



Botswana
Predator
Conservation
Trust

Executive Summary

BioBoundary Project

BPCT's BioBoundary project is a rare example of wildlife research and cutting edge biochemistry collaborating to solve a conservation problem. The problem is this: Endangered African wild dogs are territorial and use chemical scent marks to demarcate their territories. Fences, often used to separate wildlife areas from livestock grazing areas, are otherwise meaningless to most predators. However, these fences usually also demarcate where natural chemical boundaries of neighbours disappear for the resident wild dogs living near the fence. For these wild dogs, the other side of the fence represents available habitat. Therein lies the seeds of a perpetual problem.

The scent marks that the dogs use to demarcate their territories give off mixtures of hundreds of organic chemicals, at concentrations in the low parts per billion range. To analyze these complex mixtures, Dr Peter Apps, Director of the Paul G. Allen Family Foundation Laboratory for Wildlife Chemistry, has had to develop specialized methods to collect and process samples, and the hardware to enhance the performance of the gas chromatography and mass spectrometry that are the heart of this challenging lab work. Challenging or not, we believe if we could communicate with African wild dogs in their own chemical language, we could supply them with biologically relevant boundaries that discourage them from crossing into areas where they run into domestic livestock and intolerant farmers. The BioBoundary Project aims to crack the territorial communication system of African wild dogs by identifying the chemical components of scent marks which match the properties of territorial signals, and to create "virtual neighbours" for packs of wild dogs that have none by synthetically reproducing and distributing territorial scent marks.

So far, we have identified over 100 components contained in the odour of wild dog urine. Comparisons with urine scent marks from different dogs, or the same dogs at different times, or different places, have raised a host of new and exciting questions. Within a pack, the chemistry of scents from dominant and subdominant dogs differ significantly, but so too do the scents of dominant pairs from different packs. These findings raise two critical questions; whether subdominant marks are territorially active, and whether the territorial signal depends primarily on the differences between packs' scent marks, rather than on a universal "Keep Out" signal. Working out how all this chemical complexity relates to African wild dog territoriality will require intensive field study to be fully integrated with the investigations in the laboratory.