

# Rangeland Survey in Western Australia: An Evolving Process

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Rangeland surveys in Western Australia were commenced by the Commonwealth Scientific and Industrial Research Organisations (CSIRO) in the 1950s. In 1969, The Pastoral Board of Western Australia commissioned the first joint Department of Land Administration-Agriculture Western Australia rangeland survey in the Gascoyne River catchment (Wilcox and McKinnon 1972). Since then, these joint venture surveys have been progressively mapping Western Australia's rangelands until today, when over two thirds of the State's rangelands have been surveyed (Figure 1).

Rangeland surveys in Western Australia have traditionally focussed on assessing the capability of rangelands for a single land use, i.e. pastoralism, and in attempting to quantify the effects of this use on the soil and vegetation resources (Curry and Payne 1989).

The survey tradition in Western Australia has always had a strong basic environmental commitment; the first reports on the Gascoyne catchment (Wilcox and McKinnon 1972) and the West Kimberley (Payne et al. 1979) documented widespread rangeland degradation attributable to overgrazing. The authors of these reports were vilified by the local pastoral communities but stood by their findings. Rangeland survey was ready for, and concurred philosophically with, the environmentalism that became strongly established in the 1970s.

## Client Participation

The survey team adopted a new approach to its work following the ill feeling and suspicion generated by the early reports (Pringle 1991). The basis of the new approach has been to encourage clients to participate in rangeland surveys; to develop a sense of ownership of the products of each survey (Burnside and Pringle 1994). The utility of rangeland survey has increased substantially under this new approach in that clients actively seek survey information and at times express impatience when it is not available immediately.

The new approach initially involved holding consultative workshops with local pastoralists. At the workshops the survey program was discussed and pastoralists were encouraged to accompany the team when it covered their stations (Payne et al. 1982).

The level of pastoralist participation increased substantially during the survey of the north-eastern Goldfields survey (Pringle et al. 1994). In this survey, pastoral workshops on land capability were held by the survey team and Land Conservation District Committees (LCDCs).

The information gathered from pastoralists was subsequently used to develop suggested stocking rates for land systems and suggested carrying capacities for stations (Pringle et al. 1992, Pringle 1994).

## Nature Conservation

In the early 1980's, the survey program extended its focus to nature conservation issues. This made the survey program well-placed to operate within the context of ecologically sustainable development that emerged (in Australia) in the late 1980s. The survey team highlighted areas of relatively unmodified ecosystems with conserva-

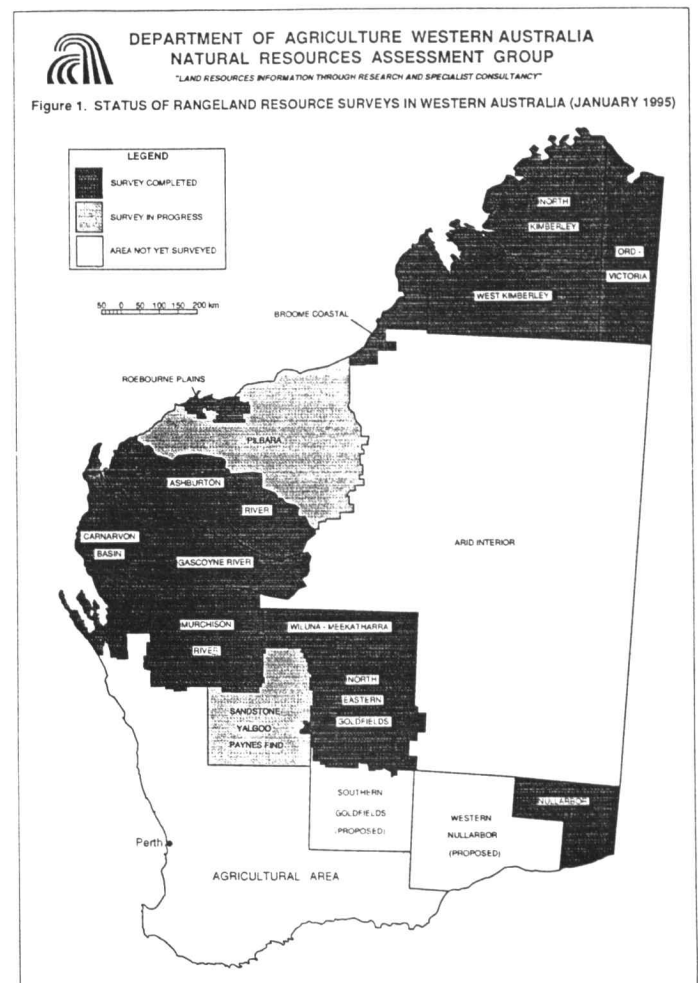


Fig. 1.

