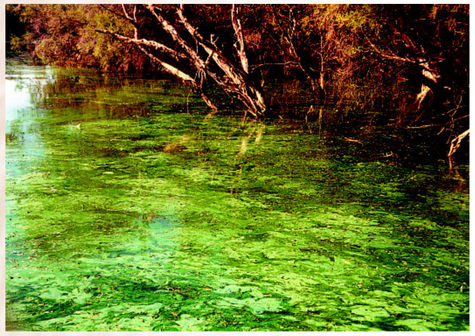
Managing nutrient movement into Ellen Brook

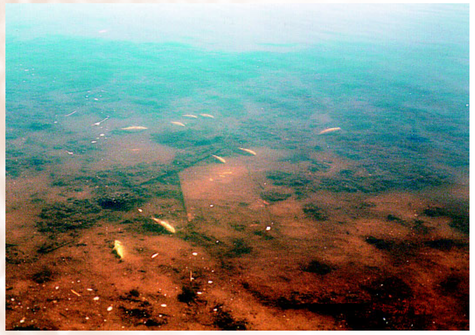
Produced by Water and Rivers Commission for the Swan Hydrogeological Resource Base and Catchment Interpretation Project, June 2000

WATER AND RIVERS COMMISSION

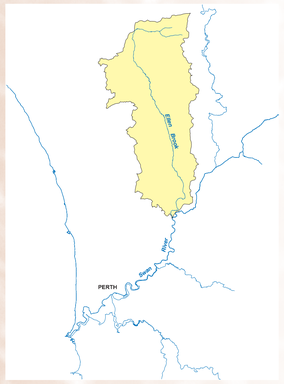
Problems



Algal blooms in Swan River



Fish deaths in Swan River



Ellen Brook catchment

Causes

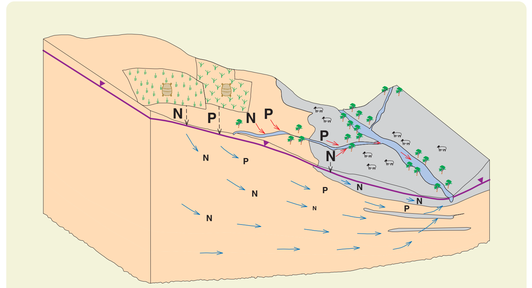
- Elevated concentration of nitrogen and phosphorus in waterways
- Ellen Brook is a major contributor of nitrogen and phosphorus into Swan River

Nitrogen in Ellen Brook	N (mg/L)	Category	Risk of algal bloom in Swan River
	< 1	Low	Low
	≥ 1 < 2	Moderate	
	≥ 2 < 3	High	⇩
	≥ 3 < 4	Very High	
	≥ 4	Extreme	High

Phosphorus in Ellen Brook	P (mg/L)	Category	Risk of algal bloom in Swan River
	< 0.1	Low	Low
	≥ 0.1 < 0.2	Moderate	
	≥ 0.2 < 0.3	High	⇩
	≥ 0.3 < 0.5	Very High	
	≥ 0.5	Extreme	High

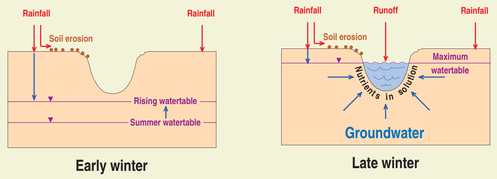
Investigation

- Drilling of bores, monitoring of groundwater and surface water, and analyses of soils indicate that nutrients generated in the catchment move via groundwater and drains/creeks into Ellen Brook
- Groundwater moves 100 metres per year through sand and 30 metres per year through clay

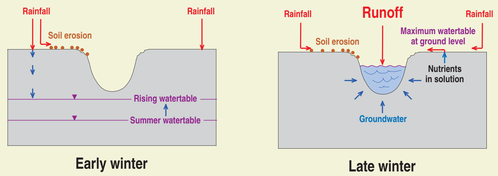


Movement of nutrients into Ellen Brook

Nutrients move in solution and with soil particles during erosion

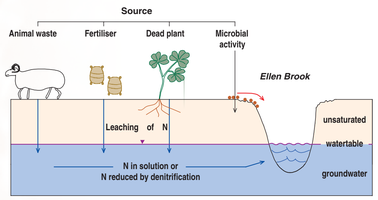


Nutrients on sand move mainly in solution

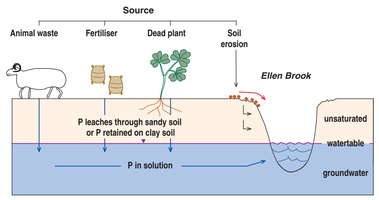


Nutrients on clay move mainly with soil particles

Agriculture is a major source of nitrogen and phosphorus



Nitrogen pathways



Phosphorus pathways

What can we do?

Best Management Practice

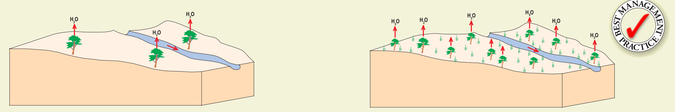
Foreshore vegetation and fencing

- Allows stock access and bank erosion
- Allows nutrient movement with soil particles
- Limited uptake of nutrients from groundwater

- Discourages stock access and stabilises bank
- Obstructs nutrient movement with soil erosion
- Greater uptake of nutrients from groundwater by trees

Outcome: Reduction of nutrients in runoff

Deep-rooted trees and perennial pastures on plains with shallow groundwater



- Low evapotranspiration, limited use of groundwater, watertable rises above ground
- Limited uptake of nutrients from groundwater

- Increase evapotranspiration, increased use of groundwater, prevents watertable rise above ground
- Increased uptake of nutrients from shallow watertable

Outcome: Prevention of groundwater discharge to overland flow

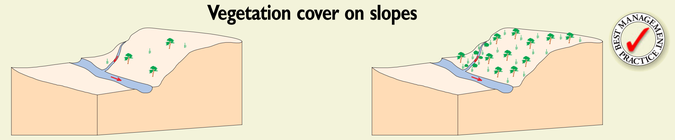
Correct stocking rates with appropriate application of fertiliser

- High erosion
- High input of nutrients from stock and fertiliser

- Reduces erosion
- Reduces source of nutrients

Outcome: Sustainable agriculture with limited impact on land and water

Vegetation cover on slopes



- High-velocity runoff
- High erosion
- Nutrients carried with soil particles

- Reduces surface runoff
- Reduces erosion
- Reduces nutrients bound to soil particles in waterways

Outcome: Slope stabilisation and nutrients retention

For more information

- Contact your local Landcare Coordinator or Catchment Coordinator for advice. Phone: (08) 9571 0300
- Seek advice on plant type, planting guide, planting density from
  1. Water and Rivers Commission, Restoration and Management Section. Phone: (08) 9278 0300
  2. AGWEST, Gardening Inquiries. Phone: 190 229 2555
  3. Conservation and Land Management. Phone: (08) 9334 0333
  4. Greening Australia. Phone: (08) 9335 8933
  5. Wildflower Society. Phone: (08) 9383 7979
  6. Rural consultants, AGWEST. Phone: (08) 9274 5355
- Visit Swan Catchment Centre for access to user friendly resources. