

**INTRODUCTION:** The Naval Submarine Base (NSB) Kings Bay is the east coast homeport to 8 Ohio Class Trident Submarines, six SSBN and two SSGN, is and the only Atlantic Fleet Activity capable of supporting the Trident II (D-5) nuclear missile. NSB provides facilities and support services to major tenant commands involved in submarine training, refitting, and weaponry. Our workforce of 8979 military, civilian, and contractor personnel make the Base the local economic driving force with an annual payroll of \$500 million and an additional economic impact of \$67.5 million through goods and services. We are located in the pristine coastal environment of southeast Georgia's Cumberland Sound bounded by Cumberland Island National Seashore Park, Crooked River State Park, and historic St. Marys, the second oldest city in the United States. NSB is 16,000 acres with 4000 acres of unspoiled coastal marsh and 10,000 acres of indigenous wildlife habitat actively managed under the Integrated Natural Resources Management Plan (INRMP).



**A surfaced Ohio Class SSBN submarine in transit to the dive point.**

**NSB ENVIRONMENTAL MANAGEMENT:** Our environmental team consists of ten professionals managing a variety of programs requiring ten major permits. Through these professionals, NSB maintains an excellent cooperative rapport with regulatory agencies who consider our Base "the best military Base in Georgia". Examples of our mutually cooperative relationship include adopting the joint US Fish and Wildlife Service (FWS)/Army Corps of Engineers Manatee Protection Standards for In-Water Construction and sponsoring the Georgia Department of Natural Resources (GADNR) annual "Weekend for Wildlife" fund raising campaign for their Non-Game and Endangered Species program. This rapport is significant as NSB generates over 300 tons of hazardous and non-hazardous waste along with millions of gallons of industrial wastewater annually from submarine refit and weapons production operations. This heavy industrial activity taking place within a natural coastal ecosystem gives NSB a high environmental profile where the regulatory community respects us as professional stewards, taking environmental management seriously and beyond minimum requirements.

**ENVIRONMENTAL MANAGEMENT SUMMARY:** Objectives of our program include complimenting the NSB mission of supporting the warfighter through a proactive approach towards environmental management and conservation. We accomplish this with programs reaching beyond minimum compliance, inviting applicable entities to participate in early planning to address potential problems, and then providing for mitigation or other options that avoid adverse impacts. The degree to which we attain these objectives is exemplified by our Environmental Management System (EMS). NSB is widely recognized for developing an outstanding EMS in accordance with international standards and Navy requirements. Our EMS is a proactive system that evaluates and implements continual improvements to processes, plans, and equipment. It improves operational readiness through best management practices that provide methods to share successes, new technologies, and innovation.

It incorporates environmental management and conservation into planning, decision-making, and business practices using a soft ware system that enables the detailed review and status tracking of these improvements. Our EMS provides web based training and NSB maintains a high percentage of personnel across all commands and contractors who are competent in EMS development.

## **ACCOMPLISHMENTS:**

### **ENVIROMENTAL MANAGEMENT SYSTEM:**

However successful our EMS is, it is a dynamic system and NSB maintains its lead in the southeast region with thorough EMS process improvements. EMS is subject to continuous change where the Installation Environmental Management Team (IEMT) evaluates processes and develops procedures that improve our ways of conducting business. Our EMS is currently

being updated from the existing web based tracking system to an improved system that tailors specific program inspection checklists to specific processes. This improvement incorporates an all inclusive web based system that facilitates meeting requirements of the annual Internal Assessment Plan. The IEMT ensures excellent communication and coordination among all management levels to review and monitor the status of continual improvements in progress tracking, updating, planning, and scope of EMS conformance. This comprehensive



**An Ohio Class SSBN being maneuvered by Sea Tractors within the NSB Restricted Area Waters. Note the Dry Dock surrounded by a pristine coastal marsh in the background.**

review includes all NSB commands, tenant commands and contractors. The EMS is emphasized by the Environmental Policy Statement that is reviewed and signed annually by the CO to continuously meet goals of managing and conserving our environment and unique natural resources.

### **NATURAL RESOURCES:**

NSB continues partnering with multiple agencies and organizations across the southeast supporting the Gopher Tortoise (GT) Candidate Conservation Agreement (CCA). Eastern GT populations are being considered for Federal Listing under the Endangered Species Act. Our GT conservation efforts are reported annually to the CCA and this data, along with that submitted by other CCA partners, is used by the FWS to determine if eastern GT populations merit Federal Listing.

