



Texas Natural Resource/Environmental Literacy Plan



Healthier,
Happier,
Smarter.

Vision

All Texans value Texas' natural resources, know the principles of natural resources stewardship and live sustainably.

Mission

To provide a framework for ongoing statewide efforts that foster natural resource/environmental literacy as a cornerstone of education, recreation and lifelong learning.

Texas Natural Resource/ Environmental Literacy Plan

The core of who we are as Texans lies in the sustenance, history and culture built around our natural world. The future of Texas' natural and cultural resources depends on every one of us having a sense of place and our role in that place.

The Texas Natural Resource/Environmental Literacy Plan serves as a framework to coordinate statewide efforts of formal and informal educators to provide lifelong opportunities for all Texans; regardless of age, culture, ability or circumstances, to become stewards of our natural resources.





What is Natural Resource/Environmental Literacy?

Natural resource/environmental literacy is the knowledge, skills and ability to understand, analyze and address major natural resource opportunities and challenges.

Natural resource/environmental literacy is a lifelong, ongoing process that develops through a variety of experiences, including formal study in schools or outdoor classrooms, informal educational experiences such as visiting a zoo, park, nature center or ranch, and in personal experiences outdoors. Literacy is not a process of indoctrination of any one agenda, but of building knowledge and experiences that help individuals make informed choices.



What is Natural Resource Stewardship?

The principles of natural resource stewardship include basic knowledge about ecological systems and the skills to use them wisely. A good steward:

- Has knowledge of basic ecological concepts
- Feels a personal connection to natural resources and future generations
- Considers the world as a system of interconnected, interacting parts
- Seeks to understand all aspects of a natural resource/environmental issue (e.g., environmental, scientific, social, political, historical, and economic)
- Has confidence that working alone or with others, an individual can influence or bring about desired outcomes through his actions
- Acts in an informed and responsible manner
- Is willing and able to pass stewardship concepts on to peers and others



What is Environmental Education?

Environmental education supports the experiences and educational processes that allow individuals to acquire the knowledge and skills to make informed decisions and take responsible action on behalf of our natural resources and future generations.

Two international documents recognize environmental education definitions and practices as the core concepts needed for environmentally literate citizens. The Belgrade Charter provides an initial goal statement for environmental education that was adopted during a 1976 United Nations conference:

The goal of environmental education is: To develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations and commitment to work individually and collectively toward solutions of current problems, and the prevention of new ones.

The world's first intergovernmental conference on environmental education in 1978 created the *Tbilisi Declaration* to further articulate the goals for environmental education, which are:

- To foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas;
- To provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment;
- To create new patterns of behavior of individuals, groups and society as a whole towards the environment.



Why this Plan?

Research shows that children and adults are spending between 7-11 hours per day indoors, sedentary, with media and only minutes per day playing or exploring in nature. This disconnection from nature has ill effects on a child's cognitive development, physical health and ability to understand their natural world.

The statistics are sobering. However, through individual and collaborative efforts, it is possible to reverse these trends. In 2010, the *Texas Children in Nature Strategic Plan* was created when bi-partisan legislators and over 80 professionals, including representatives from state and federal agencies, Non-governmental Organizations (NGO), health, education, natural resources, community organizations and businesses called for opportunities for every child in Texas to be engaged in meaningful outdoor learning experiences and achieve natural resource literacy.

Texas Children in Nature (TCiN) envisions that all children and their families, from all walks of life, will spend more time outdoors, engaged with nature for a healthier, happier and smarter Texas. The goals of the TCiN Strategic Plan call for strengthening formal and informal outdoor learning opportunities, improving human and community health through a connection with nature and supporting safe access to the outdoors for all children and families in Texas. Additionally, the TCiN Plan encourages lifelong learning, professional development and volunteer opportunities that foster a meaningful relationship with nature for both adults and children. The *Natural Resource/Environmental Literacy Plan* is designed to strengthen elements of the TCiN Plan by expanding specifically on the role of education as a tool for connecting children and adults to nature.

States across the country are developing and implementing environmental literacy plans. Successful plans involve the whole community and integrate into higher education, technical education, businesses, government services and organizations. Key principles for most plans include preparing students to understand, analyze and address major challenges facing their community, the state and the nation; provide field experiences as part of the regular school curriculum and programs that contribute to healthy lifestyles through outdoor recreation; and creating opportunities for enhanced and ongoing professional development for teachers that improve their environmental knowledge and instructional skills.

