

North American Native Fishes Association Gerald C. Corcoran Education Grant

PROJECT TITLE: Teens Promoting Native Fish Awareness and Conservation Through Research and Teaching

APPLICANT: Chad L. Hallyburton, Youth Programs Manager
North Carolina Museum of Life and Science

MAILING ADDRESS: Museum of Life and Science
433 Murray Avenue
Durham, North Carolina 27704

PROJECT SUMMARY STATEMENT:

The “Teens Promoting Native Fish Awareness and Conservation Through Research and Teaching” project will accomplish two outcomes:

1. develop understanding of regional aquatic conservation issues and build environmental decision-making skills in a group of 12-18 year old Youth Partner volunteers at the Museum of Life and Science, and
2. expose visitors at the Museum to the diversity and conservation needs of regional stream fishes.

By performing hands-on research, teen members of the Museum’s *Natural Resource Action Team* involved in the project will learn about native and introduced stream fishes and the challenges involved in conserving stream fish populations. The practical nature of the research will contribute scientific knowledge useful in conservation efforts. Project participants will utilize this knowledge to develop and present hands-on stream fish conservation activities for visitors at the Museum of Life and Science. Finally, teen participants will present the results of their project at the 2002 annual meeting of the North Carolina Chapter of the American Fisheries Society. Through their involvement in the conference, the teens will help encourage fisheries professionals to involve youth in aquatic conservation.

Members of the *Natural Resources Action Team (NRAT)* are 12-18 year old Youth Partner volunteers at the Museum of Life and Science (NCMLS) in Durham, North Carolina. *NRAT* members participate in a variety of hands-on activities designed to promote understanding of regional environmental issues, improve planning and problem solving abilities, and build teamwork, leadership, and decision-making skills. A grant of \$684.00 from the North American Native Fishes Association’s *Gerald C. Corcoran Education* fund would provide materials and equipment to conduct a student-led aquatic conservation project during 2001/2002, develop stream fish conservation activities for NCMLS visitors, and expand the impact of *NRAT* programs in the future. An additional \$1525.00 needed to support this project will be provided by NCMLS.

EDUCATIONAL OBJECTIVES:

The primary educational objectives of this project are to expose youth participants and NCMLS visitors to the diversity of regional stream fishes and the challenges facing the conservation of these fishes. While accomplishing these goals, a number of important educational and developmental objectives will be achieved. Some specific impacts include:

- *NRAT* members will work as a team to successfully complete their project. Effective division of labor will be required to complete data collection in the field, analysis of collected data, and development/delivery of the final project presentation. During the course of their project, *NRAT* members will improve their abilities to interact and cooperate within the group, both as team members and leaders.
- *NRAT* members will develop planning and problem-solving skills as they plan field-work sessions, analyze collected data, and draw conclusions from the data. These activities will be under the supervision of Youth Programs staff, but primary responsibility for decision-making will be given to the youth participants.
- *NRAT* members will strengthen their relationships with participating adults. The Museum's Youth Partner Program is based on the concept of youth and adults working in partnership to accomplish mutual goals. This philosophy will guide all *NRAT* activities.
- As *NRAT* members conduct projects, they simultaneously evaluate new environmental education activities, which are used by other Youth Partners and Museum visitors.

TARGET AUDIENCE:

NRAT members range in age from 12-18 years and reflect the socioeconomic and ethnic diversity of the surrounding Durham community. These teens are recruited from the Museum of Life and Science's *Youth Partner* program, which serves over 150 youth annually. To ensure a quality personal education experience, a maximum of 15 *NRAT* members will be recruited to participate in the upcoming project cycle. However, these youth share their findings and experiences with the entire *Youth Partner* population.

The Museum of Life and Science hosts over 280,000 visitors each year, the majority of which live in the central North Carolina region. Many of these visitors, from all age groups, participate in "Science-on-a-Cart" activities, hands-on experiments and demonstrations. Through these demonstrations and experiments, the Museum's *Youth Partners* interact with 500-2000 visitors each month. Therefore, through development of a stream fish conservation "Cart," *NRAT* members would expose several thousand Museum visitors each year to stream fish conservation topics.

DETAILED PROJECT DESCRIPTION:

Needs Statement: A community needs assessment commissioned by the United Way and the City and County of Durham identified three concerns relating to Durham area teenagers: 1) alternative education programs to better prepare high school graduates for local employment, 2) “children’s need for safe and fun things to do,” and 3) transportation challenges associated with teenagers getting to recreational activities, jobs, or services. These needs were most prominent in households with annual incomes under \$30,000, among young teens aged 13-15 years, and in minority households. The Museum’s *NRAT* serves teens from the socioeconomic group referred to in this survey and directly addresses each of the three needs.

Additionally, Durham, North Carolina, as part of the Triangle region, is experiencing explosive population growth. The Triangle area, and the southeast United States in general, contains some of the most diverse stream fish populations in North America. Unfortunately, these populations are increasingly impacted by urban development. 600,000 people are expected to relocate to the Triangle area over the next 20 years, causing an enormous strain on local aquatic systems. Local conservation organizations are committed to the conservation of aquatic resources in general and stream fishes in particular. The data collected by *NRAT* members will be useful in aiding these organizations as they plan future biotic monitoring and conservation programs.

Background: Over 50 teens have participated in the Museum’s *NRAT* since 1999, and serve in a volunteer capacity. Hands-on research activities occur throughout the school year and have included investigations of salamander populations, comparisons of aquatic biodiversity in urban and rural stream ecosystems, and examination of factors affecting the distribution of fishes in an urban stream. These projects increase participants’ science skills and knowledge, while requiring the group to work effectively as a team to accomplish its goals. In 2000 and 2001, *NRAT* projects culminated with oral presentations at the annual meeting of the North Carolina Chapter of the American Fisheries Society. The group also presented at the Piedmont Ecology and Conservation Symposium in 2000.

