Riparian Forest Buffer

Prioritization

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Indiana DNR Division of Forestry
Watershed Conservation Through Forestry Pilot Project

Goals

• Spread message of positive impact of forests on water quality.

• Develop, apply GIS methodology to target areas most in need of Riparian Forest Buffers (RFBs)

• Make available for use on a state and regional level.

Introduction
“It is imperative that managers have simple methods for quickly identifying locations for riparian buffers that address landowner and community goals while maximizing cost share program resources” Bentrup and Kellerman, 2004
Methods
<table>
<thead>
<tr>
<th>Data Category</th>
<th>Data Name</th>
<th>Origin</th>
<th>Year</th>
<th>Resolution/Scale</th>
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</thead>
<tbody>
<tr>
<td>LULC</td>
<td>NLCD</td>
<td>USGS</td>
<td>2001</td>
<td>30 meter</td>
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<tr>
<td>Soils</td>
<td>STATSGO</td>
<td>NRCS</td>
<td>1994</td>
<td>1:250,000</td>
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<td>Elevation Model</td>
<td>Indiana DEM</td>
<td>State IN</td>
<td>2005</td>
<td>1 meter</td>
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<tr>
<td>Hydrologic lines</td>
<td>NHD</td>
<td>USGS</td>
<td>2000</td>
<td>30 meter</td>
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<td>Watershed Boundaries</td>
<td>HUC 11 &amp; HUC 14</td>
<td>USGS &amp; NRCS</td>
<td>1991</td>
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</table>
Methods

Two scale prioritization approach

- Subwatershed
- Stream Reach
Methods

Subwatershed Prioritization

• % Riparian Lands in Subwatershed
• % of NPS contributing LULC in Subwatershed
• % of NPS contributing LULC in Riparian Areas
• Erosion Estimates for Subwatershed (RUSLE)
Methods

Stream Reach Prioritization

- % NPS contributing LULC
- Erosion Estimates
## Indian Creek Subwatershed Scores

<table>
<thead>
<tr>
<th>Subwshds</th>
<th>% Subwshd LULC</th>
<th>Score</th>
<th>% Rip LULC</th>
<th>Score</th>
<th>% Rip Land</th>
<th>Score</th>
<th>Erosion</th>
<th>Score</th>
<th>Final Score</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>33.9</td>
<td>1</td>
<td>9.17</td>
<td>1</td>
<td>9.31</td>
<td>2</td>
<td>6.2</td>
<td>2</td>
<td>6</td>
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<tr>
<td>2</td>
<td>71.48</td>
<td>3</td>
<td>27.46</td>
<td>3</td>
<td>8.21</td>
<td>2</td>
<td>9.6</td>
<td>3</td>
<td>11</td>
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<td>51.32</td>
<td>2</td>
<td>25.01</td>
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<td>9.02</td>
<td>2</td>
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<td>9</td>
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<td>36.95</td>
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<td>17.86</td>
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<td>11.39</td>
<td>3</td>
<td>7.21</td>
<td>2</td>
<td>8</td>
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<td>6.52</td>
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<td>4.4</td>
<td>1</td>
<td>8</td>
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</tbody>
</table>
Results

Indian Creek Subwatershed Erosion Scores

Indian Creek Subwatershed % Riparian Land Scores

Indian Creek Subwatershed LULC Scores

Indian Creek Subwatershed Riparian Land Use Scores

Indian Creek Subwatershed FINAL Scores

Legend
Indian Creek Subwatersheds
- 1
- 2
- 3
- 4
- 5
- 6
- 7

Legends
- Indian Creek Subwatersheds
- % Riparian Land
- LULC

Indian Creek Subwatersheds Final_Rank

Legend
Indian Creek Subwatersheds
- 6
- 7
- 8
- 9
- 10
- 11

Scoring Key
High numbers indicate a high potential for NPS
Results

Indian Creek Watershed Subwatershed 2
Stream Reach LULC Scores

Legend
Subwatershed 2 Stream Reaches
LULC_Score
1
2
3

Scoring Key
1: No land use LULC improvement
2: Moderate need for LULC improvement
3: High need for LULC improvement

Indian Creek Watershed Subwatershed 2
Stream Reach Final Scores

Legend
Subwatershed 2 Stream Reaches
Final_Score
2
3
4
5
6

Scoring Key
Low numbers indicate a low potential for NPS
High numbers indicate a high potential for NPS

Indian Creek Watershed Subwatershed 2
Stream Reach Erosion Scores

Legend
Subwatershed 2 Stream Reaches
Erosion_Score
1
2
3

Scoring Key
1: Low erosion
2: Moderate erosion
3: High erosion

Graphical representation of erosion scores with mapping of stream reaches.
Results

Indian Creek Watershed Subwatershed 1
Stream Reach Final Scores

Legend
Subwshd 1 Stream Reaches
Final Score
2
3
4
5
6

Scoring key
Low numbers indicate a low potential for NPS
High numbers indicate a high potential for NPS

Indian Creek Watershed Subwatershed 2
Stream Reach Final Scores

Legend
Subwatershed 2 Stream Reaches
Final Score
2
3
4
5
6

Scoring key
Low numbers indicate a low potential for NPS
High numbers indicate a high potential for NPS
How results can be used

- **Watershed planning - restoration, enhancement and protection**
- **Starting point for education and outreach to landowners.**
- **Can tie prioritized areas with cost share $**
Management Implications

Modification Examples

• Use other indicators
• Use different loading model
• Weight indicators
• Change scoring scheme
Management Implications

Limitations

• No ground truthing or validation has yet occurred
• Data resolution and error
• Intended as first round assessment
• Fine detail not detected
• Can not replace on ground surveys
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Only when the last tree has died and the last river been poisoned and the last fish been caught will we realize we cannot eat money

Cree Indian Proverb