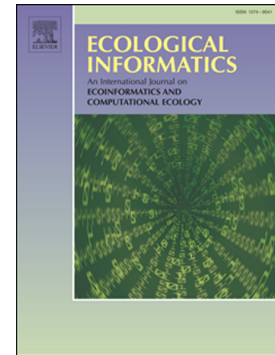


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(*Pueraria montana* var. *lobata*) at landscape scale

J.-P. Aurambout, A.G. Endress



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A model to simulate the spread and management cost of kudzu (*Pueraria montana var. lobata*) at landscape scale

J.-P. Aurambout* and A.G. Endress

Abstract

Invasive plant species are a global problem causing damaging ecologic and economic impacts valued in billions annually and requiring agencies and local governments to contain, eradicate, or otherwise manage them. The spread of invasive species is complex and involves spatially and temporally variable processes. The life history characteristics of invasive species are frequently poorly known. This makes the development of effective strategies problematic. Spatially explicit population models, offering a virtual platform to test the implications of life history hypotheses or alternative management strategies can therefore provide valuable and inexpensive support on which to base management decisions. However, two problems limit the use of such models in the actual management of invasive species: (1) field practitioners and management groups often lack the expertise (or funds) to develop their own models and (2) existing invasive species models are often too cryptic to be readily understood and modified by novices.

We present a model simulating the spread and population dynamics of kudzu and illustrate its potential through a case study application. The model, which could be adapted to fit the characteristics of other invasive plant species, couples species biology, dispersal and local management practices to generate local and regional scale outcomes that can be compared to identify those most effective given the level of available resources. This model could be further expanded, improved, and utilized as a medium through which the weed management, modeling, and decision-making communities could collaboratively increase the knowledge pool and effectiveness of their management decisions.

Keywords: Spatial modeling; kudzu; invasive species management; decision support system; NetLogo; Scenario analysis

* Corresponding author. Tel.: +39-338-1781394.

E-mail address: jpaurambout@hotmail.com (J.-P. Aurambout). The views expressed are the authors' and do not necessarily correspond to those of the European Commission.

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