NRAT activities are supervised by the Museum’s Youth Programs staff, and have involved the cooperation of outside agencies, including the City of Durham Storm Water Services Division and the University of North Carolina at Chapel Hill Environmental Resource Program. *NRAT* members were also featured in the “Students and Young Professionals” section of the March, 2001 newsletter of the North Carolina Chapter of the American Fisheries Society.

Project Narrative: All *NRAT* activities utilize an “inquiry-based learning” framework. This approach allows individuals to formulate their own ideas and draw their own conclusions while actively engaged in experiments. Beginning in September, 2001, fifteen *NRAT* members will conduct a hands-on scientific investigation to collect data on effective methods of surveying native stream fish populations. Specifically, the group will evaluate the sampling effort needed by a volunteer group to adequately characterize the fish population in a given stream reach. Specifics of experimental design will be developed by the teen project participants, under the guidance of the Museum’s Youth Programs staff.

Field-work will occur in Ellerbe Creek (Durham Co., NC) and Upper Barton Creek (Wake Co., NC). *NRAT* members will conduct the field research, analyze and display collected data using a variety of computer applications and statistical techniques, and develop a public presentation of their findings. They will conclude the project by travelling to the annual meeting of the North Carolina Chapter of the American Fisheries Society, where they will give an oral presentation to over 50 professional fisheries scientists and attend presentations on a variety of fisheries and aquatic science topics. *NRAT* members will also present their findings to Museum staff and Youth Partners.

In addition to research activities, *NRAT* members will organize a stream clean-up in Ellerbe Creek. Over 90 Museum *Youth Partners* and 70 full-time staff will be invited to participate. This will be an opportunity for *NRAT* members to share their accumulated knowledge of conservation issues facing stream fishes.

Beginning in November, 2001, *NRAT* members will use their accumulated knowledge of stream fish conservation issues to develop a "Science-on-a-Cart" activity for visitors at the Museum of Life and Science. Project participants will then engage visitors to the Museum with this "Cart" demonstration. The fish conservation "Cart" will be available for ongoing use by volunteers and Museum staff in the future.

Project Impacts: The majority of *NRAT* members live in an urban setting and have minimal exposure to their natural surroundings. By participating in this project, they will gain an understanding of local environmental issues through exposure to environmental conditions and problems in their own community. Ellerbe Creek, where many project activities will be conducted, is recognized by local governments as having poor water quality, and continues to be impacted by urban runoff and construction. Upper Barton Creek, though still a fairly healthy aquatic ecosystem, faces extreme development pressure during the next 20 years. Working in these surroundings, and comparing the two streams, will bring project participants into direct contact with the effects of urbanization on streams. Participants will be asked to identify these effects and relate them to activities in the community and their own households. Participants will also suggest community changes that could lessen the impacts of urbanization on streams.

Continuation: The materials and equipment purchased with funds from this grant will continue to be used in future *NRAT* projects. These projects will be based on the interests of participating volunteers and will be guided by Youth Programs staff. The Museum is committed to securing additional funding needed for the continuation of this project. The stream fish conservation "Cart" will be maintained for future use with Museum visitors.

Evaluation: The Museum's internal evaluation instruments, designed by *Quality Evaluation Design*, will be administered to *NRAT* members at the beginning and end of the project period. This instrument is designed to assess volunteers' appreciation and understanding of science. Additionally, program participants will maintain journals describing what they have learned and discussing questions generated during the program. The content of these journals will be used to guide the direction of discussions and activities as the project progresses.

PROJECT TIMELINE:

September, 2001	Recruit <i>Natural Resources Action Team</i> members
September, 2001	Begin field experiment
October, 2001	Conclude field experiment
	Begin data analysis and presentation preparation
November, 2001	Begin "Science-on-a-Cart" development
	Finish data analysis and presentation preparation
December, 2001	Continue "Science-on-a-Cart" development
	Present project to Museum staff and Youth Partners
February, 2002	Present project at NC-American Fisheries Society Annual Meeting
	Finish "Science-on-a-Cart" development
	Begin "Science-on-a-Cart presentation at Museum
March, 2002	Evaluate "Science-on-a-Cart" activities
	Adjust/Modify "Science-on-a-Cart" activities as needed
April, 2002	Ellerbe Creek Stream Clean-Up
April-August, 2002	Present "Science-on-a-Cart" activities at Museum

ITEMIZED BUDGET:

<u>Quantity</u>	<u>Item</u>	<u>Cost/Item</u>	<u>Total Cost</u>	<u>NANFA</u>	<u>NCMLS</u>
12	Hip Waders	\$20.00	\$240.00	\$240.00	
3	Seines	\$30.00	\$90.00	\$90.00	
2	Field Thermometer	\$12.00	\$24.00	\$24.00	
1	Field Measuring Tape (50 M)	\$40.00	\$40.00	\$40.00	
2	Stop Watches	\$10.00	\$20.00	\$20.00	
5	5-Gallon Buckets	\$4.00	\$20.00	\$20.00	
1 set	Science-on-a-Cart Materials	\$250.00	\$250.00	\$250.00	
5	Conference Fees	\$30.00	\$150.00		\$150.00
3 rooms	Conference Lodging	\$75.00	\$225.00		\$225.00
	Staff Salary (5% FTE @ 23,000/year)		\$1150.00		\$1150.00
	Total:		\$2209.00	\$684.00	\$1525.00

PROJECT STAFF:

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Project involvement: Primary responsibility for oversight of the project. Recruits participants, leads activities, and provides training in "inquiry-based" learning.