Clean Water Future

In late 2009, Dartmouth College in collaboration with the Hubbard Brook Research Foundation, American Forest Foundation, and several regional partners, helped support the development of the <u>Clean Water Future</u> website. The site aims to develop a community that invests in the natural services -- clean water, fish and wildlife habitat, scenic beauty, erosion control and flood protection, recreational use, food, and timber -- provided by private lands in the watersheds of the Northern Forest. This project involves threshold pledges, a social-marketing mechanism, to pay for actions on private lands that sustain public benefits from ecosystem services, such as clean water and healthy forests. In summer 2012, the site transitioned to its permanent home under the <u>Connecticut River Watershed Council Inc.</u> Visit the site to stay up to date with current projects!

Watch the Clean Water Future promotional video: <u>Clean Water Future (Money in the Water)</u> from

Wayne Barstad

on

Vimeo

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Clean Water Future | You Bring Nature's Benefit

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Buy a stake in your environment.

Invest today in the natural services provided by private lands. Collect on your investment every time you drink the water, breathe the air, canoe on a stream, or walk in the woods.

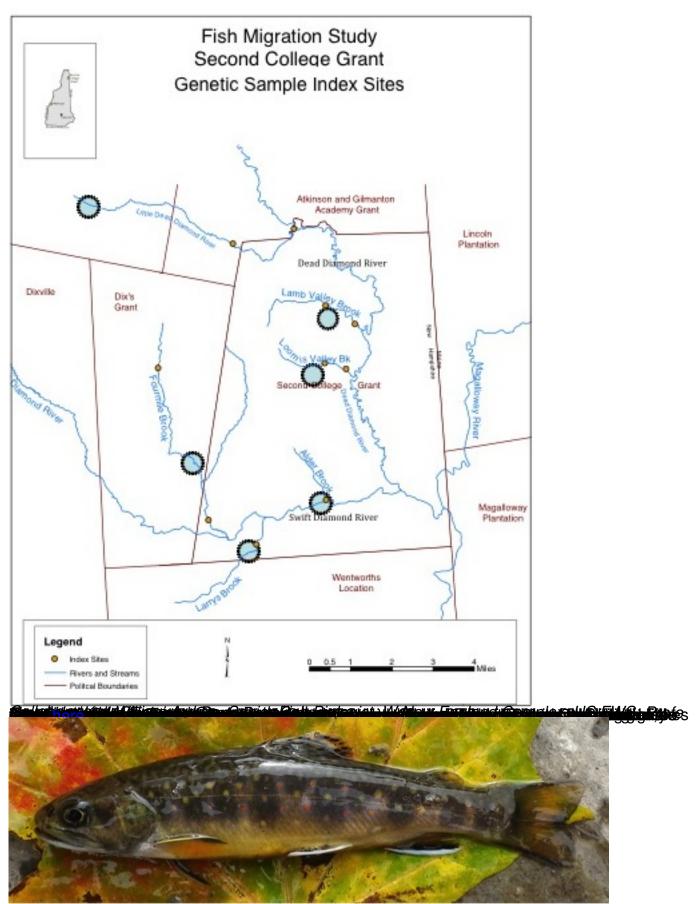
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110 Days Left



Restoring Native Brook Trout in the Second College Grant



Restoration of Atlantic Salmon in Large Lakes by Restoring River

Imprinting

Collaborators: William Ardren, Senior Fish Biologist, W New England Complex, US FWS; Steve McCormick, Research Physiologist, Conte Anadromous Fish Research Center; Dr. Hiroshi Ueda, Hokkaido University; Dr. Andy Dittman, Northwest Fisheries Science Center, NOAA Fisheries

How do Atlantic and Pacific salmon live in rivers as juveniles, migrate 4,000 km through the ocean to feed, and then return to the very same tributary they were born in to reproduce years later? This is the question of Marcus Welker's highly collaborative PhD research on Atlantic salmon migration. In order to improve restoration efforts, Marcus' goal is to better understand the function and patterns of dissolved free amino acids in stream waters, which are thought to be the environmental signal used by salmon for imprinting and homing. Marcus' field research is international in scope and takes place in three lakes containing landlocked Atlantic salmon, each with a unique management situation: Lake Champlain between Vermont, New York, and Quebec; Lake Sebago in western Maine; and Lake St. Jean in south central Quebec. Marcus is working very closely with the Lake Champlain Fisheries Technical Committee, which has identified inappropriate imprinting (resulting in the loss of precise homing to release-rivers) as a plausible obstacle to salmon restoration. This research focuses on removing this impediment and similar issues in other hatchery-driven reintroduction and restoration efforts.

Marcus' research explores (1) the pattern of dissolved free amino acids in the tributaries to three lakes, (2) the amino acid sensing receptors in the noses of Atlantic salmon and their response to amino acid exposure, and (3) the ability of Atlantic salmon to remember dissolved free amino acid patterns experienced as juveniles and use these memories to make behavioral decisions as sexually maturing adults.

Results of this research will improve the feasibility of restoring river-runs of Atlantic salmon in Lake Champlain and other watersheds in the native range of this species. Results will provide direct evidence of Atlantic salmon amino acid imprinting and inform the revision of hatchery rearing, release, and water management practices to improve fish imprinting and successful homing of adults to their release river.