Managing dryland salinity on your property

Methods for managing salt-prone areas usually involve a number of strategies and should complement whole property planning. To manage salinity effectively it is important to identify which part of the landscape you are dealing with.

Zones of water movement

The three zones in landscapes subject to salinity include (Figure 1):

- intake or recharge zone—the upper catchment where rainwater either runs off or infiltrates into the soil profile.
- transmission zone—water that is not used by plants in the intake zone enters the groundwater system and passes through the transmission zone in the mid slope area.
- discharge zone—where the watertable is high, sites lower in the catchment act as discharge zones and the groundwater either lies close to or on the soil surface, causing water-logging or salinity outbreaks.

Salinity management

Salinity is managed by a combination of revegetation and engineering strategies designed to lower the watertable in salt-affected areas. This results in reduced water-logging, evaporation, salt mobilisation and concentration at the soil surface.

Table 1 lists the management strategies applicable to each zone outlined above.

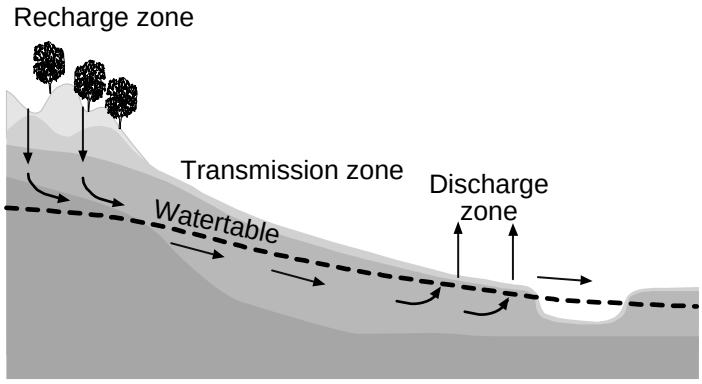

Figure 1. Salinity recharge, transmission and discharge zones

Vegetation practices

Intake or recharge zone—Maintain existing vegetation in the water intake zone and encourage natural regeneration.

Transmission zone—Increase groundwater use by planting deep-rooted trees and pastures.

Discharge zone—Increase groundwater use in salt affected areas by fencing the area to exclude stock until salt tolerant vegetation is established, then allow limited grazing. Switch from cropping to deep rooted, salt tolerant pastures and trees.

Engineering practices

Engineering strategies for managing salinity include:

- installing drains, bores and pumps
- irrigating with groundwater of suitable quality.

Table 1. Site characteristics and management strategies for saline or potentially saline catchments

Recharge zone	Transmission zone	Discharge zone
Site characteristics		
• mostly cleared • shallow-rooted pastures/crops • shallow, well drained (highly permeable) soils	• groundwater often of useful quality and quantity • shallow groundwater usually accessible by pumps, trees or deep rooted pastures • occasional water-logging	• seepage, water-logging, possible scalding • prone to erosion • loss of vegetation • salt tolerant vegetation evident • reduced land-use options • soils often impermeable
Strategies for managing salinity		
• revegetation with trees and/or deep-rooted pastures • revegetate stock routes, fence lines and water courses • avoid summer fallow • adopt agroforestry	• use pumps of windmills to lower the watertable • use trenches (up to five metres deep) to harvest the water for farm-use • install subsurface drainage • irrigate adjacent areas with water from this zone • establish dense vegetation with high water-use characteristics in areas where the groundwater is shallow and of suitable quality	• establish salt tolerant vegetation • maintain good vegetation cover by maintaining existing timber and fencing to control stock • control erosion • allow seasonal flooding where it naturally occurs • use surface and subsurface drainage • pump water if suitable • limit stock-use

Factors to consider

The following factors should be considered when choosing salinity management practices:

- short and long-term goals
- financial issues such as set-up costs
- personal interest in diversification and alternative land uses
- potential impacts on properties down slope in the catchment
- personal attitudes to environmental responsibility
- aesthetic values and wildlife habitat
- activities and attitudes of neighbours and local catchment management groups.

A cost-benefit analysis is helpful when evaluating management strategies. Important considerations include the costs of managing the current degraded situation, partial control, and reclamation of salt-affected areas.

Some management strategies may reduce the immediate income from productive lands, so long-term benefits have to be assessed. At the same time it is important to implement management options as early as possible to avoid future production losses.

Further information

This and other science notes are available from the Queensland Government website www.qld.gov.au – search ‘science notes’. For further information about this science notes series phone **13 QGOV** (13 74 68) – ask for science notes – Land series L52. Other science notes related to this topic include:

For further information on salinity visit <http://www.qld.gov.au/environment/land/soil/salinity/> or email soils@qld.gov.au.