HABITAT AND LONG-TERM DYNAMICS OF STREAM FISHES

A McIntire-Stennis supported project

UNIVERSITY OF GEORGIA
Warnell School of Forestry & Natural Resources

Environmental change is occurring at an accelerating rate; consequently, long-term population studies are critical because they document how species respond to both historic and future environmental change. Over 20+ years, we quantified population size for fishes, and habitat and environmental variation in permanent sites in the Coweeta Creek catchment (Southern Appalachians, NC). Several important species on the southern edge of their range, arelikely to be affected by future environmental variation.

In 60+ papers published in peer-reviewed journals we demonstrate that biological and environmental factors shape both biodiversity, and population dynamics of the dominant fishes including brook and rainbow trout, although habitat selection primarily is influenced by prey availability and maximization of net energy gain. Stream fish biodiversity primarily is affected by high and low flows, whereas, the population variation and individual growth rates are most affected by density and resource availability.

About McIntire-Stennis

The McIntire-Stennis program, a unique federal-state partnership, cultivates and delivers forestry and natural resource innovations for a better future. By advancing research and education that increases the understanding of emerging challenges and fosters the development of relevant solutions, the McIntire-Stennis program has ensured healthy resilient forests and communities and an exceptional natural resources workforce since 1962.

USDA

COLLABORATION

We are collaborating with the USDA Forest Service Coweeta Hydrologic Laboratory to collect and analyze historic flow data and for logistical support for fieldwork.

Highlight or number

Our collaboration has resulted in an explanatory model for invasion success of Rainbow Trout.

IMPACT

Our work shows that natural variability in flow is essential for maintenance of fish biodiversity and that habitat management models must include biological criteria such as prey availability.

We have shown that stream fish biodiversity in the Southern Appalachian is determined by hydrologic variability.

Southern brook trout and similar species will decline in both abundance and distribution with increasing temperatures.

Our microhabitat selection models show that prey availability and net energy gain are crucial factors affecting habitat selection by fishes.

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