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Land management within capability: a new scheme to guide sustainable land management in New South Wales, Australia

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Supplementary Materials Part 1:

Land management survey for NSW MER program 2009

(reformatted from version in DECCW 2009)

Introduction
You have kindly allowed one or more soil condition monitoring sites to be placed on your property as part of the NSW Government's Monitoring, Evaluation and Reporting (MER) program for soil and land condition. This program, being administered by the Department of Environment and Climate Change (DECC), is aimed at reporting on the condition of the State's soil and land resources.

As part of the site monitoring process, it is important to collect detailed information on land management activities being conducted over the monitoring sites. This will allow for the interpretation of any observed changes in soil condition and more generally to understand the role of different land management activities in determining soil and land condition.

Release of Data
Data will be incorporated into the DECC Land Management Database, which will only be accessible to DECC staff. For reporting purposes, all results will be aggregated on a regional basis and no personal information will be released.

The Survey
Responses for up to two monitoring sites can be entered on a survey form. If you have more than two sites, please use an additional form. The survey has seven sections:

Section A: General (white); **Section B**: Land and Soil Management (white); **Section C**: Cropping (pink); **Section D**: Grazing (yellow); **Section E**: Horticulture and Viticulture (light blue); **Section F**: Forestry (buff); **Section G**: Wooded Area (light green) plus a page for final comments (white card).

You will only be asked to complete Sections A and B, plus those relevant to the land use of your site(s). Most questions involve either a multiple choice selection (please choose only one option per column) or entry of a single word or numerical value. Some involve entry of a very brief description. If a question is not relevant to your operation mark it NA (Not Applicable). Additional comments are invited on the final page.

Identifying Paddocks Containing Sites
Enclosed with this questionnaire are two copies of a satellite image of your property. These images show the location of the sites sampled. One copy is a complimentary copy for you to keep. On the other image, could you please mark in the boundary of the paddock containing the sites, and identify "Site 1" and "Site 2" (if applicable). Answers to the questionnaire will correspond to these paddocks. Please return this image along with the questionnaire.

Contact Us
If you have any questions in relation to the survey, please contact your DECC regional MER Officer:

Name:……..Telephone: ……...

Office use only			
CMA	SMU	Site 1 No.	Site 2 No.

SECTION A: GENERAL

Please fill in your contact details below.

Name	……
Property Name	……
Road Address	…… …… ……
Postal Address (if different to above)	…… ……
Telephone Number	……
Mobile Number	……
Email address	
Lot/DP	
Date Survey Completed	……

A1. What are the main farming activities undertaken over your whole property?

	primary	*2ndary*	*other*
Cropping (including vegetable and fodder crops)	☐	☐	☐
Grazing	☐	☐	☐
Horticulture (tree crops) or Viticulture	☐	☐	☐
Forestry	☐	☐	☐
Management for natural habitat	☐	☐	☐
Other *(please specify)*			
……..	☐	☐	☐

A2. Please provide the name (eg, river paddock, home paddock, etc) or a brief descriptor of the paddock containing the monitoring site (to assist in easy identification of each paddock)

Monitoring Site 1 (Area 1)	*Monitoring Site 2 (Area 2)*
……..	……

A3. What is the approximate size of the paddock containing the site? Please draw the paddock on the map/image supplied.

Site 1	*Site 2*
…….. hectares ☐ acres ☐	…… hectares ☐ acres ☐

A4. What activities are generally undertaken on the area containing the site?

	Site 1 primary	*Site 1 2ndary*	*Site 2 primary*	*Site 2 2ndary*
Cropping (including vegetable and fodder crops)	☐	☐	☐	☐
Grazing	☐	☐	☐	☐
Horticulture (tree crops) or viticulture	☐	☐	☐	☐
Forestry	☐	☐	☐	☐
Management for natural habitat	☐	☐	☐	☐
Other *(please specify)*				
……..	☐	☐	☐	☐

A5. For approximately how many years has the paddock containing the site been under the current management practices?

Site 1	*Site 2*
……	……

A6. Please briefly describe the history of the area (include major changes in land use or management practices, eg, approximate date when woodland cleared for pasture, first cropping and first irrigation and how long has the current rotation been in place)

Site 1	*Site 2*
……..... …. …… ……	……..…… …. …… ……

…… …… …… …….	…… ……. …… ……

A7. Please describe any unusual features that influence management of the paddock containing the site. For example rockiness may prevent cultivation in the upper ¼ of the paddock. Please draw the relevant section of the paddock on the map/image supplied.

Site 1	*Site 2*
…… …… …… …… …… …… …… ……	…… …….. …… … …… ….. …… …….

A8. a) Is management of the monitoring site paddock the same as management over other areas of the property with similar land use?

	Site 1	*Site 2*
Yes	☐	☐
No	☐	☐

b) If no, please briefly describe the differences.

Site 1	*Site 2*
…… …… …… ……	…… …… …… ……

A9. a) Is land use or management expected to change in the next 5 years? (eg, from set stocking to rotational grazing, or from multiple tillage to no till, reduced irrigation, etc).

	Site 1	*Site 2*
Yes	☐	☐
No	☐	☐

b) If yes, please give a brief description.

Site 1	*Site 2*
…… …… …… …… …… …… …… ……	…… ….. …… …. …… …….. …… ……

SECTION B: LAND AND SOIL MANAGEMENT

This section covers general land and soil management issues over the paddocks containing the monitor sites.

B1. How frequently is machinery kept to designated wheel-tracks on the paddock? (i.e.: 'controlled traffic')

	Site 1	*Site 2*
Never		
Rarely (less than 10% of time)	☐	☐
Sometimes (10-50% of time)	☐	☐
Frequently (51-90% of time)	☐	☐
Always (greater than 90% of time)	☐	☐

B2. How frequently do you **<u>avoid</u>** using vehicles and machinery on the paddock if the soil is wet?

	Site 1	*Site 2*
Never		
Rarely (less than 10% of time)	☐	☐
Sometimes (10-50% of time)	☐	☐
Frequently (51-90% of time)	☐	☐
Always (greater than 90% of time)	☐	☐

B3. Which of the following erosion or sediment control measures **are effective** on the area? (tick multiple boxes if required)

	Site 1	*Site 2*
Cultivation or tree planting all or mostly along the contour	☐	☐
Pasture cropping	☐	☐
Erosion control banks	☐	☐
Sediment traps and dams	☐	☐
Silt fencing	☐	☐
Gully reshaping	☐	☐
Windbreaks	☐	☐
Other *(please specify)*		
…….....	☐	☐
……..		

B4. a) Have you undertaken any soil tests on the paddock over the past five years?

	Site 1	*Site 2*
Yes	☐	☐
No	☐	☐

b) If so, please list them.

