

New Hampshire Environmental Literacy Plan

A Collaboration of:

Environmental Literacy Plan Working Group

New Hampshire Environmental Educators

New Hampshire Children in Nature Coalition

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Executive Summary

Environmental literacy requires an understanding of the natural world and the capacity to interpret environmental systems. An environmentally literate citizen can make informed decisions about the environment based on scientific, aesthetic and ethical considerations while bearing in mind the interconnectedness of the social, cultural, economic and political systems.

Environmental literacy is gained through environmental education, an interdisciplinary approach to education that employs hands-on, outdoor, place-based and inquiry-based learning experiences in order to understand the environment as a whole. Incorporating numerous content areas, environmental education uses real-world experiences, giving students a chance to explore the matters at hand to gain experience investigating, defining and creating solutions to issues.

Environmental education not only builds environmental literacy but also increases overall student engagement and motivation, leading to improved academic achievement in all subject areas. In addition, learning about and from the environment encourages outdoor activities, which improve both physical and mental health.

Since the 1970s, an active group of education professionals in New Hampshire has used the environment as a context of learning. Members of New Hampshire Environmental Educators (NHEE) have actively been providing resources and professional development opportunities to all educators. The New Hampshire Children in Nature Coalition brings together organizations and individuals who are dedicated to connecting children, youth and families to the outdoors. Members of these two organizations, other educators and individuals joined to form the Environmental Literacy Plan (ELP) Working Group in order to draft New Hampshire's plan. After engaging stakeholders through various means, a draft was created, reviewed and is presented here.

New Hampshire's Environmental Literacy Plan provides an organized framework to ensure environmental literacy for all people outlined by the six Key Areas of the plan. Key Areas 1 and 2 ensure that environmental literacy activities address state education goals and are aligned with student graduation requirements. Key Area 3 focuses on the need for professional development to assist teachers and school districts. Key Area 4 considers the assessment of Environmental Literacy, and Key Area 5 addresses implementation and funding. Finally, Key Area 6 stipulates that environmental education opportunities be provided in schools and communities. The Environmental Literacy Plan serves as a component creating a pathway for achieving statewide environmental literacy and is included in the well-rounded portion of the Elementary and Secondary Education Act of 2016 (Every Student Succeeds Act). In addition, the Next Generation Science Standards include disciplinary core ideas that are essential to becoming environmentally literate.

In today's world, the need for innovative thinkers and problem solvers is great. Initiatives such as Science, Technology, Engineering and Math (STEM) encourage students to get involved in these subject areas to ready themselves for the next generation of the work force. Environmental literacy is an intricate part of preparing New Hampshire's next generations and is recognized as an important aspect of a well-rounded education for a sustainable future.

The future of New Hampshire's precious natural resources lies in an environmentally literate citizenry that is able to make informed decisions. While much is being done to educate our students, there are many challenges ahead. Ensuring environmental literacy is incredibly important to the sustainability of all of New Hampshire's systems.

On behalf of current and future citizens of our state, thank you for your consideration of this important document.

New Hampshire Environmental Literacy Plan Collaborators

New Hampshire Environmental Educators

The mission of NHEE is to advocate for high quality environmental education in New Hampshire and to provide a forum for networking and professional development for environmental education.

“Founded in 1979, New Hampshire Environmental Educators is the state professional organization for people working and/or interested in environmental education. NHEE is dedicated to promoting, supporting and improving environmental education in New Hampshire and providing professional support to its members. NHEE is a non-profit organization whose members include environmental and conservation educators, classroom teachers, students, administrators and others.”²

New Hampshire Children In Nature Coalition

The mission of the New Hampshire Children in Nature Coalition is to foster experiences in nature that improve physical and emotional health and well-being, increase understanding of and care for the natural world, and promote stronger connections to community and landscape; and providing a forum for continued collaboration by Coalition participants and others.¹

Since 2007, the New Hampshire Children in Nature Coalition has been working actively to connect families to the outdoors. The Coalition’s individual members as well as twenty-two working partners including nature centers, health organizations and state agencies, are dedicated to encouraging families to spend time outside to increase physical and mental health.

Introduction

What is Environmental Literacy?

Environmental literacy¹ requires having an understanding of the natural world and the capacity to interpret environmental systems. Environmentally literate students are aware of the interconnectedness of the global, social, cultural, economic, political and environmental structures. They are actively developing an attitude of respect and stewardship toward the natural world, and gaining the skills necessary to make informed decisions about the environment. With this knowledge and understanding, environmentally literate citizens have the ability to take appropriate actions regarding the environment based on scientific, economic, aesthetic and ethical considerations³.

“Environmental literacy demands understandings, skills, attitudes and habits of mind that empower individuals to relate to their environment in a positive fashion and to take day to day and long-term actions to maintain or restore sustainable relations with other people and the environment.”

-Chuck Roth, pioneer in the field of Environmental Education and NH resident

How is Environmental Literacy attained?