In January 2015, the Texas Association for Environmental Education (TAEE) agreed to champion the *Texas Natural Resource/Environmental Literacy Plan* for the state of Texas. Through this commitment, TAEE stands ready to move the Plan forward, reaffirming trust in the collaborative process that created it.



The Plan

The Texas Natural Resource/Environmental Literacy Plan is structured into six main components that will enable the state to meet the objectives in the *Texas Children in Nature Strategic Plan*:

Lifelong Learning and Community Connections

that develop a culture of appreciation and lifelong learning in natural resource/environmental literacy.

Formal Education

that incorporates natural resource/environmental literacy into learning relevant content, teaching practices, the use of learning environments in schools and student outcomes.

Informal Education

that incorporates natural resource/environmental literacy into teaching practices and learning environments in informal educational settings.

Professional Development

that improves natural resource/environmental content knowledge and skills in teaching about environmental issues.

Assessment

of natural resource literacy/environmental strategies and programs.

Funding and Support

strategies needed to implement the Plan.

Goals and Objectives

Goal I **Lifelong Learning and Community**

As Texans have fewer direct experiences in the natural world, it becomes increasingly important to educate all citizens about our natural resources through accessible, safe and enjoyable outdoor experiences. Nature provides an excellent context for learning. Community connections to these natural resources and environmental literacy are as diverse as the people of Texas. They extend from the youngest child to the oldest senior. They can be cultural, recreational, and intellectual. They range from general awareness, to knowledge, to action. It is in the community that all the other aspects of literacy come together.

The North American Association for Environmental Education (NAAEE) has developed the *Excellence in Environmental Education: Guidelines for Learning for (K-12)*. This document guides the development of learning programs in schools and informal and community environmental education programs for lifelong learning.

GOAL: To support a network of community connections that provide opportunities through resources, programs and places for all individuals, groups and organizations in Texas in order to develop a culture of appreciation and lifelong learning in natural resource/environmental literacy.

OBJECTIVE 1: Promote collaboration between environmental education and natural resource organizations.

- Identify, establish, and support a collaborative network of local organizations and businesses to share resources and increase program participation.
- Continually promote the development of partnerships between families, schools, park departments, nonprofits, private landowners, and others to provide training for play leaders and educators.
- Encourage regional organizations to understand, promote, and complement each other's offerings in order to reinforce lifelong learning.
- Utilize tools and strategies from national organizations to facilitate community engagement.

OBJECTIVE 2: Support access to and engagement in appropriate natural resource/environmental education for all Texans; regardless of age, ability, occupation, or situation.

- Identify key audiences and policy makers for each of the Texas Natural Resource/Environmental Literacy Plan goals.
- Develop a strategy for reaching each audience.

Goal II **Formal Education**

Education is an essential element for the development of a natural resource/environmentally literate populace and a healthy environment for future generations. Effective education for natural resource/environmental literacy is integrated throughout the curriculum in every classroom in Texas including opportunities for students to participate in outdoor learning experiences.

GOAL: To provide a framework to incorporate natural resource/environmental literacy knowledge and skills into teaching practices, the use of outdoor learning environments in schools and student outcomes and graduation requirements.

OBJECTIVE 1: Ensure that all members of a school community have access to engaging learning experiences that include using appropriate outdoor learning environments.

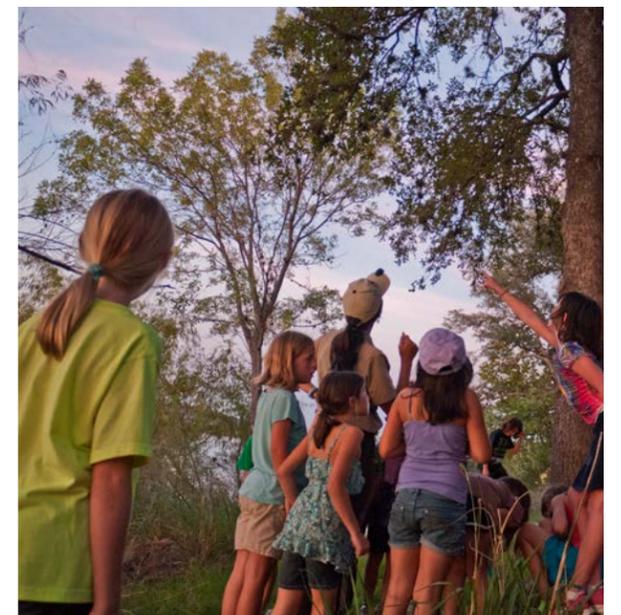
- Identify design guidelines for outdoor classrooms, wildlife habitats, and integrated natural play/learning environments.
- Promote training in best practices for use of outdoor classrooms and natural areas throughout all content areas (English/Language Arts, Mathematics, Social Studies and Science).
- Build and train a network of volunteers to help with the implementation, use and maintenance of outdoor classrooms.
- Promote awareness and training in the NAAEE's *Excellence in Environmental Education: Guidelines for Learning (Pre K-12)*.

