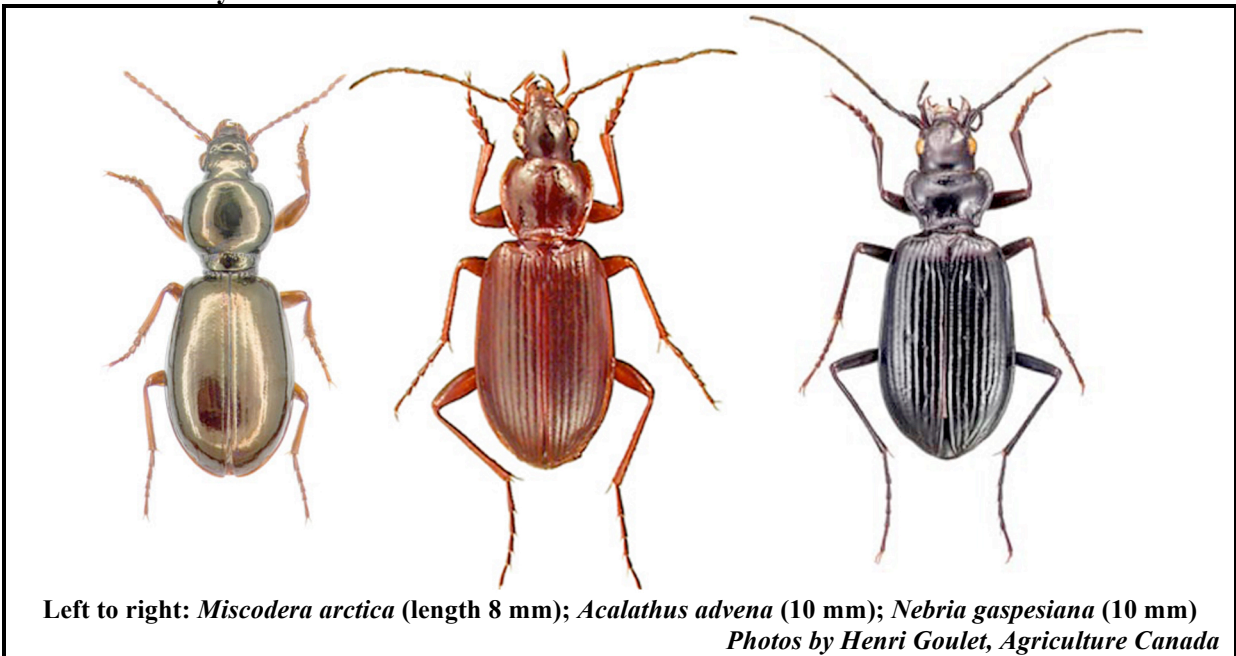




APPLICATION FOR SCIENTIFIC STUDY IN BAXTER STATE PARK

1. TITLE *Re-Evaluation of the Subalpine and Alpine Carabid Fauna of Baxter State Park*
2. NAME OF RESEARCHER: **Robert E. Nelson**
3. RESEARCHER'S CREDENTIALS: **Ph.D. (Quaternary Paleoecology), University of Washington; author or co-author of 14 peer-reviewed published articles on modern Coleoptera, including 6 on the Maine fauna; co-author of "The Ground Beetle Fauna (Coleoptera: Carabidae) of Maine" (book-length manuscript currently in final stages of evaluation by other coauthors prior to submission for publication)**
4. BENEFITS TO BE DERIVED FROM RESEARCH: **Much of what is known of the ground-beetle fauna of the alpine and subalpine zone of Katahdin is based on specimens collected 30 or more years in the past. Insects and other arthropods are responding most rapidly to global climatic change, but are often not seen by those more readily taken by megafauna – e.g., mammals and birds. The intent of this study is to provide an up-to-date assessment of the modern ground beetle fauna of this highly restricted environment within the Park, and to determine what, if any, species have been added or lost.**

Several species are of particular concern: *Acalathus advena* and *Miscodera arctica* were reported from Katahdin by Lindroth (1961-1968), but have not been collected since then, and it is not certain whether either Subarctic species is still to be found on Katahdin. Similarly, *Nebria nivalis gaspesiana* (now recognized as the distinct species *N. gaspesiana*) was only described in 1979 and was identified among specimens collected in the park in the early 1980s; however, it has apparently disappeared over its entire known former range, including Newfoundland where it was very common at one time. If it still remains on Katahdin or at other high-elevation sites in the Park, this would be the only surviving population known. Knowing whether or not the species is still to be found within the Park would obviously be invaluable information.