tion potential (Allison et al. 1990, Curry et al. 1994 and Blood 1995). These early sorties into nature conservation were expanded in the north-eastern Goldfields (Pringle et al. 1994). Here habitat types ('site types') were assessed for flora conservation status in terms of degree of reservation and threat from current land uses. Assessment of the degree of land use modification and reservation of broad land types was also made and suggestions for improved regional environmental management have been made (Pringle 1993, 1995).

In the arena of nature conservation, it is possible for biologists and biogeographers specialising in the management of biodiversity to use rangeland survey information to plan or review reserve networks and monitoring site distribution or develop threatened species or habitat management plans. Rangeland survey information is the most detailed broadscale biophysical resource inventory and ecological assessment conducted in Western Australian rangelands. Formal adoption of this information by conservation agencies would represent a long overdue initiative in inter-departmental cooperation in broad-based environmental management and land use planning.

### Multiple Land Use

The long term declining terms of trade in the pastoral wool industry (Stevens 1993) and the forthcoming changes to land tenure arrangements in the new Section 6 of the Land Act (1933) herald a time of potentially substantial change in the rangelands. This change may see the rapid expansion of multiple or alternative land uses within rangeland leases. Potential changes in land use have been accommodated within recent survey reports, with the emphasis on 'natural' resource assessment rather than 'pastoral' resource assessment (e.g. Pringle et al. 1994). These recent reports provide basic inventories and distributions of landforms, soils and plants and their interactions to produce distinctive site (habitat) types. The reports refer to pastoralism only in the context of past impacts on natural resources. Secondary interpretative reports (e.g. Pringle 1994), aimed specifically at stakeholders in the pastoral industry, deal with pastoral strengths, weaknesses and management of rangeland resources.

This approach serves two purposes. The primary technical report describing and assessing the natural resources is produced in a manner applicable to a wide range of potential resource uses. The interpretive pastoral document lacks the technical detail and is hence more accessible to the wide range of pastoral stakeholders; it is a user-friendly, single purpose document.

To ensure that as many as possible of the rangeland stakeholders' needs are met, future rangeland surveys will include client needs analysis using expert market analysts from outside the two host Departments. The RANGES project for the Pilbara survey aims to encourage stakeholder participation in the rangeland survey of the region within resource constraints of the Department of Land Administration and Agriculture Western Australia. It also aims to max-

imise the usefulness of data collected, analysed and made available to different client groups. For example, the method of resource condition assessment will be reviewed in recognition of a widening client base.

The client focus of reporting described above provides a workable framework for delivery of rangeland survey information to meet the challenges of the future (Figure 2). The survey program concentrates on natural resource description and assessment of land use impacts and hazards. A secondary step involves the use of this information in an in-

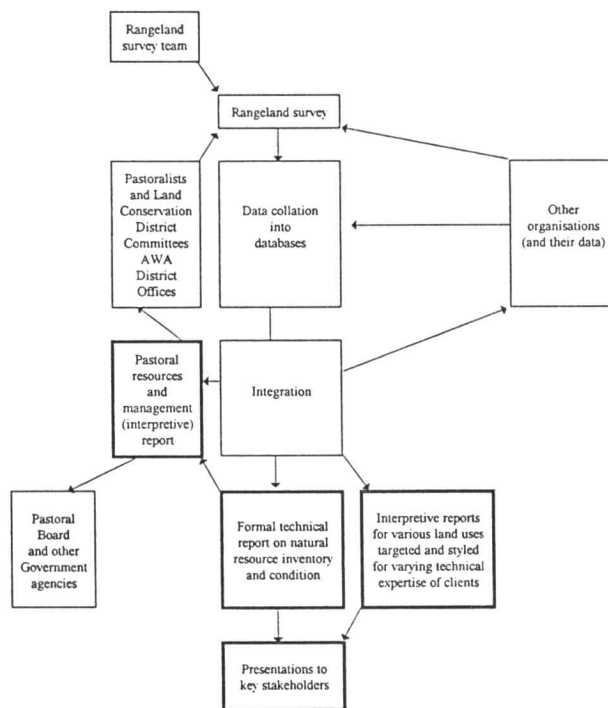


Fig. 2. The rangeland survey program in its wider rangeland management environment.

terpretive manner for a range of land uses. Quite clearly this secondary interpretation will at times be conducted by people outside the survey program and host agencies, as the range of stakeholders increases.

An excellent example of application of this two-step process is emerging in the rangeland horticultural industry. A pastoral diversification officer has requested information from the survey program to incorporate into an assessment of horticultural potential across Western Australia's Southern Pastoral Rangelands. Survey information at the scales of landscape/sub-catchment, land system, land unit and soil profile is required. Together with spatial information on climate (particularly frost regimes) and hydrogeology, an integrated assessment of horticultural potential will be made by the diversification officer in collaboration with horticulturalists, the survey team and the Geological Survey of Western Australia (Figure 3).

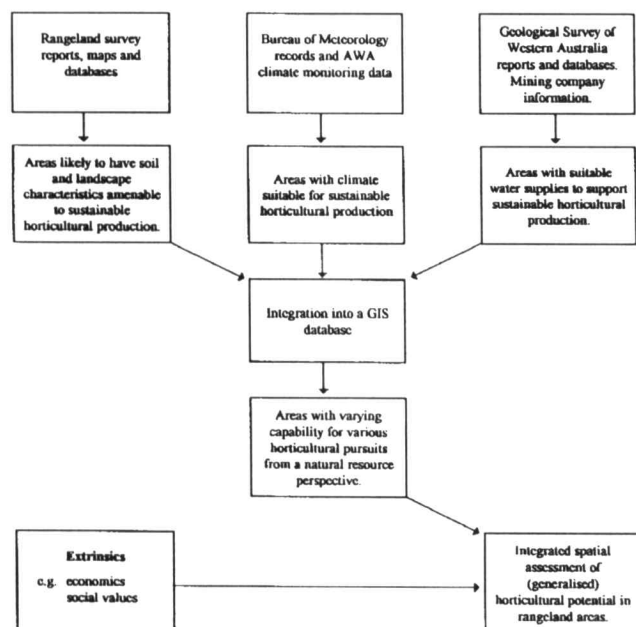


Fig. 3. Integrating sources of information to assess potential horticultural capability in Western Australia rangelands.

### Providing Timely Feedback

Another initiative being developed by the survey team regards reducing turn-around time for collected information to be made accessible for client use. Survey areas are usually very large (approximately 100,000 km<sup>2</sup> in the two most recent surveys and twice that size in the imminent Pilbara survey), and take about five to seven years from start to report publication. In the Pilbara survey, the area will be divided into biogeographic components (mostly related to geological domains and physiography), and it is planned to undertake interim reporting as each component or sub-region is covered. This will enable clients to commence reviews of management or land use planning prior to the release of the final report. This service has been available on an *ad hoc* basis in the past, but will now become a formal survey activity. It may prolong the time needed to conduct the survey, but will mean that once the survey team enters an area, information feedback is not far ahead.

### Adopting New Technology

The electronic mapping of survey information is an example of the survey team adopting new technologies to increase the efficiency and speed of rangeland surveys. Mapping has evolved from sets of hand-drafted black and white maps to fully integrated digital data on an interrogatable Geographic Information System (GIS). This evolution has not been without its stumbling blocks, but is providing more versatile data, quicker. Innovations such as automatic capture of location (using Geographical Positioning System technology) along traverse routes (at 1 km interval resource condition assessment points) and at sampling sites has re-

placed time consuming digitising of these data off aerial photographs at the end of the survey. This allows mapping to proceed more quickly and makes specific location information (such as mallee fowl sightings or declared rare flora collections for the Western Australian Museum and CALM) available immediately.

### Conclusion

Rangeland survey in Western Australia is an evolving process. It has progressed from a pastorally focussed program to a more resource-based process directed at a wider user base. The participants in the rangeland survey program have attempted to predict or respond in a timely manner to changing aspirations and values in the rangelands and technological advances to maintain or increase the relevance of our work. In this respect, the new clients we service are additions, rather than alternatives, to our traditional pastoral clients.

This article outlines how rangeland survey has evolved in a changing world; increasing efficiency, recognising new clients whilst maintaining commitment to traditional clients and formally addressing clients needs analysis.

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