Curry's Fork
Warm Water Aquatic Habitat Roundtable

Wednesday

February 2, 2011

Stakeholder Meeting

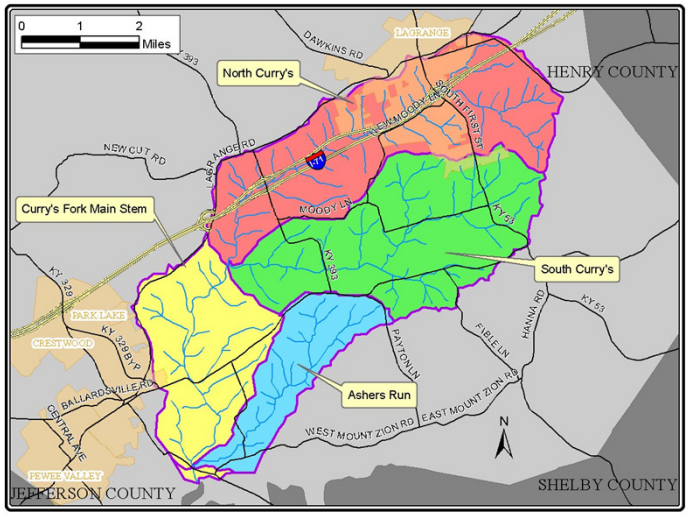
Introductions

- **Beth Stuber**
  - Oldham County Engineer
- **Paul Maron**
  - Project Manager – Strand Associates
- **Andrew Esarey**
  - Project Engineer – Strand Associates
- **Corrine Mulberry**
  - Watershed Technical Advisor

Presentation Overview

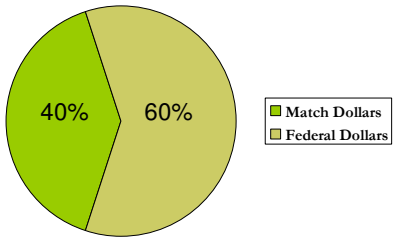
- Project Introduction and Goals
- Stream Habitat and Biology Fundamentals
- Impacts on Aquatic Habitat
- BMPs Introduction
- Warm Water Aquatic Habitat (WAH) Analysis
  - Monitoring Overview
  - Watershed Overviews
  - Proposed Remediation Activities
  - Next Steps

Curry's Fork Boundary



Clean Water Act §319(h) Grant to Oldham County Fiscal Court

- Budget
  - Total of $1.6 M
    - $900,000 Federal Dollars
    - $700,000 Oldham County Match Dollars
- Contractors
  - Strand Assoc. Inc
  - UL Stream Institute
  - Other



Technical Committee

(PARTIAL LIST)

Oldham Co. Fiscal Court
KY Division of Water
Oldham Co. Health Dept.
Local Residents
Oldham Co. Board of Edu.
Oldham Co. Planning & Zoning
County Magistrates
Homebuilders Association
Parks and Recreation
Local Farmers
University of Louisville

Mayor of LaGrange
Oldham Co. Conservation District
LaGrange Utilities
Oldham Co. Sewer District
Oldham Co. Stormwater
Third Rock Consultants
Strand Associates, Inc.
Oldham County Water District
USDA Natural Resources & Conservation Service
US Geological Survey

Collaboration

- **Technical Committee**
  - Formed August 2008
  - 19 Meetings (to date)
- **Water Quality Data Analysis Team**
  - Formed September 2009
  - 3 meetings (to date)
- **Stakeholder Group**
  - First Meeting : December 2007
  - 5 Meetings (to date)
  - RT Meeting September 2009 with 100 +/- participants
  - RT Meeting July 2010 with 40 +/- participants

