

# CHAPTER SEVEN: EDUCATION AND INTERPRETATION PROGRAM

## INTRODUCTION

Education is an integral component of resource protection and ecosystem management at Tijuana River National Estuarine Research Reserve (NERR). In order to develop lasting solutions to problems ranging from habitat destruction by visitors to upstream water pollution, education on the value of estuarine and wildlife resources is required. At the Reserve, education and outreach are viewed as powerful tools the operating agencies [California Department of Parks and Recreation (CDPR) and U.S. Fish and Wildlife Service (FWS)] can use in overseeing the human aspect of resource management.

The education and outreach programs at Tijuana River NERR strive to go beyond providing information to resource users, as information alone does not protect the resources. To have a lasting effect on user behavior, education programs must instill knowledge and cultivate a sense of responsibility in target audiences. Research helps resource managers identify which groups are contributing to resource degradation and understand how and why. Once these questions are answered, education efforts can be developed to address specific target audiences regarding resource management issues.

Because long-term protection of the Reserve requires wise planning throughout the watershed, the Reserve's education program reaches out to audiences on both sides of the international border.

During the period covered by this planning document, the educational and interpretation programs will seek to expand high school science programs that connect the Reserve's education and research programs, to develop programs for middle school students, to plan and implement a long-term education program for coastal decision-makers, and to integrate existing educational programs with watershed coordination.

### I. MISSION

The mission of the Education and Interpretation Program at Tijuana River NERR is to:

**Provide interactive, hands-on, thematic, bilingual environmental education to local and regional students, the community, and**

**coastal decision-makers through partnerships with local schools, community groups, and government agencies to promote and support estuarine stewardship by an informed and active citizenry.**

## **II. GOALS**

- Goal 1: Maintain and strengthen high-quality, interpretive and school-based environmental education programs offered through the visitor center and outdoor classroom sites (Refuge goal).**
- Goal 2: Refine existing and develop new interpretive and educational programs at Tijuana River NERR to support restoration efforts in the southern portion of the Reserve.**
- Goal 3: Develop and implement a coastal decision-maker training program.**
- Goal 4: Develop water quality monitoring as a cornerstone theme throughout the education program.**
- Goal 5: Ensure that a complete and well-trained staff is in place to implement the educational and interpretive programs.**
- Goal 6: Integrate educational and interpretive programs with other Reserve programs, particularly the research program.**

## **III. POLICIES**

### **A. NERR SYSTEM EDUCATION AND INTERPRETATION POLICIES**

The National Estuarine Research Reserve System was created in 1972, as part of the Coastal Zone Management Act (CZMA), to increase the ability to responsibly manage estuarine ecosystems. A critical aspect of this mandate for the NERR System is the education, interpretation, and outreach component. In part, a reserve must "...serve to enhance public awareness and understanding of estuarine areas and provide suitable opportunities for public education and interpretation" as described in CZMA § 315(b)(2)(C). Each NERR develops and implements a program that links education to scientific research and stewardship. Each Reserve's education program functions independently, but all have commonalities with other NERR education programs.

One goal of the NERR System's education program is to provide a crucial linkage between research and coastal management. This requires translating the monitoring and ongoing research at the sites to appropriate audiences in a method that can be understood and applied by decision-makers, students, and

members of the public. The link between research and management also requires the development of education programs that address resource management goals and objectives.

The NERR System and State Coastal Zone Management Programs share the common goal: “To enhance informed decision-making on coastal issues by facilitating the exchange of technical information (basic and applied sciences) to audiences that have the resources and ability to influence the management of coastal resources,” (Coastal Decision-makers Training, summary document, Ginger Hinchcliff, Rookery Bay NERR, p. 1).

Education policy at the Reserve is designed to fulfill the guiding principles for designing and implementing an education program as defined in the NERR System strategic plan. These principles are to:

- Develop education programs that further the goals of the NERR System and the National Wildlife Refuge (NWR) System;
- Target a culturally diverse audience of educators and students, environmental professionals, coastal resource decision-makers, and resource users;
- Function as a "system of sites" to nationally coordinate estuarine education efforts;
- Develop the NERR System as resource centers specializing in estuarine and watershed education, taking into account the diversity of differences of each reserve site;
- Capitalize on the NERR System’s ability to directly link education, research, stewardship, resource management, and restoration;
- Ensure that education priorities are based on program evaluation results by continually assessing education programs and implementing changes as necessary; and
- Encourage NERR education coordinators to be active participants in the education community.

In addition to these guiding principles, "NERR Education: A Field Perspective" lists the following series of more specific educational objectives for reserves:

- Develop programs that encourage citizen stewardship of estuaries;
- Develop reserves as resource centers that address coastal issues of global, national, regional, state, and local significance;
- Maintain a cadre of professional environmental educators in the NERR System; and
- Evaluate program quality and program cost effectiveness. (Program effectiveness is measured as it relates to educational objectives and resource management goals.)

#### **B. CALIFORNIA DEPARTMENT OF PARKS AND RECREATION EDUCATIONAL POLICIES**

The primary interpretive policy of the CDPR is to heighten and increase public understanding, appreciation, and enjoyment of the natural, cultural, and recreational values of California as represented in the state park system; and to increase public understanding and concern for people's place in their environment and thereby awaken an increased desire to protect and enjoy the natural and cultural heritage of this state (Department Operations Manual, 1300.2, April 1986).

#### **C. EDUCATION AND INTERPRETATION IN THE NATIONAL WILDLIFE REFUGE SYSTEM**

At Tijuana Slough NWR, an urban refuge, the U.S. Fish and Wildlife Service provides visitors an opportunity to understand and appreciate fish and wildlife resources. Through environmental education and interpretation -- priority uses of the NWR System (16 USC 668 dd et.seq) -- and recreation, FWS offers activities compatible with Refuge purposes. FWS continues to seek public input on ways to enhance those compatible uses.

### **IV. EXISTING CONDITIONS AND PERCEIVED NEEDS**

#### **A. INTERPRETIVE AND EDUCATIONAL THEMES FOR ALL PROGRAMS**

In 1995, the Reserve developed a number of interpretive themes for its educational and interpretive programs. The themes are divided into three main groups: 1) Wetlands and Water; 2) Ecosystem Relationships; and 3) Human Interaction. A list of all subthemes is provided as Appendix 7. Some programs focus on a specific subtheme; other programs present several themes to emphasize the relationships between different aspects of the ecosystem.

**B. GEOGRAPHIC SCOPE FOR EDUCATIONAL AND INTERPRETIVE PROGRAMS**

The Reserve’s interpretive and educational programs are targeted towards the local community, the watershed, and the San Diego region.

**1. Local Community**

The visitor center is located in the South Bay Union School District (SBUSD) in the City of Imperial Beach. Approximately two-thirds of the families in the district live on incomes below the poverty line. About 60 percent of the elementary school students in the district are Latino. The Reserve works closely with SBUSD and middle and high schools from Sweetwater Union School District.

**2. Tijuana River Watershed and San Diego Region**

Because pollution and ecosystems stretch beyond political boundaries, the Reserve’s education programs target school systems and communities on both sides of the border. The Reserve also serves schools outside the watershed in San Diego County.

**C. EDUCATIONAL PROGRAMS**

The Reserve offers a wide range of interpretive and educational programs attended by students, decision-makers, and the general public.

**TABLE 9: Education and Interpretation Visitation at TRNERR**

Program Category	Visitors		
	1995	1996	1997
Visitor Center Visitation	16,250	16,200	16,200
School Group	2,965	2,810	3,740
Junior Rangers After-School Program	550	800	940
Special Events	925	940	1,250

Guided Walks for Families	1,500	2,880	1,240
University Groups	250	350	320
Miscellaneous Groups	270	270	350

### 1. Coastal Decision-makers

As authorized under the Coastal Zone Management Act, the NERR System provides decision-makers with information and insight into effective protection and management options for estuarine resources.

In 1996, as part of this NERR program, the Reserve held a day-long workshop for coastal decision-makers. The workshop, financed by a the National Oceanic and Atmospheric Administration (NOAA) grant and organized by the California Coastal Commission, covered a wide-range of resource management challenges in the Tijuana River watershed and provided an overview on activities, facilities, and services at the Reserve. The program consisted of technical presentations, discussions, and field visits. The event was attended by about two dozen decision-makers, professors, architects, geographers, planners, environmental specialists, project analysts, and ecologists. Attendees represented numerous local and state agencies (from the U.S. and Mexico), political constituencies, and universities.

Based on the success of the workshop, the Reserve education program intends to develop and implement a long-term coastal decision-makers' program that reaches out to current, near-future, and future decision-makers in the watershed. This program will be designed to complement other Reserve programs and to support the overall restoration and management goals of the Reserve.

### 2. School-Based programs

The Reserve has placed significant effort and emphasis on its educational and interpretive school programs. Participants in these programs make up the largest group of visitors to the Reserve.

#### a. Field Trips and Teacher Workshops

Approximately 125 school classes visit the Reserve each year. Most visiting classes are from elementary schools. Before bringing their students to the Reserve, teachers are required to attend a two-hour workshop presented by Reserve staff (see Appendix 8). The training orients the teachers to the Reserve, presents information on the history and mission of Reserve, and provides pre- and post-visit curricula and activities for the teachers to use in their classrooms.

Bilingual programs are available, as well as those accommodating special education classes and students with physical disabilities.

### b. Collaboration with Local Schools

The education program at the Reserve has a successful history of collaboration with elementary schools. The program is currently developing a partnership with Southwest High School, part of the Sweetwater Union School District. Students in the program will undertake individual and group research and monitoring projects at the Reserve. High school students will be matched with undergraduate interns from area colleges and universities, who will then guide the research projects and mentor the younger students. Projects will be designed to match the research and monitoring needs of the Reserve to the highest degree possible.

### c. Materials Used for School-Based Educational Programs

Several sets of curricula and a wide range of activities are used in the educational program. While the materials are well received and have been recognized for their innovation in teaching, the curriculum offered by the Reserve does not always correspond with content, skill level, and themes being taught in schools. Reserve staff have identified the need to better coordinate the content of Reserve materials with the school group's own classroom curriculum and with the State Science Framework, School Curriculum Articulation (under development by the South Bay Union School District), Benchmarks for Science Literacy (see Appendix 9). The Reserve has written or assembled the following materials for school-based educational programs:

- **Extended-Year School curriculum (EYS).** The EYS curriculum was originally written by the Reserve and SBUSD teachers. The curriculum was revised and correlated to the California State Science Framework and Benchmarks for Science Literacy in 1995-96. It contains nine days of classroom lessons and six days of field-based lessons. It is targeted for fifth grade, but has been also successfully used for fourth/fifth grade special education classes. Some of the lessons are drawn from the Marsh Awareness with Resources for Slough Habitats (MARSH) curriculum. The EYS curriculum is not available in Spanish.
- **Preschool/kindergarten (non-reader) curriculum and activities.** A packet of classroom activities and lessons for non-readers was developed for use in the South Bay Headstart program. South Bay Headstart trains all of its teachers to bring students to the Reserve.
- **Elementary curriculum and activities.** The Reserve has developed two elementary school programs that provide teachers with activities for students and information on wetland ecology. "MARSH" and "Making of



a Naturalist,” both developed by the Reserve with NOAA funding, are available in English and Spanish. A packet of pre- and post-field trip lessons and activities assembled from MARSH, EYS, and other sources is also available. Teachers are trained on the use of this curriculum before bringing their classes to the Reserve.

- **Posters.** The following posters are available free to teachers: *Tijuana Estuary Visitor Center Exhibit Opening* [provided by Southwest Wetlands Interpretive Association (SWIA)], *Estuaries, Where Rivers Meet the Sea* (provided by NOAA), *Salt Marsh Food Chain-English*, and *Salt Marsh Food Chain-Spanish*.
- **Videos.** The following videos are available for loan to teachers: MARSH and Waterlines (English and Spanish versions), Timeless River (English and Spanish versions), Hidden Treasures, Fabulous Wetlands, Tide of the Heron, Just a Drop in the Ocean, Time and Tide, Outta Sight, Outta Mind, Garbage Man, Surfer, and videos by other NERRs (South Slough, Apalachicola, North Carolina).
- **Activities.** The following games and activities are available for loan to teachers: Watershed Model, Competitive Feeding Game, Wetland Metaphors, Water Quality Monitoring Kits-2 (teachers must complete training before use), and Salt Marsh Plants.

#### d. Water Quality Monitoring Education Program

The Reserve’s water quality monitoring education program is a watershed-wide project that provides water quality education and experiments for students and teachers on both sides of the border. The project provides hands-on training for teachers and students and offers a classroom curriculum. The Reserve is also developing broader water quality education programs that make use of a new on-site coliform monitoring and educational lab, funded by NOAA, the San Diego County Water Authority, and the California Department of Education. Local and regional high school students will be able to use the lab to process water samples and for other projects. Using data they collect, students will conduct outreach projects to the community.

In addition, the monitoring project will allow students to link their research to Geographical Information System (GIS) mapping processes and to existing water quality monitoring carried out by San Diego State University’s Pacific Estuarine Research Laboratory as part of NOAA’s System-Wide Monitoring Program (SWMP I).

