APNEP Scientific and Technical Advisory Committee
Spring Meeting Notes
April 25, 2012

Nature Research Center, 121 West Jones Street
Raleigh, NC

STAC Members Present: Peter Caldwell (USFS), Robin Dennis (USEPA), Jud Kenworthy (NOAA retired), David Kimmel (ECU), Tim Spruill (USGS retired), Curtis Richardson (Duke University), Silvia Terziotti (USGS), Reide Corbett (ECU), Brian Boutin (TNC), Bob Miller (UW-SP retired), Peter Kalla (EPA), Tom Crawford (ECU), Andy Keeler (UNC-CSI)

State Agency Liaisons Present: Allison Weakley (NCDENR-NHP), Jon Blanchard (NCDENR-DPR), Dianne Farrer (NCDACS), Sara Nienow (NCDENR-BPA).

Guests/Public Present: Michelle Moorman (USGS), Joe Hightower (USGS), Todd Ewing (NC-WRC), Rhonda Evans (EPA), Cindy Carr (NC-WRC), Rob Evans (NC-DACS-PCP), Sarah McRae (USFWS)

APNEP Staff Present: Dean Carpenter, Bill Crowell, Scott Gentry, Jim Hawhee

Call to Order

Tim Spruill, STAC Co-Chair, called the meeting to order.

APNEP Director Bill Crowell welcomed the STAC and visitors. He noted that APNEP will be moving its offices to the Nature Research Center. Staff is looking forward to new partnership opportunities with museum staff on various engagement initiatives. He also noted that support for the APNEP Citizens Monitoring Network will be subject to a Request for Proposal (RFP) in the coming year, with monitoring to be undertaken in a number of areas.

Tim also offered a welcome. He thanked staff and the museum for hosting the meeting. He noted that this is the last meeting that he will be chairing. New Co-Chairs for the STAC are Brian Boutin and Reide Corbett, beginning this July. Tim expressed his gratitude and pleasure with serving as a Co-Chair. Tim then offered the minutes for approval and asked for amendments. Meeting minutes from both summer 2011 and winter 2012 were offered. Minutes were approved unanimously by voice vote.

APNEP Update

Dean Carpenter also offered his welcome. He thanked Charles Yelton and Cindy Bogan for arranging the meeting room as well as lunch organizer Rosalind Harris with DENR. Dean also recognized other attendees, including Rhonda Evans from EPA region 4, Sara Nienow from the DENR budget office, Jon Blanchard from NC-DPR, Allison Weakley from NC-NHP, Diane Farrer with NC-DACS, and Cindy Carr with NC-WRC. Dean relayed that Jay Messer, Dick Hamilton, and Toddi Steelman have stepped down from the STAC. He also noted that one-third of the STAC's membership's terms expire on June 30. The Executive Board will review expirations and nominate new STAC members. Because there are no term limits, current members can serve again.

Dean noted that the summer (July 25) STAC meeting will be held in Virginia.

Bill noted the adoption of the Comprehensive Conservation and Management Plan by the Policy Board on March 14. It is available in both PDF and as a web page online. The 2012 Albemarle-Pamlico Ecosystem Assessment was approved by the STAC, with the Policy Board not only accepting but endorsing the document.

Status of Federal-Listed Species in the Albemarle-Pamlico Region

Sarah McCrae of the U.S. Fish and Wildlife Service's (USFWS) Raleigh Field Office offered the first presentation on federally listed species in the APNEP region, standing in for Pete Benjamin.

USFWS focuses their efforts generally on threatened and endangered species, refuges, and migratory fish and birds.

In the Albemarle-Pamlico region, 43 animals and 27 plants/lichens are federally listed as either endangered or threatened.

USFWS strategic priorities in the region include: Cape Fear shiner, Tar River spinymussel and dwarf wedgemussel, golden sedge, red-cockaded woodpecker, anadromous fish habitat restoration, and support of USFWS regional ecoteam priorities. USFWS focuses on habitats that support priority trust resources. Initiatives include water quality projects, easements, dam removal, and ongoing efforts in the refuge system.

