7. THE INTEGRATED PLAN

7.1. *Introduction*

Land degradation is affecting the condition of the natural resources (land, surface and ground water and vegetation) and reducing the potential for agricultural production in the Little River catchment. This in turn impacts on individual farm productivity, profitability and viability.

The severity of land and water degradation can be related to:

- the position of the farm in the landscape;
- past and present cropping and grazing management practices;
- the skills and investment by land managers in Best Management Practice for crop, pasture and vegetation management and infrastructure eg. watering points and fencing.

In addition to the direct effects of land and water degradation on farm productivity, degradation also has a catchment wide or cumulative impact on:

- water quality;
- the diversity and populations of native species; and
- social impacts within the community from lower production and increased costs in maintaining community facilities.

Soils, along with slope, are the key determinants of land capability, which governs which landuse options and management practices are sustainable in any part of the landscape. The health of the soil has a very strong influence on the state of all other natural resources, as it is the driver for plant growth and subsequently, the hydrologic cycle. The characteristics and condition of the soil are also the basis on which agricultural production systems depend, and the way these systems are managed in turn strongly influences the health of the soil and its surrounding landscape. Consequently, for the Little River catchment, the Land Management Units (LMUs), which provide the basis for land management recommendations, have been based on soil characteristics.

During the development of this catchment plan, a number of natural resource management issues were identified. These issues were described in the Stage 1 report and prioritised in Chapter 3. The interrelationships between soils, plant growth, the hydrological system and biodiversity, and how inappropriate management of these resources can result in degradation is illustrated in Figure 7.1.

As part of determining the future direction for the catchment, the community agreed to set Outcomes and Objectives, which seek to address these issues. The objectives have been summarised in Chapter 4, and are dealt with in detail in Chapter 8 (The Implementation Strategy), including strategies, targets and monitoring options for each objective. Table 7.1 highlights how the various "biophysical" objectives set by the Little River Landcare Group can be met through adoption of Best Management Practices (BMPs).

Twenty BMPs have been identified and described in Chapter 6. These cover the full range of practices required to address these issues and move the catchment towards meeting its outcomes and objectives over the next ten years.

This Chapter brings together the LMUs, guiding principles, BMPs for farm management, land use recommendations, and the objectives of the plan as determined by the LRLG Executive Committee, into a set of BMOs for each Land Management Unit.

INTERIM proposals for the land use mixes and recommended farming systems, which are expected to bring the landscape processes into equilibrium, are presented. **These proposals are interim, because they have not yet been subjected to economic analysis**. This will be the subject of Stage 3 of this catchment management plan. Regional issues such as planning for dryland salinity control and biodiversity enhancement are also addressed.

It is also important to note, that due to a lack of localised modelling tools and a paucity of research data for the area, it has not been possible to validate these recommendations by modelling the expected biophysical outcomes at this time. However, they are best estimates, from four different groups of natural resources advisers and environmentally aware landholders, to determine the requirements for sustainable management at a landscape scale. As with all aspects of this plan, it is a dynamic document, and as tools, techniques and data become available, it should be reviewed and revised as necessary.

Table 7.1 How Best Management Practices address the Biophysical Objectives

Objective / BMO	GROUP	1.1 Land capability	1.2 Healthy soils	1.3 Dryland salinity	1.4 Erosion	2.1 Tree cover	2.2 Biological diversity	2.3 Fauna habitat	3.1 Riparian Zone	3.2 Aquatic Life	3.3 Groundwater	3.4 Water quality	4.1 Pest animals controlled	5 Sustainable farming
1. Match land use to capability	Cropping	⁙	⁙	⁙	⁙	⁙	⁙		⁙		⁙	⁙		⁙
2. Reduce fallow length			⁙	⁙	⁙						⁙	⁙		⁙
3. Crop-pasture rotations		⁙	⁙	⁙	⁙						⁙	⁙		⁙
4. Conservation farming		⁙	⁙	⁙	⁙	x				⁙		⁙x		⁙
5. Strategic grazing	Pasture		⁙	⁙	⁙	⁙	⁙	⁙	⁙		⁙	⁙		⁙
6. Perennial mixed pastures			⁙	⁙	⁙						⁙	⁙		⁙
7. Native pastures			⁙	⁙	⁙		⁙	⁙	⁙		⁙	⁙		⁙
8. Diversity	Vegetation		⁙	⁙		⁙	⁙	⁙	⁙	⁙				⁙
9. Forestry				⁙		⁙					⁙			⁙
10. Strategic tree planting		⁙		⁙	⁙	⁙	⁙	⁙	⁙	⁙	⁙	⁙	⁙x	⁙
11. Vegetation conservation		⁙		⁙	⁙	⁙	⁙	⁙	⁙	⁙	⁙	⁙	⁙x	⁙
12. Ameliorants etc	Remedial		⁙	⁙	⁙						⁙	x		⁙
13. Earthworks				⁙	⁙							⁙		⁙
14. Engineering for salinity				⁙							⁙	⁙		
15. Salt land agronomy		⁙		⁙	⁙						⁙	⁙		
16. Cooperative pest control					⁙		⁙x	⁙	⁙	⁙			⁙	⁙
17. Buffer strips	Aquatic	⁙				⁙	⁙	⁙	⁙	⁙		⁙		⁙
18. Water extraction									⁙	⁙	⁙	⁙		⁙
19. In-stream management									⁙	⁙		⁙		⁙
20. Urban pollution										⁙		⁙		