Site 1	*Site 2*
…….....	……...
….	.
……	……
…	…
…….....	…….
….	..
……	……
….	…

c) If so, would you be prepared to release them to DECC upon request?

	Site 1	*Site 2*
Yes	☐	☐
No	☐	☐

B5. a) What fertilisers (excluding lime, dolomite and gypsum but including organic fertilisers such as chicken litter, dairy effluent and biosolids) have been applied and what were typical application rates in recent years of "fair" conditions? Record over multiple years if necessary, e.g., 50kg/ha/2 yrs. Include NPK % if known. If no products were applied, please write "none" in first box.

Type	Site 1 application rate *(specify units)*	Site 2 application rate *(specify units)*
……..……	……..	:……
……..……	……..	…….
……..……	…….....	……...
……..……	……..……..	……..……..
……..……	……..……..	……..……..

Notes: (eg, if once off application only as in many forestry operations)

Site 1	*Site 2*
…….....	……...
……..	……..

b) How were fertiliser application rates determined?

	Site 1 primary	*Site 1 2ndary*	*Site 2 primary*	*Site 2 2ndary*
Landholder assessment	☐	☐	☐	☐
Manufacturer recommendation	☐	☐	☐	☐
Consultant recommendation	☐	☐	☐	☐
Government agronomist recommendation	☐	☐	☐	☐
Set rates	☐	☐	☐	☐
Soil tests	☐	☐	☐	☐
Other *(please specify)*				
……..	☐	☐	☐	☐

B6. a) What conditioners such as lime, dolomite and gypsum conditioners were applied and what were typical application rates in recent years of fair conditions? Record over multiple years if necessary, e.g., 2 tonnes/ha/2 yrs. If no products were applied, please write "none" in first box.

Type	Site 1 Application rate *(specify units)*	Site 2 Application rate *(specify units)*
……..……	…….....	……..……
……..……	…….....	……..……
……..……	…….....	……..……
……..……	…….....	……..……
……..……	…….....	……..……

Notes: (e.g., if once off application only).

Site 1	*Site 2*
…….....	…….....
……..……	……..……

b) How were conditioner application rates determined?

	Site 1 primary	*Site 1 2ndary*	*Site 2 primary*	*Site 2 2ndary*
Landholder assessment	☐	☐	☐	☐
Manufacturer recommendation	☐	☐	☐	☐
Consultant recommendation	☐	☐	☐	☐
Government agronomist recommendation	☐	☐	☐	☐
Set rates	☐	☐	☐	☐
Soil tests	☐	☐	☐	☐
Other *(please specify)*				
……..	☐	☐	☐	☐

B7. Is this paddock irrigated?

	Site 1	*Site 2*
Yes	☐	☐
No	☐	☐

If no, please go to B12

B8. Question removed

B9. What is the primary source of irrigation water for the paddock?

	Site 1	*Site 2*
River	☐	☐
Groundwater (eg, bore)	☐	☐
Farm dam	☐	☐
Canal	☐	☐
Other *(please specify)*		
……..	☐	☐

B10. a) What is the main method of irrigation used on the paddock?

	Site 1	*Site 2*
Pivot	☐	☐
Travelling	☐	☐
Hand shift piping	☐	☐
Mechanical shift piping	☐	☐
Furrow	☐	☐
Flood	☐	☐
Micro irrigation (including drip)	☐	☐
Other *(please specify)*		
……..	☐	☐

b) How are irrigation application rates determined?

	Site 1 primary	*Site 1 2ndary*	*Site 2 primary*	*Site 2 2ndary*
Landholder assessment	☐	☐	☐	☐
Professional recommendation	☐	☐	☐	☐
Set rates	☐	☐	☐	☐
Soil tests/monitoring (eg,soil water content)	☐	☐	☐	☐
Water balance calculations (e.g., Water Use Efficiency program)	☐	☐	☐	☐
Other *(please specify)*				
……..	☐	☐	☐	☐

B11. Please give the following water quality measurements for irrigation water used on the paddock, if known. Please specify units

Site 1		*Site 2*	
Salinity (EC)		Salinity (EC)	
Sodicity (SAR, sodium absorption ration)		Sodicity (SAR)	
Alkalinity (pH)		Alkalinity (pH)	
Other if known eg,Boron, N or P concentration ……..		Other if known eg Boron, N or P concentration ……..	

B12. Is salinity a problem on the paddock or elsewhere your property?

	Site 1	*Site 2*	*Elsewhere on your property*
Yes	☐	☐	☐
No	☐	☐	☐

B13. Is waterlogging a problem on the paddock or elsewhere on the property?.

	Site 1	*Site 2*	*Elsewhere on your property*
Yes	☐	☐	☐
No	☐	☐	☐

If there are no salinity or waterlogging issues on your property, please go to section C: Cropping.

B14. What is the cause of the salinity or waterlogging problems?

	Site 1	*Site 2*	*Elsewhere on your property*
Do not know	☐	☐	☐
Regionally rising watertables	☐	☐	☐
Locally rising watertables	☐	☐	☐
Irrigation water	☐	☐	☐
Poor drainage	☐	☐	☐
Other *(please specify)*			
……..	☐	☐	☐

B15. Which of the following measures have been taken to mitigate salinity or waterlogging on the paddock and/or elsewhere on the property (if applicable)?

	Site 1	*Site 2*	*Elsewhere on your property*
Salinity mitigation plan being implemented	☐	☐	☐
Stock exclusion	☐	☐	☐
Revegetation on saline paddocks	☐	☐	☐
Revegetation in potential recharge areas	☐	☐	☐
Engineering solutions (e.g., sub-surface or surface water drainage scheme))	☐	☐	☐
Increased use of deep rooted perennial pasture species to lower watertables	☐	☐	☐
Other *(please specify)*			
……..	☐	☐	☐

B16. Approximately what proportion of the <u>whole property</u> is covered with trees and shrubs (%)

	Site 1	*Site 2*
>25	☐	☐
15-25	☐	☐
5-15	☐	☐
1-5	☐	☐
<1	☐	☐

SECTION C: CROPPING

C1. Has the paddock been cropped (including vegetable and fodder crops) in the past 5 years?

	Site 1	*Site 2*
Yes	☐	☐
No	☐	☐

If no, go to Section D: Grazing.

C2. What is the average frequency of cropping on the paddock containing the site?

	Site 1	*Site 2*
More than 1 per year	☐	☐
1 per year	☐	☐
1 per 1-2 years	☐	☐
1 per 2-3 years	☐	☐
Less than 1 per 3 years	☐	☐

C3. To the **best of your memory**, please indicate the sequence of crop and pasture phases on the paddock over the past 10 years, e.g., 2012 – wheat, 2011 - pasture, 2010 – oats, etc.

