

Trappers Help Fill The Knowledge Gap In North American Red Fox History

By *Sophie Preckler-Quisquater*

In August, researchers from the Mammalian Ecology and Conservation Unit (MECU) at the University of California, Davis received 32 perfectly preserved red fox skin snips that were contributed by members of the Saskatchewan Trappers Association (STA) during the 2020-2021 trapping season. These samples represent the start of a broader effort by the MECU team in cooperation with local trappers across Canada to address some of the questions that remain unanswered in the complex evolutionary history of North American red foxes.



Wyatt Cragg holding a red fox

Red foxes are the most widely distributed terrestrial carnivore in the world. They likely originated in the Middle East and made their way to Alaska via the Bering Land Bridge roughly half a million years ago. Approximately 100 thousand years ago, red foxes spread southward and eventually split into two additional lineages (Eastern and Western) separated by the Great Plains. Then, about 50 thousand years ago, when the Bering land bridge again formed, more foxes from Asia colonized North America and were stranded in Alaska, separated from the first wave of colonists, which were south of the North American ice sheets in the USA and southeastern Canada.

While population expansions and contractions are natural over the course of evolutionary history, the distribution of red foxes in North America has also been muddled by human translocations over the past 250 years. European settlers introduced red foxes from

Great Britain to the mid-Atlantic coastal plain of the United States during the late 18th century where they began interbreeding with Eastern red foxes. Additionally, in the late 19th century, fur-farming originated on Prince Edward Island (PEI). The stock for these farms was sourced primarily from wild Eastern and Alaskan populations and they were selectively bred for preferred traits and pelage morphs. At the start of the 20th century, fur farms began popping up throughout North America and individuals from the farms on PEI were shipped throughout the continent. However, in the mid-1900s, fur farming began to lose favor and many red foxes were released or escaped and began interbreeding with wild populations. These human translocations have complicated the evolutionary history of red fox and made disentangling natural vs. anthropogenic expansions very challenging. But with a broader sampling of individuals across North America, specifically in the Northern Great Plains region and throughout Canada, researchers at the MECU believe they can begin to tease apart the different ways in which populations have been connected throughout North America across both space and time.

The MECU uses genetic tools to study and contribute to conservation efforts for a variety of mammalian wildlife populations across the world. Valuable information about these populations (both past and present) is contained in their DNA, which can be obtained from several types of biological samples including tissue, scat, and hair. The natural drying process that trappers use to preserve their skins is remarkably effective at preserving the DNA of the animals as well, and researchers only require a small skin snip, half the size

of a thumbnail, allowing trappers to maintain the pelt's integrity. Trappers also submit important information associated with each sample including the location, sex, and pelage type. In addition to last season's contribution from Saskatchewan, the MECU has collected hundreds of tissue samples, primarily from Eastern and Western populations. This season, the MECU has expanded outreach efforts and will be working again with the STA as well as trapping organizations in Alberta and Ontario. In future years they hope to continue filling in sampling gaps and collecting tissue from trappers across all Canadian provinces. There are many examples of successful collaborative efforts between scientific researchers and trappers. Communication is a huge part of maintaining buy-in from both parties and researchers at the MECU plan to continue to provide updates, both by sharing results and offering opportunities to answer any questions about the research as it progresses. If you would like information about how you can contribute to the sampling efforts this season, please reach out to the Saskatchewan Trappers Association or to the MECU research team.

Saskatchewan Trapper's Association
Phone: 306-796-7875
P.O. Box: 189, Central Butte, SK S0H0T0
www.saskatchewantrappers.com
sta@saskatchewantrappers.com

Sophie Preckler-Quisquater
PhD Student, Ecology
University of California, Davis
Mammalian Ecology and Conservation Unit
squisquater@ucdavis.edu



Stevi Vanderzwan, lab manager for the Mammalian Ecology and Conservation Unit extracts DNA from contributed fox specimens