Other particular alpine/subalpine species that are of potential interest, and which would be sought, include *Carabus chamissonis*, *Pterostichus (Cryobius) pinquedineus*, *P. (C.) arctica* and *P. (C.) brevicornis*, *Pterostichus punctatissimus*, and *Notiophilus aquaticus* and/or *N. borealis*.

This project is being undertaken in planned coordination with similar efforts to be expended in the subalpine and alpine environment of Cadillac Mountain in Acadia National Park, in part in coordination with the July, 2013, Entomological BioBlitz at Acadia.

5. DETAILED DESCRIPTION OF RESEARCH: The plans for this research proposal are primarily for discreet hand-collecting in off-the-trail environments in the alpine and subalpine areas of the Park, although modest pitfall trapping may be employed in some areas, if approved by Park personnel. The goal will be to document the fauna while minimally impacting its composition or numbers. Unfortunately, collecting is necessary because microscopic identification is necessary to positively identify many taxa, particularly those of the subgenus *Cryobius*, which are notoriously difficult.

Specimens collected will be appropriately pinned, labeled with locality data, and identified to the lowest possible taxonomic level (species or subspecies); all specimens will be the property of the Park and will be deposited in whatever collection the Park deems appropriate – whether that be the Maine Forest Service collection in Augusta, or at Park headquarters in Millinocket. It would be hoped that should *N. gaspesiana* be encountered, one specimen could be collected in absolute alcohol and sent to the California Academy of Sciences for DNA analysis. This specimen would thus leave the state and not return.

Should Park authorities desire, I would be willing to assist in the establishment of an on-site insect specimen repository facility should one not already exist. An airtight 12-drawer Cornell insect cabinet, with appropriate pinning trays, would probably cost in the range of \$3500 and be adequate to house specimens from this survey as well as others.

Over the long-term, it is hoped that this survey would form the basis for the beginning of a major survey of the Carabid fauna of the entire Park, including lowland environments. However, it is recognized that any such continuation would require cooperative collaboration with Park authorities after the successful completion of this initial study.

6. AREA(S) OF THE PARK FOR THE RESEARCH: The study area is planned initially to include the Tablelands and other alpine environments, as well as subalpine areas around Chimney Pond and the North Basin Pond, and the summit area of South Turner Mountain. The margins of the cold waters of Avalanche Brook, Roaring Brook and South Branch Pond Brook would also be potential habitats for the *Nebria* which is hoped will still be found here. Advice from Park personnel as to additional promising collecting sites at high-elevation wet seeps (such as that which adjoins the Saddle Trail just below treeline) would be sought. The margins of Sandy Stream would also be sampled for comparisons to the more alpine faunas, but this would be of secondary importance and carried out only after the primary sites had been sampled.
7. IMPACT ON THE PARK: It is expected that impact on the park would be minimal, beyond the removal of the insect specimens. Materials that had been overturned in looking for specimens would be returned to their original positions; any holes dug to emplace pitfall traps would be filled and the traps removed. Every effort would be made while collecting is underway to ensure that the researcher remains out of sight of Park visitors, and that after collecting was completed that no visible trace of the activity remained.

8. **BUDGET: No funding is requested from BSPA for this project; outside funding sources will be approached, and adequate funding should be forthcoming for mileage, housing, meals, and equipment and supplies. No on-site housing in BSP facilities would be requested, inasmuch as the plan would be to exit the park on a daily basis and stay overnight in commercial facilities in either Millinocket or at Shin Pond, returning to resume collecting (or recover pitfall traps) as soon as park gates reopen in the morning.**
9. **TIMETABLE FOR RESEARCH AND COMPLETION OF APPLICATION: It is anticipated that all collecting and much preliminary sorting, pinning and identification would be completed by the end of August, 2013. A written report summarizing the study results should be completed by the end of the calendar year.**

(USE ADDITIONAL SHEET[S] IF NECESSARY).

DATE: **24 January, 2013**

REFERENCE:

Lindroth, C. H. 1961-68. The ground-beetles (Carabidae, excl. Cicindelinae) of Canada and Alaska, parts 1-6. *Opuscula Entomologica, Supplementa* 20, 24, 29, 33, 34, and 35; xlviii + 1192 p.