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## Assessing resource condition in grazing lands : how do different indicators compare ?

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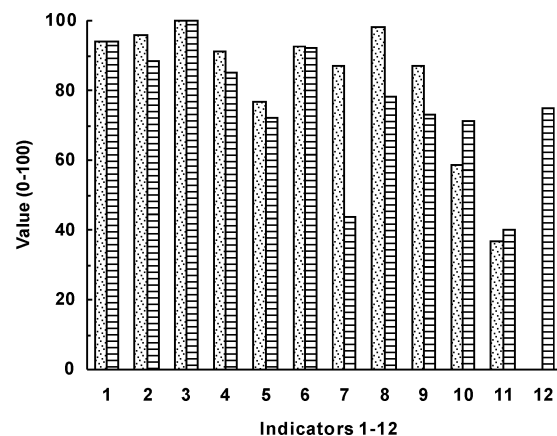
**Introduction** A widespread concern over declining resource condition of grazing lands throughout the world is leading to the need to be able to assess resource condition to both aid management decision-making , and allow producers to demonstrate the effectiveness of their land management . There are many possible indicators that can be used and many ways they can be applied . This paper illustrates the application of a number of indicators to small , commercially grazed catchments .

**Methods** Thirty catchments ( ~ 400-500 ha ) were selected in the Crows Nest region ( 27° 15' S , 152° 05' E ) of south-east Queensland . Grazing was the major land use in all catchments , although they had a variety of soils , native vegetation , pastures and extent of tree clearing . Assessments were made of 12 indicators ( Table 1 ) representing two components of resource condition ( ecosystem function and biodiversity conservation ) . Each indicator was expressed on a 0-100 scale , where 0= poor and 100= good condition . The methods are described in detail in MacLeod *et al.* ( 2004 ) .

**Results** The means and ranges of values of the 12 indicators over the 30 catchments are shown in Table 1 . For any one catchment , there were often large differences in the values of the individual indicators ( sometimes from 0 for one indicator to 100 for another ) showing that some aspects of condition were poor while other aspects were good . Levels of some indicators were good for all catchments ( e .g . salinity , soil surface , soil erosion ) , while others were poor in many catchments ( e .g . wildlife habitat , remnant vegetation ) . When the values of the 12 individual indicators were averaged to provide a single value for a catchment , there was much less variation in the values between catchments than there were for some individual indicators . Some catchments had similar overall values despite large differences for individual indicators as shown in Figure 1 for two catchments—both these catchments have the same overall value ( 76 ) , the same value for some indicators ( 1 , 3 ) , similar values for some ( 5 , 11 ) and widely different values for others ( 7 , 12 ) .

**Table 1** Range and mean values of 12 indicators of resource condition for 30 grazed catchments

Indicator/component	Min	Max	Mean
1 . Soil surface	78	100	90
2 . Soil erosion	79	99	91
3 . Salinity	100	100	100
4 . Pasture health	56	100	87
5 . Tree health ( upland )	54	95	76
6 . Tree health ( riparian )	56	97	89
7 . Weeds ( upland )	40	96	76
8 . Weeds ( riparian )	78	100	92
9 . Stream bank stability	63	95	84
10 . Stream bed stability	18	71	49
11 . Wildlife habitat	20	53	36
12 . Remnant vegetation	0	100	37
All	69	83	75



**Figure 1** Values of 12 individual indicators for two catchments .

**Discussion** The concept of a single aggregated indicator score to represent the overall resource condition of a catchment is attractive for making comparisons of catchments . However , such values may not reflect real differences between catchments . Combining values of indicators which vary independently results in overall values that vary little between catchments , and similar combined values may disguise large differences between catchments for individual indicators . Indicators are often used to meet multiple goals and a combination of an overall index ( for simple comparisons ) and individual indicator values ( for details of differences ) is more likely to be useful than either approach on its own .

### Reference

MacLeod , N .D . , McIvor , J .G . , McDonald , C .K . , Hodgkinson , J .J . , ( 2004 ) . Project CSE7 Report to Land & Water Aust .