

VIII. Education, Interpretation, and Outreach Plan



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The CZMA states that the Research Reserves “will serve to enhance public awareness and understanding of estuarine areas, and provide suitable opportunities for public education and interpretation.” As land use and development pressures place strain upon our coastal and estuarine ecosystems, educating legislators, environmentalists, and the citizens of Delaware about these fragile natural areas has become increasingly important. The original management plan of the DNERR, published in June of 1993, states that “the Delaware Environmental Legacy Report (1988) indicated that there should be two major environmental education efforts in Delaware, one for developing an environmental ethic in our youth and a second for recognizing that environmental education is a continuing process and therefore also target adults.”

This suggestion guided the education efforts of the Reserve at its inception and continues to be applicable, serving as the basic framework for both the Education Program and the Action Plan for Education, Interpretation, and Outreach. Through school field trips and outreach, professional teacher development, and public programs targeted towards children, the DNERR is working towards developing the environmental ethic in our youth. Community outreach, adult public programs, coastal decision maker workshops, and volunteer programs the DNERR are making estuarine education a lifelong learning process.

A. Goals and Objectives

The DNERR has these primary goals for education, interpretation, and outreach:

- Enhance public awareness and understanding of the value and functions of estuarine ecosystems in the Middle Atlantic Region.
- Promote the wise use of estuarine resources and encourage an environmental stewardship ethic among Reserve users and visitors as well as coastal decision-makers.

Specific objectives to aid in achieving these goals include:

- Promoting the Reserve, its resources, and its programs through publication of the Reserve newsletter and Public Programs Brochure, public displays, and guest speaking appearances to community groups.
- Promoting awareness of the NERRS and the values of estuarine/marine protected areas by maintaining interpretive displays at the Visitors Center, maintaining the Reserve website, and participating in a variety of public events.
- Providing on-site educational and interpretive services directly to students, coastal decision-makers, and the general public through field-trip experiences, in-classroom activities, workshops, and regularly scheduled public activity programs. These programs include boat and canoe trips, marsh walks, nature crafts, and lectures.
- Implementing the Coastal Training Program (CTP) to address conservation and protection of Delaware’s estuarine and coastal areas through the translation of research into usable management tools. This Program will target specific audiences such as landowners, the farming community, government officials, and science professionals.

- Providing teacher training, internships, and guidance for student projects, whereby enrollees work jointly with scientists to gain field experience and learn how research activities guide management decisions.

B. Site-Specific Facilities and Resources

Both Reserve components, at the Lower St. Jones River and the Upper Blackbird Creek, offer educational value to Delawareans as well as to residents of Philadelphia, Baltimore, Washington D.C., and Norfolk, all within a 150-mile radius of the Reserve.

1. St. Jones Reserve Component and Adjacent Areas

The St. Jones Reserve component is located 6 miles south of Delaware's capital city of Dover, along the St. Jones River Estuary. This central location entails no more than a 1-hour commute for almost all Delaware residents. The St. Jones site is home to the DNERR facilities and Visitors Center, including office space for staff, laboratories, the Coastal Resource Library, a shop, and a classroom/auditorium. The lobby of the Visitors Center houses numerous estuarine exhibits as well.

Education staff and participants benefit from a wet-lab stocked with microscopes, dissection kits, exhibits, and curriculum materials. The classroom/auditorium is equipped with a backlit projection screen for use with computer presentations, TV/VCR, slide projectors, and overhead projectors; it also houses several exhibits. An expansion plan including a new conference room has been proposed (see Chapter VI, the Facilities and Construction Plan) to provide space for visiting researchers and conference participants who otherwise fill areas slated for education purposes.

