

## View Point



It's hard to believe the holiday season is already upon us. I am excited with the promise for a fresh start in 2014. Over Thanksgiving my family was reflecting on some of the people and things for which we are thankful. My favorite Aunt Sandy was a topic of conversation. She was conspicuously absent as she just passed away earlier in the month of November. She and her

## Let's Get Hopping

By: James F. Shern, Environmental Program Manager

mother were a big influence in developing my interest in science and nature. At the dinner table I reminded everyone of one of Aunt Sandy's favorite stories.

*Some behavioral scientists were conducting a study on long-horned grasshoppers' (aka katydids or bush-crickets...) jumping habits to determine the relationship between a hopper's physical characteristics and their skill at jumping. A hopper was placed on a lab table at a precise starting point. One of the scientists made a loud noise. A fellow scientist recorded the result: a hopper with all six legs jumped six feet. Another scientist removed one of the hopper's legs and then the loud noise. Result? The hopper with five legs jumped five feet. This same sequence was repeated over and over. Remove a leg, make a loud noise etc. Results? The hopper with four legs jumped four feet, three legs jumped three feet, two*

*legs jumped two feet and with one leg jumped one foot. Finally the hopper's last leg was removed and the scientist made the loud noise. Result? The legless hopper did not move. The scientists' conclusion? Hoppers with no legs go deaf!*

My aunt always said that there was moral to that story, but you would have to figure it out for yourself.

Ridiculous right? But wait. As it turns out hoppers DO have "ear drums" (tympana) on their front legs. So losing those legs WOULD limit the hoppers ability to hear. So is it deafness or the loss of legs that result in the hopper not moving? If you have several potential explanations, choose the simplest. The explanation requiring the fewest assumptions is most likely to be correct (Google Occam's razor). The lack of legs is still a better conclusion because, without legs, the hopper

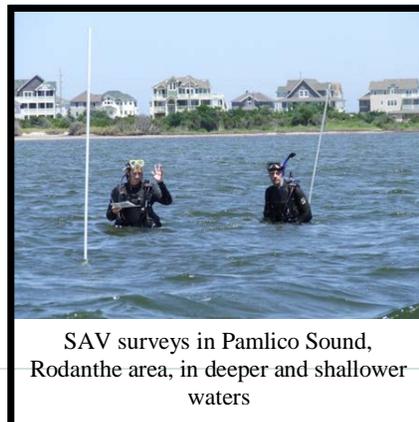
(Continued on page 3)

## Submerged Aquatic Vegetation Surveys in NC

By: Karen M. Kendig, Biosurveys Environmental Program Supervisor

North Carolina is graced with sea grass-filled sounds intermittently scattered along the coastline. Seagrasses are also known as submerged aquatic vegetation, or SAVs, and grow entirely underwater. Seagrasses fulfill an important role as nursery areas as they comprise rich aquatic habitats providing shelter, food and oxygen for microscopic algae, zooplankton, larval fish and other estuarine life including invertebrates such as snails, hermit crabs, scallops, crabs and stingrays. Submerged aquatic vegetation reduces water velocity by ameliorating wave action and helps clear the water by trapping and settling fine sediments and consuming nutrients. In spite of the name and the appearance of

linear leaves resembling grass, seagrasses are not grasses. They are actually flowering plants with rhizomes, which are a root-like stem found growing in the sediments creating stability and increasing habitat.



SAV surveys in Pamlico Sound, Rodanthe area, in deeper and shallower waters

In NC there are three types of seagrasses that can be found in higher salinity waters. Eel grass (*Zostera marina*) is a more northern species that claims North Carolina as its southernmost limit. Eel grass gets an early start in late winter or early spring and forms large dark green patches in estuaries but disappears from many areas during hot summer months. Its forest green ribbon-like leaves are distinctive and have been used as packing material or stuffing for pillows and mattresses in earlier times. Shoal grass (*Halodule wrightii*) reaches the Pamlico Sound in North Carolina as its northern limit (near Bonner bridge) and prefers warm-

(Continued on page 3)

## Project Spotlight

# R-4467 - The Hertford Bridge Project

By: Joe Miller, PDEA Project Planning Engineer

TIP Project R-4467 began as a 0.4 mile causeway repair project between the towns of Hertford and Winfall along the Perquimans River in Perquimans County. TIP Project B-4923 was the repair or replacement of the swing span S-shaped bridge (known as simply the “S-bridge” to locals connecting the causeway with the town of Hertford. The two projects were joined to form one and the TIP label R-4467 was kept.

