

Agricultural Research and Extension Network

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A community-university-GIS partnership for weed mapping

Community-based natural resource planning and management has become increasingly common in Australia, driven by environmental concerns, decentralisation and the concept that decisions on resources are often best made by people with local knowledge. However, local communities often lack the skills and resources to gain funding and other support to achieve their management objectives. Following the declaration in 2002 of the Wombat State Forest in Victoria as Australia's first 'community managed forest', various issue-based working groups were formed to deal with particular aspects of forest management. In late 2003, the Weed and Pest Animal Working Group (WPAWG) selected Blackwood as a priority area affected by weeds and pest animals that pose serious threats to biodiversity and to fire safety. The Blackwood community has been seeking assistance to eradicate major weeds for a decade, but has lacked an accurate and credible means of presenting this issue to authorities – so very little funding has been allocated by local or state government agencies. Hence, the WPAWG developed a joint project between the community and a university department, to develop accurate maps of weed distribution for use in a submission for funding for a weed management programme. The main weeds are gorse, broom and various thistles, all of European origin.

A process for collecting weed information and mapping was developed at community meetings in 2003 (see Box 1). After preliminary discussions and visits, a postgraduate student produced A3-size paper maps of the areas, showing topography, rivers and property boundaries. Community groups with good local knowledge used these maps to mark weed infestations, using a standard set of symbols and colours for different weed species and densities. Their hand-drawn weed maps (Figure 1a) were then converted to

digital format, and feedback sought from community members on accuracy and improvements needed. The final maps were overlaid on air-photography (Figure 1b). The process followed a simple participatory action research cycle, in that activities were planned, action taken (mapping) and then the group reflected on the results before taking further action.

The final maps produced were used by the community and WPAWG as hard evidence of the urgent need for weed eradication, in a submission for government funding for a Blackwood Weed management Strategy in 2004.

The community members, who spent considerable time learning weed names, walking the bush and mapping in difficult terrain and weather, seem very satisfied with the outcomes of the project and have requested future involvement of students and staff in similar projects. If many weed species are involved, sets of correctly identified plant specimens would be an essential requirement of this participatory process. The work could not have been achieved without the local knowledge of weed identification and locations, or without the involvement of students with sound skills in GIS and related technologies, particularly GPS.

The university-community partnership has helped to develop awareness among local communities of GIS technology, and among students and forest professionals about local knowledge and the extent of weed invasions. This study provides a practical example of the high potential to integrate GIS, local knowledge and participatory methods in community-based resource management, in both industrial and less developed regions.

Box 1 Steps in community-based weed mapping

Step 1. Meetings and walks with community members (discussion and observation of weed types and infested areas).

Step 2. Preparation of paper maps of each part of Blackwood /Barry's Reef area (using 1:8000 topographic maps showing property boundaries to guide users in locating points).

Step 3. Paper maps distributed to members in each area and symbols explained.

Step 4. Community members standardize on species identifications and on mapping symbols (community delegates different areas to different individuals).

Step 5. Community members map weeds in their areas and submit hand-drawn drafts to the researcher (assistance given with use of GPS to locate weeds in certain difficult areas).

Step 6. Weed information on hand-drawn maps digitized using ArcView GIS 3.2 to produce digital maps.

Step 7. GPS data downloaded to PC, converted to ArcView shape file and imported to ArcView GIS 3.2.

Step 8. Digital maps printed in appropriate sizes and scales and returned to community for checking.

Step 9. Maps of different areas were merged to produce combined database using Geo-processing tool available in ArcView GIS 3.2.



Figure 1 (a) Hand-drawn weed map prepared by community members. (b) GIS-based weed map overlaid on air photograph.

Further information

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