Aquatic federal-listed priorities in APNEP region include Roanoke logperch and James spinymussel in the Dan basin, dwarf wedgemussel and Tar River spinymussel, and shortnose sturgeon habitat. Sarah indicated priority habitat for these species.

Sarah also noted mega-petition species in APNEP region. USFWS has been petitioned to list 404 species in the Southeastern US region. About 12 of these species exist in the APNEP region. The listing process will take five to ten years. Candidate conservation will be a key approach, trying to keep species off of the list proactively.

Jud Kenworthy asked how many petitions were "legitimate," or had strong scientific backing. Of about 70 species petitioned in North Carolina, perhaps three-quarters appear to be good candidates. All species will undergo a biological status review.

The status of white-nosed syndrome in bats was inquired about. Several species of bats are concerns to be listed, but are not part of the mega-petition process. USFWS is still learning about the biological impacts of the disease.

Reide Corbett asked who submits the petitions and how much effort went into these? Center for Biological Diversity and Wild Earth Guardians petitioned USFWS in the southeast. Reide also asked if specific information required in the petition to justify listing? Sarah indicated that specific information is required.

Jud asked if there is a recovery plan for the seabeach amaranth? Sarah was not familiar with it, but the plan does exist.

Brian Boutin inquired about shortnosed sturgeon habitat and noted that many areas have been ditched and drained. These ditches could potentially extend the habitat range for the sturgeon, but they might be suboptimal habitat even if an occurrence is documented. How is USFWS prioritizing drainage ditch restoration? Brian also noted potential conflicts between pocosin restoration and aquatic habitat restoration and asked how these conflicts might be resolved. Sarah noted that this was a difficult question, and input would be sought from various refuge staff to reconcile those conflicts.

Tim Spruill asked for confirmation that there are no amphibians listed in North Carolina. Sarah confirmed that this is true.

David Kimmel asked if Atlantic sturgeon is now officially listed. Sarah noted that yes, several population segments are listed.

Status of State-Listed Species in the Albemarle-Pamlico Region

David Allen of the North Carolina Wildlife Resources Commission began by discussing those state listed species that do not overlap with federal listings. In North Carolina, listed species categories included endangered, threatened, and special concern designations. Special concern means a species has a restricted range, is in decline, or little information about the species exists.

The North Carolina Endangered Species Act protects all listed species from take or possession. Some exceptions include research, education, prior possession, or defense of human life.

The North Carolina listing process is informed by scientific councils, which are formed every five years. Recommendations are made to the Nongame Wildlife Advisory Committee, and then the NWAC makes recommendations to the full Commission. Recommended changes go to public for comment, comments evaluated and taken into consideration by NC-WRC, and finally the listing then becomes incorporated into law.

All federally endangered species are on the state list.

Responsibilities of the NC-WRC after listing include monitoring and management, which is supported by Section 6 funding from USFWS and the National Marine Fisheries Services (NMFS). Enforcement is also a responsibility of NC-WRC.

Two state-listed endangered species are the peregrine falcon and the Eastern diamondback rattlesnake. The peregrine falcon was taken off the federal list but remains on the state list due to low nesting numbers. All individuals are currently in the mountains, about ten nesting pairs. The Eastern diamondback rattlesnake is probably no longer in Albemarle-Pamlico region anymore, as it is a fire dependent species.

Three terrestrial species are listed as threatened, including the bald eagle, the gull-billed tern, and Rafinesque's big-eared bat. There are about 200 nesting pairs of bald eagle in North Carolina. The Albemarle-Pamlico region is a stronghold for this species, including at Lake Mattamuskeet. The gull-billed tern nests on beaches in relatively small numbers on the Outer Banks and estuarine islands. The numbers of this species have been declining, but a great deal of data has been collected since the mid-

1970's. The Rafinesque's big-eared bat roots in hollow trees, including Roanoke River wetlands. Information is sparse but additional surveys are beginning this summer.
The Neuse River waterdog is an amphibian of special concern, and its habitat is limited to the Neuse and Tar River drainages. WRC is re-conducting surveys from 30 years ago.