Built in 1929, the swing span S bridge is the only bridge of its kind still in use in North Carolina. The bridge currently has a sufficiency rating of 1 out of a possible 100. Mechanical parts required to keep the swing span operational are difficult and expensive to obtain. Parts are often no longer available, requiring custom made parts. The causeway, with unstable swamp marshes bordering each side, is badly damaged due to differential settling and has been repaired using a number of methods including cast in place concrete slabs, concrete piles, steel plates welded onto steel piles and many asphalt leveling buildups. Roughly \$1,000,000 has been spent on causeway repairs in the last 5 years requiring closing of the route for extended periods each time.

A number of factors had to be taken into consideration during the project development study. These included the historical significance of the bridge, the Hertford Historic District, downtown Hertford businesses, boat traffic, poten-

tial effects to a minority/low income area of Hertford as well as impacts to the natural environment. Natural resources in the study area include the Perquimans River (which has been nominated for consideration as a Wild and Scenic River), anadromous fish spawning areas, wetlands and submerged aquatic vegetation (SAV).

Since obtaining concurrence on the purpose and need for the project in July of 2009, a total of five bridge types on six alignments have been considered. After impact assessments of the 30 possible combinations of bridge type and alignment, 21 were eliminated and conceptual designs were developed for the remaining nine.

Since project inception, close contact with citizens has been maintained through five newsletters, three citizens workshops, two small group meetings and a public hearing. Rehabilitation of the existing bridge was the first choice of many citizens attending the early workshops. Unfortunately, rehabilitation of the existing bridge was the least practical of all the alternatives. Rehabilitating the bridge would require raising the bridge to prevent flooding of the machinery, which would require taking a home that is a contributing member of the historic district. In addition, the bridge rails would have to be updated to modern standards, which would require converting the bridge to one-way traffic. Also, the rehabilitated

bridge would have decreased life expectancy as compared to a new bridge. Construction of a new swing span bridge in the same location was also considered but the required take of the historic district home, when compared with alternatives available that did not require the taking of that home, ruled out construction of a swing span bridge in the same location.

With rehabilitation ruled out as well as construction of a bridge in the same location, three possible alignments remained, alignments B, D-Mod and E. Alignment B is as close to the existing alignment as possible with no adverse effects to the historic district. Alignment D-Mod bypasses the settling causeway completely and runs the most direct route from Winfall to the business district of Hertford on Church Street. Alignment E replaces part of the failing causeway with a new fixed span bridge and continues in a southwest direction touching down in a section of town with a higher concentration of minorities and low income citizens. Alignment E takes traffic away from the historic district but also takes that same traffic away from the business district.

These alternatives were presented at a public hearing in September of 2013. Comments from the hearing have been collected and the final alternative is scheduled to be determined by January 2014.



*Bridge*



*Sinking Causeway*

(SAV Continued from page 1)

er waters, south to Florida. This species is an early colonizer of shallow sandy substrates and can form extensive beautiful "grass beds" or "meadows" in higher salinity estuaries. The most versatile SAV, widgeon grass (*Ruppia maritima*), is widespread throughout North Carolina and the rest of the country in coastal waters from nearly freshwater portions of Currituck Sound, to higher salinity estuaries where inlets welcome full strength sea water. As the name implies, widgeon grass is a favorite of waterfowl and is highly nutritious.

Proximity to inlets determines salinity regimes, which influence SAV species composition. Similarly, as one moves inward up large estuarine rivers such as the Neuse and Tar-Pamlico, waters tend towards brackish to fresh and aquatic plant composition changes. Currituck Sound is only slightly brackish and becomes more fresh moving northward away from the inlet which introduces saltwater into the system. Waters with these salinity regimes are known as oligohaline and contain up to about 5 parts per thousand (ppt) salinity (as opposed to full strength sea water which is usually 35 ppt) and typically support a diversity of SAVs including pondweeds (*Potamogeton* spp., *Stuckenia pectinata*), wild celery (*Vallisneria americana*, naiads (*Najas* spp.), horned

pondweed (*Zanichellia palustris*) and parrotfeather/Eurasian watermilfoil (*Myriophyllum* spp.). Some aquatic plants such as Eurasian watermilfoil and parrotfeather can become extremely invasive.

When NCDOT projects traverse coastal waters, if suitable habitat is found (sufficiently shallow with enough light to support growth of rooted SAVs), surveys are conducted. For large bodies of water, NCDOT aerial photogrammetry maps are a valuable tool when flown at the precise elevation and under certain environmental conditions as SAVs are highly visible in the photos. Photography alone is not enough to assess projects and ground-truthing is vital, since dead vegetation or debris frequently settles in holes or depressions in the substrate which can appear the same color as SAVs in aerial photographs.