Meanwhile, the construction of indoor and/or outdoor exhibits at the St. Jones Reserve component is an ongoing project, and progress is based upon funding levels. Current exhibits include:

- Estuary Ecosystem
- St. Jones River Watershed
- A Salty World
- National Estuarine Research Reserves
- Local Estuarine Research
- Welcome Panel/Trail Sign
- What's New at the Reserve
- Hydrologic Cycle
- Blue Crab Life Cycle
- Estuarine Food Web
- Earth-Friendly Construction
- Look Who's Coming to Dinner
- People and the Estuary: Early Life on Land
- People and the Estuary: Development and Commerce
- Weather Station
- Tertiary Wetland Septic System
- Turning the Tides

- Bay Aquarium

The St. Jones site also features a 2-mile turn-around trail that leads hikers over and around saltwater and freshwater marshes, open field, and forested habitats. The clearing of new trails is not being considered, as this would lead to undesirable fragmentation of the Reserve component.

Along the St. Jones River are three areas used by education staff for boating and canoeing launch. Scotton Landing dock provides access to put in the 24-foot Carolina Skiff used for Education Program

activities; it is also a departure/arrival site for canoeing. Lebanon Landing on Route 10 and Legislative Landing in downtown Dover are also used for canoes. All three sites offer varied estuarine habitats.



Figure VIII-1. The Tertiary Wetland Septic System exhibit outside the Visitor's Center.

The John Dickinson Mansion, neighbor to the Reserve, is operated by the State of Delaware's Division of Historical and Cultural Affairs and serves as a major interpretive center, tourist attraction, and school field-trip site. The interpretation at the mansion focuses on the life of John Dickinson as well as the lifestyle and culture of colonial Delaware and America, and presents the crucial role that the St. Jones River played during that era as a vital maritime link with the outside world.

The Ted Harvey Wildlife Area, operated by the DNREC's Division of Fish and Wildlife (DFW), is also adjacent to the St. Jones Reserve component, offering access to bay-front beaches and acres of estuarine habitat. The diverse habitats of all of these areas, from uplands to tidal marsh, beach, and open waters of the Delaware Bay, present a unique outdoor classroom setting for the Reserve's Education, Interpretation, and Outreach Program.

2. Blackbird Creek Reserve Component

The Blackbird Creek Reserve component, located in southern New Castle County, is an excellent representative of an inland portion of a Delaware Bay tributary. The headwaters of the creek are formed, in part, by some of the State's most valuable and unique freshwater wetlands. Because of its fragile and relatively pristine nature, the Blackbird Creek Reserve component will continue to serve only very limited education activities. With additional land acquisition, consideration will be given to modest increases in educational programs at this site, including facility development, to meet the environmental education need in southern New Castle county.

C. Types of Activities

1. Workshops and Training in Informed Coastal Decision-Making

Coastal Decision Maker Workshops provide science-based information and training for those persons who, in a professional or volunteer capacity, make important decisions about Delaware's coastal resources. Coastal decision-makers include local and State officials, volunteer organization members, State and Federal employees, scientists, environmental educators, and realtors, among others.

- A minimum of three Coastal Decision-Maker Workshops are held per fiscal year. Topics cover the research being conducted by the DNERR Research and Monitoring Program and the DCMP. These workshops are a means of translating and transporting research findings to decision-makers and other target audiences in Delaware.
- The DNERR has begun to seek Coastal Training Program (CTP) certification by developing a needs assessment and marketing plan.
- Informed coastal decision-making has been targeted as the focus of the expansion of the Reserve's educational programs.

2. Programs for the General Public

- Outreach presentations are available to the general public and outside organizations. These presentations may include but are not limited to such topics as the Reserve itself, educational opportunities, research topics, and coastal policy.
- Participatory, interactive, and multisensory educational activities are available seasonally. Activities emphasizing interaction with natural resources, such as seining, marsh sampling, bay study, and marsh ecology, along with laboratory experiences and craft sessions, have been conducted at the Reserve.
- Tours of the Reserve emphasize natural, cultural, and historical features. Self-guided walking tours are available to all during regular public-access hours. Guided walking, boat, and canoe tours are scheduled.
- All programs for the general public are scheduled on a seasonal basis and published in the Public Programs Brochure. The postings are also given in press releases handled by the DNREC's Office of Information and Education. The public programs can also be specially scheduled for large groups upon request, depending upon staff availability.