Environmental literacy is primarily gained through the process of environmental education*. Environmental education is an interdisciplinary inquiry-based approach to education that integrates hands-on, project-based classroom and community experiences with outdoor, place-based*, in-the-field learning experiences in order to achieve an understanding of the environment as a whole. The environment, along with environmental conditions and issues, can be used as a context through which instruction in reading, writing, mathematics, science, social studies, and the arts are made relevant. The environment can also be used as context for lessons in group dynamics, problem solving, real world, and community issues. This kind of integration creates relevance and context that prevents the confusion students often experience when learning and teaching is approached out of context. It also enhances connections between people, the land, and their communities. Environmental education teaches children and adults how to learn about and investigate the world in which they live and interact, both with each other and with their environment, to attain environmental literacy.

“It is critical that every American understands how our community, economy, and the environment are connected and mutually dependent. Environmental education prepares all citizens with the 21st Century essential skills that contribute to healthier, more environmentally sustainable and economically prosperous communities... Environmental education fosters learning that can transform how we think, make decisions, and lead our lives. The future depends on our collective ability to apply an integrated approach to teaching and helping students understand the interrelated elements of sustainable environmental systems-- from ecological, economical and community perspectives.” ⁴

What is the importance of Environmental Education in today's world?

Research indicates that environmental education not only builds environmental literacy but also increases overall student engagement and motivation⁵. Heightened engagement then leads to improved academic achievement and performance on assessments in all subject areas. Using an interdisciplinary approach, environmental education uses real-world experiences, which highlight the interconnectedness of knowledge, encouraging systems thinking. This also gives students a chance to explore the matters at hand to gain experience investigating, defining and creating solutions to issues, thus improving critical thinking and problem solving skills. Working on real-world examples often benefits communities and increases collaboration and communication skills. In addition, learning about and from the environment encourages outdoor activities, which improve physical and mental health⁶.

In the world today, there is a great need for innovative thinkers and problem solvers. The problems that we face and will continue to face are complicated and involved. Initiatives such as STEM (Science, Technology, Engineering and Mathematics) encourage students to get involved in these subject areas to prepare themselves for the next generation of the work force. Environmental literacy is an intricate part of this initiative and is also recognized as an important aspect of a well-rounded education to ensure preparedness for a sustainable future. Whether becoming a scientist, joining the green jobs economy, running for elected office, teaching or simply being able to make informed decisions, environmental literacy is an important characteristic of New Hampshire citizens.

Why is Environmental Literacy important to New Hampshire?

New Hampshire has over a century-long legacy of tackling environmental issues, beginning with the establishment of the Society for the Protection of New Hampshire Forests and the passage of the Weeks Act. Today there are many organizations and conservation groups across the Granite State. They are responsible for many initiatives that speak to the desire to have local and sustainable business as well as environmental resource security. From the numerous community-supported agriculture (CSA) systems to green buildings to land conservation to sustainable timber management to healthy water and wildlife populations, people of New Hampshire are clearly concerned with the future of our state.

New Hampshire has come a long way to re-growing the native forest cover since the 1800s, when most of the state was cleared for timber and to create grazing pastures. Populations of many animal species that were nearly extinct due to changes in habitat and unregulated harvest have been managed back to sustainable populations. Conservation efforts over the years consistently attempt to protect and conserve the abundant forests and open space within New Hampshire's borders. The search for balance between

conservation and use in order to develop sustainable resource management continues. Efforts are underway to secure and protect water sources across the state, and new programs are focusing on water quality. The *Water Resources Plan* calls for educating the public about water and cites this plan as a way to help accomplish the goals of water quality and conservation in the state. The revision of *Good Forestry in the Granite State* adds to efforts in sustainable forest management on public and private lands. Individual towns are designating green spaces for wildlife, recreation, economics, education, agriculture and enjoyment of residents. Former Governor Margaret Haasan's, *Task Force on K-12 STEM Education*, calls for a well-educated and well-informed public. The career prospects of NH's young people and the state's economy depend on high quality science, technology, engineering and math (STEM) education across the state. Understanding STEM concepts are essential to increasing environmental literacy. Though many initiatives are underway, with ever-increasing population pressure, Granite Staters are continuously faced with the challenge of responsible growth and land use planning, while considering the value of our forests and natural resources. In addition, our changing climate challenges our current infrastructure and the manner in which we continue to develop. Extreme weather events are becoming more prevalent than ever before, and much planning is needed to manage storm water across the state. Warmer summers and milder winters encourage species formerly exotic to New England including disease-carrying organisms such as deer ticks. Shifts in growing seasons and extremely variable precipitation rates are having an impact on local agriculture, and warmer winters could mean a decrease in snow-related tourism.

With these many issues facing our state, now more than ever it is important for our citizens to understand the complexity of the economic, cultural, political and environmental systems. Though much is being done in our schools to encourage innovative thinking, New Hampshire needs the next generation to have a solid understanding of science and the environment in order to be ready to join the growing green jobs industry and prepare for the challenges ahead. Ensuring an Environmentally Literate citizenry is incredibly important to the future of New Hampshire.

What does New Hampshire's Environmental Literacy Plan do?

