

ACERA Project: 0704

1. **Project Title:** A method to simplify invasion models
2. **Theme:** Risk analysis
3. **Rationale:** The size and complexity of many dynamic models of agricultural and ecological systems are a major barrier to their results being accepted by managers. For example, disease and weed dispersal models work well at local scales where dynamics can be modeled at the scale of individuals. However, the size and complexity of these models they are too big to operate at landscape scales in reasonable computer time. Techniques for reducing complexity appear in the engineering literature. However, they are not readily applicable to ecosystem models because they often lead to aggregated variables that have no biological interpretation. This project will develop methods for model simplification that produce interpretable parameters and that provide an efficient platform for large-scale applications.

This project will support the development and application of methods for surveillance detection, and for spatial analysis of the potential habitat of invasive weeds and pests.

4. **Outputs:**
5. A report reviewing the techniques reducing model complexity, including guidelines for their application in ecological and biosecurity contexts
6. A case study that explains and provides examples of the methods and their strengths and weaknesses
7. **Time frame:** Commencing: *January, 2007* Finishing: *December, 2007*
8. **Project Leader(s):**

Title	Name	Organisation
Prof.	John Hearne	RMIT

9. Resources

	06/07	07/08	08/09
<i>Salaries and stipends</i>			
<i>Travel</i>			
<i>Operating and capital</i>			
Total	\$41,000	\$49,000	

10. End Users: ABARE, NRM, BRS