See also Chapter 10 for a discussion of how the water quality monitoring program relates to the Reserve's watershed coordination plan.

e. Needs for School-Based Programs

The following needs have been identified for the school-based programs:

- Recruit and organize a core group of 8-10 trained education volunteers to work with school groups.
- Make EYS curriculum available for use by elementary teachers.
- Make all program materials available in English and Spanish.
- Develop activities and curriculum for middle school students.
- Periodically update or revise current evaluation surveys for teacher workshops and school field trips.

The following needs have been identified specifically for the water quality monitoring program:

- Expansion of testing parameters to include metals and other substances, as well as soil testing.
- Funding for outreach portion of program and training videos.
- Coordination of data with other water quality monitoring data.
- Creation and maintenance of a locally based database.
- Acquisition of ongoing funding for watershed coordinator salary, materials, training, and interns.

### **3. Non-School-Based Programs**

The non-school-based programs are designed to target a diverse audience. These programs play a vital role in obtaining public support and assistance in the protection and preservation of the Reserve.

a. Interpretive Walks and Special Events

The Reserve currently offers six scheduled interpretive walks per month, and more frequently on a seasonal basis, based on availability of staff and volunteers. About half a dozen people attend each walk.

A variety of special events are offered throughout the year, including full- and new-moon walks, grunion runs, international migratory bird day, beach clean-ups, bat mania, Halloween trick or treating, hummingbird, and raptor presentations. Annual events include National Wildlife Refuge Week events and the Imperial Beach Bird Festival.

Outreach for these event is conducted through fliers and press releases to more than two dozen local media outlets (newspapers, magazines, newsletters, television, and the internet).

b. Interpretive Signs on Trails

Interpretive trail signs exist at the Oneonta Slough overlook, the south Seacoast Drive overlook, and at the Border Field State Park overlook. Additionally, there are identification plaques for plants in the visitor center's native plant garden.

c. Junior Rangers After-School Program

The Reserve conducts weekly Junior Ranger programs for elementary-aged children. These highly successful programs serve mainly local children, averaging twenty per week. Most children attend every week. Constraints on the program have been a lack of sufficient classroom space and the difficulty of working with a group of children of mixed ages (age 4 to 13). Evaluation of the program thus far has been quantitative (e.g., numbers of children attending) and based on informal feedback, rather than formal and qualitative.

d. Artist-in-Residence

Cosponsored by the California Arts Council, the Reserve hosts an artist-in-residence, who offers workshops at the Reserve and in local schools, focusing on wetland art.

e. Needs for Non-School-Based Programs

- Additional interpretive signage on the trails is needed. In the short- to medium-term, this need could be met with printed interpretive handouts, with information on the handouts coordinated with a series of numbered signs installed on the trails. Not only is this much less expensive than installing interpretive panels, but it allows for timely and seasonal interpretation, as well as inexpensive translation into Spanish.
- The Reserve's website needs to be updated on a regular basis.
- Additional classroom space is needed for Junior Ranger, Artist-in-Residence, and other programs. Additionally, the existing classroom is unusable during certain times of the year because it becomes too hot.
- A group of reliable, trained volunteers is needed to split the Junior Rangers into two age-based groups.

- An evaluation tool for the quality of Junior Ranger programs needs to be developed and implemented.

#### 4. Visitor Center Services and Exhibits

The visitor center provides an array of educational and interpretive exhibits and services that are jointly funded by NOAA, CDPR, and FWS.

##### a. Exhibits

Phase I of the visitor center exhibits were completed in June 1994. A second phase was completed in 1997. Many exhibits are designed for hands-on use. They address the following themes:

Tides	Habitats
Migration	Wetlands
Food Chains	Land-Use Management
Clapper Rails	Plant Adaptations to Salt
Bird Beak Adaptations	Tijuana River Watershed
Geology	Seasonal Changes at the Estuary

Additionally, a three-dimensional diorama of a salt marsh scene is on exhibit at the visitor center.

A CD-ROM terminal will be made available in the visitor center in 1998. It will feature: *A Tour of the Reserves*, which has images and information on all National Estuarine Research Reserves; *Turning the Tide*, an interactive CD-ROM for marine protection; *Life in the Salt Marsh*, an interactive guide to the salt marsh; and *Otter Point*, a GIS demonstration game.