OBJECTIVE 2: Support the Texas Essential Knowledge and Skills (TEKS) in K-12 Science and Social Studies standards that reflect the inclusion of natural resource/environmental literacy knowledge and skills in a way that they are consistent and identifiable across all grade levels.

- Develop reference materials for TEKS revision teams to use when the subject area standards are due for review.
- Develop resources and materials to support strategic incorporation of natural resource/environmental literacy concepts in subject areas after the TEKS are revised.

OBJECTIVE 3: Support the inclusion of natural resource/environmental literacy in high school graduation requirements.

- Perform a gap analysis of existing requirements.
- Develop reference materials to support incorporation of natural resource/environmental literacy in future graduation requirement review.



Goal III Informal Education

While natural resource/environmental literacy is developed within the formal classroom, informal programs across Texas provide unique opportunities to engage, encourage and inspire learners to become natural resource/environmentally literate. From museum experiences and zoo or aquarium encounters, trips to ranches, farms and private lands, to park programs and utility presentations, Texans continue to learn ways to become better stewards of the environment outside the classroom.

GOAL: To provide a framework to support natural resource/environmental literacy knowledge, skills and outcomes through teaching practices and learning environments in informal and nontraditional educational settings.

OBJECTIVE 1: Support best practices and critical content for natural resource/environmental literacy in informal education settings.

- Define best practices and critical content needed for successful informal education programs.
- Promote awareness and training in NAAEE's *Nonformal Environmental Education Programs: Guidelines for Excellence*.
- Promote awareness and training in NAAEE's *Environmental Education Materials: Guidelines for Excellence*.
- Develop criteria to identify and recognize existing high quality informal education programs.
- Implement outdoor, nature-based education via well-trained volunteers and parents.
- Explore and incorporate effective technology as a tool for learning.

OBJECTIVE 2: Facilitate collaboration among formal and informal education resources.

- Increase awareness of and improve access to resources; including sites, materials, professional development, and expertise.
- Identify and promote understanding between formal and informal educators of the issues relevant to them both.
- Identify "case studies" of successful formal-informal partnerships and communicate to others the traits that made them successful.
- Identify and share resources and best practices through related networks and organizations.
- Utilize technology as a tool for collaboration.

“ Impacting children in classrooms has the potential of increasing the environmental literacy of all citizens. To foster the development of environmentally literate citizens, the preparation of teachers in environmental literacy that have an appreciation of, knowledge and skills about, and pro-environmental behavior towards the environment is critical. ”

Christine Moseley, PhD
Professor Emeritus in Interdisciplinary Studies
Department of Interdisciplinary Learning and Teaching
University of Texas at San Antonio



Goal IV Professional Development

Just as natural resource/environmental literacy can affect all aspects of life, including education, community, culture, and economics, it can also find a place in a wide range of professional development.

GOAL: To support programs, partnerships and resources for all stakeholders in natural resource/environmental literacy to improve content knowledge and skills in teaching about natural resource/environmental issues.

OBJECTIVE 1: Increase the natural resource/environmental literacy of community leaders and decision makers so that they can motivate their spheres of influence for natural resource/environmental stewardship.

- Identify key stakeholders and decision makers.
- Determine appropriate means to reach each audience.

OBJECTIVE 2: Support empowerment of formal educators through professional development to motivate their schools, administrators and students to value their natural resources, foster natural resource/environmental stewardship and to implement a plan for campus and district sustainability.

- Develop methods that encourage and support experienced teachers to engage in effective student learning outdoors.
- Provide professional development to in-service and preservice teachers about the benefits of outdoor learning, the opportunity for interdisciplinary teaching and how outdoor learning supports structured learning in the classroom.

- Provide professional development to administrators about outdoor learning; free, outdoor spontaneous play and its benefits for fitness, health, brain development, and learning; the importance of training educators to use outdoor learning; and, how outdoor learning supports structured learning in the classroom.
- Work with partners such as, but not limited to, the Texas Association of School Administrators (TASA), Texas Association of School Boards (TASB), and Local Educational Agencies (LEAs) to host, plan, implement, and evaluate learning opportunities for school administrators.
- Promote awareness and training in NAAEE's *Excellence in Environmental Education: Guidelines for the Preparation and Professional Development of Environmental Educators*.
- Endorse and promote existing training that meets the needs of informal educators.
- Promote awareness and training in NAAEE's *Non-formal Environmental Education Programs: Guidelines for Excellence*.



