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Statement of Research Interests

I have always been fascinated by animal behavior and its implications for the distribution and survival of various species. As my career has progressed, I have found the application of behavioral and demographic information to the conservation and management of species increasingly interesting and exciting. Too often a species' behavioral requirements are not taken into account, but clearly, an understanding of these issues is necessary for effective conservation and management.

For my Ph.D. research, I explored the function of juvenile behavior in mammals. The function of early development is much debated. One school of thought contends that juvenile behavior serves as practice for adulthood; the other maintains that the behavior insures survival through an inherently dangerous period. I chose to tackle this problem by investigating the mother-infant bond. I studied how these two individuals work towards one common goal (offspring survival) to assess the function of development more completely than had been done before. I investigated how the mother-infant bond was characterized, maintained, and how it changed with foal age. Specifically, I used mother-infant communication as a tool to demonstrate parent-offspring conflict and maternal investment. I found that some behaviors and strategies most useful later in development are clear and consistent regardless of the survival challenges that foals may face. Others are much more varied and reflect idiosyncratic features of mother and infant responses to one another. This important distinction had not been demonstrated in more conventional studies. The behaviors of both mother and offspring have evolved a 'flexibility' which enables them to adapt to changing circumstances. They are not static, or 'prewritten' as would be expected if they evolved only to insure future benefits. Whatever its long-term consequences may be, the behavior of mother and offspring has evolved primarily to insure the infant's more immediate survival.

Upon finishing my doctoral degree, I chose to apply my skills to the conservation of endangered species. As project coordinator for the Zebras of Kenya Project for Earthwatch Institute, I studied the population dynamics and behavior of two closely related zebra species—the highly endangered Grevy's zebra and the more common Plains zebra. The focus of the research was to determine why Plains zebra flourish, while Grevy's consistently decline. Some important differences between the species are the physiological and behavioral requirements of females with young foals. Grevy's must remain near reliable watering sites to ensure ample milk production. This is not so of Plains zebra. As the number of Grevy's females with foals increases at a site, they will stay regardless of reduced vegetation levels, thereby decreasing foal survivorship. But my research showed that these females only use watering sites with high visibility, indicating that safety from predators is of utmost importance. This finding enabled the more effective management of critical water resources, thereby contributing to the species' survival.

While working in Kenya, I became increasingly interested in other conservation issues plaguing East Africa, particularly those with substantial impacts on the local people. As manager of the Carnivore Disease Project, I worked with a team of researchers and Ph.D. students to conserve several carnivore species in Serengeti National Park, Tanzania. We explored the infection dynamics of three viral diseases—rabies, canine distemper and canine parvovirus. Using veterinary, behavioral, and demographic techniques, we worked to identify 'hot spots' where there is a higher risk of disease transmission between wildlife and domestic dogs. This data will be used to improve the efficacy of domestic dog vaccination, and is essential to the control and eventual eradication of these infectious diseases from the Serengeti ecological region.

Cassandra Nuñez—Statement of Research Interests, page 2

At the request of the National Park Service and the Foundation for Shackleford Horses, Inc., I conducted a study to determine whether porcine zona pellucida (PZP) administration affects mare behavior on Shackleford Banks. PZP has been used ‘successfully’ on a number of wildlife species, including white-tailed deer, American black bear, tule elk, South African elephant, llamas, and alpacas. The first report on the use of PZP in feral and domestic horses was in 1989. Researchers have only begun to study the potential effects of the drug on the social structure and consequent viability of these animal populations. To date, no adverse effects of the drug have been found.

My work with the Shackleford horses showed that recipients of the vaccine change harem groups more often, consort with more males, and spend more time in the center of their respective harems than do mares not receiving the drug. These impacts have the potential to affect both the number and nature of relationships formed. Considering the degree and importance of sociality in equines, these effects on social dynamics can have severe consequences. This study was particularly relevant as it highlights the pitfalls of generalizing species responses to PZP from one population to another. Many of the decisions to contracept Shackleford horses, for example, were based on the ‘success’ of the drug with Assateague horses. Regardless of species and ecological similarities, there are many additional factors, such as demography, accessibility to resources, and seasonal fluctuations in behavior that should be considered before such managerial decisions are made.

I find the study of animal behavior and the application of that study to the conservation and management of species absolutely fascinating and important work. It is my goal to apply what I have already learned about collecting, analyzing, and interpreting behavioral data to such endeavors. The behavioral needs of species are just as important as their habitat and resource needs and must be studied and understood if conservation and management programs are to be effective.