North Carolina Sandhills Conservation Partnership

Quarterly Meeting Minutes

"Sandhills Geology"

1:00-4:30 PM, Wednesday, March 15, 2023

- Welcome & land acknowledgement
  - As we gather to discuss stewardship and conservation of the Sandhills, it is important to acknowledge the original inhabitants and stewards of these lands. Many still live here today, including the Tuscarora, Coharee and the remnants of several other tribes forcibly removed from their lands which then coalesced as the Lumbee tribe. These tribes are still present and active in our communities, and that fact challenges us to think creatively about how we can better involve them in our work. We pay our respects to these past, present, and emerging leaders who have been custodians of this land for many years. We also welcome them to become a part of our partnership as we form conservation strategies going forward.

- Attendees:

Present:

Brian Williams	Fort Bragg
Pete Benjamin	USFWS
Jeff Marcus	TNC
Dallas Shoemaker	NCWRC

Other attendees:
Sarah Hecocks (TNC/USFWS), Alan Schultz (Fort Bragg – Wildlife), Andy Van Lanen (SEI), Dave Heins (Fort Bragg), Debbie Crane (TNC), Erick Rietschier (TNC), Jake Comer (Quail Forever), Jeff Marcus (TNC), Jesse Wimberley (Sandhills PBA), Jessie Jordan (NC State Parks), Jessie Schillaci (Fort Bragg - ESB), Julian Wilson (NCFS), Lauren Pharr (NCSU/SEI/NCWRC), Nathan Shepard (NCNHP), Phil Doerr (Retired: NCSU/SEI), Rhonda Sturgill (TNC), Saubhagya Silwal (Salem & Gilford Colleges), Susan Miller (USFS), John Hammond (USFWS), Matt Jones (TNC), Deb Maurer (TNC), Kerry Brust (SEI), Gabriela Garrison (NCWRC), Scott Pohlman (NCNHP), Colleen Bowers (NC State Parks), Jacob Brown (NC State Parks), Mike Schafale (NCNHP), Stacy Huskins (Fort Bragg), Anna Prinz (SEI), Alan Schultz (Fort Bragg), Jennifer Fawcett (NCSU), John Langdon (USFS), Bob Ganis (retired geologist), Chris Swezey (USGS), Mary Lou Addor (Sentinel Landscapes), Jessie Schillaci (Fort Bragg), Jackie Britcher (Fort Bragg), Alicia Jackson (UNC Greensboro)

Total attendees: **42**

- Partner updates
  - Sarah Hecocks: work to identify locations of previously unknown upland depressional wetlands is going well, having discovered and mapped a few on the Sandhills Game Lands (SGL) so far. An update on behalf of Mike Martin (NCWRC) that tiger salamander breeding has been decent this year, despite dry conditions that will probably lead to many pools drying up before metamorphosis. No gopher frog breeding in the Sandhills this year.

- Jeff Marcus: In process of hiring a TNC land protection specialist by April.
- Erick Rietschier: accomplished a lot of fire line prep and burning over the past couple months.
- Rhonda Sturgill: left protection specialist position to become conservation coordinator; if anyone is looking to volunteer, let her know.
- Anna Prinz: avian keratin disorder is an increasing disease issue. 92 birds in 2022 with deformities; increase from 5 to 22 birds on SGL this past year. Is a bigger issue in Alaska but is emerging in con US. Need to continue monitoring and reporting any observations of bill deformities here.
- Scott Pohlman: NCNHP and the NCWRC recently agreed to add the Thunder Road Hawthorn Site to the registry of NH areas. The site is significant for a collection of rare insects documented from the site. Part of the agreement includes adapting management - particularly fire - to retain populations of the insects. The NC Biodiversity Project helped identify the site for its ecological value, and may help develop and implement monitoring of the site, but additional help might be needed. WRC is one of several partners who have recently shown interest in the conservation of taxonomic groups that often get less attention, and their flexibility in management of the site is appreciated.
- Jesse Wimberley: Learn and Burn and Thinning Demonstration coming up
- Bob Ganis: led a successful field trip this morning with 20 members of the partnership in and around Weymouth Woods to discuss the geologic origins of the NC Sandhills.
- Stacy Huskins: many good burn days on FB this year, and many wildfires which has its benefits and drawbacks. 760 acre clearcut underway (~1/2 done so far) for the tank range.
- Brian Williams: several ACUB easements and acquisitions hoping to close by late spring/early summer.
- Jen Fawcett: NCSU Forestry Extension program recently received approval for another person to cover western part of state; looking to fill another similar forestry position; recently wrapped up women in fire training exchange (been doing it since 2016) with 6 great burn days on >1400 acres with >50 people from all over the world.
- Jessie Jordan: Some of the burning for the WTREX event took place at Carver's Creek SP. In process of recruiting for an assistant land management specialist
- Julian Wilson: planning a longleaf 101 academy Sept 19-21 in the Sandhills. Certified burner course is May 22-24; registration opens up April 3 as well as Oct 23-25 with registration opening Sept 1. Longleaf Coalition recognized 5 landowners for longleaf honor roll in 2022 and 3 so far in 2023.
- Susan Miller: Last Monday had an Ember Alliance crew completing fire trainings for the Joint Chiefs project, in which they will mostly be helping the NCFS burn ~8000 acres of Steven's Amendment burning. Were able to hire 3 new partnership coordinators across NC (Nantahala based in Franklin, Uwharrie/Croatan based in Troy, statewide based in Asheville). Also recruiting several wildlife biologists
- John Langdon: recently hired as the new partnership coordinator in Troy