##### b. Printed and Visual Interpretive Materials

The following materials are available to Reserve visitors:

- Reserve brochure -- a general brochure on the Reserve is being developed.
- Your Native Plant Garden -- a description of the visitor center native plant garden
- Bird checklist
- Education programs -- a one-page document that describes the educational programs at the Reserve. This will be redesigned to fit as an insert into the Reserve brochure.
- Typical Field Trips -- Information for Teachers
- Newsletter -- a quarterly newsletter for volunteers

The Reserve offers several video, laser disc, and slide programs. The Reserve also maintains a resource library of approximately 500 titles available to the public if requested. There is no catalog or database of library materials.

### c. Needs for Visitor Center Exhibits and Services

The following needs have been identified for visitor center services and exhibits:

- A newsletter needs to be made available for the public. It should contain summaries of recently completed research at the Reserve and a description of education and interpretation programs and upcoming activities.
- The library needs to be catalogued and an electronic check-out system needs to be established.
- The text of the visitor center's exhibits need to be translated into Spanish and made available to the public, possibly through handouts.
- Permanent or semi-permanent exhibits on the cultural history of the Reserve and the region need to be funded, developed, and installed.
- Permanent or semi-permanent exhibits on the different land management systems operating at the Reserve (including NWRS and California State Park System) need to be funded, developed, and installed.
- Funding needs to be identified to develop and install outdoor exhibits that will line the pathway to the visitor center.
- Adequate staffing and volunteer levels need to be established to have the visitor center open seven days per week.

### D. INTEGRATION OF EDUCATION WITH OTHER PROGRAMS

The Reserve education program integrates research, education, interpretation, and stewardship into programs that meet site and national estuarine management goals. To meet the particular needs of improving water quality, increasing biodiversity, and restoring habitat, the Reserve aims to engage various audiences with effective programs that incorporate information developed by educators and researchers through estuarine monitoring. Key steps to this integration of programs include forming staff

teams to develop specific programs that integrate education, interpretation, monitoring, and research to address problem issues.

## **E. STAFFING AND ADMINISTRATION**

### **1. Current Educational and Interpretive Staff**

The current staffing of the Education and Interpretation Program is as follows:

- Education Coordinator -- Permanent, full time
- Education Specialist --Permanent, 3/4 time
- Watershed Coordinator -- Temporary, 3/4 time

### **2. Education Committee of the Management Authority**

The Education Committee of the Management Authority meets once each year to provide advice and ideas to the education department, and to report to Management Authority on activities of the education program. Quarterly reports on the education program will be provided to the Management Authority via the Reserve manager. The Education Committee will also serve to promote integration with other program areas, such as research, resource management, and watershed management.

### **3. Volunteers and Internships**

Volunteers are used in the educational and interpretive programs to assist with visitor center services, office work, native plant garden, educational programs, and mounted patrol. Training for these volunteers includes a visitor center orientation, a nature walk, a bird walk, and supplemental training through Chula Vista Nature Center. Specialized training for field trips is provided through job shadowing and teacher training workshops. Monthly training on various topics is provided for volunteers and staff.

Two unpaid education interns work with the Reserve's education department. Several unpaid interns will be assisting with the water quality monitoring education project. No funding is currently available for paid internships.

### **4. Needs for Staffing and Administration of Educational and Interpretive Programs**

The following needs exist within the staffing of the Reserve's education and interpretation program:

- Permanently fund the watershed coordinator position.
- Recruit and train volunteers for educational field trips, Junior Rangers, and special events.
- Recruit and train education interns for water quality monitoring and other programs.

#### F. PARTNERSHIPS IN EDUCATION

Successful educational and interpretive programs coordinate with other organizations to share ideas and resources and to avoid duplication of efforts. The Reserve has worked with the following organizations and groups:

- **Commission on Environmental Cooperation (CEC) project: San Diego Natural History Museum, PROBEA, San Diego County Water Authority.** This project trains teachers throughout the watershed (U.S. and Mexico) on water quality monitoring, provides teachers with monitoring kits, supports teachers in monitoring and reporting, and will create a database of monitoring results. It is funded by the North American Environmental Cooperation. (See also above, Water Quality Monitoring Program.)
- **Southwest Wetlands Interpretive Association (SWIA).** The Reserve staff works with SWIA to reach the local community and obtain funding for interpretive and education programs.
- **South Bay Union School District (SBUSD).** The Reserve established this partnership through the Extended-Year School program and will continue this partnership through other options with SBUSD.
- **Southwest High.** This partnership is newly established and will involve students in ecological research and monitoring projects, including performing services such as GPS mapping of trails and use of the GIS database to observe Reserve conditions.
- **Oneonta School and California Applied Science Implementation (CAPSI) project.** The Reserve, Oneonta School, and CAPSI partner to implement hands-on, inquiry-based science education in a four-year project that will begin at Oneonta Elementary School and ultimately go district-wide.

