

ON EDGE EFFECT IN PLANAR SAMPLING

E.B. Jensen and R. Sundberg

Department of Theoretical Statistics, Institute of Mathematics, University of Aarhus, Ny Munkegade, DK-8000 Aarhus C, Denmark and Institute of Mathematical Statistics, University of Stockholm, Box 6701, S-113 85 Stockholm, Sweden.

The estimation of the number of planar objects per unit area, N_A , by means of counting objects in a bounded planar region (sampling window) T is an important problem in planar sampling. Objects entirely contained in the region T are naturally counted while it is less obvious how to treat objects hitting the boundary (edge) of T . This edge effect problem may be handled in a number of ways; one way is to define a unique point on each object and count the object if its associated point lies in T (Miles, 1978). In this paper, we discuss the generalization of the associated point method obtained by associating m points to each object. An object with k associated points inside T is counted with weight k/m . If the objects are not negligible in extent compared to T , one may obtain a more precise estimate of N_A by using more than one associated point per object. The resulting increase in precision relative to $m = 1$ is investigated for different types of associated points, as a function of object size, in particular under the Poisson model and a hard-core model for the distribution of object centres in the plane.

REFERENCE

Miles, RE. The sampling, by quadrats, of planar aggregates. *J Microsc* 1978; 113: 257-67.