

Title: Some statistical models in ecology: home range, core areas and more.

Abstract: We study the problem of estimating the home range  $S$  of an animal from animal tracking data, an important problem in ecology. We first review briefly some of the more traditional methods reported in the bibliography. Our approach is based in modeling the movements of the animal as a trajectory of a diffusion process with reflections on the boundary of the set  $S$ . We introduce it via some real data examples. We start with the simplest model considering a reflected Brownian motion. Our approach allows us to find more flexible regions close to reality, as shown in some real data examples we provide. Next we consider a more general model in order to estimate the core area. Finally, we establish consistency and rates of convergence for some estimators of the home range  $S$ , its boundary and core areas.