Director's Research Committee Meeting – May 9, 2017

ME Natural Areas Program Office, Williams Pavillion, ME State Offices, Augusta, ME

May 9, 2017 - 10:00 a.m.

Committee Member Attendees: Charlene Donahue, Cyndy Loftin, Kathleen Murray, Paula Work, Don Cameron, David Courtemanch, Shawn Haskell

Committee Member Absentees: Don Hudson, Richard Dearborn, Dykstra Eusden

BSP staff attendees: Jensen Bissell - Director, Eben Sypitkowski - Resource Manager, Georgia Manzo - Park Secretary

Meeting was called to order at 10:05 a.m by Jensen Bissell, followed by introductions. It has been two years since the last meeting of this committee. Bissell explained that Jean Hoekwater, Park Naturalist, had a slip and fall at the BSP headquarters fifteen months ago and has not yet been able to return to work. An interim naturalist will be hired in the coming days to cover responsibilities.

Research applications began coming in and quickly expanded to six. Each presenter will provide a brief description of the proposed project including the benefit(s)/impact(s) to Baxter State Park and will field questions. Bissell will review the information and committee recommendations.

(See applications for researchers' credentials and additional details of proposed research project.)

First presenters (by phone): **Caitlin McDonough MacKenzie and Jacquelyn Gill. Project Title: A Paleoecological Perspective on Subalpine and Alpine Vegetation in Maine**

Sediment cores will be taken from 1) center (pollen) and 2) edge (larger macrofossils) of Chimney Pond floor in winter to assess how vegetation on Katahdin has shifted in response to climate change.This is part of a larger project supported by the David H. Smith Fellowship and the Society for Conservation Biology.

- Katahdin is highest and largest alpine tract in Maine
- Steel barrel piston sampler used
- Will process, label, hike samples off mountain in PVC tubes.
    - May be buying new equipment. Equipment may be heavy. Consider packing samples up and BSP will bring them down later
- Timetable: one day set-up, two days coring, one day processing/labeling, one day for inclement weather. Cored in 1973 (Davis and Davis) for deglaciation of Katahdin. Chimney Pond is 5.3 meters in depth, sediment depth 383-391 centimeters. Showed 3,050 years ~90 years from the present
- Sargent Mountain cores taken in 1980 and 2007 but not for paleo-designation purposes. Same methods for this project - rafts tethered to the shore with wooden platform - ice collection
- Sediment chemistry and analysis, and collaboration with other research organizations are planned. McDonough MacKenzie said, "I'm excited to learn more about the coring process, and I know the importance of sharing the data across the ecological community."
- Insect fragments in the sediment cores often can be identified, and are a valuable research source for entomologists

- No visual impact and no long term impact to sediment have been recorded with this process.
    - Watch for rare plants and avoid trampling on them.
- Edge may not be the best place to take a sample. Look for natural place for it to occur, may be a modern or not modern pattern.
- Define “edge”. Seasonally, at Chimney Pond, the edge moves around. Choose area that is liquid year-round. Volume and area of liquid is much smaller in winter than summer. Window of opportunity with regard to ice thickness is narrow
- Two cores at edge and two in center recommended.
    - Second core can provide comparisons if first core reveals unusual findings
- Benefit to Park - Understanding past responses to climate change can help assess vulnerability of alpine plants to current climate change
- Blogs/Posting - Activities will be transparent
- Housing requested for three people for one week

McDonough MacKenzie is attending National Science Foundation Core Mini-Camp for two weeks of training, and is going into the Park on a scouting trip. It was suggested that she reach out to Timothy Cook (Worcester State University) and Noah Snyder (Boston College), both doing similar studies.

Second Presenters (in person)**: Leah Beck, MS Student, John Daigle, School of Forest Resources Professor, University of Maine. Project Title: Perceived Crowding, Preferences for Social and Resource Conditions, and Behavioral Choices of Visitors to Baxter State Park**

An on-site paper questionnaire (survey) of Park visitors will be developed and will be conducted on the Hunt Trailhead and an email questionnaire will be introduced to Long Distance A.T. hikers at Abol Bridge/Debsconeag Wilderness Area in order to determine visitor characteristics, preferences, factors that influence perceived crowding and determine what the hiker is employing to reduce this challenge. Project timeline is provided. Information gathered may illuminate the visitor experience as it relates to perceived crowding.

