Influence of exurban residents’ land ethic and regional land-use context on property management behaviors

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Exurban Development
Significant Impacts to Wildlife

- Ecosystem fragmentation
- Edge effects and nest predation
- Source–sink dynamics
- Disruption of movement, dispersal
- Altered community structure, composition
- Roads
- Recreation
- Domestic pets
- Human–wildlife conflicts
- Cumulative impacts
Diverse Landscapes – Diverse Impacts?

Heterogeneous

Homogeneous
Summary of Previous Work

- Impacts to birds in subdivisions
- ...but impacts did not depend on region
- Magnitude of change was similar across the two regions.

Glennon & Kretser 2013, Glennon et al. *In review*
Implications

Doesn’t matter where the development is, birds have a similar response to something.
What is that Something?

Habitat/landscape alteration versus

Land ethics and human disturbance around the exurban environment
Test how individual land ethics and land-use decisions, operating within a regional land-use context, shape human impacts on biological communities and how understanding this relationship can yield better management opportunities and potentially ecologically healthier landscapes.
Landowner Characteristics:
Demographics, wildlife management objectives, beliefs and knowledge, conservation and land use attitude

Regional Management Context:
Planning, zoning, easements, enforcement

Land Ethic

Local Land-Use Practices & Activities:
Trails, roads, pets, feeding wildlife, agriculture, gardens, livestock, lawn maintenance, noise, lights

Landscape Pattern:
Configuration, size, shape, diversity and connectivity of habitat patches

Local Habitat Configuration:
Structure, canopy, understory, ground cover

Environmental Quality:
Avian richness, abundance, reproductive success, and mammal presence

Conceptual Model
Research Questions

1. What land ethic do exurban landowners identify with most strongly?

2. Is there a relationship between a land ethic and land-use activities?

3. Do attitudes, norms, and behavioral controls explain behavioral intent to engage in practices that benefit wildlife?
Madison County, Montana

Essex County, New York
Each landscape: 6 subdivisions, ~ 100 landowners
6 control sites

Ecological Study

2012
- point counts,
- nest success,
- veg surveys,
- human activity
- camera traps,
- acoustic monitoring

2013
- 2012 methods
  plus night lighting

2014
- 2012 methods
  plus revised night lighting

Social Study

2012 methods
mail survey

2014
semi-structured interviews
Methods & Response

- Landowners participating in the ecological study plus adjacent parcels
- County tax rolls
- Mailed 508 surveys (4-wave design)
- Demographics, land ethic scale, activities (day-to-day & larger mgmt), limits & influences, intention to benefit wildlife
- Factor analysis, regression and general linear models
- Theory of Reasoned Action

<table>
<thead>
<tr>
<th></th>
<th>ADK</th>
<th>GYE</th>
</tr>
</thead>
<tbody>
<tr>
<td># Surveys Mailed</td>
<td>248</td>
<td>260</td>
</tr>
<tr>
<td>Response Rate</td>
<td>54%</td>
<td>42%</td>
</tr>
<tr>
<td># Usable Surveys</td>
<td>125</td>
<td>98</td>
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</table>
Factor Analysis : Land Ethic

<table>
<thead>
<tr>
<th>Land Ethic</th>
<th>Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mastery</td>
<td>- Humans have more value than nature</td>
</tr>
<tr>
<td></td>
<td>- Humans have the right to alter nature</td>
</tr>
<tr>
<td>Stewardship</td>
<td>- Humans have a responsibility to conserve</td>
</tr>
<tr>
<td></td>
<td>- Humans are part of nature and are also responsible for it</td>
</tr>
<tr>
<td></td>
<td>- We have to ensure that we leave enough nature intact for future generations</td>
</tr>
<tr>
<td>Partnership</td>
<td>- People and nature are of equal value</td>
</tr>
<tr>
<td></td>
<td>- We must not set ourselves above nature, but must work together with it</td>
</tr>
<tr>
<td></td>
<td>- Nature wants to grow, prosper, and develop, just like humans do</td>
</tr>
<tr>
<td>Participation</td>
<td>- Humans are part of nature</td>
</tr>
<tr>
<td></td>
<td>- I often feel a connection with nature</td>
</tr>
<tr>
<td></td>
<td>- Natural sites are important, even if they are not useful to us</td>
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</tbody>
</table>

Do exurban landowners identify with these land ethics? (deGroot et al. 2011)
### Land Ethic