It is always the goal to avoid and minimize disturbance to these important aquatic ecosystems. Before impacts occur, species of SAV are identified and percent coverage of SAVs and the area to be impacted (shaded or physically disrupted) is calculated. When necessary, mitigation for SAVs is carried out, yet suitable mitigation is often difficult to determine. Because SAVs have exacting

environmental requirements, with particular importance to stability in the environment, establishing new populations can be difficult. Creative solutions from staff, consultants and agencies (NCDENR-Division of Marine Fisheries and NOAA-National Marine Fisheries Service) are sometimes implemented. NCDOT is currently funding research on a wave action model to demonstrate stability required by seagrasses to establish and grow. Other creative types of mitigation are sure to surface as NCDOT is planning for several bridges or causeways that may require mitigation for this important resource.



(View point Continued from page 1)

couldn't jump if it were deaf or not. It usually pays to keep it simple.

I was happy to hear that we decided to start publishing this Centerline newsletter again (even though I promised Phil I would get this article to him about a month ago). It reminded me of the late 1990s and early 2000s when I was lucky enough to work as an on-call consultant for PD&EA. Charles Bruton had always said that although I didn't work directly for the Department, I was an extension of his staff. Upon Charles' retirement I took the opportunity to ask him if I could give him an exit interview. I specifically asked him

what were the biggest challenges facing the department. He indicated that "turf battles", "mistrust between units", and "poor communication" were the department's biggest challenges.

Fast forward 10 years and I found myself giving a similar exit interview to Jim Trogon. I asked him the same question. What are the biggest challenges facing the department? It was interesting to me that my two mentors' replies were so similar, and that we still face such similar challenges. His answers were "working in silos" and "resistance to change", and suggested a lack of consequences for insubordination. He would say we all need to "hitch to the same wagon and pull in

the same direction". At the same time it is important to "respect different perspectives and to be open minded to other ideas and viewpoints". "If you don't like the idea of changing", he would say, "You will like the idea of being irrelevant even less".

## NCDOT PDEA Partners With ACEC/NC to Address Issues

By: Michael Iagnocco, PWS, Environmental Group Leader, STV/Ralph Whitehead Associates



The American Council of Engineering Companies of North Carolina (ACEC/NC) is a professional association of nearly 200 member firms in N.C., employing over 6,500 professional engineers, technicians and scientists. ACEC/NC is a member organization of the American Council of Engineering Companies in Washington D.C. The American Council of Engineering Companies (ACEC) is the national organization for state organizations and is the largest national association of engineering firms engaged in the independent practice of consulting engineering. ACEC has over 5,000 member firms in the 50 states, employing over 300,000 professionals, technicians, scientists and support personnel. ACEC/NC member firms are regularly engaged by the NCDOT (Department) to conduct engineering, planning, environmental, and related services.

ACEC/NC has a series of standing committees, one of which is the Transportation Committee (TC). The TC, in turn, is comprised of a number of subcommittees, most of which interface with personnel representing various divisions within the Department. TC subcommittees include Rail, Design-Build, Joint Training, Structures, Procurement, Operations, Construction & Materials, and the Joint Conference. In

the summer of 2013, following a series of meeting and discussions to gauge the Department's interest, a new TC subcommittee was formed - the Project Development and Environmental Analysis (PDEA) subcommittee. The overarching goal of the committee is to create an open dialogue between NCDOT PDEA and ACEC/NC member firms, many of which are NCDOT contractors, as a means to discuss issues and procedures, discuss what's working and what needs work, and to identify potential opportunities for ACEC/NC to offer assistance.

Phil Harris, PE, Natural Environment Section Head, has agreed to serve as the co-chair of the PDEA subcommittee along with Mike Iagnocco of STV. PDEA staff comprising the subcommittee includes Jennifer Harris, Western Project Development Section Manager; Rob Hanson, Eastern Project Development Section Manager; Eric Midkiff, Central Project Development Section Manager; Drew Joyner, Human Environment Section Head; Jay McInnis, Eastern Project Development Group Supervisor; and Derrick Weaver, Central Project Development Group Supervisor. The remaining six ACEC/NC PDEA subcommittee members were determined through a solicitation of its member firms and a review of 'applications.'

The inaugural PDEA subcommittee meeting was held on August 19, 2013. In addition to the introduction of committee members, the PDEA representatives shared information on their organizational structure, staffing, and work environment. A key outcome of this initial meeting was the development of potential future meeting topics which included the following: training of consultants in an effort to establish procedures and maintain consistency; training of Department staff, particularly as it relates to managing outsourced work; negotiating task order agreements, notably the issues that arise in trying to achieve a 'fair and reasonable price',

one that is within 5% on hours and 10% on dollars, and the challenges that arise especially when specialty services are part of the scope; 'lessons-learned' from other DOT's on procedures, policies, processes, and; the NEPA/404 Merger Process. Monitor future issues of *Centerline* for future updates of meeting topics, discussions and action plans!

### Employee Spotlight



Erin Cheely is an Environmental Biologist in the Natural Environment Section's Project Management Group. She was born and raised in Jacksonville, Florida. She received a BS in Biology from Winthrop University in 2002. After graduating, she worked for the Department of Environmental Protection in Florida. Erin moved to North Carolina in 2003 and began working with freshwater mussels as a research technician at NC State University. She began her career at NCDOT in June of 2006.

