

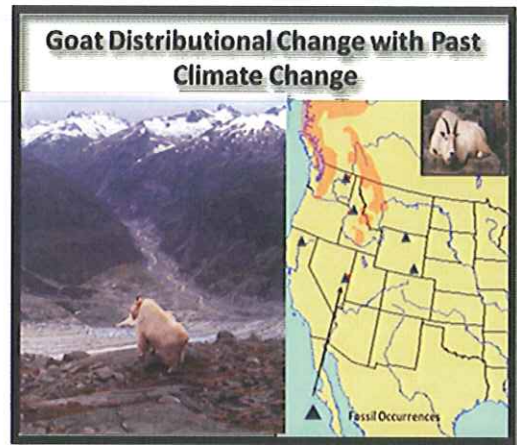
Project Title: Will Glacier National Park be a Refuge for Mountain Goats?

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Project Description:

Climate change and glacial recession are prominent features of the landscape in and around Glacier National Park. Mountain goats are revered icons of peaks and wilderness, yet they are also likely barometers of climate-sensitive species. The adjacent photo reflects how goat distribution has been retained northward during past climate epochs whereas southern habitats became unsuitable due to climate change.



Much remains unknown about goat biology including the extent to which the species persist as Glacier's glaciers continue recession. Given that goats along with all wildlife are protected by park and NPS enabling legislation, better information is urgently needed to understand how climate and other threats may affect goats.

Further, as habitat change and a preponderance of visitors rate wildlife viewing as an important park activity, it is germane to understand where and how future goats populations will be distributed. Many populations of mountain goats throughout the northwest are struggling, yet managers face difficulty in teasing out various competing hypotheses. As is fitting for a national park, one role of which is to act as a barometer for larger ecosystems they anchor, Glacier National Park is an ideal setting for focusing on climate-related hypotheses because confounding issues such as hunting and disturbance from snowmobiles are absent.

We propose to provide critical information to address the looming questions of how climate change will affect Glacier's goats. Specifically, we ask i) how glacier-and snowmelt-fed alpine meadow habitats – which are forecast to diminish in size and productivity with climate change – function as nutritional providers for goats during the short summer, ii) how the nutritive value of these meadows is affected by temperature and precipitation, iii) how assimilated nutrition of goats foraging on these meadows varies with climate variables, iv) how weight gains of nannies (adult females) and kids in turn reflects these dynamics, and v) how kid production and survival – and thus ultimately mountain goat population dynamics – respond to body mass. Our ultimate goal is to understand how these different drivers affect goat persistence. With a continuous series of data on vegetation, diets, body condition of goats, and their productivity, we will then model how future climate change will affect the abundance and distribution of Glacier's mountain goats.

To understand the links between future climate and Glacier's goats, we will need to follow individual, marked female goats for a number of years. Once captured, their use of habitat, production of kids, behavior, and even body condition dynamics can be monitored remotely. We will also make detailed measurements of alpine vegetation in randomly selected quadrat plots.

Budget: \$100,000/yr for a 3-year period