- Five to 15 minute survey
- 30 percent of AT hikers - 380 people needed to adequately represent
- Mid-late July to October for best representation
- Hiker
    - gets the survey,
    - is presented photos (various levels of congestion on the trail) in random order,
    - asked what they experienced, asked what they would like to experience
- Fast and slow hikers may experience crowding in a different way
- Standard methodology is that seeing numbers is more effective than asking numbers.
- Concerns expressed with regard to length of time to take the survey.
    - Provide short explanation of importance “the greater good”.
    - Incentives?
        - Maybe drawing for REI products
- Thru-hiker or not, where they came from and where they are going may impact their response
- Encouraged to work with Park for useful, accessible material for the public
- Working with many groups (MATC, Friends of Baxter et al)
- Recommended that information be shared at the Northeast Alpine Stewardship Gathering
- Science builds on science -

    - sharing information with hikers is important and may affect their philosophy next time they hike
- Demographics questions will include whether they are local or not
- Consider that the Park is becoming increasingly crowded, but for first-timers, that's their perception of normal
- AT hikers usually hike early, quickly and stay on the peak and wait for other AT Hikers.
    - Changes the experience at the peak and upsets other hikers
- Days of sampling will depend on how many come through each day.
    - Tentative plan - sample four days, then change the days next time regardless of weather
- Park will vet survey prior to its use.
- Human noise, night noise may be helpful information
- Lodging requested for one (1) researcher

Bissell stated that the deliverables/conclusions must be appropriate for the wilderness setting that is BSP. The Deeds of Trust are the Park's driving force. The Park protects habitats by limiting the number of people, using parking spots to help with that control. The A.T. Hiker group is being brought into those same parameters. Bissell also stated that the double file, side-by-side hiking depicted in the photos needs to be corrected to single file that is practiced on BSP trails to protect the various rare plant species.

Third Presenter (by phone): **Steven Albert, Assistant Director, The Institute for Bird Populations. Project Title: Sampling Hermit Thrush for The Bird Genoscape Project**

- UCLA is prime mover behind this project - mapping migratory pathways of 100 genuses of birds
    - Get the UCLA Permit
- Genoscape map shows genetically distinct pathways and the Institute is a good partner with a network of 400-500 bird mapping stations.
- Some regional populations of species have increased, some have crashed.
    - Taking regional approach to help those populations most in need
- Lure birds into nets by playing voice recordings of males, take measurements, collect as many central tail feathers as possible, draw blood samples (30 per population with room for additional analyses), release birds unharmed in 10-15 minutes.
- Space - a few meters per net
- Time of day - Sunrise to 11 a.m.,
- Time of year - June 29 - July 6, when migrators are gone and before they come back
- Thirty birds in five days,
    - If 30 birds are accomplished in two days, that is all that will be used
- Probably one half of quota from BSP and one half from David King - don't want to overly tax a given area
- Link breeding areas with winter areas
- Benefit to Park -
    - full annual cycle monitoring
    - Where is the decline occurring. Maybe in the Park, maybe in South America
- 10 microlitres of blood with high concentration, the rest into storage. Collaboration with others who may need it.
- No specific reason for BSP except that
    - eBird showed there was a high concentration of the Hermit Thrush, and
    - BSP was appealing as sole landowner of large area.

It was suggested that Albert contact Becky Holberten - University of Maine and Adrian Leopold - ME IF&W who have done behavioral studies and stress hormone studies. Brian Roth at the University of Maine CFRU can identify landowners

for this project. The SFMA is the obvious place for this if it is determined to be best among other landowners in region for hermit thrush population (see Brian Rolek's work).

Fourth Presenter (in person): **Cory Mosby, Furbearer and Small Mammal Biologist for ME IF&W. Project Title: Detecting Northern Bog Lemming using DNA from Small Mammal Fecal Pellets**

The Northern Bog Lemming is a small nondescript state threatened species similar to a vole and is rare in Maine, with only four locations statewide (two separate sites in BSP). They exist in high elevation sites but some were found in low elevation sites and were likely transient dispersing individuals but one of the Maine captures occurred in a low elevation site (Sweeney Pond) that does not have a high elevation site nearby. DNA from fecal pellets collected from small mammal runways in the field will be used to detect Northern bog lemmings.

- With sample droppings, the lemming does not have to be trapped/killed. Efficient.
- BSP has long-term persistence of this species - 100 years.
- Will detect and determine how high elevation affects their population
- Minimally invasive process - walk the runways, detect pellets, GPS the points.
- Baxter is heavily forested
    - Will do transect perpendicular to the trail - level areas and moist substrate (usually) and thick moss layers and thick forest cover
    - Eight sites across two elevation gradients. Four transects within each site. Transects 100 meters long, spaced 50 meters apart.
    - 15-20 pellets collected per transect
        - Spatial footprint may be greater if enough samples are not obtained in sites chosen but more transects than planned should not be necessary
- BSP preservation is likely why these animals are persisting in the State
- First detected in BSP last summer
- Recommended considering stable isotopes analysis (i.e. food habits)
- Some collected last year were not bog lemmings
    - second goal is other data collected (other small species).

Bissell mentioned that Traveler Mountain has similar habitats to Katahdin and the researcher was urged to remember that. It was mentioned that Connor Wood had some samples analyzed for a reasonable cost.