Site 1	
Year	Crop or pasture phase
Current year	
1 year ago	
2 years ago	
3 years ago	
4 years ago	
5 years ago	
6 years ago	
7 years ago	
8 years ago	
9 years ago	

Site 2	
Year	Crop or pasture phase
Current year	
1 year ago	
2 years ago	
3 years ago	
4 years ago	
5 years ago	
6 years ago	
7 years ago	
8 years ago	
9 years ago	

C4. Please record typical approximate yields in recent years of "fair" conditions in table (b). Please specify if crops have "failed", "not been harvested" or were "grazed" (if fodder crops) in the yield column.

Site 1	
Crop	Approx yield/year in recent years with "fair" conditions *(specify units)*
……	……
……	……
……	……
……	……
……	……

Site 2	
Crop	Approx yield/year in recent years with *"fair" conditions (specify units)*
……	……
……	……
……	……
……	……
……	……

C5. If you grow hay, what has been the average number of cuts per year for the past 5 years?

Site 1	*Site 2*
……	……

C6. For what proportion of time is the paddock sown to annual legumes?

	Site 1	*Site 2*
None	☐	☐
<10% of time, ie < 6 months each 5 yrs	☐	☐
10-25% of time, ie, up to 6 months each 2 yrs	☐	☐
25-50% of time, ie, up to 6 months each year	☐	☐
>50% of time, ie, more than 6 months each year	☐	☐

C7. Which of the following cropping systems are typically used on the paddock?

	Site 1 primary	*Site 1 2ndary*	*Site 2 primary*	*Site 2 2ndary*
Rotational	☐	☐	☐	☐
Continuous	☐	☐	☐	☐
Opportunistic	☐	☐	☐	☐
Other *(please specify)*				
……..	☐	☐	☐	☐

C8. How are crops typically established on the paddock?

	Site 1	*Site 2*
Single crop	☐	☐
Undersown with pasture	☐	☐
Alternating strips of different crops and/or pasture	☐	☐
Intercropping two or more crop species	☐	☐
Other *(please specify)*		
……..	☐	☐

C9. On average, how many cultivations or tillages does the paddock receive prior to sowing?

Site 1: ☐☐ *Site 2:* ☐☐

C10. What equipment is commonly used to cultivate soil on the paddock?

	Site 1 primary	*Site 1 2ndary*	*Site 2 primary*	*Site 2 2ndary*
Did not cultivate	☐	☐	☐	☐
Mouldboard plough/ Rotary hoe	☐	☐	☐	☐
One way disc	☐	☐	☐	☐
Two way disc	☐	☐	☐	☐
Tined Implement (narrow spacing < 20cm)	☐	☐	☐	☐
Tined implement (wide spacing ≥ 20cm)	☐	☐	☐	☐
Other *(please specify)*				
……..	☐	☐	☐	☐

C11. How often, if at all, would you rip the paddock (in years)?

Site 1	*Site 2*
……	……

C12. How do you control weeds on the paddock prior to sowing?

	Site 1 primary	*Site 1 2ndary*	*Site 2 primary*	*Site 2 2ndary*
Did not control weeds	☐	☐	☐	☐
Soil cultivation	☐	☐	☐	☐
Burning	☐	☐	☐	☐
Herbicides	☐	☐	☐	☐
Grazing	☐	☐	☐	☐
Mechanical slashing	☐	☐	☐	☐
Other *(please specify)*				
……..	☐	☐	☐	☐

C13. What is the average number of days between first soil cultivation and sowing? (i.e.: the length of bare fallow)

Site 1	*Site 2*
……	……

C14. What equipment is commonly used to sow the crop(s)?

	Site 1 primary	*Site 1 2ndary*	*Site 2 primary*	*Site 2 2ndary*
Disc seeder	☐	☐	☐	☐
Tine (narrow point)	☐	☐	☐	☐
Tine (broad point)	☐	☐	☐	☐
Other *(please specify)*				
……	☐	☐	☐	☐

C15. What is the typical row spacing of crops?

Site 1	*Site 2*
……	……

C16. What percentage of the crop land's surface area is disturbed during sowing?

	Site 1	*Site 2*
Less than 5%	☐	☐
5-20%	☐	☐
20-50%	☐	☐
50-100%	☐	☐

C17. Following a crop harvest, how many weeks is the paddock typically rested for before being grazed (excluding stubble) or cropped again?

Site 1	*Site 2*
……	……

C18. What methods of stubble management are applied?

	Site 1 primary	*Site 1 2ndary*	*Site 2 primary*	*Site 2 2ndary*
Left intact	☐	☐	☐	☐
Left intact with chemical treatment of weeds	☐	☐	☐	☐
Slashed/Mulched	☐	☐	☐	☐
Removed by baling	☐	☐	☐	☐
Lightly grazed (partial removal, < 50%)	☐	☐	☐	☐
Heavily grazed (removal of majority)	☐	☐	☐	☐
Ploughed in	☐	☐	☐	☐
Cold burn	☐	☐	☐	☐
Hot burn	☐	☐	☐	☐
Other *(please specify)*				
……..	☐	☐	☐	☐

C19. Overall, what is the minimum ground cover you aim to maintain over most of the year (more than 90% of the time)? (*NB: If no target, circle "No target".*)

Site 1: ☐☐☐% *No target* *Site 2:* ☐☐☐% *No target*

SECTION D: GRAZING

D1. Have you grazed the paddock in the past 5 years?

	Site 1	*Site 2*
Yes	☐	☐
No	☐	☐

If no, go to Section E: Horticulture and Viticulture.

D2. What type(s) of stock are grazed on the paddock?

	Site 1 primary	*Site 1 2ndary*	*Site 2 primary*	*Site 2 2ndary*
Beef cattle	☐	☐	☐	☐
Dairy cattle	☐	☐	☐	☐
Sheep	☐	☐	☐	☐
Fat lambs	☐	☐	☐	☐
Horses	☐	☐	☐	☐
Other *(please specify)*				
……	☐	☐	☐	☐

D3. Over the past 12 months, approximately how many head of stock have been grazed on the paddock, and for how long? (ensure stock type is consistent with C2)

Site 1		
Type of stock	Number of stock	Days grazed on paddock

Site 2		
Type of stock	Number of stock	Days grazed on paddock

D4. Which grazing systems best describes paddock use over the past 12 months?

	Site 1 primary	*Site 1 2ndary*	*Site 2 primary*	*Site 2 2ndary*
Rotational grazing based on time (not cell)	☐	☐	☐	☐
Cell grazing (high intensity, short duration, small paddocks, often temporary fencing)	☐	☐	☐	☐
Set (continuous)	☐	☐	☐	☐
Rotational grazing based on pasture growth	☐	☐	☐	☐
Other *(please specify, eg,grazed as part of a forage cropping system)* ……...	☐	☐	☐	☐

D5. What is the average ground cover maintained in the paddock, in normal (fair) years? (*alternatively use tonnes per hectare)*

Site 1: ☐☐☐% ……..t/ha *Site 2:* ☐☐☐% ……..t/ha

D6. What is the average pasture height maintained in the paddock, in normal (fair) years?