Likewise, data from the GT survey was used to conduct the 2009 Eastern Indigo Snake (EIS) survey, a Federally Threatened species that readily utilizes GT burrows. NSB, in cooperation with the FWS and the University of Georgia, examined the known 432 GT burrows and other suitable habitats for EIS's. Due to the strong ecological relation between GT's and EIS's, this data was also submitted to the CCA.

GT's and EIS's are ecologically linked to the Longleaf Pine (LP) ecosystem. In the reporting period we restored approximately 100 acres of LP habitat by thinning inferior pines and retaining the mature LP. Likewise, we converted approximately 50 acres to LP in a 2010 reforestation effort that planted approximately 35,000 seedlings. A 28 acre site close to this LP conversion has been approved for conversion to LP in the next reforestation effort.



**GT's are a Keystone Species in that many other species linked to the Longleaf Pine ecosystem depend on their burrows for habitat and refuge. The eastern GT population is being considered for Federal Listing as an Endangered Species.**



**Managed Longleaf Pine forests at NSB support regional top priority conservation initiatives by providing outstanding habitat for Gopher Tortoises and other species dependent on Gopher Tortoise burrows and contiguous Longleaf Pine communities**

Areas managed for LP are planned for in the INRMP. These areas are in close proximity to each other, older natural LP stands, and older LP conversions. They also border the Crooked River State Park LP forest. This planning maximizes LP forest continuity with LP communities representing various size and age classes, managed across political boundaries, and well within the principles of ecosystem management. These areas are located where NSB is open to the general public and benefit all stakeholders, public and private alike.

These benefits are in addition to restoring local indigenous wildlife habitat because this ecosystem approach supports long range, Region-wide Initiatives for LP and for Bobwhite Quail. This ecosystem approach fully supports the GADNR State Wildlife Action Plan and even that of private entities such as the Longleaf Alliance where LP communities are a number one conservation priority. These initiatives and plans are long term whose longevity makes these benefits available to future generations of stakeholders and the NSB contribution is considered valuable in helping reach these long range goals.

LP community restoration is also a goal of the NSB prescribed burning regime. Prescribed burning efforts over the reporting period resulted in wildfire fuel reduction, timber stand improvement, and wildlife habitat improvement on over 1400 acres of pine forest. This success is a direct result of partnering efforts with Fort Stewart Forestry in 2009 and the US Forest Service/Georgia Forestry Commission in 2010.



**Prescribe burning improves wildlife habitat and timber stands while reducing the risk of wildfire**

NSB also experienced three wildfires in 2010. Two were insignificant although one

burned approximately 25 acres and severely scorched the timber. Due to some direct fire mortality and the likelihood of insect infestations we immediately harvested the wildfire site, and because this site is adjacent to the 50 acre LP conversion described above, it is approved for LP conversion in the next reforestation effort. This effort provides for even more contiguous LP communities and when combined with the prescribe burn regime, benefits many species considered rare and/or being considered for Federal Listing as Threatened or Endangered.

NSB continued the Rare, Threatened, and Endangered Species Monitoring project with 2010 efforts focusing on Birds of Conservation Concern. This multi-species approach evaluates long term population trends for many species including various At-Risk species and our data will be combined with that from other areas to monitor regional population trends and potential relations to climate change. Likewise, our endangered species project, Manatee Habitat Mitigation, continues and in 2010, survey data was released to Fleet Forces Command to support their Atlantic Fleet Training and Testing Draft Environmental Impact Statement (DEIS). The DEIS is considering modeling manatee acoustic criteria using the Navy Underwater Warfare Center Exposure Model. This ongoing manatee effort will result in the first population estimate undertaken in Georgia and very clearly supports Navy efforts to avoid adverse impacts to manatees.

## EROSION AND SEDIMENTATION CONTROL:

Manatees also benefit from the ongoing Shoreline Erosion Control project. The site is severely eroded and large sediment loads enter receiving waters including areas where Manatees congregate and the submarine channel. Erosion also threatens the integrity of a Waterfront Restricted Area access road. This mission essential project restores approximately 1000 linear feet of eroded shoreline using geo-textile fabric and rip-rap for bank stabilization. The project eliminates point source sedimentation into high use manatee waters while simultaneously providing a substrate for marine growth that Manatees are known to feed on.

## AQUATIC WEED CONTROL:

The Shoreline Erosion Control project addressed problems in a brackish water system and NSB addressed problems in a fresh water system as well. A popular recreational lake was inaccessible due to aquatic weeds. In 2009, NSB stocked the lake with 1100 Grass Carp. These fish consume large quantities of aquatic weeds and act as biological control agents. The lake is no longer infested and once again accessible for recreation. This project also supports waste minimization efforts by eliminating the use of aquatic herbicides and therefore, stopping their containers and rinsate from entering the waste stream.

