Assessing Resource Condition in Grazing Lands: How Do Different Indicators Compare?

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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

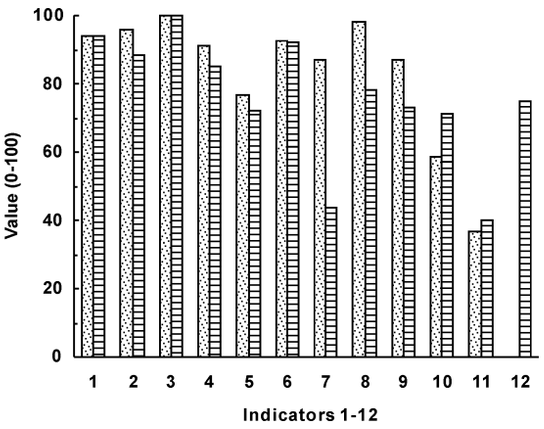

Figure 1 *Values of 12 individual indicators for two catchments .*

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 .