Introduction

A meeting was held at the U.S. Fish and Wildlife Service Regional Office on November 14th to review the status of the North Atantic LCC project titled *Forecasting changes in aquatic systems and resilience of aquatic populations in the North Atlantic Landscape Conservation Cooperative: Decision-support tools for conservation*, to outline user needs, and to provide input for desired management applications. The participants in this management group included members of federal and state agencies, universities, and NGOs (Table 1). The session provided an opportunity to review approaches from a number of efforts that are developing tools to predict the impact of climate change and other stressors on salmonids in the Northeast . An important objective of the meeting was to build linkages between researchers and aquatic resource managers in order to enhance application development and ensure that products are useful to managers. This document summarizes some of the key discussion points from the meeting and outlines areas where the management group can continue to contribute to the project.

Presentations

Presentations were provided by Ben Letcher (USGS), Austin Polebitski (U. Mass), Ty Wagner and Tyrell Deweber (PSU/USGS PA Coop Fish and Wildlife Research Unit) on population persistence and occupancy models and approaches to modeling stream temperature and flow based on air temperature and precipitation projections from downscaled Global Circulation Models. It was apparent that these efforts utilize creative approaches to integrate population and environmental models and incorporate sophisticated methods to address model uncertainties.

Feedback and questions raised

Participants suggested a number of potential uses for the decision support system (DSS) including habitat restoration strategy prioritization, fish passage barrier removal planning, vulnerability assessments, flow restoration, stocking and harvesting assessments, and stream sampling guidance. Discussion also focused on the potential to use a DSS to quantify the impact of multiple stressors across representative catchments (e.g. barrier vs. discharge source). Due to time constraints the group only discussed general ways that a DSS could be used with these management questions.

Comments, concerns, and suggestions

- Models being developed by Letcher et al. are based on a relatively few populations (less than 6 currently) and that it will be difficult to accurately predict how climate change will affect wild brook trout populations throughout a large geographic range such as the North Atlantic LCC.
- Model validation will be difficult.
- Coarser scale analysis may be more suitable for some management needs (e.g. catchments may provide adequate resolution to predict risks from development).
- More information is needed on the potential scale of output and on anticipated platform development.
- Timelines should be made clearer to work group.

- DSS management objectives and final products are not well identified or articulated.
- Efforts should build on and incorporate concepts, parameters and identified future needs of the 2010 national fish habitat condition assessment completed under the National Fish Habitat Action Plan (NFHAP).
- Consideration should be given as to how the modeling and decision support tools could be applicable to other/larger downstream river systems (not just headwaters), other fish/aquatic species (beyond brook trout), and non-climate related aquatic habitat stresses and limiting factors
- Unclear if focus is solely brook trout or if work will also focus on Atlantic salmon.

Roles for management group

While a separate scientific steering committee is providing technical review for the project, there is a continued need for input from field managers and users as the project is tasked with developing decision support tools. The management group will work with NALCC staff and project managers to:

1) Assist with identifying additional watersheds with datasets meeting minimum criteria (20 sites sampled/year, abundance estimates, etc.).
   - Action Item: Obtain specific criteria from Ben Letcher and work with group to identify additional sites and datasets
2) Strengthen communication and coordination with other salmonid modeling efforts
   - Action item: Request participation of PI's at June EBTJV meeting
3) Ensure coordination with climate change/land conversion modeling efforts underway through Northeast CSC, USGS, PA Coop Unit, and other similar projects (e.g. Mark Hudy, USFS).
   - Action item: Jason Detar (PAFBC) and Callie McMunigal (USFWS) will hold a conference call with PI's
4) Examine other potential management application and decision support for stream flow models
   - Action item: Dave Perkins is organizing a focus group with fish passage engineers and river restoration practitioners
5) Continue to identify specific management needs and applications
   - Action item: Examine materials that may already outline management needs (e.g. EBTJV Conservation Strategies).
   - Action item: Hold additional facilitated meeting with management group in early 2012. Gain better understanding of coarse/fine scale management needs (e.g. watershed vs. reach scale datasets). This meeting should select specific management issues that can benefit from modeling and DSS efforts and examine issues such as data needs and scale requirements in detail.
6) Develop buy-in and "DSS champions" in order for tools to be widely used.
   - Action item: none identified.

Table 1. Management Team Meeting Participants:

Organization	Participants
U.S. Fish and Wildlife Service	Meredith Barton, John Sweka, Mike Millard, Jed Wright, Bill Ardren, Callie McMunigal, Andrew Milliken, Dave Perkins, Lia McLaughlin, Paul Pajak
Maine Department of Inland Fisheries and Wildlife	Merry Gallagher
NH Fish and Game	John Magee
MA Department of Fish and Game	Tim Purinton
PA Coop Fish and Wildlife Research Unit	Ty Wagner and Tyrell Deweber
Pennsylvania Fish and Boat Commission	Jason Detar
US Forest Service	Keith Nislow
USGS	Ben Letcher
University of Massachusetts	Austin Polebitski
TNC	Kim Lutz