Predator Recognition in Captive Tadjik Markhor (*Capra falconeri heptneri*): Implications for Reintroduction

One purpose of captive breeding programs for endangered species is the potential reestablishment of wild populations. However, behavioral problems resulting from relaxed selection or adaptation to captivity can lead to decreased predator recognition and increased mortality in reintroduced individuals. Predator training of prey animals can reduce this mortality, but a species must have some instinctual response to the signs of predators as a prerequisite for successful training. The Tadjik markhor (*Capra falconeri heptneri*) is one of the most endangered mammals in the world and may be reintroduced to portions of its former range in the future. We assessed the potential of captive Tadjik markhor to recognize signs from their natural predators using visual and olfactory cues, and compared their behavior to baseline levels and after exposure to novel but non-threatening cues. Mean percent time in vigilance behavior did not differ between predator and control cues, but both were higher than baseline (ANOVA; $P < 0.001$). However, markhor exhibited more alarm calls and ear flicks when faced with predator cues than when faced with control cues or during baseline observations (MRPP, $P < 0.001$). These results suggest that captive markhor have not entirely lost their ability to recognize threats from potential predators and may respond to pre-release training in the event of a reintroduction program that uses captive-raised individuals.

Keywords: Anti-predator behavior, Endangered Species, *Capra falconeri heptneri*, Predator Recognition, Reintroduction