- **City of Imperial Beach Public Works Department.** This partnership centers around water quality monitoring training and annual pollution prevention activities.
- **Chula Vista Nature Center.** The Chula Vista Nature Center provides training for Reserve volunteers.

## **V. EDUCATION AND INTERPRETATION PLAN OF ACTION**

**Goal 1. Maintain and strengthen high-quality, interpretive and school-based environmental education programs offered through the visitor center and outdoor classroom sites.**

Objective 1a: Maintain and expand high-quality educational programs developed for each grade level.

Tasks:

- Assemble curricula and develop an educational program for middle school students.
- Improve structure for receiving feedback and assessment of programs from teachers and develop qualitative methods for program evaluation.
- Increase the number of components of the educational program available in Spanish, translating curriculum and exhibit text into Spanish and training more bilingual volunteers.
- Revise educational programs to better coordinate programs with California State Science Framework, School Curriculum Articulation, and Benchmarks for Science Literacy.
- Assess the feasibility of bringing more schools from Mexico to visit the Reserve. Explore in particular, the opportunities to pair Mexican school children with U.S. school children during visits.

Objective 1b: Maximize beneficial partnerships within the education and environmental community.

Tasks:



- Increase teacher services, e.g., establish curriculum library for teachers.
- Maintain partnerships with South Bay Union School District and Sweetwater Union School District.
- Partner with the Municipality of Tijuana, teacher groups such as Probea, and Mexican schools to host Mexican school groups and to extend the influence of educational programs.

Objective 1c: Increase signage and written trail interpretation throughout the Reserve.

Tasks:

- Create a Reserve-wide interpretive sign plan as a joint effort of the managing agencies.
- Obtain funding to implement an interpretive sign plan.

Objective 1d: Expand and diversify interpretative programs

Tasks:

- Design and implement kayak or canoe interpretive program, in conjunction with an outdoor outfitter.
- Design and implement horseback interpretive programs, in conjunction with Tijuana River Valley Equestrian Association and Mounted Assistance Unit.

**Goal 2. Refine existing and develop new interpretive and educational programs at Tijuana River NERR to support restoration efforts in the southern portion of the Reserve.**

Tasks:

- Develop strategies to integrate Goat Canyon restoration initiatives into educational programs.
- Develop new interpretive programs on the cultural history of the Tijuana Estuary area.

**Goal 3. Develop and implement a coastal decision-maker training program.**

Tasks:

- Identify goals and audiences for a coastal decision-maker training program.
- Work with resource managers to determine key themes to be conveyed to decision-makers.
- Work with partners to encourage revision in statewide education to include watershed themes.
- Communicate with decision-makers to identify: 1) which coastal resource issues are most pressing to their agencies or constituencies, and 2) issues on which they wish to be better informed.
- Secure funding to implement the coastal decision-maker training program.

**Goal 4. Develop water quality monitoring as a cornerstone theme throughout the education program.**

Objective 4a: Use water quality monitoring to unite the community, schools, and agencies throughout the watershed.

Objective 4b: Integrate multiple education themes and service-learning projects into the water quality monitoring education program.

Task:

- Work with teachers to develop water quality projects at the Reserve for students.

Objective 4c: Expand the water quality monitoring education program to increase the utility of information of data recorded.

Tasks:

- Develop standard monitoring protocols with guidance from the research community.
- Develop a database of water quality results and make database available to the public.

Objective 4d: Relate water quality monitoring to programs in the watershed, the bioregion, and beyond.

Tasks:

- Integrate Reserve efforts with the United Nations Environmental Program to determine land-based sources of marine pollution.
- Integrate NERR system-wide information via Estuary-Net on-line database.

**Goal 5. Ensure that a complete and well-trained staff is in place to implement the educational and interpretive programs.**

Tasks:

- Secure long-term sources of funding for staffing.
- Hire permanent staff person to assist education program manager.
- Recruit and train a dependable corps of education volunteers.

**Goal 6. Integrate educational and interpretive programs with other Reserve programs, particularly the research program.**

Objective 6: Integrate research results in the school-based and non-school-based programs.

Tasks:

- Centralize research information, in conjunction with the Reserve research coordinator.
- Provide current research information to staff and volunteers in the educational and interpretive programs.
- Integrate research results into public newsletters and visitor center exhibits.