Figure VIII-2. Coastal Decision-Maker Workshop.

3. Programs for Students

- Students from elementary school through college have the opportunity to visit the St. Jones Reserve component as an extension of their classroom learning. The St. Jones Curriculum is used to teach what makes an estuary unique and provides students with the tools and knowledge to make difficult decisions about the future of these valuable resources.
- The curriculum is content-standard and performance-indicator correlated for grades 5–12 in Science, Math, Social Studies, and Language Arts, and is flexible enough to be tailored to the needs of any grade level. Lesson plans are formulated as needed to meet the requests of classroom educators. Topics include, but are not limited to, wetland values, organisms of the estuary, watersheds, water quality/pollution, ecology,

and history. An effort has been made to introduce students to the management and policy of estuarine and watershed resources as well as to provide a historical perspective on estuarine science.

- Education staff members visit schools to deliver in-class programs centered around the on-site information given during visits to the Reserve. This hands-on learning brings the estuary to the students when the students cannot visit. These outreach programs can also serve as pre- or post-field trip visits to provide a more complete experience.
- The DNERR internship program offers one seasonal intern position per year to college/university students majoring in, or interested in, an environmental discipline. In the educational track, these interns participate in environmental educational programming for a variety of age groups.

4. Programs for Educators

- Workshops are offered to teachers and other professional educators to guide them in the use of the facilities and resources of the Reserve. These professional teacher development programs, which are open to teachers of all grade levels, promote the use of the St. Jones Reserve site as a place for field trip opportunities.



Figure VIII-3. Pre-School Naturalist Program.

- The DNERR serves on the steering committee for a professional teacher development program called “Green Eggs & Sand: The Horseshoe Crab/Shorebird Education Project.” The DNERR coordinates with other partners to develop curriculum surrounding a complex natural resource management controversy and train teachers in the use of said curriculum.
- In partnership with the Delaware Teacher Center, the DNERR provides teacher workshops seasonally as well as through the state-wide teacher inservice day. Workshops highlight such topics as beach ecology, estuarine ecology, nonpoint source pollution, and the link between cultural and natural resources.
- The DNERR partners with environmental education agencies and organizations in Kent and Sussex Counties to form the “Downstate Environmental Educators Roundtable.” This conglomeration of educators provides opportunities for partnership programs.

D. Publications and Promotional Events

The Education Program staff produces interpretive and educational materials such as brochures, newsletters, and articles. The DNERR regularly participates in highly visible, annual public events such as the Delaware State Fair, Water Festival, Earth Day, National Estuaries Day, Coast Day, and the Delaware Envirothon.

E. Coordination and Cooperative Efforts

1. Coordination of Education Activities at the Reserve

The Education Coordinator develops, implements, and evaluates DNERR education activities and programs, and coordinates these with the assistance of the Estuarine Educator. The Estuarine Educator's primary role is conducting elementary education programming and public programs development. Both staff members report directly to the Reserve Manager.

2. Coordination with the National Estuarine Research Reserve System

The Education Coordinator is responsible for maintaining a working relationship with the NERRS. DNERR materials and information are available to other sites in the System upon request.

3. Coordination with Other Educational Programs

The Education Coordinator is responsible for combining the DNERR Education Program with cooperative efforts from other educational and environmental programs. This coordination attempts to further the goals of the DNERR Education Program while strengthening environmental education in the state.

