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**Hearing on H.R. 3644, the “Bay-Watershed Education and Training
(B-WET) Regional Program and National Environmental Literacy
Grant Program Act”**

U.S. House of Representatives
Committee on Natural Resources
Subcommittee on Insular Affairs, Oceans and Wildlife

Madam Chairwoman, members of the Subcommittee, on behalf of the National Wildlife Federation (NWF), our nation’s largest conservation advocacy and education organization, and our more than four million members and supporters, I thank you for the opportunity to testify before the Subcommittee on H.R. 3644, the Bay-Watershed Education and Training (B-WET) Regional Program and National Environmental Literacy Grant Program Act, and express strong support for swift Committee action on the bill. We believe H.R. 3644 supports NWF’s mission to inspire Americans to protect wildlife for our children’s future. I commend the Subcommittee for holding this hearing and Congresswoman Capps for taking the leadership role as the lead sponsor of H.R. 3644.

I am the Vice President for Education and Training at the National Wildlife Federation, a national leader in environmental and outdoor education for nearly 75 years. We have been connecting children to nature and advancing environmental education for decades through our long-standing national programs, publications and curricula including *Schoolyard Habitats* and *Access Nature* curricula, *Climate Classroom*, and *Ranger Rick, Your Big Back Yard* and *Wild Animal Baby* magazines. I have also served as the President of the National Environmental Education Foundation (NEEF) and author of the report, “Environmental Literacy in America: What 10 Years of NEEF/Roper Research and Related Studies Say about Environmental Literacy in America.”

In this testimony, I highlight the following:

- I. The Need for Environmental and Outdoor Education
- II. Overview of Environmental and Outdoor Education Models
- III. Key Research and Studies Supporting the Positive Impacts of Environmental and Outdoor Education on Student Achievement, Motivation, Critical Thinking, Conflict Resolution, Interest in Math and Science Careers, etc.
- IV. The National Wildlife Federation’s Programs, Publications and Curricula that Support Environmental and Outdoor Education
- V. The Critical Role of the National Oceanic and Atmospheric Administration’s (NOAA) Regional Bay-Watershed Education and Training and National Environmental Literacy Grant Programs

I. The Need for Environmental Education

Most Americans believe they know more about the environment than they actually do, as highlighted in my 2005 report: “Environmental Literacy in America: What 10 Years of NEEF/Roper Research and Related Studies Say about Environmental Literacy in America.” In the course of a lifetime, an individual will accumulate environmental knowledge from a combination of school, the media, personal reading, family members and friends, outdoor activities, entertainment outlets, and a wide range of other professional and personal experiences. For a few motivated individuals, this can eventually add up to an accomplished environmental literacy. But for most Americans, it falls far short. Most people accumulate a diverse and unconnected smattering of factoids, a few (sometimes incorrect) principles, numerous opinions, and very little real understanding. Research shows that most Americans believe they know more about the environment than they actually do.

That is why 45 million Americans think the ocean is a source of fresh water; 120 million think spray cans still have CFCs in them even though CFCs were banned in 1978; another 120 million people think disposable diapers are the leading problem with landfills when they actually represent about 1% of the problem; and 130 million believe that hydropower is America's top energy source, when it accounts for just 10% of the total. It is also why very few people understand the leading causes of climate change and water pollution or how they should be addressed. Years of data from Roper surveys show a persistent pattern of environmental ignorance even among the most educated and influential members of society.

A more recent and disturbing phenomenon also warrants our careful attention. It is perhaps best described in a book by family expert and author Richard Louv (2005), as widespread "nature-deficit." Louv is among a growing number of analysts who see unprecedented pattern changes in how young people relate to nature and the outdoors. As kids become more "wired" than ever before, they are drawn away from healthful, often soul-soothing, outdoor play. The age-old pattern of children spending hours roaming about and playing outside is becoming close to extinct due to a combination of electronics, cyberspace, and parental efforts to keep their children indoors and, in their minds, safer.

Without being alarmist, these conditions are becoming less acceptable and more perilous to society. We are moving past the time when we can rely on a cadre of environmental experts to fix our environmental problems. With most environmental issues becoming more complex and difficult to manage, and with the preponderance of pollution shifting toward problems caused by individuals and small entities, a stronger and wider public understanding of environmental science and related issues is a growing necessity. We are also moving into a time when direct contact with the natural world is being markedly scaled back. Comprehensive environmental education is the only real answer. But can we get there? Our leaders need to comprehend far more about what works and what does not. The public needs true education on the environment.

We need to improve the quality and delivery of lifelong education on the environment – to grasp its original promise and make it work. We need to build more support for resource stewardship

through education and use an informed public to mitigate some of the adverse effects of our actions on the environment.