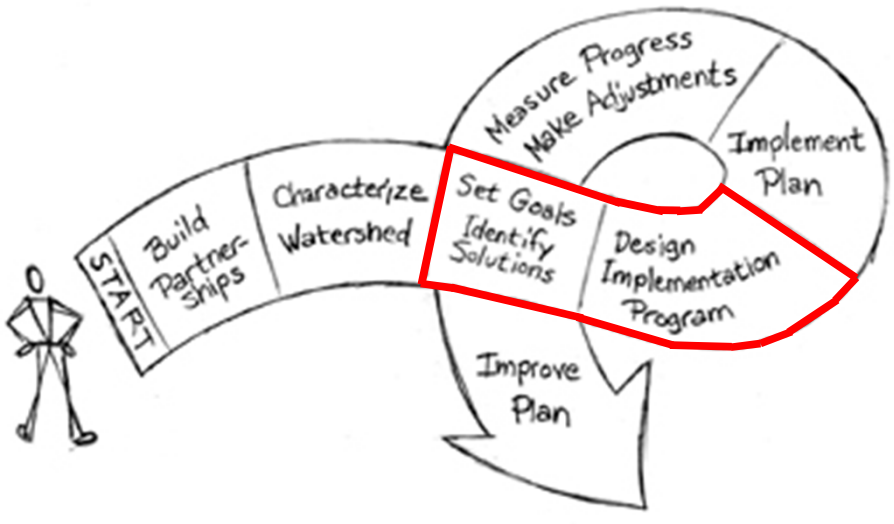
Project Goals & Objectives

- **Improve Water Quality of Curry's Fork**
- **Meet goals and objectives of the Clean Water Act**
- **Accomplished through:**
  - Development of Watershed Plan (Based on EPA's nine required elements)
  - Targeted Implementation of selected aspects of plan

Why a Watershed Plan?

- **Effective use of:**
  - Existing Watershed Programs
  - Available funds
  - Coordination efforts
- **Clean Water Act Section 319(h) Nonpoint Source Pollution Control Grants REQUIRE the development of a comprehensive watershed plan prior to implementing solutions/controls with 319(h) Grant funds**

Watershed Plan Components



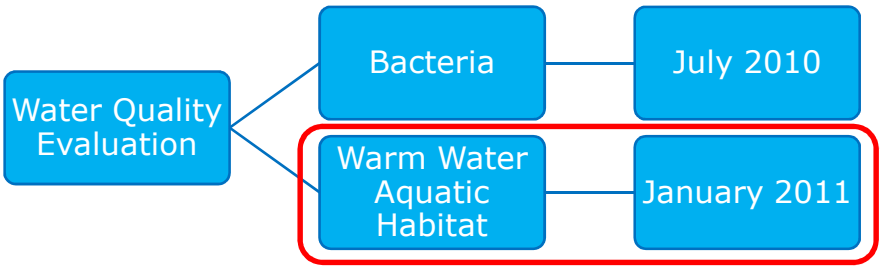
Clean Water Act Basics

- **Fishable, Swimmable, and Drinking Goals**
- **Designated Use**
  - WAH – Warm Water Aquatic Habitat
  - CAH – Cold Water Aquatic Habitat
  - PCR – Primary Contact Recreation
  - SCR – Secondary Contact Recreation
  - DWS – Domestic Water Supply
  - OSRW – Outstanding State Resource Water
- **Numeric and Narrative Criteria for each use**

What is WAH?

- **401 Kentucky Administrative Regulations definition:**
  - "a surface water and associated substrate capable of supporting indigenous warm water aquatic life."
- **What does this mean?**
  - "Typical" Stream, most streams are WAH
  - Streams not specifically listed in KY Regulations are by default WAH, PCR, SCR and DWS

Project Approach Evaluation Split



WAH Water Quality Assessment

- Conduct Extensive Sampling
- WQDAT to review sampling results and prioritized remediation activities
- Identify More and Less Probable Pollutant Sources
- Propose Solutions/Remediation Activities
- Conduct Feasibility analysis with pollutant reductions and cost estimates
- Finalize implementation plan
- Incorporate into watershed based plan

We are HERE.

