

V Meeting degli Utenti Italiani di GRASS  
- Geographic Resources Analysis Support System -  
Aula Magna della Facoltà di Ingegneria dell'Università degli Studi di Padova  
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## **A spatial predictive model of wild boar damages to agriculture**

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The damage caused by wildlife to agricultural production is one of the most important problems for wildlife management throughout Italy. Damages are refunded by Provincial Administrations, thus drawing resources from habitat improvement and other activities. In additions, farmers are generally dissatisfied by the refunding schemes, and conflicts with hunters result. Several species cause significant damage (e.g. starling, coypu, roe deer), but wild boars is by far the species responsible of the most frequent and quantitatively most important damage.

The present work was carried out for the Provincial Administration of Pisa. We aimed at developing a predictive model for the localization of areas with the greater risk of damage. This model will allow a better management of the environment and of the wild boar (e.g. intensifying preventive culling in sensitive areas).

Following farmers' complaints, for two year we surveyed every single occurrence of damage in the wildlife reserves of Pisa Province, attributing them to species, quantifying their agricultural and economical importance, and taking the coordinates of damaged fields by means of GPS.

Wild boar damage points were imported in GRASS as sites, and stored in a PostgreSQL database. We then calculated random sites to compare their distribution with that of damaged points. We converted sites to raster, then measured their distance to several potentially relevant habitat features (woodlands, roads, nature reserves, etc.).

The statistical program R was then utilized first to find whether damaged points were closer or farther away form linear and areal features. A correlation table allowed us to reduce multicollinearity among variables, selecting, among correlated ones, only the more biologically relevant ones. Only features that showed significant differences were retained and a logistic multivariate regression, with stepwise selection of variables, was run. The resulting equation was then recalculated for a grid superimposed on the entire Province, and a map showing the risk was produced.