New Hampshire's Environmental Literacy Plan provides an organized framework to expand environmental education for all people. It provides an opportunity to engage people in the outdoors and the world around them. The Environmental Literacy Plan ensures that environmental education providers, state natural resource agencies, organizations and local citizens are involved appropriately and effectively in schools and communities. The plan also ensures that environmental education activities are aligned with student graduation requirements and address state education goals. It ensures that teacher professional development opportunities in environmental education are aligned with student achievement goals, while assuring consistency and accuracy in

environmental knowledge. Finally, the Environmental Literacy Plan serves as a necessary component of a comprehensive state environmental education program⁷. A state Environmental Literacy Plan is also a required element for federal funding based on the pending No Child Left Inside legislation.

The Environmental Literacy Plan Process

Creating New Hampshire's Environmental Literacy Plan

Since the 1970s, New Hampshire has had an active group of education professionals that have focused on using the environment as a context of learning. Members of the New Hampshire Environmental Educators (NHEE) have been involved in providing professional development opportunities resources to educators. Through the years, NHEE has collaborated in several educational planning efforts, including statewide conservation and environmental education plans, as well as being actively involved in the development of the current science and social studies frameworks.

In 2008, efforts began on the NH Environmental Literacy Plan, but only became a reality after a New England Environmental Education Alliance (NEEEA)-sponsored workshop, led by the North American Association for Environmental Education (NAAEE) in the fall of 2009, that focused on developing state Environmental Literacy Plans. Each of the six New England states, including New Hampshire, embarked on the process, and consequently have been able to provide support to one another via monthly conference calls. This collaboration has been invaluable to the process, as it has allowed for sharing of ideas, methods and processes. Members of NHEE and the New Hampshire Children in Nature Coalition (NHCINC) came together to create a working group. This group created a “Case for Support” document outlining the importance of Environmental Literacy and the specifics of the plan. Representatives of the working group then met with the NH Commissioner of Education to discuss a potential plan. The commissioner was supportive, and the working group representatives continued with a presentation to the NH Board of Education in June of 2010 to formally establish communication with the Department of Education.

The working group then performed a “crosswalk analysis” (comparing NH Frameworks with environmental education concepts) of the current NH Science and Social Studies Frameworks (Appendix C). This has since been updated since NGSS has been adopted by the NH Board of Education as science standards for NH. They engaged key stakeholders and added people to the Environmental Literacy Plan Working Group. Members of the working group (Appendix E) held five community forums and three focus groups across the state to gather ideas from teachers, environmental educators and interested citizens for what an environmentally literate citizenry would look like and how such might

be attained. In addition, almost 200 public school teachers and a few dozen private, charter and non-formal educators from all over New Hampshire participated in an on-line survey to gather ideas regarding environmental education and literacy. The committee then created a timeline for the development of the ELP draft. A graduate student was hired in an internship position to coordinate writing groups, assemble the draft and further assist in the writing process.

A preliminary ELP draft was prepared and presented at the New Hampshire Environmental Educator's conference in March 2011 to gather feedback. In April, the Advisory committee came together to review and make suggested changes and additions to the document.

A final draft was prepared by the graduate student intern and reviewed by the Environmental Literacy Plan Working Group. The draft was available for public comment, was presented to the Commissioner of Education and the NH Board of Education in April 2012 when it was endorsed by the Board. In 2016, the Environmental Literacy Plan Working Group met and made updates to the plan including using materials from the North American Association for Environmental Education correlations to the Next Generation Science Standards. Funding for Environmental Education has now been included in the federal Every Student Succeeds Act under both Title II and Title IV.

Key Area 1: Ensuring Environmental Literacy through Standards

Current Context

New Hampshire has content frameworks in areas that are built from and aligned to rigorous standards. These standards reference resources such as the Benchmarks for Science Literacy, Next Generation Science Standards National Science Education Standards, National Math Standards and National Curriculum Standards for Social Studies.

As one of the first steps in developing a State Environmental Literacy Plan, the Environmental Literacy Plan working group performed a crosswalk analysis comparing the New Hampshire Social Studies and Science Frameworks with the *Excellence in Environmental Education Guidelines for Learning (K-12)*⁸ of the North American Association for Environmental Education and found a strong alignment between the documents (Appendix C). There is also a [strong alignment](#) with the Next Generation Science Standards and the *Excellence in Environmental Education Guidelines for Learning (K-12)* of the North American Association for Environmental Education. New Hampshire has adopted the national Common Core State Standards in English language arts and mathematics.

Strategies

Support for environmental literacy within educational frameworks happens on a variety of levels including classroom, family, school, school district and state levels. Therefore it is necessary to engage multiple stakeholders in the process. The following are strategies:

- Develop an Environmental Literacy Advisory committee that includes representatives from the New Hampshire Environmental Educators, New Hampshire Children in Nature Coalition and NH Department of Education to pair nonformal* Environmental Education providers with school administrators and classroom teachers, and Nonformal Environmental Education providers with after school programs, extended learning opportunity providers and state agencies.
- Develop an environmental education database to connect nonformal Environmental Education providers with local classrooms. The database will also provide resources to all educators in order to support environmental education efforts across the state.
- The NH Department of Education will encourage teachers to use high quality proven environmental education materials correlated to NH frameworks.
- Partnerships will provide opportunities to integrate meaningful outdoor field and service learning experiences at every grade level.
- Support, including financial, will be provided for teachers to partake in more professional development in environmental literacy.
- Resources will be made available for planning and developing schoolyard habitat and outdoor classrooms.