- Pete Benjamin: Recently reclassified Northern long-eared bat from threatened to endangered (doesn't occur in Sandhills); will likely list tricolored bat as endangered soon which occurs in every NC county and will bring regulatory challenges to the Sandhills going forward
- Lauren Pharr: has been presenting preliminary findings of PhD work on RCW brood reduction to NC chapter of Wildlife Society and NCLC. Continuing data collection over next 2-3 years.
- John Hammond: Kathy Matthews in Raleigh office has been working on developing tools to assess needs for tricolored bat
- Gabriela Garrison: NCWRC has partnered with Xerces Society, USFWS, and several other state agencies across SE to launch the SE bumblebee atlas (starting in May) which is a citizen science project to document bumblebees across the region. Non-lethal (photo) collection. Training from 9-2 on May 13 at zoo. Virtual training April 19 6-8pm. www.sebumblebeeatlas.org
- Jessie Schillaci: lots of AKD seen on Fort Bragg; presentation given at recent Army meeting by SEI.
- Alan Schultz: chronic waste disease occurring locally. Been working on Bird Atlas, switching from winter to spring.
- Mary Lou Addor: in process of linking more partnerships into Sentinel Landscape and strategic planning process.

- NFWF grants and proposals
  - Jesse Wimberley: able to increase ask to 3 million dollars; SPBA put in an application for 1.3 million (will hear back this summer), which would cover
    - part-time position to support Joint Chiefs work
    - position to support new Lumbee tribal PBA and Hoke Community Forest work
    - burning on BTG TIMO lands (potential new partner that has been difficult to find compatibility with)
    - ~30 RCW inserts on private lands locally.
  - Jeff Marcus: the company BTG owns hundreds of thousands of acres of TIMO lands, so there's high potential to have positive influence on a large landscape scale; the challenge is that they have to maximize profit on those lands for their shareholders. TNC works with investors who are looking to invest in projects that do good for the planet and also have profitable returns; TNC seal of approval is given to companies willing to meet set of criteria for best management practices, which then attracts those investors. The NFWF funding would help these companies plant longleaf and do controlled burning, without any cost to the company (a baby step that will hopefully lead to something bigger down the road!). TNC just received a 2-year NFWF grant from the last cycle to support a 6-person burn crew, partner management (e.g. TRLT, PCP), ForestHer; will be applying for the next round in the next year. TNC also put in an application for this cycle to support work in the Cape Fear Arch.
  - Jen Fawcett: application this time around more focused on NC, and would support:

- Partnership with NC State Parks to increase fire training and implementation
- More TREX events
- Development and utilization of new fire science tools via Southern Fire Science Exchange, including a course on carbon sequestration and projects specific to DOD lands
- Support of SE Fire Map from Tall Timbers
- 2 new extension staff: 1 state-wide PBA coordinator to facilitate training by successful PBAs (eg Sandhills) to struggling PBAs
- Efforts to reach underserved audiences
- Development and implementation of curriculum for a K-12 program (like FireWorks) on longleaf species and fire
- Outreach and fire education to private landowners that have campsites on rental properties (e.g. HipCamp)
- More ForestHer workshops

➢ Working Group updates

RCW Recovery (Kerry Brust):