Project Activities

- **Documenting the Watershed**
  - Watershed Conditions and Characteristics through stream evaluations
    - Chemical Sampling
    - Physical Stream, Geomorphic, and Habitat Assessments
    - Biological Assessments
  - Ongoing and Planned Watershed Activities
- **Public Outreach**
  - Technical Committee/Water Quality Data Team
  - School Presentations/Information/Roundtables

Project Timeline

- **Complete Warm-Water Aquatic Habitat Analysis and Recommendations**
  - February 2011
- **Finalize Report and Submit to State**
  - March 2011

Stream Habitat and Biology

- **Healthy Streams for wildlife are healthy streams for people**
- **Fish are good indicators of healthy streams**

Biological Needs for Fish

- Habitat - pools, riffles, shelter
- Food - insects, small fish, amphibians
- Dissolved oxygen
- Free of toxic chemicals

Fish Habitat in Streams

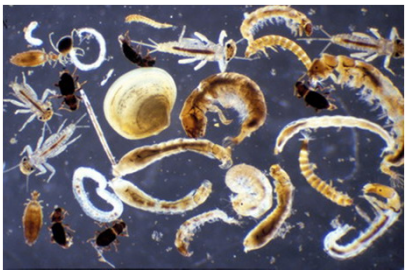
- Riffles in streams bring food to the deeper slow moving water in pools
- Rocks and logs provide barriers that slow water and provide resting areas for fish
- Shelter provided by trees and streamside plants provide shade for fish

Fish Habitat in Streams

North Curry's

Food for Fish in Streams

- A stream habitat that is diverse in food items will support a larger diversity of fish species
- Invertebrates, such as insects, and smaller vertebrates, such as amphibians, provide a food source for fish



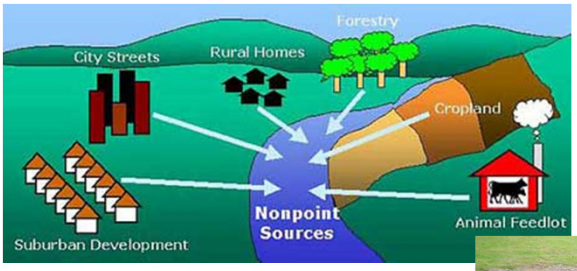
Dissolved Oxygen for Fish

- Dissolved oxygen is a critical component of water quality in streams
- Food sources for fish are dependent on oxygen availability
- Fish species may be less tolerant of living in water with low oxygen levels

Effect of Chemicals

- Point source pollution from a discharge can introduce toxic chemicals that kill fish directly or remove oxygen from the water
- Nonpoint source pollution entering the stream from land use all along the stream can impact water quality
- Nitrates from fertilizer, oil from parking lots, pesticide residues, topsoil from erosion, animal wastes are common sources of pollution in streams

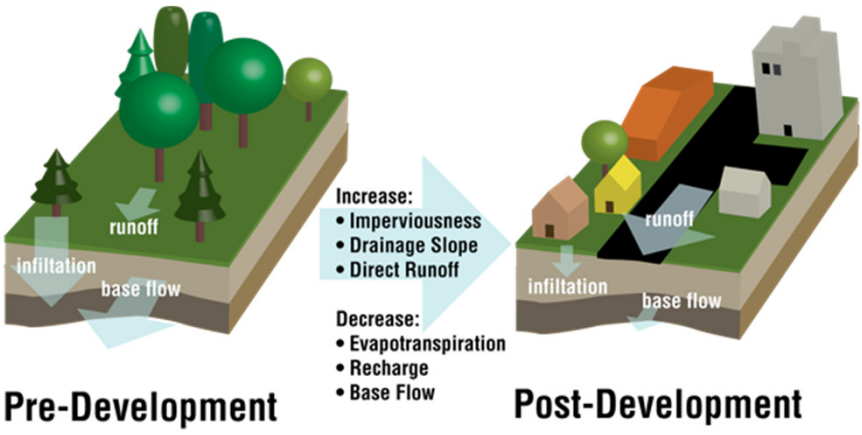
Point vs. Non-Point



Fish as Indicators

- Erratic swimming
  - Indicates that toxic substances are present or that dissolved oxygen levels are too low
- Disease
  - Red sores or white, cottony patches on fish caused by toxic chemicals
- Absence of fish
  - Badly stressed streams will have reduced fish diversity or abundance due to urban runoff or sewage