There are three goals related to standards of environmental literacy in New Hampshire.

1. Educationally Meaningful Outdoor Field Experience

Short Term Outcomes*:

- A database of environmental education resources is available and used by stakeholders
- Teachers are aware of how environmental literacy is integrated into frameworks.

Medium Term Outcomes*:

- Integrate learning about the environment in all content areas and across the curriculum.
- Every child at every grade level has at least one educationally meaningful* outdoor field experience every year.

Long Term Outcome*:

- Every child at every grade level has integrated multiple educationally meaningful* outdoor field experience every year.

2. Partnerships for developing environmental literacy

Short Term Outcomes:

- Teachers are supported by administration in using the environment as a context for learning.
- Districts provide professional development opportunities on environmental literacy.

Medium Term Outcomes:

- Schools have support for developing outdoor learning spaces near the school.
- School districts have a relationship with environmental education content and professional development providers.

Long Term Outcomes:

- Every school has an outdoor learning area with easy access.
- School districts have a partnership with local environmental education nonformal organizations to develop environmental literacy in students.
- An Environmental Literacy liaison is located at either the Department of Education or in one of the state agencies.

3. State and National support for environmental literacy standards

Short Term Outcomes:

- NH Department of Education and other state agency partners facilitate regular meetings of the Environmental Literacy Plan Advisory Committee.
- Nonformal EE centers correlate their program to the NH Frameworks where applicable.
- Strong relationship with the Environmental Literacy Plan and the NH STEM initiative.
- Provide examples of models for partnerships between school districts and nonformal environmental education organizations in the environmental database.

Medium Term Outcomes:

- Use principles and practices to select and develop effective environmental literacy programming for students.

Long Term Outcomes:

- NH Department of Education participates in national and regional dialogues and work groups to develop, support and adopt future generations of science and social studies standards that support environmental literacy.

Key Area 2: Ensuring Environmental Literacy through Graduation Requirements

Current Context

State requirements for high school graduation were last reviewed in 2005. They include:

- | | |
|---|-------------------------------|
| 1. Arts Education: 0.5 unit | 6. Mathematics: 2 units |
| 2. Computer Education 0.5 unit | 7. Physical Education: 1 unit |
| 3. Health Education: 0.75 unit | 8. Science: 2 units |
| 4. Industry Arts or Technology: 4 units | 9. Social Studies: 2 units |
| 5. English: 4 units | 10. Open Electives: 7 units |

Different school administrations may have additional requirements such as community service hours or a community service project. In New Hampshire the local school administrative units are responsible to develop curriculum to meet the graduation requirements.

Strategies

Incorporating environmental literacy competencies for graduates would involve collaboration between NHEE, NH Department of Education and other state agencies, service-learning providers, nonformal environmental education centers, and schools and school administrative units.

- Partnerships will work together to identify strategies to increase the number of environmental literacy opportunities, including service learning projects*, environmental science classes, community clubs and extended learning opportunities.
- NH Department of Education will encourage schools to meet existing science and social studies frameworks.
- Additional recommendations for ways of achieving and demonstrating environmental literacy will be provided to school administrative units.

Short Term Outcome:

- An increase in the number of place-based and service learning projects that incorporate environmental literacy

Medium Term Outcome:

- An increase in the number of districts that include an elective class on environmental science/literacy at the high school level.

Long Term Outcome:

- Fully integrate environmental education across the curriculum.
- Districts develop a requirement for Environmental Competency

Key Area 3: Ensuring Environmental Literacy through Professional Development

Current Context

The Elementary and Secondary Education Act (ESSA) of 2016 identifies professional development (PD) as an essential component of a district-wide educational improvement plan. High-quality professional development identifies many factors that aid in developing effective professional development programs such as administrator support, long-term and sustained training and programs that are grounded in research and clinical knowledge of teaching and learning. The professional development must be aligned with pre-K-12 curriculum and assessment practices for the participant's school, and include age-level appropriate instruction. These are components of professional development programs that lead to changes in teaching practices.

According to an educator survey conducted by the Environmental Literacy Plan Working Group, over half of the teachers who responded strongly agreed that they would like to integrate environmental content into their classes, however only a quarter of the responders strongly agreed that they felt prepared to integrate environmental issues into the classroom.

Many pre-service teacher education degree programs currently do not have an environmental literacy component. Professional development opportunities should be available for informal and formal educators and administrators at all levels including early childhood, pre K-12 as well as the college level.

Strategies

All strategies are guided by the NAAEE *Guidelines for the preparation and professional development of environmental educators*¹⁰, and guidance from the federal Department of Education.

- NH Department of Education, together with NH Environmental Educators, will develop and maintain an online database of state environmental education resources and programs.
- Schools and teachers will continue to partner with state and federal natural resource agencies in New Hampshire.
- A task force will be created with broad-based representation to develop environmental literacy competencies for K-12 teachers based on NAAEE guidelines, and professional development providers will align their programs with those guidelines.
- Higher education institutions will work together with nonformal EE providers and NH Department of Education to discover aspects of environmental literacy that support other initiatives such as STEM.