Site 1	*Site 2*
…….cm	*……..cm*

D7. How frequently does pasture condition determine stocking rates on the paddock?

	Site 1	*Site 2*
Never	☐	☐
Rarely (less than 10% of time)	☐	☐
Sometimes (10-50% of time)	☐	☐
Frequently (51-90% of time)	☐	☐
Always (greater than 90% of time)	☐	☐

D8. a) Does ground cover determine total destocking of the paddock?

	Site 1	*Site 2*
Yes	☐	☐
No	☐	☐

b) If yes, at what percentage of ground cover is the paddock completely de-stocked?

Site 1: ☐☐☐% or …… ……..t/ha *Site 2:* ☐☐☐% or ……. …..t/ha

D9. How frequently is the paddock de-stocked if the soil is wet for extended periods (ie, several days)?

	Site 1	*Site 2*
Never	☐	☐
Rarely (less than 10% of time)	☐	☐
Sometimes (10-50% of time)	☐	☐
Frequently (51-90% of time)	☐	☐
Always (greater than 90% of time)	☐	☐

D10. How frequently is the paddock de-stocked during periods of grass seeding or bud formation of pasture?

	Site 1	*Site 2*
Never		
Rarely (less than 10% of time)	☐	☐
Sometimes (10-50% of time)	☐	☐
Frequently (51-90% of time)	☐	☐
Always (greater than 90% of time)	☐	☐

D11. Please list up to 5 of the main pasture species currently in the paddock

Site 1	*Site 2*
1……..	1……..
2……..	2……..
3……..	3……..
4……..	4……..
5……..	5……..

D12. Currently, what proportion (by area) of pasture species on the paddock are native?

Site 1	*Site 2*
☐☐☐% Native	☐☐☐% Native

D13. Currently, what proportion (by area) of pasture species on the paddock are perennial?

Site 1	*Site 2*
☐☐☐% Perennial	☐☐☐% Perennial

D14. How has pasture on the paddock been renovated over the past 5 years?

	Site 1 primary	*Site 1 2ndary*	*Site 2 primary*	*Site 2 2ndary*
Sowing with multiple cultivation	☐	☐	☐	☐
Direct drill seeding	☐	☐	☐	☐
Broadcast seeding	☐	☐	☐	☐
Renovation not required or natural regeneration	☐	☐	☐	☐
Not renovated (but may be desirable)	☐	☐	☐	☐
Other *(please specify)*				
……..	☐	☐	☐	☐

D15. If the paddock has been sown with pasture species, when did this last occur?

Site 1	*Site 2*

SECTION E: HORTICULTURE AND VITICULTURE

E1. Is the paddock containing the site used for horticulture (tree crops) or viticulture? (if vegetables are grown, refer to section C: Cropping)

	Site 1	*Site 2*
Yes	☐	☐
No	☐	☐

If no, go to Section F.

E2. Please record typical approximate yields in recent years with "fair" conditions in table (b). . Please specify if products have "failed", or "not been harvested" in the yield column.

Site 1	
Crop	Approx yield in recent years with "fair" conditions (specify units)
……	……
……	……
……	……
……	……
……	……

Site 2	
Crop	Approx yield in recent years with "fair" conditions (specify units)
……	……
……	……
……	……
……	……
……	……

E3. What is the predominant method of harvesting?

	Site 1	*Site 2*
Hand picked	☐	☐
Mechanical (vibration)	☐	☐
Other *(please specify)*		
……..	☐	☐

E4. What is the type of ground cover between rows?

	Site 1 primary	*Site 1 2ndary*	*Site 2 primary*	*Site 2 2ndary*
Sown pasture	☐	☐	☐	☐
Volunteer plants	☐	☐	☐	☐
Other crops	☐	☐	☐	☐
Bare soil	☐	☐	☐	☐
Mulch	☐	☐	☐	☐
Other *(please specify)*				
……..	☐	☐	☐	☐

E5. How is plant growth between rows controlled?

	Site 1 primary	*Site 1 2ndary*	*Site 2 primary*	*Site 2 2ndary*
Plant growth is not controlled	☐	☐	☐	☐
Soil cultivation	☐	☐	☐	☐
Herbicides	☐	☐	☐	☐
Grazing	☐	☐	☐	☐
Mowing/slashing	☐	☐	☐	☐
Other *(please specify)*				
……..	☐	☐	☐	☐

E6. What is the minimum percentage of ground cover you aim to maintain between rows?

	Site 1	*Site 2*
Less than 25%	☐	☐
25-50%	☐	☐
51-70%	☐	☐
Greater than 70%	☐	☐

SECTION F: COMMERCIAL FORESTRY

F1. Is the site being used for commercial forestry operations?

	Site 1	*Site 2*
Yes	☐	☐
No	☐	☐

If no, go to Section G

Please note if the site is primarily a windbreak, tree lot within a farm paddock, a mine site regeneration area, a natural forest maintained for non-commercial reasons or regrowth go to Section G.

F2. What is the predominant forest type?

	Site 1	*Site 2*
Exotic plantation	☐	☐
Native hardwood plantation	☐	☐
Native hardwood forest	☐	☐
Other *(please specify)*		
……..	☐	☐

F3. For plantations, in what year was the current rotation established?

Site 1	*Site 2*

F4. What was the method of ground preparation for the latest rotation of the forestry operation?

	Site 1 primary	*Site 2 2ndary*	*Site 2 primary*	*Site 2 2ndary*
Windrow and burning of residual vegetation	☐	☐	☐	☐
Rip and contour mound soil	☐	☐	☐	☐
Rip and rough stack residue	☐	☐	☐	☐
Rip only	☐	☐	☐	☐
Rip and burn residue	☐	☐	☐	☐
Burn residue only	☐	☐	☐	☐
Remove trash from area	☐	☐	☐	☐
Chip and mulch	☐	☐	☐	☐
None	☐	☐	☐	☐
Other *(please specify)*				
…….	☐	☐	☐	☐

F5. How is plant growth between trees controlled in the first few years after site preparation?

	Site 1 primary	*Site 1 2ndary*	*Site 2 primary*	*Site 2 2ndary*
Plant growth not controlled	☐	☐	☐	☐
Soil cultivation	☐	☐	☐	☐
Herbicides	☐	☐	☐	☐
Grazing	☐	☐	☐	☐
Mowing/slashing	☐	☐	☐	☐
Other *(please specify)*				
……..	☐	☐	☐	☐

F6. What is the current type of ground cover between trees?