Fifth Presenter (in person): **Bryn Evans, PhD student, University of Maine - Orono. Developing Large-Scale Optimal Monitoring Protocols for Mesocarnivores**

Research will provide current data on occupancy and habitat relationships for carnivore species native to Maine and provide best management practices to monitor population trends, with the primary focus on American marten and fisher, with additional data on all usual ME winter species.

- Trail cameras will be used for the surveys (in all areas of the Park)
    - Dense cameras used (3 provides high detection probability - boosted to 60% chance)
    - Close spacing of cameras better for some species
- Sample both intensely harvested and unharvested habitat - how much of that landscape is impacting species
- Benefit to get multiple species data
- No traps or lethal devices used

- roads - will hike in 100 meters
- Impact to the Park - Beaver meat will be the lure, will hike with cameras and retrieve cameras and bait in two weeks or a little longer
    - Sample summer and winter but not tied to the same site as long as habitat is the same
    - Some sites need to be ongoing sites to sample on a regular basis
    - Will try to flag only at camera site if going back to retrieve

BSP will have accurate data of camera location. BSP advocates that researchers do a good job of hiding the cameras. No specific policies regarding bait in Park, just use of traps.

Sixth Presenter (by phone): **Timothy Cook, Worcester State University. Project Title: Quantifying the Impacts of Humans, Climate Change, and Extreme Floods on Erosion**

Using sediment cores, this study investigates the impacts of humans, climate change, and extreme floods on erosion. The South Branch Pond Watershed and the basic physical and chemical composition (whether matter is organic or inorganic material that gets washed in from streams, i.e. presence of nuclear weapons testing) is the focus. They will look at the change in mass of the sample before and after combustion, looking at the composition of material over time and how that changes. (Lead 210 is naturally occurring in organic material of the last 100 years).

- Part of a larger project looking at change in land use activity and climate change and resulting erosion
- Interest in BSP
    - Working in rugged, mountainous terrain
    - Watershed from top of mountain down
    - As compared to gentler terrain
- Significance to Park
    - Better understanding of hazards that impact the landscape
    - And impact to resources
        - Critical to habitat
        - Impacts downstream - water quality
- Two canoes for a stable working platform
- Has not considered winter cores - usually done in summer
    - Freezing of equipment, etc, easier with canoe
- Extend hollow tube to deepest part of lake (one or two <8’ sediment cores)
    - From both Upper and Lower South Branch Ponds
        - Tube of mud provides timeline of erosion over last 1,000 years
- If results are promising, return in a few years to get longer core
- Some in cold storage at Worcester State University
    - Send archive to geological repository at University of Michigan
- Quantifying human effects on erosion (i.e. Hiking)?
    - Not footprint, but if significant trail building resulting in erosion on trails, yes
- ME DEP permit obtained? Not yet

It was asked if the same hole would be utilized the second time. Cook responded that it makes it easier but isn’t necessary. Chose South Branch Ponds because in the preliminary work done in Vermont, they wanted to study 20+ lakes with an even distribution across the northeast, and limiting to sites being impacted by erosion. Wanted good geographic coverage and varying characteristics. It was suggested that other sites in northwestern Maine might be considered

including Little Kennebago Lake, Enchanted Pond, Chain of Ponds, and Baker Lake. Recommendation to speak with Linda Bacon, Lakes Unit at ME DEP for guidance (linda.c.bacon@maine.gov).

Other Discussion:

- Concerns about boring
    - Should take more than one edge sample
    - How well they correlate center to edge cores
    - Archiving samples
    - Not extensive coring for all the effort
    - Feasibility
    - Timing
        - Steve Norton, George Jacobson, John Cangelozi - could fill them in on difficulty
        - Bob Nelson, Colby College, has done these borings
        - And Ann Dieffenbacher-Krall, University of Maine

- For mesocarnivores study - get permit before starting if altering animal behavior
- Northern Bog Lemming study clearly beneficial to Park - especially with isotopes.
- Erosion study - maybe connect him with others and do the pilot project outside the park

Donahue ended the meeting stating that researchers from the USDA Forest Service have run traps for three summers (2014-16) to study the effects of the 2013 tornado on woodborer and bark beetle populations. Results will be forthcoming as it takes a long time to process samples and get them identified and then analyze the data.

The bycatch from the traps is being processed by David Bourque and Dana Michaud, volunteers with expertise in insect taxonomy and beetles in particular. They are processing the third year's samples while also finishing up ID's from the two earlier years on all the non-woodboring beetles and other taxons. From the first year's samples there were 4,000+ specimens of 357 identified beetle species. At least 25 were new to the State of Maine and 70 new to the Maine Forest Service collection. An additional 50 have not been identified yet and some may be new to science species. There are also old growth obligate species that are not often encountered. Dave and Dana do not keep track of their hours, Dave started to last year and said it was too scary but from what they say, it is probably equal to a full time job at during the winter months. They are also counting the number of specimens/species and when they are trapped. Lots of new information coming from a side-project!

Meeting adjourned at 2:10 p.m.

Respectfully submitted,

Georgia Manzo, Park Secretary