There are four aspects of professional development addressed by New Hampshire's Environmental Literacy Plan.

1. Pre-service Professional Development

Short Term Outcomes:

- Establish student-learning outcomes for Environmental Literacy competencies.

Medium Term Outcomes:

- Establish a requirement for Environmental Literacy competencies in higher education programs through coursework, internships, and other experiences.
- Most higher education institutions that provide administrative training will require Environmental Literacy competencies.

Long Term Outcomes:

- Teacher certification includes environmental education components.
- Administrative certification includes environmental education components.

2. In-service Professional Development

Short Term Outcomes:

- Maintain existing environmental education professional development opportunities.
- Educators seek out environmental education professional development.
- Educators begin to integrate environmental education into the curriculum.
- Professional development opportunities should be marketed to educators and administrators.

Medium Term Outcomes:

- Establish new relationships with environmental literacy professional development providers.
- Establish network for sharing environmental literacy professional development funding opportunities and EE resources.

Long Term Outcomes:

- All districts have a working relationship with an environmental literacy professional development provider.
- Majority of educators are integrating environmental education into student coursework.

3. Professional Development Providers

Short Term Outcomes:

- Establish training guidelines amongst nonformal Environmental Education providers, which are aligned to current professional development guidelines.

Medium Term Outcomes:

- Establish network of field-based training organizations and opportunities providing high quality professional development that encourages environmental literacy.

Long Term Outcomes:

- All teachers have participated in field-based environmental literacy training.
- A network exists to continue high quality field-based training.

4. Professional Development Policy

Short Term Outcomes:

- Administrative units participate in environmental literacy professional development.

Medium Term Outcomes:

- Administrative units identify environmental education as a core component of high quality education.

Long Term Outcomes:

- Schools adjust curriculum requirements to include environmental education.
- Administrative units encourage environmental education professional development and seek out funding for training.

Key Area 4: Ensuring Environmental Literacy through Assessment

Current Context

The NH Department of Education collects a variety of student information¹¹. This information includes student achievement data for reading, writing, comprehension, mathematics, inquiry, life sciences, earth-space sciences and physical sciences. With appropriate planning, information can be built into the current system to assist in the evaluation related to environmental literacy. This information provides a picture of the content knowledge of students regarding the environment.

Strategies

- The Environmental Literacy Plan Advisory Committee will develop a plan to assess current environmental literacy in students.
- The NH Department of Education and other state agencies, including nonformal Environmental Education providers, will determine how environmental literacy can be measured using state competencies. Environmental education centers will conduct pre-and post-experience surveys with students to determine learning through their programs.
- Alternative methods for measuring environmental literacy will be provided to districts based on the work of the Environmental Literacy Plan Advisory Committee.

Short Term Outcomes:

- Teachers create a record of environmental projects and include them in student portfolios.
- Multiple ways to assess environmental literacy will exist.

Medium Term Outcomes:

- Include examples of environmental understanding in the Information and Communication Technology*portfolio required for the 8th grade.

Long Term Outcomes:

- Have an environmental literacy index developed from other testing tools.
- Students at the high school level have a portfolio demonstrating environmental literacy.
- Individual districts create an environmental literacy assessment.

Key Area 5: Ensuring Environmental Literacy through Funding and Support

Current Context

In these economic times, support for any Environmental Literacy Plan requires examining opportunities for creating partnerships and identifying areas where multiple goals can be reached at the same time environmental literacy can be achieved. Enhanced efforts to support environmental literacy will need to be funded through grants and funding streams outside of the state's current funding systems. It is not expected that school administrative units will be able to devote financial resources to promote environmental literacy, no matter how compelling the case. Environmental literacy partners must work together to make connections with STEM and other well-rounded education initiatives.

Strategies

Many partners are necessary for the implementation and funding of the Environmental Literacy Plan. The Environmental Literacy Plan Advisory Committee must partner with universities, NHEE, state agencies, DOE, local businesses and industries, PTOs and PTAs, and nonformal EE centers. Implementation will require participation at every level from State agencies to school districts to individual teachers.

- ELP Advisory Committee and the DOE will seek funding opportunities from a variety of granting sources.
- ELP Advisory Committee will seek out partnerships with the business community around training for green jobs.
- ELP Advisory Committee will work with STEM collaborative to seek funding for professional development.
- Nonformal centers will work with local schools to identify local funding sources.
- Grant opportunities around developing and building outdoor classroom or schoolyard habitat will be shared with the school community.
- ELP Advisory Committee will develop a process to promote, implement and monitor the ELP by working through their various agencies and networks.

Short Term Outcomes:

- Professional development opportunities that are aligned with STEM and other initiatives will be sought out.
- Funding sources will be located to assist schools in creating field experiences and environmentally focused field trips.
- Educational organizations incorporate appropriate sections of the ELP into their mission, goals and/or strategic plan.

Medium Term Outcomes:

- Strengthen State agency's commitment to providing EE professional development and classroom materials support.

Long Term Outcomes:

- Fully funded opportunities for professional development supporting environmental literacy are provided.
- All students have field experiences at nonformal EE centers and in their schoolyard.
- Schools support the implementation of the ELP into school learning programs and practice.