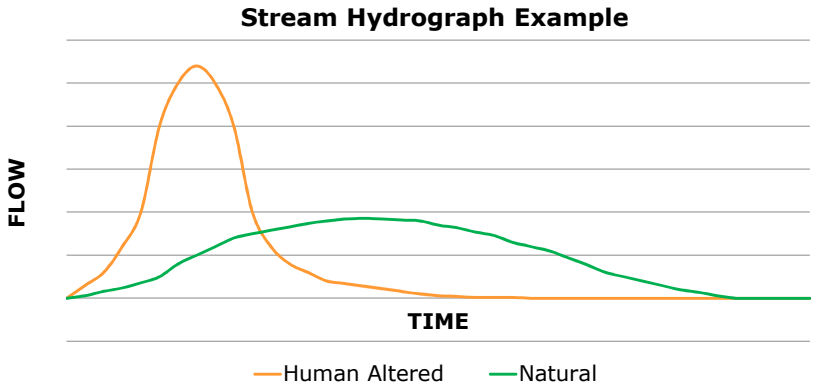
Impacts on Aquatic Habitat



http://www.invisiblestructures.com/images/pre_post_development.png

Impacts on Aquatic Habitat

- Increased Impervious Area
- Increased Flow and Velocity



Impacts on Aquatic Habitat

- Removal of the Riparian Zone

South Curry's Fork

Ashers Run

Impacts on Aquatic Habitat

- Increase flow = increase in erosive forces

Curry's Fork Main Stem

Impacts on Aquatic Habitat

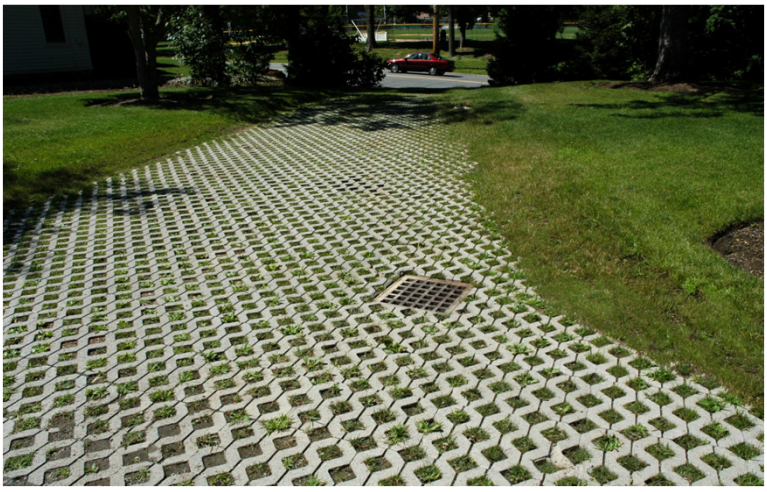
North Curry's Fork

Impacts on Aquatic Habitat

- Eutrophication (increased nutrients)

BMP

- **B**est **M**anagement **P**ractices



BMP

Ongoing Efforts

- Darby Creek
- Floyd's Fork
- This Plan
- Stream Restoration Projects
- MS4 Permits

