

APPALACHIAN LANDSCAPE CONSERVATION COOPERATIVE GRANT 2013 PROGRESS REPORT

Quarter: (circle one)

2012 1st

2012 2nd

2012 3rd

2012 4th

Grant Number and Title: **ALCC 2012-01 Stream Classification for Appalachian LCC**

Grant Receipt/Organization: The Nature Conservancy

Grant Project Leader: Dr. Mark Anderson

Were planned goals/objectives achieved last quarter? Yes

ALCC Conservation Need Addressed: Development of a stream classification system compatible throughout the Appalachian LCC as a platform to study ecological flow issues

Progress Achieved: (For each Goal/Objective, list Planned and Actual Accomplishments)

Goal 1) Prepare and implement monthly discussion on gradient, confinement and geology/soils

Prepared materials and hosted second Steering Committee Call on Sept 5th 1-3: topics included

Review decisions from last call

Project area: extent includes all of the OH Basin, all HUC8s that touch the LCC boundary or touch the Marcellus Shale project area. **Stratification:** team does not want stratification hard-wired in but want attributes on Freshwater ecoregions (EDUs, HUCs, Omernick Level III Ecoregions). **Size:** Strong agreement that this is an important variable and that it should be measured by drainage area. General support for the 7 size classes but a bit more investigation requested for the headwater vs. creeks division.

Gradient

We reviewed the importance of gradient to channel morphology, debris transport, distribution of aquatic organisms, and explained how calculated as rise/run = slope (Multiplied by 100 to communicate as %). Proposed six slope classes and gave evidence for importance. **Feedback** included strong agreement that this is an important variable to include and that class breaks generally seem appropriate but suggest we consider using macroinvertebrates or algal communities rather than rare species to derive class breaks. Suggested that we maintain all classes and folks can simplify as needed for their own projects. Team did not think that we needed finer scale data to calculate gradient. Would be nice but may not be necessary for this regional scale. Scale of analysis matters (i.e., more important for small creeks than large rivers) suggested that we consider using 1000-m lengths

Landforms, floodplains, and channel confinement

We have not used this variable in previous work but are thinking about using it in this analysis. Feedback was that this variable is very important and has been missing to date. We reviewed map of 30-m landforms for the Northeast and Southeast and of the Active River Area. Explained the method for delineating floodplains and potentially landscape confinement. **Feedback** was that folks were excited about this variable; think it is important to include. They suggested that it is not necessary to include disconnected wetlands, and to incorporate a river width index

Geology and soils

We reviewed bedrock geology map created for the region and explained how it was created and aggregated from the state geologic maps. We also reviewed the characteristics of the bedrock groups that have more ecological meaning and discussed how they relate to stream buffering capacity and pH and to a proposed index: Class 1: low to no acid neutralizing capacity, Class 2: medium to low acid neutralizing capacity, Class 3: medium to high acid neutralizing capacity, Class 4: very high acid neutralizing capacity. Also reviewed how we incorporated soil texture into the map. **Feedback:** buffering capacity is important to include and bedrock geology is appropriate method to measure, In addition to buffering capacity, provides important information on water chemistry, Suggestion to use pH data in STORET to quickly verify how well the geology classes correspond to pH. The group felt cumulative scale is more appropriate than local scale. The team was comfortable with us using SSURGO where available and fill in with STATSGO, and suggested that we consider including erodibility (k factor) as some rivers are naturally more turbid than others.

2) Literature Review of Freshwater Classification Frameworks for the Appalachian LCC Region

We created a 23 page draft report reviewing the major classification approaches in the US with a focus on the Appalachian LCC region. The document is attached. Here is the table of contents:

Summary

Review of Aquatic Ecosystem Classification

Taxonomic Classifications

- *Fish Assemblages in the Conterminous USA*
- *Pennsylvania Classification*
- *New York Classification*
- *Maryland Key Riverine Habitats*

Environmental Classification

Overview and Approaches

- *Frissel 1986*
- *Rosgen 1994*
- *Maxwell 1995*
- *Higgins 2005*

Applications and Examples

- *Freshwater Biodiversity Conservation Assessment of the Southeastern United States*
- *Virginia's Comprehensive Wildlife Conservation Strategy.*
- *A Framework for Assessing the Nation's Fish Habitat,*
- *Northeast Aquatic Habitat Classification and Map.*
- *New York Freshwater Blueprint*
- *Stream Classification Framework for the SARP Region*

References

We have been using this document as a working draft for our discussions. For the hydrologic work we have been using a review completed in 2012 “A framework for hydrologic classification with a review of methodologies and applications in ecohydrology” by Julian D. Olden, Mark J. Kennard, and Bradley J. Pusey (Ecohydrol. 5, 503–518 2012) as our primary review document.

Difficulties Encountered:

None so far.

Activities Anticipated Next Quarter:

Goals for the upcoming Quarter include:

- Prepare and host third call to review results and finalize decisions on hydrologic classification and flow modeling.
- Apply the decisions from call two and three to the stream reach mapping
- Prepare and submit interim report on decisions and literature review (Dec 31).

Expected End Date:

October 31 2014

Costs:

Funds Expended to Previous to this Report: \$5931.14

Amount of ALCC Funds Requested within this Report: \$1286.27

Total Approved Budgeted APPLCC Funds: \$74,458.00

Are you within the approved budget plan? Yes

Are you within approved budget categories? Yes

Signature:

A handwritten signature in black ink, appearing to read "Mark Anderson", with a long, sweeping horizontal stroke extending to the right.

Mark Anderson

Director of Conservation Science

The Nature Conservancy, Eastern Division

Date: October 28, 2013