Please read and follow these instructions carefully.

- *Fill out every applicable field (fields will automatically expand as necessary).*
- *Sign and email the completed form to the Curator (Link Olson, link.olson@alaska.edu) and Collection Manager (Aren Gunderson, amgunderson@alaska.edu). If you are requesting frozen tissues, also copy the Genomic Resources Collection Manager Kyndall Hildebrandt (kbhildebrandt@alaska.edu)*
- *Review the conditions that apply to granted requests on our web page and be aware that compliance with these conditions will be considered when evaluating future requests from you, your advisor, or your lab PI.*

Date of request:2014-10-13

Your name: Jocelyn Colella

E-mail address:jcolella@unm.edu

Your current position (e.g., graduate student, faculty researcher, etc.): Graduate Student

Advisor's name (if student or postdoc): Joseph Cook

Institution (where research will be conducted): University of New Mexico

Street address (where loan will be sent): University of New Mexico
CERIA Bldg 83, Room 204
Albuquerque, NM 87131

Shipping is paid by the recipient. We ship via Fed-Ex only:

***Please list Fed-Ex account number to be charged here*:**8037 3695 0592

If other shipping arrangements are needed please enter details here:

Phone number (required for deliveries):512-567-9843

For destructive/consumptive requests (e.g., frozen tissues, samples for stable isotope analysis), please provide the name of the Principal Investigator whose lab will be used (if different from advisor):

Project title (to be made publicly available on UAM's collection database):

Stoat (Mustela erminea) diversity and phylogeography in Alaska's Alexander Archipelago: a genomic and morphometric approach

Brief summary of the proposed research. This should address the following:

1. **Objectives of the project**
2. **Complementarity of proposed research to previous or ongoing studies**
3. **Data to be obtained and methods of analysis**
4. **Feasibility and time frame**
5. **Qualifications of the investigator(s) to conduct the research**

Objectives:

1) Reanalyze the degree of morphological and genetic divergence between 20 ermine sub-species defined by E.R. Hall in 1944

2) Resolve the taxonomic status of ermine using genomic and morphometric data

3) Test for contact and hybridization among clades. Detail the extent and dynamics of contemporary and historical introgression. Translate these findings into an assessment of species limits.

Previous molecular research (Dawson et al. 2013, 2007; Fleming and Cook, 2002) indicates that ermine likely persisted through the last glacial maximum in isolated, un-glaciated pockets of coastal land leading to isolation and divergence. Glacial recession has led to massive range expansion and secondary contact between 4 morphologically and genetically distinct clades in southeast Alaska. Preliminary genetic data indicate that the endemic Mustela erminea haidarum (island-based ermine subspecies) may be a reclict population sufficiently divergent to warrant protection under the Endangered Species Act but futher characterization is necessary. Additionally, recent genomic work by my collaborator Dr. Charlotte Lindqvist at the University of Buffalo indicates that hybridization may be occuring along the northern extent of the Alexander Archipelago. Characterizing the extent of hybridization and introgression in this region will provide insight into the processes of diversification and speciation in the presence of gene flow, an understudied phenomenon in the animal world. A previous loan, including samples from UAM has already generated over 50 complete mitochondrial genomes and a suite of 10 nuclear markers for 96 individuals. This genomic data will be combined with geometric morphological findings from the skulls requested here, to more fully charactized diversity and phylogeography of ermine across the topographically complex and insular Alexander Archipelago.

I will be using a high-resolution camera in conjunction with Helicon Remote and Focus software to generate three dimensional images of each skull. Images will be collapsed into a single file and marked with 24 distinct landmarks. Eight of these landmarks will correspond to lateral measurements obtained by E.R. Hall in his original study of ermine morphology (1944). Additional measurements will provide more robust insight into morphological differences, allow for analyses of shape differences between subspecies and eliminate size as a confounding variable. I am conducting this research under the supervision of senior PhD student Bryan S. McLean, my advisor Dr. Joseph A. Cook and collaborators Dr. Charlotte Lindqvist and Dr. Sandra Talbot. This team of researchers has published on the diversification of multiple arctic systems, signatures of coastal refugia, morphometric analyses of rodents, and have used molecular data to detect hybridization. These top-level researchers have agreed to train me in the generation and analysis of molecular and morphological data and have the necessary equipment available to complete the proposed work.