Six reptiles of special concern in APNEP region include the Carolina pigmy rattlesnake, Carolina watersnake, diamondback terrapin, outer banks kingsnake, southern hognose snake, and timber rattlesnake.

There are 18 birds of special concern in the Albemarle-Pamlico region. Yellow-bellied sapsucker is common in the Albemarle-Pamlico region but has declining nesting numbers in mountains. Five of these birds are beach nesting birds. Others like loggerhead shrike are early successional species, limited to habitats like old agriculture fields. Black rail and least bittern are secretive marsh birds, little information exists about these species and they are not commonly found. Glossy ibis and listed herons nest in scrub/shrub habitat, including dredge islands. The Common tern has seen a 59% decline since late 1980's, but least terns have increased 50% over that same time period. Least terns can nest on flat gravel roofs characteristic of commercial rooftops. Glossy ibis populations are variable from year to year, dependent on weather, and are currently down 26% from their long term average.

The Buxton Woods white-footed mouse is only found on the southern end of Hatteras Island in maritime forest and is listed due to its restricted range.

Allison Weakley asked how are population goals determined for waterbirds. While many listed species don't have goals, waterbirds do because they were set by the NC-WRC.

Jud Kenworthy asked if North Carolina is obligated by law to list species under ESA. David said he didn't think North Carolina was obligated by law, that it was just convention. Members of the audience noted that plants are.

Reide Corbett noted that a group at UNC is currently doing some bat monitoring, and he has been contacted by a consulting firm that might have mutual interests in monitoring this species.

Peter Kalla asked if NC-WRC is getting good cooperation from landowners for least tern conservation. Generally no, but these relationships could be subject to more effort. By way of example, David noted that the Outer Banks Mall had over 500 pairs on their roof while the Food Lion in Emerald Isle had 300 pairs.

Dean Carpenter asked if there is a regular assessment of waterbird populations. David replied that waterbirds do through the waterbird management group (meets every two to four years after surveys), who do assessments and write reports. Other species are hit-and-miss. Specific projects might serve as a status assessment.

Jim Hawhee asked about efforts related to the piping plover, as rules related to their protection have been the subject of recent controversy. David noted that the Southeastern US region is lagging behind other states. North Carolina has piping plovers all year, the only state in which they are always present.

Todd Ewing of WRC presented on listed aquatic species in North Carolina.

Four federally-listed aquatic species exist in North Carolina: two fish and two mussels. 17 aquatic species are state-listed, including four fish, 11 mussels, and two crayfishes. Four species are currently proposed for state listing, including two fish, one mussel, and one snail. Several other species are considered rare by the Natural Heritage Program.
Atlantic pigtoe is a species under consideration for listing due to the CBD "mega-petition." The number of occurrences is decreasing. They are found in the Neuse and Tar-Pamlico river basins.

The Green floater, a mussel, is doing a little worse than the Atlantic pigtoe. It is also in decline, with CPUE (catch-per-unit-effort) usually at less than 1 per hour.

Bridle shiner, a state listed rare species, is only found in three North Carolina locations, all in the Neuse basin. It may actually be more common, but the species is difficult to sample effectively.

The state endangered yellow lance is found in Neuse and Tar basins. Perhaps not as rare as we think, and populations seem to be persisting. This species is also difficult to sample, and they have to be targeted by biologists.

The Carolina madtom is state threatened. It is difficult to assess condition despite many surveys. The species is decreasing dramatically in Neuse basins (13% of historic levels), one of only a few places where it is still found. In the Tar basin the species is doing pretty well, and it is currently found throughout its historical range.