Assessment of Natural Resource/ Environmental Literacy

Assessment on the effectiveness of natural resource/environmental education programs is critical to ongoing success. The same is true for the need of assessment regarding the delivery and implementation of the Plan itself. Established program evaluation methodologies and guidelines should be used to report on the status of natural resource/environmental literacy in Texas.

GOAL: To develop systems for the evaluation of the overall Texas Natural Resource/Environmental Literacy Plan; including assessment of effective strategies and programs for ongoing improvement.

OBJECTIVE 1: Continuously assess the effectiveness of the Texas Natural Resource/Environmental Literacy Plan.

- Create an assessment system to evaluate the Plan as a whole.
- Identify assessments within each section of the Plan.

OBJECTIVE 2: Promote awareness and training in NAAEE's Excellence in Environmental Education: Guidelines for Learning (Pre K-12) Executive Summary & Self-Assessment Tool.



Funding and Support

Education and community partners need to develop strategies to implement the *Texas Natural Resource/Environmental Literacy Plan*. Funding is needed to support natural resource/environmental education efforts at the local, regional and state levels.

GOAL: The Plan will ensure that the partners in this initiative have the necessary funding and support to implement the elements of the Texas Natural Resource/Environmental Literacy Plan.

OBJECTIVE 1: Support implementation of the Texas Natural Resource/Environmental Literacy Plan through collaboration and partnerships among Texas organizations receiving funding for natural resource/environmental education.

- Coordinate existing networks of organizations that provide natural resource/environmental education.
- Create an incentive to collaborate between organizations seeking funding.

OBJECTIVE 2: Broaden the variety of funding sources.

- Identify or create a clearinghouse of sources for funding.

In January 2012, members of the Texas Children in Nature education team called together leading experts to develop the Natural Resource/Environmental Literacy Plan. After identifying major content areas and stakeholders in the Plan, a diverse team of writers was convened for two writing meetings. The Texas Natural Resource/Environmental Literacy Plan is the product of their work. Thanks to all who contributed to the Plan.

Tom Arsuffi
Director
Texas Tech University Llano River Field Station

Mark Barnett
STEM Education Specialist
Education Service Center - Region 20

Rebecca Benz
Director, Camp Fire Central Texas

Michael Black
Education Specialist, National Park Service -
Big Thicket National Preserve

Susan Campbell
Education Coordinator
San Antonio Natural Areas

Peggy Camahan
Regional Collaborative Director
Our Lady of the Lake University

Lynne Christopher
Secondary Education Coordinator
San Antonio Water System

Koy Coffey
Education Program Specialist
Texas Wildlife Association

Chris Comer
Education Specialist, NASA

Kiki Corry
Project WILD Coordinator/ STAT Board
Texas Parks and Wildlife Department

Courtney Crim
Assistant Professor, Trinity University

Leslie Dubey
Chief of Interpretation and Outreach National
Park Service - Big Thicket National Preserve

Scott Feille
Regional Director, REAL School Gardens

Lendon Gilpin
Assistant Director Edwards Aquifer Research
and Data Center - Texas State University

Jaime Gonzalez
Community Education Manager
Katy Prairie Conservancy

Valeria Hellmann
Environmental Ecology Educator
Witte Museum

Nancy Herron
Outreach & Education Director,
Texas Parks and Wildlife Department

Tracy Hollis
Program Director, Natural Science Education
Center at Grand Prairie ISD

Lari Jo Johnston
Environmental Educator
Coastal Bend Bays & Estuaries Program

Jennifer Jordan Kazuba
Science Specialist, Education Service Center
Region XIII

Josef Kaul
Education Coordinator,
San Antonio River Authority

Stacy McReynolds
Education Manager, San Antonio Zoo

Amy Moreland
Site Coordinator, UTeach Institute
The University of Texas - Austin

Lacy Morrison
Education Curator, San Antonio Zoo

Chris Moseley
Professor University of Texas at San Antonio

Suraida Nafiez-James
Education Program Manager
Gulf of Mexico Foundation

Irene Pickhardt
Statewide Science Coordinator
Curriculum Texas Education Agency

Ann Quinn
Director, Education & Conservation
SeaWorld San Antonio

Emily Seldomridge
Postdoctoral Research Associate
Texas Tech University Llano River Field Station