Stream Evaluation

- Biological Assessment

Dragonfly Larvae

Stream Evaluation

- Physical Habitat Assessment

Curry's Fork

Ashers Run

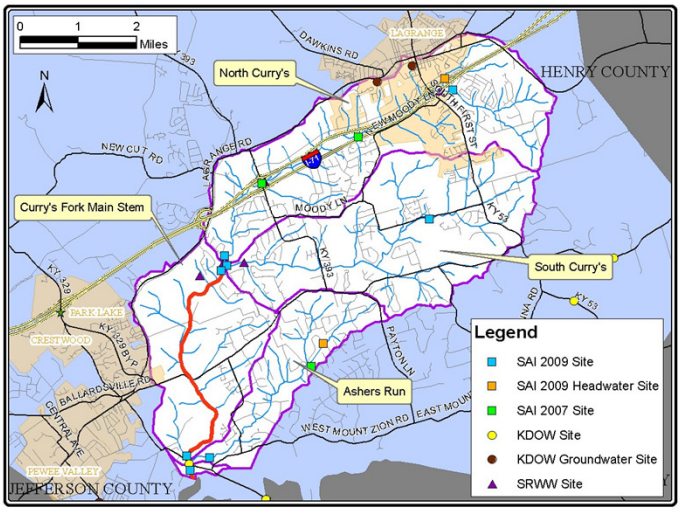
Stream Evaluation

- Water Chemistry Sampling

Ashers Run

South Curry's

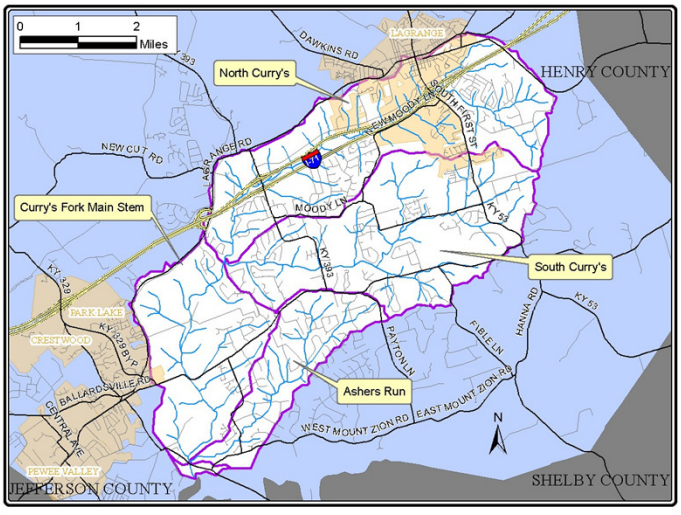
Total Sampling Site Locations



Roundtable Input

- **We need your input, knowledge and expertise**
- **Break-Out into Small Groups**
  - Review each sub-watershed's characteristics
  - Evaluate each potential solutions based on what **YOU** think
- **Logistics**
  - Materials will be distributed to each table
  - Discuss at your table!

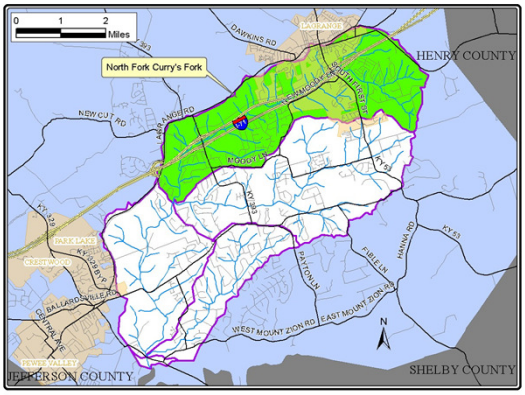
Watershed Status
Entire Curry's Fork Watershed



Watershed Solutions
Entire Curry's Fork Watershed

1) Educate planners, designers, reviewers, etc. of developments on low-impact design and incentivize its inclusion in new developments and re-developments.
2) Expand and the level of protection for floodplains
3) Expand and enhance "no-disturb"/riparian zones around creeks.
4) Promote the use of voluntary conservation easements to protect lands around creeks.
5) Preserve forested areas
6) Improve the performance and regulation of on-site wastewater systems
7) Use stream restoration projects to improve stream function and to educate.
8) Provide watershed educational and recreational opportunities
9) Establish a citizen-based watershed group.

Watershed Status
North Curry's

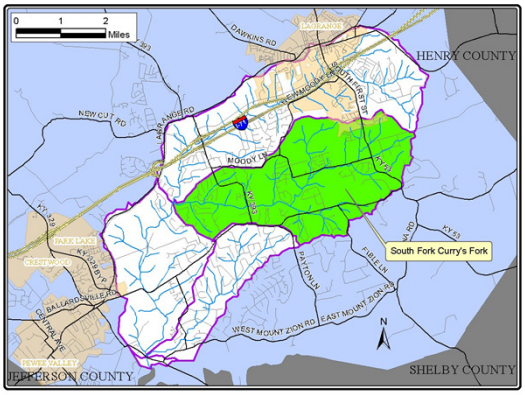


Biological Assessment	**Average**
Water Chemistry	**Average**
Physical Habitat	**Better**

Watershed Solutions
North Curry's

1) Use enhanced development guidelines in undeveloped areas that promote the incorporation of low-impact design elements and water quality BMPs into the design and construction
2) Eliminate Sewer Overflows
3) Require dischargers to the stream to meet more stringent nutrient limits
4) Complete stream restoration projects that have been identified as feasible to implement and effective
5) Increase stormwater infiltration into the ground to address flooding and water quality issues