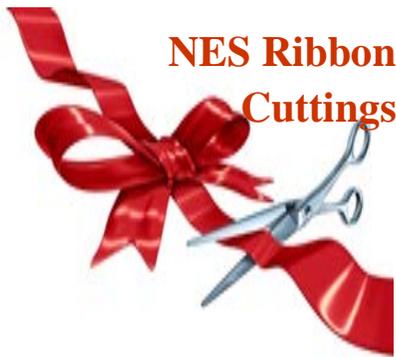
Like the rest of the Project Management Group, Erin is responsible for multiple aspects of managing projects throughout the preconstruction process including wetland and stream delineations, protected species surveys, natural

(Continued on page 5)

(Spotlight Continued from page 4)

resource document preparation, managing consultants, coordinating with regulatory agencies and other units within NCDOT, and permitting. Erin enjoys taking ownership of her projects and the opportunity to ensure impacts to the natural environment are minimized.

Erin lives with her husband, Adam, and their two cats. She enjoys exercising, sleeping, eating pie, and old lady activities like jigsaw puzzles, making jam, playing with the cats, and crafty stuff.



the last 10 years, Karen has been invaluable in leading surveys for federally listed plants and animals, forest service projects and submerged aquatic vegetation surveys. She is in the process of completing a book that will help other biologists identify mussels, called "Freshwater Mussels of NC". Karen's expertise, good nature, sense of humor, friendship and generosity will be missed around the workplace. We wish her "Happy Gardening" in her retirement.



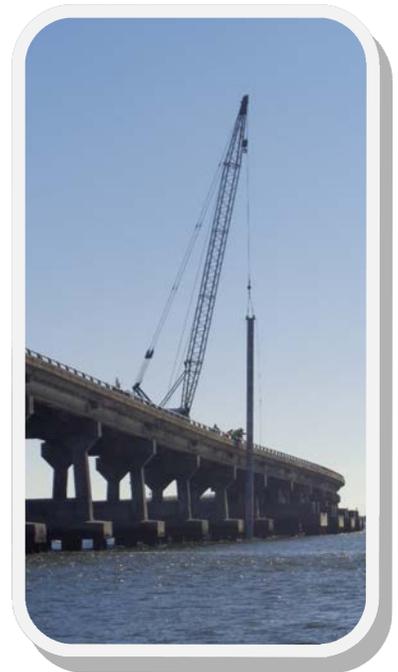
**Cheryl Gregory**

Congratulation to Cheryl Gregory for becoming the newest member of the NES Biosurveys Group. Cheryl started at NCDOT in 2003 with Project Management Group and later moved to Biological Surveys Group and was there until 2009. Her expertise includes threatened and endangered species surveys, using GPS and GIS software, management of T&E plant mitigation sites, overseeing consultanting firms, wetland and stream determinations, applying for 404 permits and 401 Water Quality Certifications and preparing Biological Assessments. After leaving NCDOT she worked as a volunteer at the Tolga Bat and Research Hospital in Australia. There she collected and cared for injured and orphaned flying foxes and assisted in public educational outreach. In 2011 she started working

for NC Division of Water Resources (NCDWR) and worked there until taking this position. Welcome back Cheryl.

**Multi-agency team work at Bonner Bridge**

We want to extend a big "thank you" to USCG, the NCDENR DCM and DWR, and the USACE for their cooperation in insuring a swift solution to the scouring issue at Bonner Bridge. The NES PMG staff (Elizabeth Lusk, Chris Rivenbark, and Michael Turchy) were busy coordinating closely with NCDOT Division 1 and upper management on the eve of Thanksgiving. The federal and state resource agencies went out of their way to also make this their top priority. Two permits were issued within two hours of receiving NCDOT's emergency permit applications. We at NCDOT and NES were very thankful for the quick response and cooperation from both the regulatory agencies, as well as Division and Raleigh forces.



**Positioning Test Pile Adjacent to Bent**  
Photo Courtesy of Pablo Hernandez/Division 1



**Karen Kendig**

After 30+ years of service in North Carolina's environmental programs, Karen M. Kendig is retiring. As an environmental supervisor and biologist

NCDOT  
Project Development Environmental Analysis Branch  
Natural Environment Section  
<https://connect.ncdot.gov/resources/Environmental/Pages/default.aspx>  
Main Office:  
(919)707-6000



**Newsletter Contact Information**  
Philip S. Harris, PE  
(919)707-6123  
pharris@ncdot.gov  
Bruce Ellis  
(919)707-6115  
bellis@ncdot.gov  
Christie Murphy  
(919)707-6144  
cmurphy@ncdot.gov