Numerous local, State, regional, and international organizations have been involved in education at the DNERR. These organizations include but are not limited to:

- British Trust for Ornithology
- Delaware Envirothon
- Delaware Nature Society (DNS)
- Delaware State University (DSU)
- Delaware State Museums
- Delaware Teacher Center
- Delaware Tourism Office
- Department of Agriculture
- Department of Education
- Department of Natural Resources and Environmental Control (DNREC)
- Farm Service Agency
- Natural Resources Conservation Service (NRCS)
- Private and Parochial Schools
- Public Schools
- Soil and Water Conservation Districts

- The Nature Conservancy (TNC)
- University of Delaware (UD)
- Wash Wader Ringing Group
- Wesley College

F. Coastal Training Program

The NERRS is implementing a national initiative, entitled the Coastal Training Program (CTP), that aims to improve decision-making related to coastal resources management at local and regional levels. This is a major focus of expansion for the NERRS as a whole and thus, for the Delaware Reserve. The CTP will play an important role in ongoing coastal issues training and provide opportunities for partnering with various organizations to benefit from efficient use of all resources and to improve the understanding of coastal issues across a wide spectrum of audiences.

CTP Staffing

The DNERR will, at the end of its planning process, attempt to fill the CTP Coordinator position. This position will be Federally funded from a line item in the DNERR operations grant. Identifying matching monies will be a significant challenge that may delay implementation of the CTP program. Every effort will be made to identify matching monies and proceed with the Program. The DNERR will explore the potential for partnerships to help fill the CTP Coordinator position. Local Universities will be approached to gauge interest in working with the DNERR to implement CTP. The potential partner's primary responsibility would be to offer a full-time position to the CTP Coordinator who would then be detailed to work for the DNERR. This arrangement will very likely produce match and build stronger ties between the Reserve and University. In implementing this approach, the DNERR would retain sole authority over its CTP Program and funding.

The CTP objectives are to:

- Provide the best available science-based information, tools, and techniques to those individuals and groups that are making important decisions regarding resources within coastal watersheds, estuaries, and near-shore waters;
- Increase networking and collaboration across sectors and disciplines related to coastal management issues in local and biogeographic areas; and
- Increase understanding of the environmental, social, and economic consequences of human activity within the coastal landscape.

The DNERR supports and maintains the staff positions of Reserve Manager, Research Coordinator, and Education Coordinator, and has delivered consistent and complete Coastal Decision-Maker Workshop programs, allowing the Reserve to pursue CTP funding. Prior to actual implementation of the Program, the following will be completed:

- Establishment of a CTP Advisory Committee;
- A completed market analysis;
- An implementation plan;
- A strategy document;
- A current needs assessment; and
- A marketing plan

G. Action Plan for Education, Interpretation, and Outreach

In March of 2001, the education coordinators from the NERRS met to draft a National Education Action Plan based on a self-reflective analysis of individual program and management functions. The areas targeted for the National Education Action Plan were Informed Decision-Making, General Public/Adult Education, K–12 and Professional Teacher Development, Facilities, and Public Relations/Promotion. Thirteen actions were compiled keeping these areas in mind. The DNERR has used the identified functional areas as a guide to its program management and has considered the relevant actions from the national plan in relation to the DNERR site and its management plan.

The DNERR will do the following:

- **Action 1: Continue to disseminate information about the DNERR and its functions through interpretive and educational materials such as brochures, newsletters, articles, and presentations.**

Information dissemination has been loosely coordinated in the past; Action 1 will take a more formal and professional approach to this task. Production of “The Skimmer” and Public Programs Brochure is to follow a definite schedule to ensure timely publication. These documents are distributed to the DNERR Master Mailing List comprise of persons wishing to receive general reserve information. A site-specific color brochure promoting the Reserve will also be published. This publication will be distributed at various environmental centers around the state to expand the visibility of the DNERR. Press releases will be issued for newsworthy DNERR findings and events; the DNERR will coordinate all press releases with the DNREC Office of Information and Education. Publication of one-page research topical papers is being considered as well. These topical papers would be distributed to environmental professionals wishing to learn more about DNERR research projects and to potential research partners. Action 3 also includes the Reserve’s continued participation in highly publicized public events, e.g., Coast Day, the Delaware State Fair, and others. These events will increase public visibility of the Reserve and its programs.

