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Dear UCM Collections,

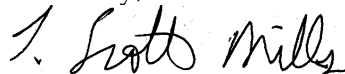
Please consider this request for my research assistant Kairsten Fay and our lab volunteer Dana Moore to visit your bird collections. This will be a key component of a major project to characterize the global distribution of winter color phenotypes for some 21 species that undergo seasonal coat color change (see Appendix 1 attached). We have shown using snowshoe hares that climate change will lead to compromised camouflage as animals molt to winter white and confront decreased snow duration (Mills et al. PNAS 2013, Zimova et al. Proc. R. Soc. B 2014). We have also found a fitness cost to mismatch, but also the possibility for adaptation via evolutionary rescue. With this project, we are seeking to describe globally the distribution of winter color molts (brown, white, and polymorphic zones with both brown and white winter color morphs). In particular, we are identifying zones of "Active Climate-Mediated Evolution" (ACME), where both brown and white color polymorphic zones persist in areas undergoing active natural selection due to climate change. We will connect these ACME zones to relevant covariates such as winter snowpack, elevation, latitude, continental vs maritime, etc. The outcome of this research would be a publication that I hope will guide future research into these areas of high interest for both evolutionary biology and for understanding the trajectory of adaptation to climate change.

We are accomplishing this project through literature review and examination of museum collections. At the museum, we would like to look at all specimens for species from Appendix 1 that were collected during potential winter molt months (because winter months varies globally we describe it liberally as Oct. 1 to July 1).

For each specimen, we have in place a data collection protocol. We would take a picture (no flash if necessary) and record coat color. We would record metadata including species, collection date and location, observer name, elevation, and sex and age (as available). The location of the sample within the collection would also be recorded in case we have to return for follow-up.

Please let me know if there are further questions. Thank you!

Sincerely,



L. Scott Mills

APPENDIX 1: LIST OF SPECIES THAT UNDERGO SEASONAL COAT COLOR CHANGE
(defined as from mostly brown in summer to nearly complete white in winter in at least some portions of range)

Leporidae

- Snowshoe hare (*Lepus americanus*)
- White-tailed jackrabbit (*Lepus townsendii*)
- Arctic hare (*Lepus arcticus*)
- Mountain hare (*Lepus timidus*)
- Japanese hare (*Lepus brachyrus*)

Muridae

- Collared lemming (*Dicrostonyx groenlandicus*)
- Arctic Lemming (*Dicrostonyx torquatus*)
- Ungava collared lemming (*Dicrostonyx hudsonius*)
- Richardson's collared lemming (*Dicrostonyx richardsoni*)
- Nelson's Collared Lemming (*Dicrostonyx nelsoni*)
- Ogilvie Mountains Collared Lemming (*Dicrostonyx nunatakensis*)
- Wrangel lemming (*Dicrostonyx vinogradovi*)
- Siberian hamsters (*Phodopus sungorus*) (=Djungarian hamsters)

Cervidae

- Possibly?: Peary caribou (*Rangifer tarandus pearyi*)

Mustelidae

- Stoat (*Mustela erminea*)
- Long-tailed weasel (*Mustela frenata*)
- Least weasel (*Mustela nivalis*)

Canidae

- Arctic fox (*Vulpes lagopus*)

BIRD DATASET: Family Tetraonidae

- Rock Ptarmigan (*Lagopus muta*)
- White-tailed Ptarmigan (*Lagopus leucura*)
- Willow Ptarmigan (*Lagopus lagopus*)