⁙ represents a positive impact x represents a potentially negative impact

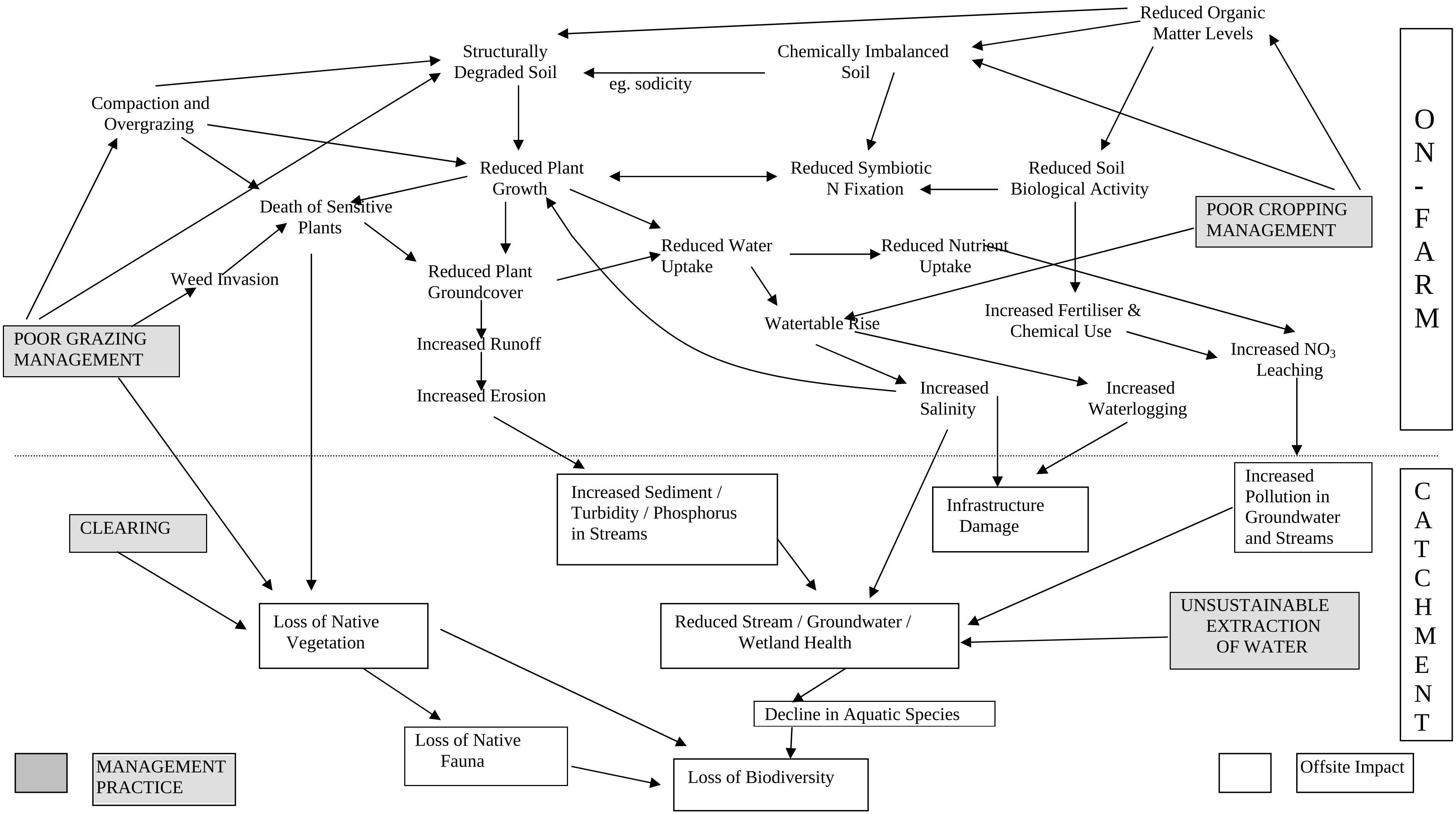

Figure 7.1: Interrelationship Between Natural Resources, Agricultural Production and Offsite Impacts

Adapted from Cregan, P., and Scott, B. (1998) Soil Acidification - An Agricultural and Environmental Problem

7.2. *Best Management Options for Land Use*

Addressing the natural resource management problems in the Little River Catchment requires planning and management at both the landscape ("big picture") and property scale. Chapter 6 provided guiding principles and management strategies for the property or local scale, while this chapter deals with the land use strategies for landscape scale.