	Site 1 primary	*Site 1 2ndary*	*Site 2 primary*	*Site 2 2ndary*
Sown pasture	☐	☐	☐	☐
Volunteer plants	☐	☐	☐	☐
Plant leaf litter/mulch	☐	☐	☐	☐
Bare soil	☐	☐	☐	☐
Other *(please specify)* …….....	☐	☐	☐	☐

F7. What is the normal ground cover percentage over the area?

	Site 1	*Site 2*
>70%	☐	☐
51-70%	☐	☐
25-50%	☐	☐
<25%	☐	☐

Note: for fertilizer and conditioner use, refer to Section B.

F8. What form of harvesting is practised?

	Site 1	*Site 2*
Thinning	☐	☐
Specify thinning type eg,1 row in 4 or selective	……	……
Selective logging of mature trees	☐	☐
Extensive logging in compartments or coups	☐	☐
Clear felling of compartments or coups	☐	☐
Other *(please specify)* ……	☐	☐

F9. What harvesting methods/equipment are used?

	Site 1 primary	*Site 1 2ndary*	*Site 2 primary*	*Site 2 2ndary*
Chain saw	☐	☐	☐	☐
Harvester	☐	☐	☐	☐
Forwarder/skidder	☐	☐	☐	☐
Snigged to log landing or dump	☐	☐	☐	☐
Other *(please specify)* ……	☐	☐	☐	☐

F10. What is the average width (m) between the edge of operations and the top of the drainage line bank?

Site 1	*Site 2*

F11. Do you have a harvest management plan in place?

	Site 1	*Site 2*
Yes	☐	☐
No	☐	☐

F12. Were the tracks designed by a forest/road engineer?

	Site 1	*Site 2*
Yes	☐	☐
No	☐	☐

F13. Are rollover banks (eg, water bars or “whoa boys”) and other water erosion control management items in place as recommended?

	Site 1	*Site 2*
Yes	☐	☐
No	☐	☐

F14. What is the maximum spacing of rollover banks (m)?

Site 1	*Site 2*

F15. What proportion of the total ground surface area is disturbed by heavy vehicle and equipment use during harvesting operations, (including log dumps, roads and tracks)?

Site 1: ☐☐☐% *Site 2:* ☐☐☐%

F16. a) Is the area being grazed by livestock?

	Site 1	*Site 2*
Yes	☐	☐
No	☐	☐

If no, go to F17

b) If yes, for what purpose?

	Site 1	*Site 2*
Uncontrolled access	☐	☐
Light supplementary feed	☐	☐
Stock shelter	☐	☐
Fire hazard reduction	☐	☐
Reduce competition for tree seedlings	☐	☐
Other *(please specify)*		
……	☐	☐

c) Does the factor of ground cover influence destocking of the site?

	Site 1	*Site 2*
Yes	☐	☐
No	☐	☐

d) If yes, at what percentage of grass cover is the site de-stocked?

Site 1: ☐☐☐% *Site 2:* ☐☐☐%

e) Extent of stock exclusion during plantation rotation?

	Site 1	*Site 2*
No stock exclusion	☐	☐
During plant establishment (1 to 3 years)	☐	☐
Duration of rotation	☐	☐
Other *(please specify)*		
	☐	☐

F17. Is there significant grazing or disturbance by native wildlife (kangaroos, etc) and or feral animals (rabbits, pigs, etc), to the extent of significantly impacting on ground cover?

	Site 1	*Site 2*
Yes	☐	☐
No	☐	☐

F18. a) When was the last wild fire through the area (year)?

Site 1	*Site 2*

b) When was the last controlled burn?

Site 1	*Site 2*

Note: other questions of relevance to forestry are in Section B: Land and Soil Management (B2, 3, 5, 6)

SECTION G: WOODED AREA

This refers to areas with extensive tree and/or shrub cover with generally low intensity use, but not commercial forests. They may be managed entirely as natural habitat with full exclusion of stock or they may be accessible to stock for shelter or camps, but contain little formal pasture.

G1. Does the monitoring area belong in this category?

	Site 1	*Site 2*
Yes	☐	☐
No	☐	☐

If no, go to final comments at the end of the survey.
If yes, but is managed for: Pasture for formal grazing purposes (ie, more than stock shelter) please return to Section D: Grazing;
Forestry purposes, please return to Section F: Commercial Forestry

G2. Which of the following best describes the native vegetation of this area?

	Site 1	*Site 2*
Natural remnant	☐	☐
Revegetated	☐	☐
Regrowth	☐	☐
Mixture	☐	☐
Other *(please specify)*		
……..	☐	☐

G3. What is this land used for?

	Site 1 primary	*Site 1 2ndary*	*Site 1 other*	*Site 2 primary*	*Site 2 2ndary*	*Site 2 other*
Maintaining biodiversity	☐	☐	☐	☐	☐	☐
Stock shelter	☐	☐	☐	☐	☐	☐
Windbreak	☐	☐	☐	☐	☐	☐
Salinity control	☐	☐	☐	☐	☐	☐
Timber for farm use	☐	☐	☐	☐	☐	☐
Aesthetic	☐	☐	☐	☐	☐	☐
Restoration of disturbed site (eg, mined areas)	☐	☐	☐	☐	☐	☐
Unused / no purpose	☐	☐	☐	☐	☐	☐
Other *(please specify)*	☐	☐	☐	☐	☐	☐
……..						

G4. Is the area fenced? If no, go to G7

	Site 1	*Site 2*
Yes	☐	☐
No	☐	☐

G5. How effective is exclusion of livestock and feral animals from the area (by fencing)?

	Site 1	*Site 2*
No exclusion	☐	☐
Partial exclusion	☐	☐
Total exclusion	☐	☐

G6. How frequently are fences inspected and maintained?

	Site 1	*Site 2*
More than once per year	☐	☐
Once per 1 to 2 years	☐	☐
Less than once per 2 years	☐	☐

G7. If the area has been planted, in which year(s) did this occur?

Site 1	*Site 2*

G8. a) Do you allow grazing on the area for specific purposes?

	Site 1	*Site 2*
Yes	☐	☐
No	☐	☐

If no, go to G9

b) If yes, for what purpose?

	Site 1	*Site 2*
Light supplementary feed	☐	☐
Stock shelter	☐	☐
Fire hazard reduction	☐	☐
Other *(please specify)*		
……	☐	☐

c) Does ground cover determine destocking of the area?

	Site 1	*Site 2*
Yes	☐	☐
No	☐	☐

d) If yes, at what percentage of ground cover is the area de-stocked?

Site 1: ☐☐☐% *Site 2:* ☐☐☐%

G9. a) Is there significant grazing or disturbance by native wildlife (kangaroos, etc), or feral animals (rabbits, pigs, etc) to the extent of significantly impacting on ground cover?