- 2022 summary of SEI work in SOPI & MOOR clusters
- SOPI:
  - ~10% of population is on private property (80 of the ~800 PBGs)
    - Safe Harbor program implementation in 90's added some stabilization to RCW numbers on private lands
    - 52 groups in 1980, 49 in 2022
  - Golf course groups affected by development around clusters, usurpation of cavities by other woodpecker spp due to snag removal/manicure mentality, lack of fire & understory vegetation
  - Of the 49 groups in 2022: 37% on golf courses, 33% on Moss, 12% on private forests, 10% on WeWo, 8% on horse farms
  - More RCWs/group on Moss & WeWo (3.25) opposed to golf course/horse farm/private forest (2.52)
- MOOR:
  - Majority are Safe Harbor properties; large working forests (pine straw & timber); prescribed fire is largely conducted in winter
  - RCW reoccupation within the last decade
  - 300 artificial cavities installed over the last 20 years (225 SOPI & 75 MOOR)
  - 30 recruitment clusters installed: 17 SOPI, 13 MOOR
    - % recruitment clusters occupied by RCWs (active in 2022) = 18% SOPI, 85% MOOR
    - Cost ~$100,000
  - Translocation: 34 juvenile RCWs moved from FB to SOPI/MOOR
    - These birds produced 103 fledglings 2012-2017
    - As of 2022, 7 of the 34 RCWs remain as breeders in SOPI/MOOR
  - Population growth: 6 groups in 1980, 0 in 2002, 22 in 2022. Management of natural areas nearby gave a boost to adjacent private lands
  - 3.16 birds/group on MOOR private forests (still less than SOPI WeWo, but comparable)
  - 5 more groups in historic "gap" between FB & SGL since 2017

        - Hoping to receive NFWF funding for ~30 cavities
    - SGL:
        - ~186 PBGs on Block A (increase from 121 in 2005)

Land Protection (Sarah Hecocks & Rhonda Sturgill):

- TRLT:
    - Watery Branch: 210 acres purchased by TRLT & transferred to UNF. Very close to Uwharrie Trail and contains headwaters of Watery Branch.
    - Morrow Mountain Expansion: 215 acres purchased by TRLT & transferred to Morrow Mtn SP. Funding came in part from LWF. Located ~0.5mi from Hardaway Site, a national landmark with high Native American cultural significance. Property contains tributary of Little Mountain Creek and connects park to town of Badin.
- TNC:
    - Caddell: right by WRC depot. Some mature longleaf (80-90 years old), heavy duff layer; needs thinning & burning. ACUB- and LWF-funded. Will be transferred to WRC at no cost
    - Smith-Jackson: protects Little Dismal isolated wetland which WRC has put some work into restoring. Has been raked for pine straw but still has healthy wiregrass population. Will be transferred to WRC. LWF-funded.
    - Van Geem CE: adjoins WRC on 3 sides, and TNC Haskell CE on 4th side. Two impoundments, old longleaf pine, fire-suppressed. ACUB and TNC funds.
    - Moses II: lots of ag areas, large wetland and large oaks. Will be restored. Contains Quewiffle Creek which will be beneficial for burning adjoining Quewiffle Preserve.
    - Nickerson: donation that will help protect FB southern boundary. Fire-suppressed. Will be a fee transfer.

Resource Management (Jessie Jordan):

- No updates.

Communications (Debbie Crane):

- Shoutout to WTREX & Carmella Stirrat to get great coverage of that event
- Lauren Pharr cofounded Field Inclusive, which the TNC NC Chapter has sponsored. Hopefully other partners will consider sponsoring! They are now giving out scholarships. An article on that is here: https://news.ncsu.edu/2023/03/field-inclusive/?utm_campaign=Field-Inclusive-Feature&utm_medium=referral&utm_source=ncsu.edu&utm_content=hp-hero&fbclid=IwAR3CfkyIgcYe_a278Er4C2r2xmWNo72dwVE-Og9xuS_iNSrmWuNvDXcRSvI
- Fall TNC newsletter is dedicated to the military; shoutout to SCP for the difference it has made in shaping the relationship between DOD and conservation
- Party for the Pine Saturday April 22 (Earth Day); still looking for partners to table: https://www.friendsofwewo.org/party-for-the-pine-2023
    - A woodpecker (pileated?) is making a cavity in the oldest longleaf—475 years old this year

Reserve Design (Sarah Hecocks):

- Seeking input on how this working group can be improved to better benefit the partnership.