Cappy Smith
Aquatic Resource Education Specialist
Texas Parks and Wildlife Department

ZoeAnn Stinchcomb
Education Director
Texas Freshwater Fisheries Center - TPWD

Janice Sturrock
Supervisor of Education
Austin Nature and Science Center, Austin PARD

Noah Talerico
Teacher
John H. Wood Charter School

Tamara Trail
Secretary, Board of Directors
Taking Care of Texas

Sarah Valdez
Education Coordinator
Edwards Aquifer Authority

Sally Wall
Middle School Science Specialist
Clear Creek ISD

Haidee Williams
Project Director SEDL

Greg Wukash
Education Coordinator
San Antonio Water System

The following organizations endorse the Texas Natural Resource/Environmental Literacy Plan; indicating overall agreement with the content and strategy and its alignment with their mission:

American YouthWorks
Audubon Texas
Bayou Preservation Association - Harris County
Camp Fire Central Texas
City of Corpus Christi Oso Bay Wetlands
Preserve & Learning Center
City of Port Aransas Nature Preserve
Coastal Bend Bays and Estuaries Program
Coastal Prairie Conservancy
Corpus Christi Museum of Science and History
Dallas Arboretum and Botanical Garden
EcoRise Youth Innovations
Edinburg Scenic Wetlands and
World Birding Center
Energy Corridor District - Houston
Families in Nature
For the Love of Nature
GLOBE

Guadalupe-Blanco River Authority
Gulf of Mexico Foundation
Hill Country Alliance
Houston Zoo, Inc.
Katy Prairie Conservancy
Mission-Aransas National Estuarine
Research Reserve
National Butterfly Center
National Wildlife Federation
North American Butterfly Association
San Antonio River Authority
San Antonio Water System
San Antonio Zoo
Santa Ana National Wildlife Refuge
Science Teacher Association of Texas
Sea World
South Llano Watershed Alliance
Texan by Nature

Texas A&M Forest Service
Texas Association for Environmental Education
Texas Botanical Gardens & Native American
Interpretive Center
Texas Brigades
Texas Children in Nature
Texas Conservation Corps
Texas Outdoor Educators Association
Texas Parks and Wildlife Department
Texas Tech University Llano River Field Station
Texas Tech University Museum -
National Historic Landmark
Texas Wildlife Association
Travis Audubon
Westcave Outdoor Discovery Center
Wimberley Valley Watershed Association



“ As a child, I took part in the Austin Nature and Science Center’s summer camp program. A strong memory I have is of playing the game ‘Oh, Dear!’ from the WILD curriculum. That game really impressed on me how all nature is connected. I’ve since become a nature educator myself. We seldom know what seeds of understanding we cultivate in young minds, or the ripple effects we set in motion. ”

Emma Trester-Wilson
Family and Adult Education Program Specialist
San Antonio Botanical Garden

“ Our world is simultaneously bigger and more fantastic than we can imagine and smaller and more fragile than we ever thought. Those of us who grew up with its inspiration have the responsibility and pure joy of teaching and learning about it every chance we get. ”

Kiki Corry
Project WILD Coordinator
Texas Parks and Wildlife Department

“ All life is linked to our natural resources, but understanding and caring for them comes from experiences. As a child, my love of nature was shaped through playing outdoors with friends and from inspiring teachers and a naturalist who regularly visited our elementary school. This led me to a career in conservation. Today, kids have so much competing for their time. Our challenge, as caring adults, is to share our knowledge and provide opportunities for others to blaze their own conservation trail and steward our natural resources. ”

John S. C. Herron
Texas Director of Conservation
The Nature Conservancy



Life's better outside.®

© 2017 Texas Parks and Wildlife Department PWD RP K0700-2704 (1/17)

In accordance with Texas State Depository Law, this publication is available at the Texas State Publications Clearinghouse and/or Texas Depository Libraries.

TPWD receives funds from the U.S. Fish and Wildlife Service. TPWD prohibits discrimination on the basis of race, color, religion, national origin, disability, age, and gender, pursuant to state and federal law. To request an accommodation or obtain information in an alternative format, please contact TPWD on a Text Telephone (TDD) at (512) 389-8915 or by Relay Texas at 7-1-1 or (800) 735-2989. If you believe you have been discriminated against by TPWD, please contact TPWD or the U.S. Fish and Wildlife Service, Office for Diversity and Workforce Management, 5275 Leesburg Pike, Falls Church, VA 22041.