- **Action 2: Continue to provide on-site and outreach educational experiences, including Coastal Decision-Maker Workshops, field experiences, and programming.**

Since the designation of the DNERR, the education staff has carried out various on-site and outreach activities. Action 2 is to continue this programming and expand as staffing and funding permit. Topics will be selected as deemed appropriate to the goals and objectives of the Reserve; this may include the general topic areas of land use, biodiversity, invasive species, habitat protection and restoration. All educational programming will incorporate DNERR research findings. On-site programming is to include, but is not limited to, school field trips for K-12 and college audiences, scheduled organizational field experiences and programs, public programs, and visitation. Outreach is to include, but is not limited to, K-12 and college and organizational off-site programs. A minimum of three Coastal Decision-Maker Workshops will be held per year. These will be structured around research topics of relevance to the Reserve, the DCP, and current environmental concerns (see Chapter IX, the Research and Monitoring Plan, for a more detailed list of topics). Priority audiences for CDMWs are coastal professionals and elected/appointed officials.

- **Action 3: Maintain existing exhibits, and develop and construct new exhibits as funding permits.**

Existing exhibits will be maintained to continue adding to the educational value of the Reserve. Exhibits will be kept up-to-date to ensure that they provide timely material. Exhibit space is still available inside the Visitors Center as well as outdoors at the St. Jones Reserve component; new exhibits will be geared toward the goals, objectives, and research and monitoring activities of the DNERR program, and will complement those already in place. A special emphasis will be placed on highlighting coastal zone protection activities and new technologies being used by coastal professionals.

- **Action 4: Expand the Friends of the DNERR, and encourage citizen action and volunteerism to assist with various Reserve projects.**

October 2000 saw the beginning of the Friends of the DNERR. To date, the group has conducted several business meetings and has hosted guest presentations. It will be the responsibility of the Friends, not DNERR staff, to determine the group's scheduled events and meetings and to expand upon their current organization. Possible expansion ideas include involvement of the Friends in opening the Reserve to the public on weekends, hosting other activities, and participating in more volunteer-oriented projects. The goal of the group is to attain more organizational structure and consequently to be eligible to apply for nonprofit status.

- **Action 5: Find the niche of the St. Jones Reserve component within the vast array of educational field-trip opportunities in the State of Delaware.**

The St. Jones Reserve component will closely correlate its programs to grade-specific science modules offered in Delaware's public schools (e.g., 7th grade "watersheds", 5th grade "ecosystems", 4th grade "land and water", and others). This correlation will justify field-trip experiences to the Reserve, maximize their relation to classroom learning, and give more structure to the field experiences scheduled. Correlating programs with other organizations and locations near the Reserve will also provide a well-rounded field experience incorporating one or more subject areas. In addition, this Action entails creating appropriate curricula to support the program. The DNERR will accept requests for pre-kindergarten through college level; secondary and post secondary audiences are priorities for expansion.

- **Action 6: Proceed with the Coastal Training Program.**

The primary focus of expansion is the Coastal Training Program (CTP). The first funded year of CTP activity will consist of fulfilling any preparatory tasks, e.g., needs assessments, market analysis, and developing a program strategy. Subsequent years of CTP funding will provide ongoing professional education about coastal and environmental topics as defined by those preparatory tasks. When matching funds are identified, the DNERR will explore hiring of a full-time CTP Coordinator. The coordinator position will be 100% federally funded through the CTP line item in the operations grant.

- **Action 7: Conduct an educational program assessment for any new lands or facilities purchased in the Blackbird component.**

Chapter X (Stewardship) discusses the possible acquisition of new lands and/or facilities.

- **Action 8: Explore cooperative efforts/partnership opportunities that, while strengthening the broader vision of estuarine education, retain the uniqueness of the DNERR.**

All education programs carried out by the DNERR offer opportunities for cooperation with numerous environmental and natural resources organizations at the local, State, and national levels. The DNERR will explore possible partnership opportunities that could augment aspects of its educational programming. In doing so, every attempt will be made to retain the uniqueness of the DNERR and not dilute its particular organizational strengths. Priority targets for this expansion include state universities and colleges, DNREC divisions and sections, and the U.S. Fish and Wildlife Service.

