** Modeling Prey & Predator - Using Army Cutworm Moth Occurrence to Inform Grizzly Bear Foraging Suitability at Talus Slopes in Glacier National Park

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Army cutworm moths (ACM) migrate hundreds of kilometers from low elevation agriculturally dominated landscapes to aggregate in talus slopes of high elevation massifs along the Continental Divide from New Mexico into Canada. In certain mountain ranges of Montana, the moths' summer occurrence overlaps the domain of recovering grizzly bear populations. In Glacier National Park, the moths' nourishing ~70% fat and 25% protein summer body composition compels grizzly bears to ascend mountains to feast on moths by the thousands each day. Due to the difficulty in accessing and surveying this terrain, the habitat characteristics as well as the mountain locations where grizzly bears forage for ACMs in Glacier, is poorly understood. We implemented systematic ground and aerial surveys from 2019-2021 to 1) develop models describing the talus slope features for ACM occurrence in Glacier, and then 2) used a park-wide projection of the resultant ACM model as an input to better understand the relative suitability of grizzly bear foraging for ACMs across the park, using Maxent modelling. We show the habitat features predicting ACM occurrence drive grizzly bear foraging patterns. Further, while our models together indicate ACMs scantly occur at high elevations, our observations show a remarkable percentage of the park's grizzly bear population is attracted to these rugged locations across summer moths. Given the park's increasing annual visitation rates and their expanding demand for off-trail recreation, our findings will aid park land managers' ability to preserve these sensitive habitats for grizzly bears while maintaining appropriate human use.