	Site 1	*Site 2*
Yes	☐	☐
No	☐	☐

b) If yes, what are the main animals?

Site 1	*Site 2*

G10. What is the normal ground cover percentage over the area?

	Site 1	*Site 2*
>70%	☐	☐
51-70%	☐	☐
25-50%	☐	☐
<25%	☐	☐

G11. a) When was the last wild fire through the area?

Site 1	*Site 2*

b) When was the last controlled burn?

Site 1	*Site 2*

FINAL COMMENTS

Do you have any further comments relating to management or condition of the area containing the site?
(e.g., impacts from recent bushfires or locust, grasshopper or other insect plagues; any innovative practices that are unusual for your type of land use)

……
……
……
……
……
……
……

Do you have any comments relating to this survey or the MER program?

……
……
……
……
……
……
……

Thankyou for your contribution.

If survey has not been collected by a field team member, please return to:
MER Monitoring Team
Address …

Supplementary Materials Part 2:

Management practices appropriate for each land and soil capability (LSC) class for each hazard (first approximation)

Table SM2-1: Management practices and allowable land and soil capability classes for water erosion (first approximation)

Land use	Impact	Allowable LSC classes[1]	Land management actions
Cropping	Very high	Class 1	>2 crops per year Very long fallow (>3 months) Multiple tillage (4 or more passes) Stubble – hot burn, heavy grazing, ploughed in Cultivation equipment – very high disturbance (e.g. rotary hoe)
	High	Classes 1– 2	2 crops per year Long fallow (1–3 months) Multiple tillage (2–3 passes) Stubble – cold burn, light grazing, baled Cultivation equipment – high disturbance (e.g. one-way disc)
	Moderate	Classes 1–3	1 crop per year Short to moderate length fallow (1– 28 days) Single tillage (1 pass) Stubble – left intact, killed with chemicals Cultivation equipment – moderate disturbance (e.g. two-way disc, narrow or wide-spaced tine) Moderate erosion controls (e.g. contour banks, cultivation along contour)
	Low	Classes 1–4	1 crop per 2–4 years No fallow (<1 day) No tillage Stubble – slashed, mulched High erosion controls (e.g. pasture cropping)
	Very low	Classes 1–5	1 crop per 5 or more years (fodder or pasture establishment) Other actions as for Low impact
Grazing	High	Classes 1–4	Moderate ground cover (50–60% average, significant periods with low cover) Perennial or annual grasses No erosion controls
	Moderate	Classes 1–5	Moderate ground cover (60–70% average, minor periods with low cover) Predominantly perennial grasses Moderate erosion controls (e.g. occasional control banks)
	Low	Classes 1–6	High ground cover (>70% average, no periods with low cover) All perennial grasses High erosion controls (e.g. frequent control banks)
Horticulture	High	Classes 1–3	Low ground cover between rows (<50%) Tillage between rows Erosion controls
	Moderate	Classes 1–4	Moderate ground cover between rows (50–70%) Tillage between rows Erosion controls
	Low	Classes 1–5	High ground cover between rows (>70%) Tillage between rows Erosion controls
Forestry	High	Classes 1–5	Woody vegetation and ground cover – average cover 60–70% High ground disturbance by vehicles and equipment
	Moderate	Classes 1–6	Woody vegetation and ground cover – average cover 70–80% Moderate ground disturbance by vehicles and equipment
	Low	Classes 1–7	Woody vegetation and ground cover – average cover >80% Low ground disturbance by vehicles and equipment

[1] Highest value represents the Upper sustainable LSC class

Table SM2-2: Management practices and allowable land and soil capability classes for wind erosion (first approximation)

Land use	Impact	Allowable LSC classes	Land management actions
Cropping	Very high	Class 1	Low ground cover (<30% average)
			Very long fallow (>3 months)
			Multiple tillage (4 or more passes)
			Stubble – hot burn, heavy grazing, ploughed in
			Cultivation equipment – very high disturbance (e.g. rotary hoe)
	High	Classes 1– 2	Low–moderate ground cover (30–50% average)
			Long fallow (1–3 months)
			Multiple tillage (2–3 passes)
			Stubble – cold burn, light grazing, baled
			Cultivation equipment – high disturbance (e.g. one-way disc)
			Poor or no effective wind breaks
	Moderate	Classes 1–3	Moderate ground cover (50–70% average)
			Short to moderate length fallow (1– 28 days)
			Single tillage (1 pass)
			Stubble – left intact, killed with chemicals
			Cultivation equipment – moderate disturbance (e.g. two-way disc, narrow- or wide-spaced tine)
			Moderately effective wind breaks
	Low	Classes 1–4	Good ground cover (>70% average)
			No fallow (<1 day)
			No tillage
			Stubble – slashed, mulched
			Low disturbance cultivation equipment (e.g. wide-spaced tine) or no cultivation
			Effective wind breaks
	Very low	Classes 1–5	1 crop per 5 or more years (fodder or pasture establishment)
			Other actions as for Low impact
Grazing	High	Classes 1–4	Moderate ground cover (50–60% average, significant periods with low cover)
			Perennial or annual grasses
			Moderately effective wind breaks
	Moderate	Classes 1–5	Moderate–good ground cover (60–70% average, minor periods with low cover)
			Predominantly perennial grasses
			Moderate erosion controls (e.g. occasional control banks)
			Effective wind breaks
	Low	Classes 1–6	Good ground cover (>70% average, no periods with low cover)
			All perennial grasses
			Very effective wind breaks
Horticulture	High	Classes 1–3	Low ground cover between rows (<50%)
			Tillage between rows
			No effective wind breaks (apart from crop trees)
	Moderate	Classes 1–4	Moderate ground cover between rows (50–70%)
			Tillage between rows
			Moderately effective wind breaks (apart from crop trees)
	Low	Classes 1–5	High ground cover between rows (>70%)
			Tillage between rows
			Effective wind breaks (apart from crop trees)
Forestry	High	Classes 1–5	Woody vegetation and ground cover – average cover 60–70%
			High ground disturbance by vehicles and equipment
	Moderate	Classes 1–6	Woody vegetation and ground cover – average cover 70–80%
			Moderate ground disturbance by vehicles and equipment
	Low	Classes 1–7	Woody vegetation and ground cover – average cover >80%
			Low ground disturbance by vehicles and equipment

[1] Highest value represents the Upper sustainable LSC class

Table SM2-3: Management practices and allowable land and soil capability classes for soil structure decline (first approximation)

