

PARAMETER Biotic - Fungi - Rabbits

AIM To monitor broad changes in wild rabbit populations distribution and abundance

RATIONALE Wild rabbits (*Oryctolagus cuniculus*) are an essential keystone element of Mediterranean landscapes, the 'Montado' ecosystem included, and also an important game species (Delibes *et al.*, 2007). Rabbits are main prey for a large number of predators, some of them critically endangered such as the Iberian Lynx (Delibes *et al.*, 2000) or the Iberian Imperial Eagle (Sanchez *et al.*, 2008). The species is also a "landscape modeler" as rabbits have a considerable effect on plant composition and structure over large areas and therefore in the habitat quality and quantity of a number of species. Rabbits have declined massively in recent decades, mainly due to myxomatosis and viral hemorrhagic disease, and nowadays the species show an uneven distribution and density with many low-dense areas and fewer areas still containing rabbits at relatively high density (Cabezas-Diaz *et al.*, 2009). While being important to know whether rabbit numbers have changed appreciably, there are no practicable methods of making direct measures of their population size, and an index method based on dropping counts is therefore used to estimate relative abundance and detect population changes.

ECOSYSTEM SERVICES Food, Recreation, Cultural value

VARIABLE Abundance

KEYWORDS Rabbit, biodiversity, keystone species, game species, hunting

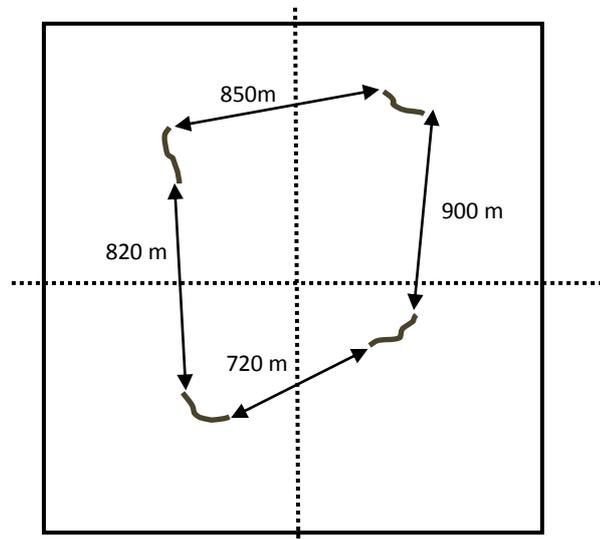
AUTHOR(S) Paula Gonçalves & Margarida Santos-Reis (mmreis@fc.ul.pt)

METHOD Latrine counting along foot-transects¹

Location A 2x2 km UTM grid is superimposed to the study area and, in each cell, four transects of 250m are designed covering the four quadrants. The distance between transects has to be lower than 1000m to ensure statistical significance of abundance estimates (INCOB, 2009).

Sampling Two weeks prior to sampling, all droppings and latrines found within 2 m of both sides of transects are cleared. At the time of sampling, transects are walked again and all the latrines (> 50 pellets in an area of 30 cm in diameter - Iborra & Lumaret, 1997) within the cleared stripe are counted. For each latrine, geographic coordinates, latrine size (number of dropping and diameter), shrub density and any other relevant information must be registered. In areas where hare and/or sheep are present, recorders must be able to confidently distinguish between rabbit, hare and sheep droppings.

Frequency and period Every year, preferably in the highest abundance peak corresponding to post-breeding period (May and June); if possible, a second sampling should occur in the lowest abundance period (late August or September) (Gonçalves *et al.*, 2002).



Adapted from: INCOB, 2009

Estimators Kilometric Abundance Index (KAI) = number of latrines / distance

¹ For practical reasons we propose using the methodology defined for wild rabbits quick assessments in the frame of the Iberian Lynx Action Plan (INCOB 2009).

REFERENCES

Cabezas-Díaz, S., Lozano, L. & Virgós, E., 2009. The declines of the wild rabbit (*Oryctolagus cuniculus*) and the Iberian lynx (*Lynx pardinus*) in Spain: redirecting conservation efforts. In: Aronoff, J.B (Ed.). Handbook of Nature Conservation. Nova Science Publishers, Inc. pp. 283- 310

Delibes, M., Rodríguez, A., Ferreras, P., 2000. "Action Plan for the conservation of the Iberian lynx (*Lynx pardinus*) in Europe" Available at: <https://wcd.coe.int/com.instranet.InstraServlet?command=com.instranet.CmdBlobGet&InstranetImage=1391875&SecMode=1&DocId=1459460&Usage=2>

Delibes, M., Redpath, S., Angulo, E., Ferreras, P., Villafuerte, R., 2007. Rabbits as a keystone species in southern Europe. *Biological Conservation*, 137, 149-156.

Gonçalves H., Alves P.C. & Rocha A., 2002. Seasonal variation in the reproductive activity of the wild rabbit (*Oryctolagus cuniculus algirus*) in a Mediterranean ecosystem. *Wildlife Research*, 29, 165-173.

Iborra, O. & Lumaret, J.P., 1997. Validity limits of the pellet group counts in wild rabbit (*Oryctolagus cuniculus*). *Mammalia* 61,205-218

INCOB, 2009. Projecto INCOB – Rede de monitorização de coelho-bravo. Metodologia e proposta de actuações. ICNF

Sánchez, B., González, L., Barov, B., 2008. Action plan for the Spanish Imperial Eagle *Aquila adalberti* in the European Union. Available at: http://ec.europa.eu/environment/nature/conservation/wildbirds/action_plans/docs/aquila_adalberti.pdf