Briefly explain your efforts to obtain material from other sources and why the requested UAM specimens are necessary for this project:

I have all tissue loans necessary to complete the genomic portion of this project through the acquisition of 2 loans from MSB and UAM. To test for the existence of Hall's pre-defined subspecies (1944) using expanded sample sizes, my study requires broad-scale sampling across the each sub-species' geographic range. This expansive sampling can only be achieved by securing loans from a variety of museums including UAM, MSB, and MVZ. Fortunately, active collecting from all of these repositories allows large-scale phylogenetic studies, like mine, to produce represenative samples capable of testing broad evolutionary questions.

Have you (or your current advisor/Lab PI) previously borrowed or used material from UAM's Mammal Collection? Yes☒ No☐

If you answered "yes":

Have all resulting publications, GenBank accession numbers, or other products been communicated to UAM? **Yes☒ No☐**

Were all UAM specimens included in any published study individually identified by UAM catalog number? **Yes☒ No☐ No resulting publications☐**

Please indicate how data you will obtain from UAM specimens will be made available to the scientific community (e.g., publications, GenBank accessions, MorphoBank submissions):

Publications in high-impact scientific journals (Target journals: Molecular Ecology and Genomic Biology and Evolution) - inlcuding supplemental materials, encorporation into my Masters Thesis, Sequences generated will be submitted to GenBank

If this is a request for destructive sampling (e.g., hair, bone, skin, or other material to be permanently removed from a specimen; does not apply to consumptive requests for frozen tissues), please describe the type and amount of material you are requesting and your experience and expertise in obtaining similar data from similar specimens or samples:

Source of funding for the proposed research (if applicable):

If NSF funds are being used for the proposed research, please provide:

***NSF project title:**

***NSF Award Number:**

***NSF abstract URL:**

**Because we rely on funding from the National Science Foundation to support our collections, we ask that you provide this information to further demonstrate and document NSF's support of collection development* and *use. Knowledge of other sources of funding for collections-based research is also helpful in our efforts to continue obtaining funds for supporting the collection and making specimens freely available to the scientific community.*

Material requested. For each specimen requested, please provide the UAM *catalog* number (do not use any other number), scientific name, and specimen part (e.g., frozen tissue sample; skin; skull; etc.). Tabular data downloaded from Arctos and edited in Excel or any word processor can be pasted directly into the field below. If you are not requesting a specific specimen (e.g., if you only need a tissue sample from a single representative of a particular taxon), please provide as much information on what you are requesting as possible.

UAM:Mamm:48734
UAM:Mamm:49986
UAM:Mamm:51441
UAM:Mamm:62579
UAM:Mamm:76193
UAM:Mamm:101868
UAM:Mamm:101972
UAM:Mamm:115824
UAM:Mamm:48742
UAM:Mamm:49488
UAM:Mamm:49493
UAM:Mamm:56100
UAM:Mamm:71987
UAM:Mamm:71988
UAM:Mamm:32766
UAM:Mamm:37099
UAM:Mamm:4385
UAM:Mamm:4596
UAM:Mamm:4756
UAM:Mamm:66486
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UAM:Mamm:93287
UAM:Mamm:99495
UAM:Mamm:14815
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UAM:Mamm:63080
UAM:Mamm:63101
UAM:Mamm:64253
UAM:Mamm:67072
UAM:Mamm:71490
UAM:Mamm:73575
UAM:Mamm:74555

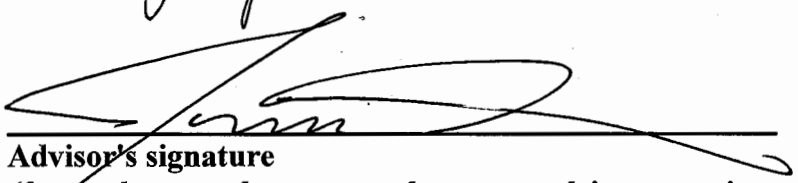
UAM:Mamm:83215
UAM:Mamm:83664
UAM:Mamm:83667
UAM:Mamm:80030
UAM:Mamm:80715

Signature

Advisor's signature
(for graduate students or postdocs, your advisor or major professor must cosign)

UAM:Mamm:83664
UAM:Mamm:83667
UAM:Mamm:80030
UAM:Mamm:80715

Signature



Advisor's signature
(for graduate students or postdocs, your advisor or major professor must cosign)