As our nation moves towards a clean energy economy and creates new “green jobs,” we must ensure that our education infrastructure keeps pace. As our nation advances policies to address major environmental challenges in the coming decades, including global climate change, we must have an environmentally literate citizenry that has the knowledge to find new and innovative solutions to protect our planet. There is widespread public support for environmental education, with 95% of adults and 96% of parents supporting environmental education in public schools.

II. Overview of Environmental and Outdoor Education Models

Hands-on, experience-based environmental education can improve student achievement and connect children to the natural world. There are four major types of outdoor education programs that serve to connect children to nature:

- (1) investigational approaches;
- (2) outdoor learning;
- (3) place-based learning; and
- (4) community service.

Traditional environmental problem solving in a community or “investigational approaches” have shown to increase test scores on environmental knowledge, reading, and writing skills. Outdoor learning programs like Outward Bound or the National Outdoor Leadership Schools have become “meaningful lifetime experiences” and often promote environmental stewardship. Place-based education connects the school to its immediate environment. Community service approaches advance responsible environmental behaviors and give children an opportunity to support local green spaces.

Experts note that if environmental education is done right it can be worth up to \$75 billion a year in measurable environmental benefits.

III. Key Research and Studies Supporting the Positive Impacts of Environmental and Outdoor Education on Student Achievement, Motivation, Critical Thinking, Conflict Resolution, Interest in Math and Science Careers, etc.

Since the late 1990s, significant academic evidence demonstrates that nature study and outdoor education programs significantly increase students’ overall school performance — a term that includes not just test scores but attitude and behavior as well.

The Environment as an Integrating Context for Learning (EIC Model™)

In 1998, the State Education and Environment Roundtable (SEER) published a seminal study on the contribution that environmental education makes to student achievement. “Closing The Achievement Gap: Using the Environment as an Integrating Context for Learning” covered 40 schools across 12 states.

The study found that integrated environmental education programs throughout the curricula (science, language arts, arts, and social studies) combined with hands-on learning elements like nature study areas, team teaching, and broad school administration support, created top-performing students.

A comprehensive follow-up study conducted in 2000 found that EIC classes performed better in 154 of 201 measures as follows:

Language Arts: 86 of 108

Math: 22 of 34

Science: 10 of 15

Social Studies: 10 of 13

Discipline: 4 of 4

Attendance: 22 of 27

SEER has continued to study the use of the environment as an approach to learning, showing that integrating environmental studies into other disciplines and teaching strategies can help solve many of our current problems in education.

Higher Statewide Test Scores

A 2003 study entitled “Environmental Education: Improving Student Achievement” compared 77 pairs of demographically equivalent schools. Half of the schools had implemented environmental education (EE) programs for three years or more and the other half did not have programs.

The study examined standardized test performance in those schools, including the Washington Assessment of Student Learning, and Iowa Test of Basic Skills. Schools with EE programs showed higher scores on standardized tests in math, reading, writing, and listening. The pattern of improved test scores for students who had been through environmental education programs persisted for the five years of data investigated (1997-2002).

Closes the Gap in Underserved Communities and Serves as an Educational Equalizer

A 2004 study evaluated a place-based environmental education project in an under-resourced, predominantly African-American, Louisiana school district. The performance gap between the district’s performance and the state average on state educational tests improved across all subject areas. The National Environmental Education Foundation found that “environment-based education appears to be a kind of educational equalizer, improving reading, science achievement, and critical thinking across ethnic and racial groups and across socioeconomic levels.”

Case Studies Verify Improved Performance

The National Environmental Education Foundation (NEEF) published a 2000 report containing case studies of schools with environment-based programs (five individual schools, a model school program involving five schools, and a statewide program). The report compared the test scores (on statewide standardized tests) of students from environment-based programs with those of students in various statewide or district-wide comparison groups.

The report identified other examples of results:

- All 3rd graders at Hawley Environmental Elementary School in Milwaukee, WI passed the Wisconsin Reading Comprehension Test, as compared with only 25 percent of the total Milwaukee public school population.
- Isaac Dickson Elementary School's 4th grade students in Asheville, NC achieved a 31 percent increase in math achievement in one year.
- Scores on college admission ACT tests were higher for students from the School for Environmental Studies in Apple Valley, MN, than their peers in the district, the state, and the nation.
- First graders in the EIC classroom at Kruse Elementary in Pasadena, TX, performed higher on the Iowa Test of Basic Skills in all categories.
- Since incorporating environmental issues into the curriculum, Tompkinsville Elementary and other Kentucky schools have increased their achievement in science, reading, and social studies on statewide tests.
- All five schools in Florida's Model Schools in EE program showed steady increases over five years on FLORIDA WRITES! and FCAT assessment programs.

