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Landscape Approaches: A Multi-Scale Web-Based Fish Habitat Decision Support Tool

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A Multi-Scale Web-Based Fish Habitat Decision Support Tool

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Dr. Todd Petty, WVU
Frank Orr, Critigen

www.FishHabitatTool.org
About us

Downstream Strategies

“Downstream Strategies offers environmental consulting services that combine sound interdisciplinary skills with a core belief in the importance of protecting the environment and linking economic development with natural resource stewardship”

- West Virginia–based company since 1997
- Offices in Morgantown and Alderson, West Virginia
- Program tools include monitoring and remediation, GIS, and stakeholder involvement
- Clients include Federal, state, and local governments, foundations and non-profits, universities, attorneys, individuals, and private businesses
Project Overview

Timeline
- 2008 – Midwest Fish Habitat Partnerships
- 2009 - Great Plains FHP
- 2012 - North Atlantic LCC

Habitat assessment process
- Landscape characteristics used to predict aquatic characteristics (statistical models)
- “Post-modeling” indices of stress and habitat quality

Webtool
- Web map format
- Access to assessment data and results
- Unique analysis/prioritization tools
Assessment Process

- NHD+ catchment - unit of analysis for all inland assessments
- Landscape data to predict various aquatic responses
  - Land cover/Land use
  - Geology/Soils
  - Landform (elevation, slope, etc)
  - Climate
- Sample data collected mostly from state and federal agencies
Assessment Process

- Boosted regression trees
- Grounded in the research done at WVU for “Watershed Planning”
- 37 distinct predictive models
Web-based Mapping Application Design
www.FishHabitatTool.org

- Tutorial
- Case Studies
- Metadata
- Contact
- Tool
- Press
Custom Web-based Mapping Application
Analytical Tools
Custom Web-based Mapping Application
Visualization Tool
Custom Web-based Mapping Application
Visualization Tool
Custom Web-based Mapping Application
Ranking
Custom Web-based Mapping Application
Futuring
Summary

- Accessible, flexible tool for aquatic prioritization
- Utilizes unique combination of factors
  - Habitat quality
  - Stress
  - Current conditions
  - Climate
  - Others (socioeconomic, landcover, soils, etc)
Ongoing/Future Work

- As broad-scale connectivity data improves, these factors can be utilized within this process
  - Within model as predictor variables
  - Within application/prioritizations

- Opportunity:
  - Robust connectivity data = more comprehensive tool
Ongoing:
Lake Superior Brook Trout Assessment

- Lake Superior Brook Trout Assessment
  - Fishwerks barrier passibility data
  - Created segment-level passibility values for entire flow network
Ongoing:
Lake Superior Brook Trout Assessment

• Lake Superior Brook Trout Assessment
  – Prioritized this subwatershed as a priority for brook trout restoration.
  – Currently using this data to prioritize barrier replacement efforts
Ongoing/Future Work

Creating passibility values for entire flow networks

Updating data
  – Fisheries data
  – Predictor data
  – Barrier/passibility data
Questions?