Key Area 6: Ensuring Environmental Literacy through Community Connections

Current Context

New Hampshire's communities play a key role in educating citizens of all ages about local environmental issues. Knowledge of the local environment is passed from generation to generation and requires proper communication to preserve the stories and understandings unique to that place. With this information, communities can work to support and preserve their local resources.

Strategies

Strong communities are those that are diverse, resilient and connected on many levels. In order to properly prepare the next generation to be responsible and knowledgeable citizens, it is crucial that they have experiences with real-world projects and connections with community members. These community members in turn will benefit from continuing involvement and education in their towns.

- Lines of communication will be opened between the many key stakeholders in a community, including school administrators, teachers, business owners, students, NGOs, local government officials and community groups from early childhood education to senior citizen centers. NHEE and NHCiNC can each serve as a vehicle for opening these pathways of new communication.
- Partnerships must be made to educate citizens, coordinate environmental practices and oversee local decisions.
- Local projects and environmental issues must be identified with a plan to involve citizens in decision making and resolution of the problems.

The Environmental Literacy Plan Working Group has defined two goals to support community connections in New Hampshire.

1. Strong Connections

Short Term Outcome

- School projects incorporate and increase service-based learning on the environment and environmental issues.
- Community members volunteer in schools around environmental topics.
- Environmental literacy extended learning opportunities should be developed in communities.
- Programs specifically for early childhood education providers should be offered.

Medium Term Outcome

- Communities and government units support local businesses to adopt sound environmental practices and those businesses use natural resources in sustainable ways.
- Partnerships between community members and schools continue to strengthen environmental projects that are interconnected between school and community.
- Community partners including local government partners like park and recreation departments, businesses, profit and non-profit organizations should work together to maximize efforts.

Long Term Outcome

- The community benefits from strong environmental connections between businesses, schools and government.

2. Local Environment

Short Term Outcome

- Students study relevant environmental issues in their community and work to resolve those issues.

Medium Term Outcomes

- The community's overall health and vitality continues to be strengthened.
- The environment is viewed as a key component to a community.

Long Term Outcome

- Environmental, social and economic impacts on a community and the natural environment are considered.
- Community members have developed skills to investigate issues and develop solutions with consideration for the natural environment.

**Appendix A
Logic Models**

Key Area 1: Standards Logic Model

Input	Output Activities	Output Audience	Short Term Outcomes	Medium Term Outcomes	Long Term Outcomes
DOE Consultants and partners Partnership of NHEE and DOE DOE School administrators Nonformal EE providers Teachers Agencies Non-formal EE providers State agencies After- school programs Extended learning opportunities providers	DOE Encourage teachers to use high quality proven EE materials correlated to NH Frameworks Develop Database of EE Resources for NH includes providers, lesson plans, and activities Encourage teachers to integrate content areas while using the environment as the context Provide opportunities to integrate meaningful outdoor field and service learning experiences at every grade level	Classroom Teachers	Database of EE resources will be used. Teachers are aware of frameworks and how they integrate with environmental literacy	Integrate learning about the environment in all content areas and across the curriculum Every child at every grade level has at least one educationally meaningful outdoor field experience every year	Every child at every grade level has multiple educationally meaningful outdoor field experience every year
School districts Administrators Teachers Community members Nonformal EE providers PTA's Local community	Establish policies to support academic and/or service oriented clubs Resources are available for planning and developing schoolyard habitat and outdoor classrooms Encourage collaborations with local resources that provide	School Districts	Teachers are supported by administration in using the environment as a context for learning	Support for developing outdoor learning spaces near the school	Every school has an outdoor learning area with easy access

	outdoor/environmental learning opportunities				
State agencies Nonformal EE providers Community members School board Nonformal EE providers	Provide support for teachers to partake in more professional development on environmental literacy District's professional development plans include environmental literacy training in all content areas	Teachers School Districts	Districts provide professional development opportunities on environmental literacy	School districts have a relationship with EE content and professional development providers	School districts have a partnership with local EE non-formal organizations to develop environmental literacy in students An Environmental Literacy liaison is located at either the Department of Education or in one of the state agencies.
ELP Advisory Committee Key stakeholders Schools Businesses Administrators State agencies DOE DES Nonformal EE providers NHEE, etc.	Develop a statewide Environmental Literacy group with representatives from state agencies, NH Children in Nature Coalition, schools, business EE Database includes models of relationship/partnership	ELP committee Schools Businesses DOE DES NHEE, etc.	DOE and other state agency partners facilitate regular meetings of ELP Advisory Committee Nonformal EE centers correlate their program to the NH Frameworks where applicable	Use principle and practices to select and develop effective environmental literacy programming for students	DOE will participate in national and regional dialogues and work groups to develop, support and adopt future generations of science and social studies standards that support environmental literacy

	with Non-formal EE providers		Strong relationship with the NH STEM initiative Provide examples of models for partnerships between school districts and non-formal EE organizations		
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Key Area 2: Graduation Requirement Logic Model