Sparks Interest in Science and Math as Future Career Pathways

According to the National Environmental Education and Foundation, 80% of all students decide to opt out of science and math careers before entering high school. Environmental education is a "heuristic tool for making science more relevant and appealing," and "provides an appealing entry point for students thinking about future careers." In one study, educators observed thousands of students in environmental education programs and found that test scores improved across the board. Science was the only subject where 100% of the students' scores improved.

Critical Thinking and Willingness Improves

A recent study examined over 400 high school students in eleven Florida high schools and contrasted students' critical thinking skills in environmental education programs and traditional classes. The environmental education classes significantly raised students' scores on two nationally recognized critical thinking skills tests. Teachers concluded that students' critical thinking skills improved because the environmental programs involved interdisciplinary problem-solving approaches, empowered students by allowing them to choose their projects, and allowed students to connect their projects to their communities.

Environmental Education Creates More Motivated and Competent Students

In a 2004 study about the effects of environment-based education on students' critical thinking skills, test results of 400 students (grades 9, 12) in 11 Florida high schools were examined to measure their responses to Environment as an Integrating Context for Learning (EIC Model) programs.

Through an evaluation of performance on norm-reference tests (Achievement Motivation Inventory, Cornell Critical Thinking Test, and California Measure of Mental Motivation) and interviews with selected students, EIC programs were found to significantly raise scores on all three tests.

A Washington state study concluded that students enrolled in environmental education programs showed better overall GPA improvements and increased attendance and motivation. Another study showed EIC students had better attendance rates 77% of the time and fewer discipline problems.

Researchers at University of Illinois report findings that indicate exposure to natural settings in the course of common after-school and weekend activities may be “widely effective” in reducing attention deficit symptoms in children.

The authors surveyed the parents of 322 boys and 84 girls who had been diagnosed with ADHD. These parents reported on how their children performed after participating in a wide range of activities. Some of the activities were conducted indoors while others were conducted in outdoor spaces without much greenery, such as parking lots and downtown areas. Some activities took place in relatively natural outdoor settings such as a tree-lined street, backyard, or park.

Findings: “In each of 56 analyses, green outdoor activities received more positive ratings than did activities taking place in other settings. These findings suggest that green outdoor activities are beneficial in reducing ADHD symptoms among both boys and girls.”

Cooperation and Conflict Resolution

The American Institutes of Research for the California Department of Education looked at the effects of outdoor camp-like education programs on 255 at-risk, 6th grade students in a 2005 study. Through the program, participating students made significant progress in cooperation and conflict resolution. Similarly, the study found positive gains in self-esteem, relationships with peers, attentiveness and willingness to learn.

Important academic benefits included:

- 27-percent improvement and maintenance of science scores, and
- Significant benefits to English Learner (EL) students.

While the residential, week-long design of this program indicated a positive effect on the students, programs with less of an experiential immersion have also improved student performance as well.

IV. The National Wildlife Federation’s Programs, Publications and Curricula that Support Environmental and Outdoor Education

The National Wildlife Federation has been connecting children to nature and advancing environmental education for more than seven decades through our long-standing national programs, publications, and curricula.

National Wildlife Federation has certified schoolyard wildlife habitats in more than 3,400 U.S. schools and helped create garden plots in thousands more. These areas have increased outdoor awareness and time children spend outside in several ways:

- Hands-on creation and management of the habitat are positive learning experiences for both students and teachers. Simple tasks of plotting the space, selecting plant material

and seeds while learning how to nourish and nurture the garden or habitat, make lasting impressions. These activities enhance students' abilities to see the natural world and recognize their place in it.

- Available high-quality curricula teach children about natural processes ranging from growing food for humans to raising food plants for wildlife. Most of these curricula are correlated with state standards for science, mathematics, social studies, and language arts and have demonstrated success in raising test scores.
- After-school educational programs play a larger role in the daily care of children than they did 20 years ago. Schoolyard gardens and wildlife habitats diversify the educational experience by getting kids out of the traditional classroom setting while offering intensely interesting educational experiences.

In a Houston schools study, fourth grade students who participated in NWF's Schoolyard Habitats® Program increased math scores significantly more than peers with a traditional curriculum. Overall, minority children showed more improvement.

In addition to NWF's Schoolyard Habitats Program, NWF publishes award winning magazines including *Ranger Rick*, *Your Big Back Yard* and *Wild Animal Baby* and a monthly *Ranger Rick* Educators Guide. To help provide age-appropriate education about climate change, NWF developed and maintains an online resource called Climate Classroom. To help parents and caregivers connect children to the natural world, NWF maintains an online community and published a weekly blog that includes outdoors activities at www.GreenHour.org. NWF also supports sustainability education at institutions of higher education through our Campus Ecology Program and support greening of schools through our new Eco-Schools USA initiative.

