr>
<td>Other</td>
<td>733,251</td>
<td>694,266</td>
<td>-5.3%</td>
</tr>
</tbody>
</table>
The Challenge...

- Average ownership size decreasing.
- Different management objectives, may not be driven by traditional factors.
- Aging population, largest intergenerational transfer.
The Challenge...

- **Rapid Change in Rural Landscapes.** How do we maintain rural lands with increasing human population?

- **Different Actors – Landowners and Urban Texas.** How do we engage broader audience?

- **Game Changers – Water, T&E, and Energy.** How do we balance demands? How do we take these challenges and create opportunities?
The **Grand Challenges**...

- **Changing Places** – Loss of working lands, fragmentation and conversion.
- **Changing Perspectives** – Aging landowners, different objectives, largest intergenerational transfer.
- **Changing People** – Increasing human population, shifts in ethnicity and urban residents.
Promoting Private Lands Stewardship through Research, Education, and Policy.

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