Input	Output Activities	Output Audience	Short Term Outcomes	Medium Term Outcomes	Long Term Outcomes
Collaboration between DOE and NHEE	<p>NHEE will work with DOE, other state agencies and NGOs to identify strategies to increase the number of environmental literacy opportunities for communities</p> <p>DOE will encourage schools meeting science and social studies frameworks as current standards to contain objectives tied to environmental literacy</p>	<p>School Districts</p> <p>Schools</p> <p>Teachers</p> <p>Service Learning Providers</p>	An increase in the number of place-based and service learning projects that incorporate environmental literacy	An increase in the number of districts that include an elective class on environmental science/literacy at the high school level	Fully integrate environmental education across the curriculum

Key Area 3: Professional Development Logic Model

Inputs	Output Activities	Output Audience	Short Term Outcomes	Medium Term Outcomes	Long Term Outcomes
NHEE DOE	Organize a committee to develop and maintain an online database Develop an online database with state EE resources and programs	In-service teachers	Educators refer to EE database for EE professional development opportunities Educators seek out EE Professional Development Educators are beginning to integrate EE into the curriculum Opportunities should be marketed to educators and administrators	Establish network for sharing EL-Professional Development funding opportunities	Majority of educators are integrating EE into student coursework
Schools Teachers State Agencies	Schools and teachers continue to partner with state and federal natural resource agencies in NH	Natural Resource Agencies Non-formal DOE	Maintain existing EL-Professional Development opportunities	Establish new relationships	All districts have a working relationship with an EL-Professional Development provider

<p>Higher education institutions</p> <p>DOE</p>	<p>Provide an Environmental Literacy (EL) course for pre-service preK-12 teachers</p> <p>Change requirements for teacher certification</p> <p>Change requirements for pre-service preK-12 teacher graduation</p> <p>Establish an assessment tool to determine effectiveness of EL-PD courses</p>	<p>Pre-service teachers</p> <p>DOE Pre-service teachers</p> <p>DOE Pre-service teachers</p> <p>Higher Ed institutions DOE</p>	<p>Establish student learning outcomes for course</p>	<p>Teacher certification includes EE components</p>	<p>Course required by most higher education institutions that provide education degrees</p>
<p>ELP Advisory Committee</p>	<p>Endorsement for ELP from school administrators' professional organizations</p>	<p>School administrators</p>		<p>Schools adjust curriculum requirements to include EE</p> <p>Partnering of formal and non-formal EE providers is encouraged by educators/administration/DOE</p>	<p>Majority of school administrators identify EE as a core component of high quality education</p>

Higher Education institutions NHEE Nonformal EE providers DOE Open NH	Create a task force with broad-based representation Network for partnering non-formal and formal educators Work with DOE initiatives that support EL such as STEM	Higher education institutions NHEE DOE Professional Development centers Natural Resource Agencies NHCINC Local businesses Industries Legislators Council for business and social responsibility	Task force establishes EL competencies for K-12 teachers based on NAAEE guidelines	Competencies are established and assessed by in-service Professional Development providers as well as pre-service higher education institutions	
Nonformal EE providers Higher education institutions State and federal natural resource offices NGOs	Provide field-based EL training for teachers	In-service and Pre-service teachers	Establish training guidelines	Establish network of field-based training organizations and opportunities	All teachers have participated in field-based EL training

Key Area 4: Assessment Logic Model

Inputs	Output Activities	Output Audience	Short Term Outcomes	Medium Term Outcomes	Long Term Outcomes
DOE DOEs from RI, ME, VT Schools Non-formal EE providers	Determine how current questions from the NECAP Science assessment can be combined to correlate to environmental literacy EE centers conduct “exit surveys” with students to determine learning through their programs	Statewide	Measure environmental literacy based on current NECAP Science Assessment Teachers create a record of environmental projects and include in student portfolios Multiple ways to assess environmental literacy will exist	Include examples of environmental understanding in the ICT literacy portfolio required for the 8 th grade	Have an environmental literacy index developed from NECAP Science or other testing tool Students at the high school level have a portfolio demonstrating environmental literacy

Key Area 5: Implementation and Funding Logic Model

Inputs	Output Activities	Output Audience	Short Term Outcomes	Medium Term Ourcomes	Long Term Outcomes
<p>ELP Advisory Committee Universities NHEE State Agencies DOE</p> <p>ELP Advisory Committee NHEE Business Industry</p>	<p>Statewide environmental literacy group and DOE will seek funding opportunities from a variety of granting sources</p> <p>ELP Advisory Committee will seek out partnerships with the business community around training for green jobs</p> <p>ELP group will work with STEM collaborative to seek funding for professional development</p>	<p>Teachers School Districts</p> <p>Teachers School Districts</p>	<p>Partnership between professional development opportunities around STEM and other initiatives</p>	<p>Strengthen State agency's commitment to providing EE Professional Development and classroom materials support</p>	<p>Funding is fully available for professional development in Environmental Literacy</p>
<p>Nonformal Centers</p> <p>EE Groups PTA State Agencies</p>	<p>EE centers will work with local schools to identify local funding sources</p> <p>Grant opportunities around developing and building outdoor classroom or schoolyard habitat will be shared with the school community</p>	<p>Schools School Districts</p>	<p>Funding sources will be located to assist schools in creating field experiences and environmentally focused field trips.</p>		<p>All students have field experiences at nature or environmental centers and in their schoolyard</p>