Today, NWF is launching a major new campaign called "Be Out There." The National Wildlife Federation has teamed with the upcoming feature film *Where the Wild Things Are*, to launch Be Out There™, a national campaign to get families and kids to spend daily time outdoors for their health, happiness and well-being. Directed by Spike Jonze and based on Maurice Sendak's classic book, *Where the Wild Things Are* is an adventure for every generation, the story of a young boy who feels misunderstood at home and escapes to the island of the Wild Things. As an education partner for the film, National Wildlife Federation shows kids how they can escape into nature and learn about the wild things wherever they live.

Be Out There™ is a National Wildlife Federation initiative to give back to American children something they don't even know they've lost: connection to the natural world. Time outside improves children's physical, mental and emotional health as well as classroom performance. Be Out There™ engages American families and communities, educators and healthcare practitioners, corporate leaders and policymakers in helping to raise happier, healthier kids with a life-long appreciation of nature.

V. The Critical Role of the National Oceanic and Atmospheric Administration's (NOAA) Regional Bay-Watershed Education and Training and National Environmental Literacy Grant Programs

For the last several years the National Wildlife Federation has supported funding in Congress for NOAA's environmental education programs, including the regional Bay-Watershed Education and Training and national Environmental Literacy Grant Programs. These successful programs have been run for the last few years under broad authority from the America COMPETES Act and we are pleased that H.R. 3644 will specifically authorize these two programs and increase the funding for the programs to \$50 million by FY 2013.

Both of these programs will help to educate Americans about our "Great Water" systems across the nation, and provide young people with the opportunity to learn about and experience watersheds first hand. In particular, we are pleased that the legislation includes the opportunity to connect with coastal and watershed resources through "water-dependent and outdoor recreation, experiential learning, and hands-on involvement." This language will help ensure that young people get outdoors, connect with their local watersheds, and "get out" on the water. This type of activity will not only advance environmental literacy, but it will help to expose young people to the fun of time outdoors such as fishing. This is particularly important as we've seen youth participation in fishing decline over the last several years.

The Environmental Literacy Grants (ELG) program helps to establish new partnerships that deliver educational materials to thousands of teachers and students. The ELG program enables NOAA to partner with the top science centers, aquaria, and educators in the country to educate the public about vital issues around our changing planet. It also allows NOAA to leverage the vast array of climate science being undertaken to increase public understanding and the quality of education. These funds are awarded on a competitive basis and are increasingly used to build capacity at the national level.

ELG is a critical program for providing capacity on the national level. In 2005 ELG funded the National Science Teachers Association to develop a series of education products for teachers corresponding to topics aligned to NOAA's mission. The products – called Science Objects and SciGuides – address teacher professional development needs, and provide classroom resources. Another grant in 2005 to the American Meteorological Society provided for the continued development of a national cadre of precollege teachers competent in ocean and coastal environmental science content and appropriate pedagogy who serve as Ocean Education Resource Teachers and leaders in their local areas and home states.

The National Wildlife Federation also supports NOAA's regional Bay Watershed Education and Training (B-WET) program. Administered by the NOAA since 2003, the B-WET program offers competitive grants to leverage existing environmental education programs, foster the growth of new programs, and encourage development of partnerships among environmental education programs within watershed systems. B-WET's rigorously evaluated programs are implemented by region, which allows the unique environmental and social characteristics of the region to drive the design of targeted activities to improve community understanding, promote teacher competency, and enhance student interest and achievement in science. A fundamental goal of the program is to demonstrate how the quality of the watershed affects the lives of the people who live in it. B-WET supports programs for students as well as professional development for teachers, while sustaining regional education and environmental priorities. The National Wildlife Federation supports the expansion of this successful model to new regions,

including the Great Lakes, so long as the funding level for the overall program increases allowing NOAA to maintain and grow existing regions while expanding to new areas.

The National Wildlife Federation also supports environmental education legislation including the No Child Left Inside Act (H.R. 2054) and funding for programs across the federal agencies at the U.S. Forest Service, Environmental Protection Agency, U.S. Department of Education and U.S. Department of Interior.

Citations:

Citations for the research, studies and case studies cited in this testimony can be found in the following reports which are available online.

Time Out Report, Kevin Coyle, 2009.

<http://www.nwf.org/nwfwebadmin/binaryVault/Time%20Out%20with%20BOT%20Activities1.pdf>

Connecting Today's Kids with Nature, Heather White, 2009.

<http://www.nwf.org/BeOutThere/docs/Connecting%20Kids%20with%20Nature%202008%20Report.pdf>

Environmental Literacy in America, Kevin Coyle, 2005.

<http://neefusa.org/pdf/ELR2005.pdf>

Conclusion:

The National Wildlife Federation supports H.R. 3644 to bolster and increase funding for NOAA's successful environmental education programs. Thank you again for providing the National Wildlife Federation with the opportunity to provide testimony.