The Triangle floater is threatened, with a recommendation to list the species as endangered. CPUE is decreasing across locations.

The Chameleon lampmussel is not listed but is proposed as threatened. It is found only in small headwater creeks, which are often the first to be impacted by development.

The Roanoke slabshell is an example of a success story, very large and easy to find. The species is still listed as threatened, but robust populations have been established. WRC is recommending them for delisting.

The Chowanoke crayfish has a current status of special concern but is part of the CBD petition. It is only found in Chowan and Roanoke basin. People haven't looked for it often. NC-WRC is initiating surveys for this species by zeroing in on habitat, and the species may be more common than is currently thought. Spiny crayfish and Carolina ladle are also being found more commonly with targeted searching.

The Notched rainbow mussel is found in many places but numbers are going down. It is proposed to be listed from special concern to threatened.

The Mimic shiner is of special concern and found in upper Tar and Neuse River basins. It could be three or four species: difficult to identify. The shiner is proposed to be listed as threatened. It is possible that the species might be more common but misidentified due to its similarities with other species.

Ridge lioplax is currently not listed but proposed for special concern. It is very common at Lake Waccamaw, rare in the Neuse basin, and potentially decreasing in the Tar River basin.

The American eel is not listed in the state but petitioned for federal listing. In North Carolina the numbers are very good for this species. Only NC-DWQ has data, but the species appears to be abundant in the Neuse and Tar-Pamlico basins. In 100m transects, there are areas where 50 or more have been found.

Working Lunch

Tim Spruill turned the meeting over to Dean for the working lunch. On behalf of APNEP staff, Dean honored Tim Spruill for his service as the STAC Co-Chair. He detailed highlights of Tim's career service and service to APNEP.

Plant Conservation in the Albemarle-Pamlico Region

Rob Evans of NC-DACS opened his presentation with an overview of the North Carolina Plant Conservation Act. The Plant Conservation Act does not have the same protections as takings for Endangered Species Act. However, it empowers the development of regulations to protect these species.

Until a few years ago, there was no systematic method for listing plant species for the program. North Carolina's Plant Conservation Program does not consider global rarity in its methodology. Short term trend analysis and threats are used to determine listing priorities according to matrices.

In North Carolina there are 5700 native taxa to be protected. 19 plant species are endemic to the state, with two believed to be extinct.

Rob provided context and background for selection criteria regarding important plant conservation areas (ICPAs). He proposed establishing preserves to protect at least two examples of each imperiled species in their natural habitat, would refer to them as plant conservation preserves. First imperiled, then viable imperiled plant locations were identified. Looking at the best two areas for each species, the scope of this conservation mission becomes realistic. Roughly 343 sites would still need to be protected to achieve this goal.

There are currently 22 plant conservation preserves in the state. Each preserve has a core/focal species. Currently, 156 imperiled plant species have met the minimum conservation goal (two areas), 179 are partially protected, 47 have no protection, and 37 are historical only.

The US Forest Service is the largest owner of imperiled species, followed by North Carolina State Parks, NC-WRC, DOD, and US National Park Service. However, plant conservation preserves have the highest density of imperiled species. NC-DOT recognizes them.

In 2011 $1.7 million were use to expand or purchase new nature preserves.

Rob overlaid his records on the Albemarle-Pamlico region. Relatively few viable areas were shown in the region. There are 172 imperiled species found in the region (41% of statewide total), and 27 are only found here. There are 1,117 known populations, 450 viable populations, and 83 identified IPCAs in the watershed. Five federally listed species are present.

Which habitats are most important for imperiled plant conservation? Wet longleaf savannas (18 imperiled species found here), followed by lime sinks/open bays (17 species), diabase glades (16 species), rich woods (13 species), and others.

