

Biology Seminar

By: Dr. Cara Brook

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Population trajectories and pathogen persistence: Conservation biology meets disease ecology in Madagascar



Wednesday, February 05, 2020 | 12:00pm
HCK 132 Refreshments at 11:45am

Conservation biologists strive to understand the factors and processes underpinning the extirpation or extinction of threatened species in order to identify opportunities for intervention. Disease ecologists investigate many of these same principles with application to deciphering infection dynamics—though with an intervention goal typically focused on pathogen extinction rather than preservation. As both a conservation biologist and a disease ecologist, I apply mathematical models to longitudinal field data to decipher the mechanistic processes which underly both

wildlife population and associated pathogen persistence for threatened mammals on the island nation of Madagascar. Some 82% of non-marine vertebrates found in Madagascar are endemic, and approximately one-third of these vertebrates are listed as threatened on the IUCN Red List. I carried out population viability analyses of Malagasy mammals menaced by human hunting, including lemurs and Pteropodid fruit bats. I found that human hunting of these slow life history trait taxa is largely unsustainable in any form, though in a few cases, less severe rates of human exploitation or ‘faster’ life history parameters for certain species can overcome anthropogenic threats to safeguard population resilience. Bats, in particular, demonstrate uniquely slow—and thus, vulnerable—life histories for their body sizes, traits which are believed to support their unique roles as the tolerant reservoir hosts for several of the world's most virulent viral zoonoses, including Ebola and Marburg filoviruses and Hendra and Nipah henipaviruses. In a second, complementary arm of my research program, I lead a longitudinal field study tracking viral- and immuno-dynamics in wild Madagascar fruit bats, which are hosts for potentially zoonotic filo- and henipaviruses. I apply epidemiological models to field-derived data to elucidate the mechanisms by which these bats maintain virulent pathogens at small population sizes without exhibiting symptoms of clinical disease.

Seminar Speaker Host: Karen Petersen