Issues such as dryland salinity, biodiversity decline, and degraded water quality require a coordinated approach to management, which is consistent with land capability. Given the processes that control landscape function, this has to consider hydrology and hydrogeology. To develop a landscape or catchment approach, the following key biophysical aspects need to be defined for each land management unit:

- Minimum tree cover %
- Minimum pasture % (perennial pastures, mixed grasses and legumes)
- Maximum cropping % and frequency
- Minimum ground cover %
- Areas of significant recharge

7.2.1 What's the difference between Best Management Options (BMOs) and Best Management Practice (BMP)?

The term "Best Management Practice" (BMP) is becoming increasingly common in all fields including agriculture and natural resources management. BMPs are generally much more prescriptive than Best Management Options (BMOs), and describe the most effective technical option to achieve an outcome e.g. prevent salinity.

However, the balance between viable agriculture and the environment usually involves some trade-offs or compromise. For example, ideally, it may be necessary to retain / replant 70% tree cover in a recharge area to prevent rising water tables. (This would represent BMP.) However, the community might decide that economic, social and environmental benefits are best balanced if tree cover is only 30% - even if this means some land will be lost from production due to salinisation. This is the "trade off position", and represents a BMO- a decision that the catchment community can live with.

Put another way, BMOs are the most suitable options to conserve and maintain the natural resource base, while sustaining the community both economically and socially. Ultimately, the aim of BMOs is to improve our land, water and vegetation resources, while maintaining a viable rural community. Invariably, this will involve some change. Some of these changes will require co-operation at the catchment level, but success depends on implementation at the individual property or paddock scale.

The recommended land use percentages, agreed to by the Little River community, have struck a balance between cautious estimates of the requirements for a healthy and functioning landscape, and the extent of land use change that can be reasonably expected to occur ie. they are Best Management Options. These BMOs assume that policy makers and investors in natural resource management will facilitate the necessary economic and institutional reforms required by the community to enable implementation.

The figures provide the approximate mix of land uses required to restore the ecosystem to some equilibrium in the medium term (10 -15 years). While an "average target" figure has been provided for each landuse on each LMU, there is some flexibility in the way these are implemented. The targets represent an average across the whole LMU. However, variation in slope, land capability, and soils means there is need to fine tune these recommendations on a local level. Discussion on possible ways to implement the land use mixes and BMOs at property level can be found in Section 7.4.

Table 7.2 highlights the priority BMPs for each LMU ie which practices are most important in various parts of the catchment. The BMOs for land use are summarised in Table 7.3, and expanded on in the following section. For each LMU, the proportion of cropping, perennial pastures and tree / woody perennial species cover has been outlined. A possible farming system has also been described which, if implemented, should achieve these landuse ratios. A detailed description of the land use recommendations for each LMU follows in this Chapter.

Table 7.2: Priority Best Management Practices for each Land Management Units

PRIORITY	**HIGH**				**MEDIUM**				**LOW**
LMUs / BMPs	**Red Brown Earth**	**Non Calcic Brown**	**Siliceous Sand**	**Riparian**	**Red Podzolic**	**Euchrozem**	**Alluvial**	**Red Solodic**	**Shallow**
1. Match land use to land capability	xx	xx	xx	xx	xx	xx	xx	x	x
2. Reduce fallow length	xx	xx			x	xx	xx	x	
3. Crop-pasture rotations	xx	xx			xx	xx	xx	xx	
4. Conservation farming	xx	xx			x	x	xx	x	
5. Strategic grazing	x	x	xx	xx	x	x	x	xx	xx
6. Perennial mixed pastures	xx	xx	xx	x	xx	xx	xx	xx	
7. Native pastures			xx	xx	x			xx	xx
8. Diversity	x	x	x	xx	x	x	x	x	xx
9. Forestry		x	x		xx			xx	x
10. Strategic tree planting	xx	xx	xx	xx	xx	xx	xx	xx	x
11. Vegetation conservation	x	x	xx	xx	x	xx	x	xx	xx
12. Ameliorants etc	xx	xx	xx		xx	x	x	x	(x)
13. Earthworks	x	x	x		x	x		x	
14. Engineering for salinity	x	x				x			
15. Salt land agronomy	x	x	x	x	x	x	x	x	
16. Cooperative pest control			x	x			x weeds	x	x
17. Buffer strips				xx			x		
18. Water extraction				x			x		
19. In-stream management				xx					
20. Urban pollution				x					

xx represents a high priority for that LMU. x represents a beneficial BMO for that LMU

However, a high priority BMO on a high priority LMU should take precedence over a high priority BMO on a medium or low priority LMU in funding allocations.