Land use	Impact	Allowable LSC classes	Land management actions
Cropping	Very high	Class 1	Very high frequency of cropping (with tillage), >2 per year Multiple tillage (4 or more passes) Very high disturbance cultivation equipment (e.g. rotary hoe Stubble removal by very hot burn Very long fallow (>3 months) No traffic control, frequent traffic in wet conditions
	High	Classes 1–2	High frequency of cropping (with tillage), 2 per year Multiple tillage (3 passes) High disturbance cultivation equipment (one way disc) Stubble – hot burn, heavy grazing, ploughed in Long fallow (1–3 months) No traffic control, moderate traffic in wet conditions
	Moderate	Classes 1–3	Moderate frequency of cropping (with tillage), 1 per year Minor tillage (2 passes) Moderate disturbance cultivation equipment (e.g. two-way disc, narrow-spaced tine) Stubble management – cold burn, baling, light grazing Moderate fallow (1–4 weeks) Minor traffic control, rare traffic in wet conditions
	Low	Classes 1–4	Low–moderate frequency of cropping (with tillage), 1 per 2–3 years Minimum or no tillage (one or no passes) Low disturbance cultivation equipment (e.g. broad-spaced tine) Stubble management – slashed/mulched, killed with chemicals Short fallow (<1 week) Traffic control, no traffic in wet conditions Minor addition of gypsum for sodic problems
	Very low	Classes 1–5	Low frequency of cropping (with tillage) 1 per 4 years or more Zero tillage Stubble management – left intact No fallow Traffic control, no traffic in wet conditions Significant addition of gypsum for sodic problems
Grazing	High	Classes 1–4	High grazing intensity leading to low–moderate ground cover Shallow rooted perennial pastures Regular stock trampling in wet conditions
	Moderate	Classes 1–5	Moderate grazing intensity leading to moderate ground cover Predominantly long term deep rooted perennial pastures Occasional stock trampling in wet conditions
	Low	Classes 1–6	Low grazing intensity leading to good ground cover Deep rooted perennial pastures No stock trampling in wet conditions
Horticulture	High	Classes 1–3	Low ground cover and biomass between rows High compaction between rows by vehicles and stock, regular movement in wet conditions
	Moderate	Classes 1–4	Moderate ground cover and biomass between rows Some compaction between rows by vehicles and stock, occasional movement in wet
	Low	Classes 1–5	High ground cover and biomass between rows Minor compaction between rows by vehicles and stock, no movement in wet
Forestry	High	Classes 1–5	Some compaction by vehicles and stock, occasional movement in wet conditions Relatively low ground cover for forests (25–50%)
	Moderate	Classes 1–6	Minor compaction by vehicles and stock, no movement in wet conditions Moderate ground cover for forests (50–70%)
	Low	Classes 1–7	No compaction by vehicles and stock, no movement in wet conditions Relatively high ground cover for forests (>70%)

[1] Highest value represents the Upper sustainable LSC class

Table SM2-4: Management practices and allowable land and soil capability classes for acidification (first approximation)

Land use	Impact	Allowable LSC classes	Land management actions
Cropping	Very high	Class 1	Annual legume pastures in cropping rotations Removal of biomass in large quantities (frequent removal of hay and plant material) Stubble removal by very hot burn Very high use of nitrogen based fertilisers (in relation to crop requirements) Very high irrigation levels with deep soil drainage
	High	Classes 1–2	Annual legume pastures in cropping rotations Removal of biomass (removal of hay and plant material) Stubble removal by hot burn, heavy grazing, baling High use of nitrogen based fertilisers (in relation to crop requirements) High irrigation levels with some deep soil drainage
	Moderate	Classes 1–3	Perennial pastures in cropping rotation Ground cover managed to maintain water use and minimise nitrate leaching Stubble removal by cold burn, light grazing Limited removal of biomass (grain and animal products) Moderate use of nitrogen based fertilisers (in relation to crop requirements) Moderate irrigation with minimal deep drainage
	Low	Classes 1–4	Perennial pastures in cropping rotation Special management practices (e.g. pasture cropping) to manage ground cover to maintain water use and minimise nitrate leaching Limited removal of biomass (grain and animal products) Stubble left intact, killed with chemicals, ploughed in Low use of nitrogen based fertilisers (in relation to crop requirements), most fertilisers are non-acidifying Balanced irrigation for crops with no deep drainage High use of lime
	Very low	Classes 1–5	Use of acid tolerant species Perennial pastures in cropping rotation Special management practices (e.g. pasture cropping) to manage ground cover to maintain water use and minimise nitrate leaching Very limited removal of biomass (grain and animal products) Very low use of nitrogen based fertilisers (in relation to crop requirements), fertilisers are non-acidifying Balanced irrigation for crops with no deep drainage Very high use of lime
Grazing	High	Classes 1–4	Annual legume pastures High grazing intensity leading to low–moderate ground cover High use of nitrogen fertilisers, in relation to pasture requirements High irrigation levels for pasture with some deep soil drainage
	Moderate	Classes 1–5	Predominantly long term perennial pastures Moderate grazing intensity leading to moderate ground cover managed to maintain water use and minimise nitrate leaching Minimal use of nitrogen fertilisers, in relation to pasture requirements Moderate irrigation for pasture with minimal deep drainage
	Low	Classes 1–6	Long term perennial pastures Low grazing intensity leading to good ground cover to maintain water use and minimise nitrate leaching Fertilisers are non-acidifying Balanced irrigation for pasture with no deep drainage

Continued over

Land use	Impact	Allowable LSC classes	Land management actions
Horticulture	High	Classes 1–3	Low ground cover and biomass between rows High use of nitrogen based fertilisers, in relation to crop requirements High irrigation levels for crop with some deep soil drainage
	Moderate	Classes 1–4	Moderate ground cover and biomass between rows Minimal use of nitrogen fertilisers, in relation to crop requirements Moderate irrigation for crop with minimal deep drainage
	Low	Classes 1–5	High ground cover and biomass between rows Very low use of nitrogen based fertilisers (in relation to crop requirements), most fertilisers are non-acidifying Balanced irrigation for crop with no deep drainage
Forestry	High	Classes 1–5	Extended periods with low ground cover and tree growth
	Moderate	Classes 1–6	Moderate ground cover and tree growth
	Low	Classes 1–7	Continuous high ground cover and tree growth

[1] Highest value represents the Upper sustainable LSC class

Table SM2-5: Management practices and allowable land and soil capability classes for salinity (first approximation)