<table>
<thead>
<tr>
<th>Land Ethic</th>
<th>Scale Mean</th>
<th>Alpha</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>ADK</td>
<td>GYE</td>
</tr>
<tr>
<td>Mastery</td>
<td>2.5</td>
<td>2.9</td>
</tr>
<tr>
<td>Stewardship</td>
<td>6.6</td>
<td>6.5</td>
</tr>
<tr>
<td>Partnership</td>
<td>5.6</td>
<td>5.3</td>
</tr>
<tr>
<td>Participation</td>
<td>6.4</td>
<td>6.2</td>
</tr>
</tbody>
</table>

**Seven-point scale:**
- 1 – Disagree
- 4 – Neutral
- 7 – Agree
Regression: Land Ethic & Behaviors

Land Ethic as a predictor of Land Management Activities:
- Trail or road maintenance
- Silviculture
- Construction

Adjusted $R^2 < -0.02; p > .2$

Does not support idea that land ethic influences activities and management

Land Ethic as a predictor of Land Use Activities:
- Yard maintenance
- Grill/listen to music/kids play outside
- Small construction
- Non-motorized winter recreation
- Biking/hiking
- Let dogs run

Adjusted $R^2 < -0.02; p > .1$
Theory Reasoned Action: Full Model

**Attitudes:**
- feelings toward activities to benefit wildlife

**Perceived Norms:**
- neighbor influence
- professional opinion

**Perceived Behavioral Influences and Limits:**
- land use regulations
- homeowner associations

**Intention:**
undertake land management practices that benefit wildlife

**ADK:** $B=0.214$, $p=0$
**GYE:** $B=0.322$, $p=0.001$

**ADK Adjusted R²:** 0.286
**GYE Adjusted R²:** 0.479
Strengths of Relationships

Regressions of each component with intention to engage in activities to benefit wildlife

<table>
<thead>
<tr>
<th></th>
<th>Attitudes</th>
<th></th>
<th>Norms</th>
<th></th>
<th>Behavioral Control</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>ADK</td>
<td>GYE</td>
<td>ADK</td>
<td>GYE</td>
<td>ADK</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.261</td>
<td>0.359</td>
<td>0.141</td>
<td>0.242</td>
<td>L: -0.004</td>
<td>L: -0.012</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>I: 0.007</td>
<td>I: 0.035</td>
</tr>
<tr>
<td></td>
<td>Standardized B-Coefficient</td>
<td>0.517</td>
<td>0.605</td>
<td>0.388</td>
<td>L: -0.079</td>
<td>L: 0.008</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>I: 0.130</td>
<td>I: 0.215</td>
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<tr>
<td></td>
<td>p-value</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>L: 0.425</td>
<td>L: 0.943</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>I: 0.204</td>
<td>I: 0.048</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>113</td>
<td>87</td>
<td>96</td>
<td>83</td>
<td>L: 104</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>I: 98</td>
<td>L: 87</td>
</tr>
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Interviews

Preliminary Results

• Landowners possess explicit and ultimate control over the management of their land
• Landowners want to engage in wildlife friendly behaviors, but unsure what to do
• Regulators have few mechanisms for constraining or influencing landowners after the building phase

Adirondacks

• Town-level regulatory bodies possess the most power

GYE

• No county-level code enforcement
• HOAs possess the most power

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Landowners</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>Agency</td>
<td>9</td>
<td>7</td>
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<tr>
<td>Representatives</td>
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Discussion

Land Ethic:

- Mastery/Dominance not prominent
- Stewardship (implying responsibility) and Participant in Nature supported

Land Ethic does not predict activities and management practices

Attitudes are the strongest predictor of intent to engage in wildlife friendly behaviors

- Norms are important also
- Behavioral controls (i.e. regulation and policy) much less influential
Conservation Implications

Despite wanting to do the ‘right’ thing – (stewardship & partnership) exurban landowners may be choosing activities that negatively impact native species.

Opportunity to provide information to landowners and to HOAs or other groups/agencies that work with landowners.
Management Implications

- Exurban landowners have autonomy to manage private land
- Self-governance (i.e. HOAs) might be most direct route
- Community-based approaches needed
Next Steps
ACKNOWLEDGMENTS:

Funding provided by the National Science Foundation BCS-1060505 and Adirondack Kieckhefer Fund.

Special thanks to: Michale Glennon and Sarah Reed and the landowners participating in the study

Photos by: WCS staff, WCS field crew, Larry Master, Steve Zack, Leslie Karasin, Kevin Ellison

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