NHEE members Colleges Universities State Agencies ELP Advisory Committee	ELP committee will develop a process to promote, implement and monitor the ELP by working through their various agencies and networks	Nonformal EE providers Schools	Educational organizations incorporate appropriate sections of the ELP into their mission, goals and/or strategic plan		Schools support implementation of the ELP into school learning programs and practices
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Key Area 6: Community Connections Logic Model

Input	Output Activities	Output Audience	Short Term Outcomes	Medium Term Outcomes	Long Term Outcomes
Collaboration and communication between key stakeholders	Partnerships are formed to strengthen communities Open lines of communication between "audience" members	School teachers Administrative units Students Business owners Local government officials NGOs Community groups Early Childhood Education centers Senior Citizen groups and centers	School projects incorporate service-based learning Community members volunteer in schools Environmental literacy extended learning opportunities should be developed in communities Programs specifically for early childhood education providers should be offered	Communities and government units support local business Community partners including local government partners like park and recreation departments, businesses, profit and non-profit organizations should work together to maximize efforts	Strong connections exists between businesses, schools, government, families and individual citizens
Collaboration and communication between key stakeholders	Partnerships are formed to strengthen communities Open lines of communication	School teachers Administrative units Students Business owners Local government officials	Students study relevant environmental issues in their community and work to resolve those issues	The community's overall health and vitality improves The environment is viewed as a	Environmental, social and economic impacts on a community and the natural environment are considered

	between "audience" members	NGOs Community groups Early Childhood Education centers Senior Citizen groups and centers		key component to a healthy community	Community members have developed skills to investigate issues and develop solutions with consideration for the natural environment
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Appendix B

*Glossary

Environmental Education: A process aimed at developing a world population that is aware of and concerned about the total environment and its associated problems, and which has the knowledge, attitudes, motivations, commitments, and skills to work individually and collectively toward solutions of current problems and the prevention of new ones.¹²

Environmental Literacy: Environmental Literacy is having an understanding of the natural world and the ability to make decisions about the environment based on scientific, economic, aesthetic and ethical considerations¹³.

Information and Communication Technologies (ICT): Each NH student is required to create an electronic portfolio by the end of grade 8

Inquiry-Based Learning: Inquiry is a multifaceted activity that involves making observations; posing questions; examining books and other sources of information to see what is already known; planning investigations; reviewing what is already known in light of experimental evidence; using tools to gather, analyze, and interpret data; proposing answers, explanations, and predictions; and communicating the results. Inquiry requires identification of assumptions, use of critical and logical thinking, and consideration of alternative explanations. (p. 23- National Science Education Standards)

Meaningful Experience: Experiences are: investigative or project-oriented, an integral part of the instructional program, part of a sustained activity, considers the environment as a system¹⁴.

Nonformal Education: Organized learning opportunities outside the formal educational system. These tend to be short-term, voluntary and require few if any prerequisites, typically have a curriculum and often a facilitator, usually are local and community-based.

Open Space: an area of land or water that either remains in its natural state or is used for agriculture, free from intensive development for residential, commercial, industrial or institutional use; it includes agricultural and forest land, undeveloped coastal and estuarine lands, undeveloped scenic lands, public parks and preserves (NYS Department of Conservation <http://www.dec.ny.gov/lands/317.html>)

Place-based Education: The process of using the local community and environment as a starting point to teach concepts in language arts, mathematics, social studies, science and other subjects across the curriculum¹⁵. Place-based Education emphasizes hands-on, real-world learning experiences. This approach is akin to using the Environment as an

Integrating Context (EIC), which has been shown to increase academic achievement¹⁶.

Service Learning: A teaching and learning strategy that integrates meaningful community service with instruction and reflection to enrich the learning experience, teach civic responsibility, and strengthen communities¹⁷.

Short Term Outcomes: 2-5 years

Medium Term Outcomes: 5-10 years

Long Term Outcomes: 10-15 years

Appendix C

Crosswalk Analysis: NGSS and NAAEE Guidelines for Excellence

[View the North American Association for Environmental Education report](#) summarizing the strong alignment between the Next Generation Science Standards and the *Excellence in Environmental Education Guidelines for Learning (K-12)* of the North American Association for Environmental Education.

Appendix D

ELP Working Group 2010-2012

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Appendix E

Community and Government Partners

Antioch University New England

Appalachian Mountain Club

New Hampshire Department of Resources and Economic Development: Division of Forest and Lands

New Hampshire Children in Nature Coalition

New Hampshire Department of Education

New Hampshire Department of Environmental Services

New Hampshire Environmental Educators

New Hampshire Fish and Game Department

New Hampshire Project Learning Tree

New Hampshire Sierra Club

Plymouth State University Department of Environmental Science and Policy

Squam Lakes Natural Science Center

Southern New Hampshire University School of Arts and Sciences

The Margaret and H. A. Rey Center

United States Forest Service

University of New Hampshire, Durham

Appendix F

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¹ See definition in Glossary in Appendix B

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