Land use	Impact	Allowable LSC classes	Land management actions
Cropping	Very high	Class 1	Clearing of native vegetation Very long fallow (>3 months) Low yielding crops Very low ground cover (<20% average) Very high irrigation levels with deep soil drainage
	High	Classes 1–2	Long fallow (1–3 months) Low yielding crops Long term annual based pastures in rotation Low ground cover (20–30% average) High irrigation levels with some deep soil drainage
	Moderate	Classes 1–3	Moderate fallows (1–4 weeks) Moderate yielding crops Low–moderate ground cover (30–50% average) Cropping rotations with pastures Moderate irrigation with minimal deep drainage
	Low	Classes 1–4	Short fallow (<1 week) Moderate to high yielding crops Moderate ground cover (50–60% average) Low crop frequency, rotations with perennial pastures Full adoption of advanced conservation tillage principles Balanced irrigation with little deep drainage
	Very low	Classes 1–5	No fallows High yielding crops Moderate–good ground cover (60–70% average) Very low crop frequency, rotations with perennial pastures Full adoption of advanced conservation tillage principles Balanced irrigation with no deep drainage
Grazing	High	Classes 1–4	Moderate ground cover and biomass for long periods (50–60% average cover) Low–moderate proportion of perennial grasses (>50%)
	Moderate	Classes 1–5	Moderate to good ground cover and biomass (60–70% average cover) High proportion of perennial grasses (50–80%)
	Low	Classes 1–6	High levels of ground cover and biomass maintained (>70% average cover) Very high proportion of perennial grasses (>80%)
Horticulture	High	Classes 1–3	Low ground cover and biomass between rows (<50% average) Regular tillage between rows
	Moderate	Classes 1–4	Moderate ground cover and biomass between rows (50–70% average cover) Occasional tillage between rows
	Low	Classes 1–5	High ground cover and biomass between rows (>79% average) No tillage between rows
Forestry	High	Classes 1–5	Woody vegetation and ground cover – average cover 60–70% High ground disturbance by vehicles and equipment
	Moderate	Classes 1–6	Woody vegetation and ground cover – average cover 70–80% Moderate ground disturbance by vehicles and equipment
	Low	Classes 1–7	Woody vegetation and ground cover – average cover >80% Low ground disturbance by vehicles and equipment

[1] Highest value represents the Upper sustainable LSC class

Table SM2-6: Management practices and allowable land and soil capability classes for organic carbon decline (first approximation)

Land use	Impact	Allowable LSC classes	Land management actions
Cropping	Very high	Class 1	Very high frequency of cropping (with tillage) Multiple tillage (4 or more passes) Very high disturbance cultivation equipment (e.g. rotary hoe) Stubble removal by very hot burn Very long fallow (>3 months) Excessive use of herbicides
	High	Classes 1–2	High frequency of cropping (with tillage) Multiple tillage (3 passes) High disturbance cultivation equipment (one way disc) Stubble – hot burn, heavy grazing, ploughed in Long fallow (1–3 months) Large use of herbicides
	Moderate	Classes 1–3	Moderate frequency of cropping (with tillage) Minor tillage (2 passes) Moderate disturbance cultivation equipment (e.g. two-way disc, narrow-spaced tine) Stubble management – cold burn, baling, light grazing Moderate fallow (1–4 weeks) Moderate to high use of herbicides
	Low	Classes 1–4	Low frequency of cropping (with tillage) Minimum or no tillage (one or no passes) Low disturbance cultivation equipment (e.g. broad-spaced tine) Stubble management – slashed/mulched, killed with chemicals Short fallow (<1 week) Moderate use of herbicides
	Very low	Classes 1–5	Very low frequency of cropping (with tillage) Zero tillage Stubble management – left intact No fallow Low use of herbicides
Grazing	High	Classes 1–4	High grazing intensity leading to low–moderate ground cover and biomass Shallow rooted perennial pastures
	Moderate	Classes 1–5	Moderate grazing intensity leading to moderate ground cover and biomass Predominantly long term deep rooted perennial pastures
	Low	Classes 1–6	Low grazing intensity leading to good ground cover and biomass Deep rooted perennial pastures
Horticulture	High	Classes 1–3	Low ground cover and biomass between rows
	Moderate	Classes 1–4	Moderate ground cover and biomass between rows
	Low	Classes 1–5	High ground cover and biomass between rows
Forestry	High	Classes 1–5	Relatively low ground cover for forests (25–50%)
	Moderate	Classes 1–6	Moderate ground cover for forests (50–70%)
	Low	Classes 1–7	Relatively high ground cover for forests (>70%)

[1] Highest value represents the Upper sustainable LSC class

Table SM2-7: Management practices and allowable land and soil capability classes for mass movement hazard (first approximation)

Land use	Impact	Allowable LSC classes	Land management actions
All uses	Very high	Class 1	Concentration of water flows and seepage flows Increased deep drainage Very large loads on soils (e.g. very heavy vehicles and equipment) Removal of trees and stabilising vegetation Cutting of high batters (>8 m)
	High	Classes 1–2	Concentration of water flows and seepage flows Increased deep drainage Large increased loads on soils (e.g. heavy vehicles and equipment) Removal of trees and stabilising vegetation cutting of high batters (<8 m)
	Moderate to high	Classes 1–3	Controlled concentration of water flows and seepage flows Controlled increases in deep drainage Moderate increases in load on soils (e.g. large standard vehicles and equipment, heavy stock) Partial removal of trees and stabilising vegetation cutting of high batters (<5 m)
	Moderate	Classes 1–4	Small controlled concentration of water flows and seepage flows Small increases in deep drainage Controlled moderate increases in load on soils (e.g. standard vehicles and equipment, stock) Minor removal of trees and stabilising vegetation Cutting of high batters (<3 m)
	Moderate to low	Classes 1–5	Very small controlled concentration of water flows and seepage flows Small increases in deep drainage Minor increases in load on soils (stock) cutting of high batters (<2 m)
	Low	Classes 1–6	No concentration of water flows and seepage flows Very minor increases in deep drainage Very minor increases in load on soils (e.g. small stock) Cutting of high batters (<1 m)
	Very low	Classes 1–7	Insignificant modification or movement on the site
	Nil	Classes 1–8	No modification or movement on the site

[1] Highest value represents the Upper sustainable LSC class

Table SM2-8: Management practices and allowable land and soil capability classes for acid sulfate soil hazard (first approximation)

Land use	Impact	Allowable LSC classes	Land management actions
Cropping	Very high	Class 1	Soil disturbance to any depth
			Drains to any depth
			High density of drains
	High	Classes 1–2	Soil disturbance to >5 m
			Drains to >5 m
			High density of drains
	Moderate to high	Classes 1–3	Soil disturbance to 4 m
			Drains to 4 m
			High density of drains
	Moderate	Classes 1–4	Soil disturbance to 2 m
			Drains to 2 m
			Moderate density of drains
	Moderate to low	Classes 1–5	Soil disturbance to 1 m
			Drains to 1 m
			Moderate density of drains
	Low	Classes 1–6	Soil disturbance to 0.5 m
			Drains to 0.5 m
			Low density of drains
	Very low	Classes 1–7	No disturbance or drainage
	Nil	Classes 1–8	No active land use

[1] Highest value represents the Upper sustainable LSC class