➢ Geologic History of the Carolina Sandhills and Carolina Bays – *Dr. Chris Swezey, USGS*

- Chris is a research geologist for USGS in Reston, VA. He primarily conducts geologic mapping and have done extensive mapping of the Carolina Sandhills. He has a personal connection to the NC Sandhills as his grandfather was born in Moore county.
- Both the Carolina Sandhills and the Carolina Bays are interpreted as relict features from the time of the last glaciation when the southeastern United States became very cold, dry, and windy.
- A technique called luminescence dating (which indicates when quartz grains were last exposed to sunlight) has revealed that a lot of loose sand on the Atlantic Coastal Plain dates from the time of the last glaciation
    - LiDAR data (high-resolution topography) have revealed that much of this loose sand has the form of wind-blown dunes.
        - This loose sand includes low-relief parabolic dunes on the Delmarva Peninsula, fields of parabolic dunes in river valleys of the Atlantic Coastal Plain, the sand of the Carolina Sandhills, and sand rims associated with Carolina Bays.
        - These sands have yielded a wide range of luminescence ages (suggesting that the sands were mobilized episodically at any given site), but most of the luminescence ages coincide with the Last Glacial Maximum (~31.1-23.2 thousand years ago) and the Younger Dryas cold event (~12.8-11.5 thousand years ago).
    - In the Carolina Sandhills, the loose sand at the surface is mapped as the Pinehurst Formation, and is thought to have been derived by erosion of sands of the immediately underlying Cretaceous Middendorf Formation.
- The Carolina Bays are interpreted as relict thermokarst lakes (which are common today around Barrow, Alaska).
    - Thermokarst lakes form by the thawing of frozen ground, creating a depression that can be modified later by wind and water.
        - This interpretation suggests that frozen ground (permafrost) once extended as far south as the Carolina Bays.
- Much of this information can be found in recent peer-reviewed publications by Chris Swezey of the U.S. Geological Survey (publications available upon request: cswezey@usgs.gov).

- Sandhills Geology and Natural Communities – *Mike Schafale, NCNHP*
    - Mike has contributed an immense amount to our understanding of natural communities in the Sandhills; thank you, Mike!
    - Coastal Plain:
        - An eastward-thickening wedge of sediments, from 0 to 10,000 feet; covers older rocks. Marine and non-marine deposits included.
        - West edge is the Fall Zone (or line); east is the shoreline
        - Geologically, continues underwater eastward as the continental shelf
        - Late Mesozoic (Cretaceous)-Cenozoic sediments recording transgressions and regressions (sea-level rise and fall)
    - Geologic components of the Sandhills region:
        - Cretaceous coastal plain sediments –Middendorf formation- laid down in river deltas -- interbedded sand and clay -
        - Windblown (aeolian) sand dunes – Pinehurst formation - derived from underlying sediment – covered much of the landscape
        - Mainly erosional topography -- stream dissection with about 100 feet of relief

- Ecologically important soil characteristics of the Sandhills:
  - Drainage - driven by topography, water table, and texture
  - Texture – driven by geologic/geomorphic origin (coastal, aeolian, fluvial); affects moisture and nutrient availability
  - Soil horizons (old soils) – fragipans, plinthite
  - Organic matter accumulation – driven by wetness and hydrologic regime
- Sandhills community patterns:
  - Rolling relict dune field: Xeric Sandhill Scrub – longleaf pine, turkey oak, wiregrass
  - Side slopes with interbedded clay: Pine/Scrub Oak Sandhill – longleaf pine, turkey oak-blackjack oak, wiregrass-
  - Drainages fed by seepage: Streamhead Pocosin, Sandhill Streamhead Swamp, Canebrake, White Cedar, beaver ponds
  - Clay layers on side slopes: Sandhill Seep – savanna and bog plants on hillside
  - Shallow swales with finer texture sediment: Mesic Pine Savanna, Pine/Scrub Oak Sandhill (Mesic Transition Subtype), "Pea swales"
  - Deep dune swales: Small Depression Pond, Vernal Pool
  - Little River terraces: Mesic Pine Savanna (Little River Subtype) – odd mix of wet and dry species, *Amorpha georgiana*
  - Little River Bluffs: Cape Fear Valley Mixed Bluff Forest: Odd mix of wet and dry species, high shrub diversity