



Project Title: “Brook Trout vulnerability to projected climate changes in Driftless Area streams in Wisconsin

Headline Title (2-5 words): Brook Trout Vulnerability Driftless Area

Brief Summary (Abstract): We developed watershed-scale models to predict current water temperature and fish distribution by stream segment throughout the Upper Midwest and the Great Lakes Region. We used these models and downscaled climate projections for Wisconsin to project mid-21st century climate impacts on water temperature and fish distribution. We used this information to assess the vulnerability of fifteen fish species in streams to future changes in climate. This vulnerability assessment became a critical component of a regional planning process for the Driftless Area in Wisconsin, in which adaptation strategies are being developed to lessen the impacts of climate change on coldwater fishes, particularly brook trout.

Project Location: Wisconsin, Driftless Area

Partners: Wisconsin DNR, Michigan DNR, USGS, Michigan State University

Background: Expected climatic changes in air temperature, precipitation, and evapo-transpiration patterns across the Upper Midwest and Great Lakes region may threaten the viability of inland trout resources. A need was identified to develop a vulnerability assessment in order to understand how expected changes in climate may impact thermal conditions and trout populations in streams across the state.

Project Goals: The goals of this project were to produce a vulnerability assessment for climate change impacts on water temperature and brook trout in Wisconsin streams using a watershed-scale modeling approach and to use this assessment in a regional planning process and in the development of adaptation strategies for the Driftless Area of Wisconsin.

Strategy Goals Implemented:

Goal 2, Strategy 2.1: Update current or develop 2 new species, habitat, and land and water management plans, programs and practices to consider climate change and support adaptation.

Goal 2, Strategy 2.2: Develop and apply species-specific management approaches to address critical climate change impacts where necessary.

Goal 3, Strategy 3.1: Increase the climate change awareness and capacity of natural resource managers and other decision makers and enhance their professional abilities to design, implement, and evaluate fish, wildlife, and plant adaptation programs.

Goal 5, Strategy 5.3: Advance understanding of climate change impacts and species and ecosystem responses through modeling.

Climate Impacts Addressed: Thermal conditions in streams and brook trout distribution in streams

Status of Project Implementation (Timeline, Milestones, Next Steps): Watershed-scale models of stream temperature and trout distribution have been completed. Implementation of the vulnerability assessment and adaptation strategies as part of the Driftless Area regional planning process is ongoing.



Project Outcomes: Regional and statewide models suitable for assessing climate impacts on thermal conditions and fish distribution in streams have been completed and are available in an interactive website. The vulnerability assessment has been used to identify Driftless Area brook trout streams that are (1) at risk to being lost due to projected changes in climate, (2) in need of adaptation measures to enhance resiliency to climate impacts, and/or (3) identified as thermal refugia and therefore prioritized for protection.

Funding Sources: U.S. Fish and Wildlife Service Sportfish Restoration Funds and USFWS Upper Midwest and Great Lakes Land Conservation Cooperative Funds

Photos/Attachments:

Links

All Regional Model Results and Vulnerabilities are accessible in an interactive format at:

<http://wimcloud.usgs.gov/apps/FishVisDev/FishVis.html#>

Driftless Area Master Planning website:

<http://dnr.wi.gov/topic/lands/masterplanning/driftlessstreams/>

3 Images below (also attached as PNGs)

Driftless Area and brook trout habitat

Resilience of Brook Trout to Climate Warming

Driftless Area Master Planning map



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CLIMATE ADAPTATION STRATEGY



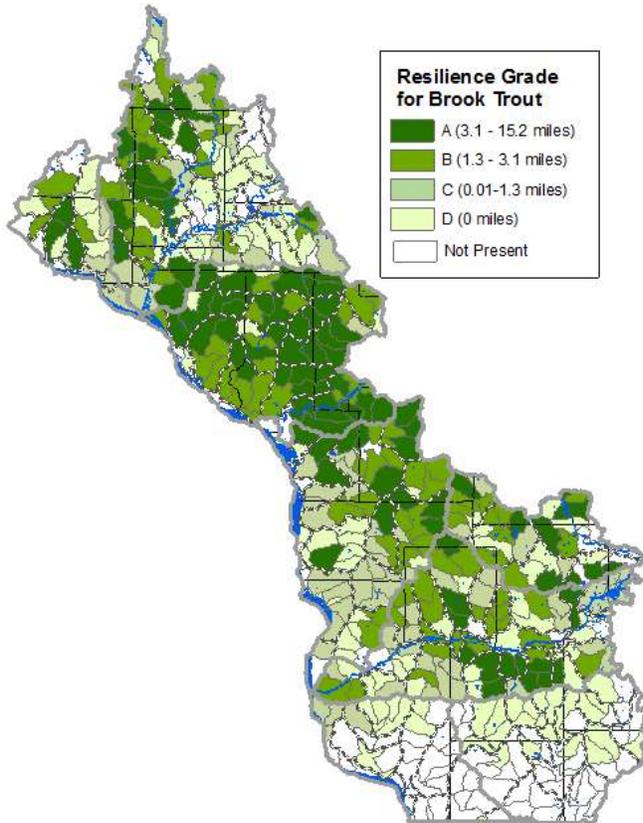
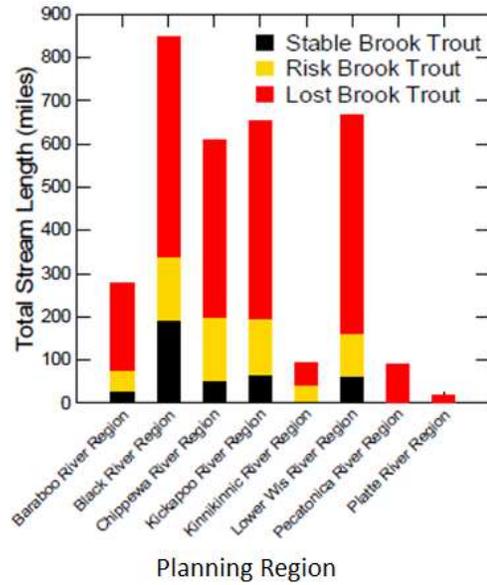


Figure 2.29: Climate effects on brook trout distribution (2046 – 2065).



Resilience of Brook Trout to Climate Warming



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