Watershed Status
South Curry's

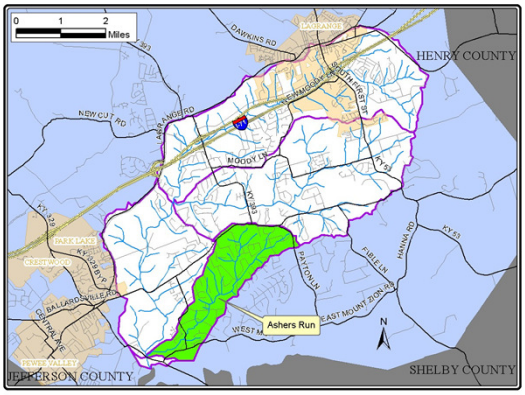


Biological Assessment	**Worse**
Water Chemistry	**Average**
Physical Habitat	**Worse**

Watershed Solutions
South Curry's

1) Utilize BMPs that maximize infiltration, reduce runoff, and improve water quality
2) Use enhanced development guidelines in undeveloped areas that promote the incorporation of low-impact design elements and water quality BMPs into the design and construction
3) Require dischargers to the stream to meet more stringent nutrient limits
4) Implement BMPs to improve habitat and riparian areas along agricultural lands
5) Complete stream restoration projects that have been identified as feasible to implement and effective
6) Use the findings of the Watershed Plan to augment the implementation of Oldham County's Stormwater Quality Management Plan

Watershed Status
Ashers Run

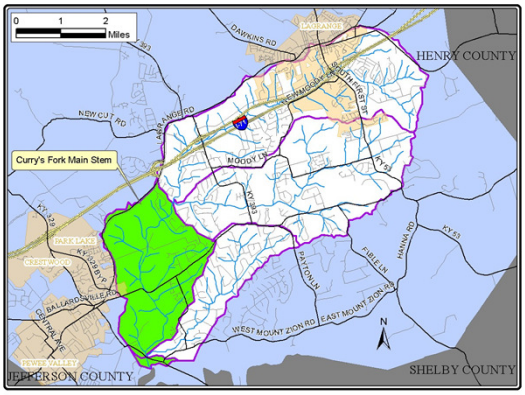


Biological Assessment	**Worse**
Water Chemistry	**Better**
Physical Habitat	**Worse**

Watershed Solutions
Ashers Run

1) Complete stream restoration projects that have been identified as feasible to implement and effective
2) Implement BMPs to address to improve habitat and riparian areas along agricultural lands
3) Use the findings of the Watershed Plan to augment the implementation of Oldham County's Stormwater Quality Management Plan
4) Encourage producers with marginal pasture lands to put their land into conservation easements
5) Develop and implement Agricultural Water Quality Plans

Watershed Status
Curry's Fork (Main Stem)



Biological Assessment	**Better**
Water Chemistry	**Average**
Physical Habitat	**Average**

Watershed Solutions
Curry's Fork (Main Stem)

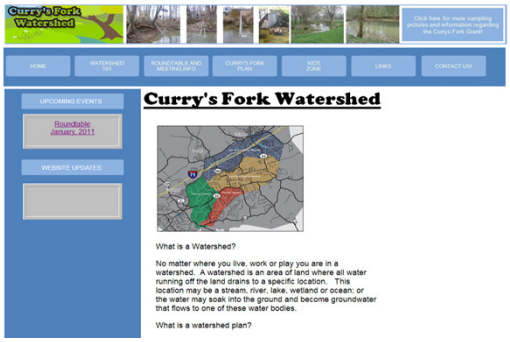
1) Require dischargers to the stream to meet more stringent nutrient limits
2) Eliminate small treatment plants in the watershed
3) Eliminate Sewer Overflows
4) Use the findings of the Watershed Plan to augment the implementation of Oldham County's Stormwater Quality Management Plan
5) Complete stream restoration projects that have been identified as feasible to implement and effective

Next Steps

- Incorporate Community Feedback
- Evaluate WAH Recommendations
- Update Plan
- Submit for Approval

Thank You for Listening!

- Remember: There is no one source of pollution.
- For updates, Visit us on the Web at http://www.oldhamcounty.net/Curry_Fork/index.htm



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