Rob provided examples of other habitats and associated imperiled species, including dune/beach, limestone outcrops, and lime sinks/open bays. Also discussed were disjunctions, species that occur in the Albemarle-Pamlico region but are characteristic of other locations (e.g., mountains).
Longleaf savannahs are rich habitats, but are fire dependent. Fire results in increased flowering. Without fire, the stands and diversity begin to disappear. Fire suppression has had a cascading effect on habitats statewide. Fire was not confined to the coastal plain or longleaf systems, according to historical records.

Rob showed an example of the hoary picune, barely hanging on and shaded by maple saplings until fire. After fire, the species became dominant. Other examples outside of the Albemarle-Pamlico region were presented, including a case study of a tomato farm. Non-native soil was removed, and they created a new wetland and "bog." The machine collapsed into the muck, which created prime habitat for endangered arrowhead species.

Jon Blanchard asked if there are reserve designs for the remaining imperiled species. Accepted minimum area of the Significant Natural Habitat Area (SNHA) defines these borders.

Pete Kalla asked what methodology was used to redesign the tomato farm. Consultants designed the bog at the tomato farm.

Pete Caldwell asked if these areas are open to the public. Many are not and are posted as no trespassing. Poaching has been a problem, including the bunched arrowhead. Guided trips may be offered by stewards and other staff members.

Dean Carpenter asked why there are so few preserves in the Albemarle-Pamlico region. It is largely incidental. The Plant Conservation Program was a very small organization and opportunistically went after sites as they became available. Now they are becoming more systematic about their approach.

Red Wolf Recovery in the Albemarle-Pamlico Region

David Rabon of the USFWS presented on red wolf recovery efforts in North Carolina. He opened with life history characteristics and the story behind the species' decline. Red wolves historically were found throughout the southeastern United States, but they were reduced to small areas in Texas and Louisiana. In 1967 the red wolf was federally listed as endangered and red wolf recovery program was initiated. The Endangered Species Act in 1973 gave recovery efforts more support, but in 1975 biologists also came to realize that preservation in the wild was not viable and a captive breeding program was initiated. In 1980 the red wolf was declared functionally extinct in the wild. Only 14 founder wolves formed the basis for the current population.

Recovery objectives include preserving 80-90% of genetic diversity for 150 years (currently at 89.5%) and removing threats that can bring about extinction. Currently, 90-110 wolves exist in a single wild population, with 165 wolves in captivity.

Historically, efforts to reintroduce the red wolf were targeted to Kentucky, but public outcry led to reintroduction at Alligator River NWR in 1985. Four male/female pairs were released in 1987 from well established genetic lines. Criteria for success originally were simply survival of released wolves. Only 25-30% of introduced animals survived initially. Experimental reintroductions analyzed trends for age, pairs/groups, soft (fenced pens) versus hard release. Soft releases resulted in higher survival rates.

The first hybridization event was documented in 1993, with a coyote. As the 1990's progressed, biologists considered this trend as one that could imperil the recovery of the red wolf.
USFWS began implementing an adaptive management plan, which included a strategy to establish coyote free zones and move westward while building the red wolf population from east to west. Zone 1 was designated a coyote free zone with active removal of non-red wolf canids, primarily on federal land. Red wolves can hybridize and produce viable offspring and with both gray wolves and coyotes.

In Zone 2, coyotes were sterilized and reintroduced to hold areas for red wolf expansion. Zone 3 was referred to as the dispersal zone, which is a lower priority for intensive management.

Management tools and techniques include sterilizing and releasing coyotes to hold space for red wolves. Alternatively, the coyotes may be euthanized if landowner doesn't allow reintroduction.
Hybrids are also euthanized to prevent confusion and backcrosses. 75% of red wolves are radio collared, and genetics testing can be done through blood or scat.

Applying adaptive management techniques, the recovery team found success by tagging and collaring pups in their den a week or so after birth, rather than waiting until the pups were older.

Insertions of 18 month old pups from island propagation sites in Florida is also a technique that has helped bolster red wolf populations. When the teams sample pups, captive pups can be transferred into a wild litter. Ideally, the pups should be no more than 2-3 days apart in age. Captive to wild success rate was 92%, but even captive to captive survival rate was 82%.