## WASTE MINIMIZATION:

The reporting period saw substantial reductions in generated hazardous waste (HW) that significantly reduced HW disposal costs. These reductions are in comparison to prior years before deployment of the Paint Distribution System (PDS) but are only just now quantifiable for the reporting period. The PDS is described here for the readers' benefit however, the discussion focuses on waste and disposal cost reductions that were realized in 2009 and 2010.

The PDS is an EMS process improvement as discussed earlier. It replaced an old method of issuing gallons with a modern system to distribute quantities needed to meet the requirement (i.e. quarts, cups). This single process improvement substantially reduced the volume of paint waste and epoxy debris entering the waste stream which in turn reduced disposal costs. Further, this EMS improvement extends beyond the fence line and is applicable to all stakeholders including municipalities and private enterprise.

In the reporting period, 312 tons of HW was generated, stored, and disposed of in accordance with the HW Management Plan. This figure represents an approximate 45% reduction in HW entering the waste stream. Likewise, HW disposal costs totaled \$251,589 representing an approximate 25% reduction for the reporting period.

Recycling continued to provide valuable waste diversions during the award period. The years 2009 and 2010 ended with annual revenues of \$176,229 and \$236,017 respectively. The \$132,047 profit, used to support Quality of Life initiatives, resulted from recycling 29 tons of batteries, 74 tons of used motor oil, 1,372 tons of scrap metal, 18 tons of glass, 642 tons of paper and paper board, and 61 tons of construction and demolition waste. Additionally, 1,517 tons of wood waste was diverted from landfills by chipping

and composting. Finally, 14,466 gallons of waste cooking oil (not included in total recycled weight) was recycled in the reporting period.

The volume and disposal cost reductions combined with a total of nearly 3750 tons of solid waste diverted from landfills during the reporting period is noteworthy. In 2009 and 2010 NSB had significant new construction including major MILCON, additional vessels for routine Port Operations, and several new Coast Guard operated vessels along with infrastructure modifications to support these vessels and associated personnel. All these combine to increase the volume of generated waste. Our ability to divert these from the waste stream through process improvements, recycling, composting, and other innovative EMS methods is a testimony to the NSB commitment to environmental quality.

#### AIR QUALITY:

In 2010, NSB installed a Vapor Recovery System (VRS) at the Navy Exchange to meet newly mandated VRS requirements for large quantity gasoline facilities. The VRS prevents the release of gasoline vapors by capturing the vapors as fuel is being pumped into the underground storage tanks (UST) and redirecting the vapors back into the fuel truck tanks. The system was tested and approved for use at the time of installation and is expected to save NSB over 10% in fuel costs as well as eliminating the emission of ozone depleting vapors into the atmosphere.

#### SOIL AND WATER QUALITY:

Routine tank/line integrity testing discovered a failed fuel line from an UST to an emergency generator. Corrective action was considered mission critical to avoid soil and groundwater contamination and to ensure the generator remained operational. NSB, in cooperation with the GADNR, developed a detailed Corrective Action Plan (CAP) to address removal of free product from the soil, removal of potentially contaminated groundwater and soil, and repairs that ensured system integrity. The CAP accomplished the above remediation events and was followed by a system of vacuum enhanced free product/groundwater recovery and routine sampling and analysis for long term monitoring. This CAP resulted in removing and replacing 430 tons of petroleum impacted soil and recovering nearly 40 gallons of free product.



#### DRINKING WATER:

NSB worked in close cooperation with the GADNR to solve problems relative to the recently imposed Stage 1 Maximum Contamination Limits (MCL) of the Clean Water Act Disinfection Byproduct Rule. The inception of the new Stage 1 MCL put the existing water treatment plant out of compliance so various technologies were evaluated to

**The new water treatment facility is operational, in compliance with the recent Stage 1 MCL's, and ready to meet requirements of the future Stage 2 MCL's**

determine the best way to achieve compliance. This resulted in NSB and the GADNR agreeing on nanofiltration as the best available technology to achieve compliance although it would require a new water treatment facility. The design and construction totaled \$11 million and in 2010, the new water treatment facility was built and is now operational. The new facility not only complies with the Stage 1 MCL's but is also designed to meet the further reduced Stage 2 MCL's to be phased in as future requirements in 2013.