Current challenges include controlled hunting preserves. Coyotes can stand in for foxes to train hunting dogs, which has created a market for coyotes. Sometimes coyotes escape from these preserves and are reintroduced into the wild.

Also, it is difficult to distinguish a young red wolf from a coyote, and biologists are concerned that red wolves might be trapped instead.

Vehicle strikes remain a challenge. They used to be the primary cause of death for reintroduced animals, but now the rate is down to about 17% of mortalities. 35% still killed by gunshots, approximately seven gunshot deaths per year.

Climate change also presents an issue for red wolf recovery in the refuge. The refuge will have to expand westward to accommodate the same population size as water levels rise in their eastern habitat range.

An audience member asked if collars have been found from killed wolves. Yes, they are sometimes thrown into canals.

Jud Kenworthy asked what carrying capacity for the area is now. Biologists can't say with certainty at this point.

Anadromous Fish in Albemarle-Pamlico Waters

Joseph Hightower gave an overview of the history of the fishery for anadromous fish in the Albemarle-Pamlico region. Pound nets were introduced in 1870, and by 1896 there were 1,125 nets in Albemarle Sound. These acted as barriers for anadromous fish. Even if anadromous fish made it into the rivers from the sounds, river fisheries were also problematic. In some cases, gill nets extended across the river mouths.

In the late 1800s, dams began to limit the range of anadromous fish species. In the Roanoke basin their migratory limit declined from Salem, Virginia to Weldon, North Carolina and was also limited to Goldsboro on the Neuse River.

The current population status for river herring: the species are under ESA review, categorized as depleted by Atlantic States Marine Fisheries Commission (ASMFC) and DENR, and the North Carolina fishery is currently closed.

American shad is a species of concern: ASMFC considers it depleted coast wide. In the Albemarle Sound region there is a stable and low population. While declines have been seen since the 1950's, they might be insignificant compared to the carrying capacity of the system, as indicated by landings information from late 1880's onward.

For Hickory shad there is a recreational fishery around the Weldon area that is of local importance. Its status is currently unknown in North Carolina.

Striped bass is the success story in the Albemarle region. The populations are viable here, but of concern in central/southern region. The species is currently at record levels since the 1950's, with an elongation of the size and age curve. However, in the Neuse basin these successes haven't been seen.

Shortnose sturgeon is currently on the endangered species list.

The Carolina population segment of Atlantic sturgeon was listed as endangered in April. Species populations have seen precipitous declines, and habitat is threatened.

The status of the American eel in North Carolina is unknown by NC-DMF and ASMFC, but the species is under ESA review by USFWS. The species will likely be updated to depleted this year. Even where eelways exist, moving down through turbines can be problematic.

Joe then discussed his research. According to acoustic monitoring, about 500,000 striped bass are migrating up the Roanoke River each year.

Another ongoing effort is the estimation abundance and mortality for striped bass. Pay for tags program underway.

He noted that blueback herring recruitment has declined precipitously. Research into habitat quality showed that a lack of dissolved oxygen had an effect, but recruitment was good for experimental hatching rates. Habitat quality is not a major concern.

On the Little River, a tributary of the Neuse River, three dams have been removed since 1998. Migration studies are done to demonstrate benefits and demonstrate the value of habitat restoration.

Effects of water quantity (flows) can also be demonstrated. High flow events are strongly correlated with anadromous fish migrations upstream.

Flathead catfish may be having significant effects on spawning fish. Direct observation of gut contents, and PIT tags are being found that were injected into shad.

Of the anadromous fish in our region, striped bass is the only viable species.

Action Items

Dean confirmed that Reide and Brian will be co-chairing for the next two years. They will nominate five other members to form an executive board and develop an action plan for the Committee. Updates will be provided at the summer STAC meeting.

Adjourn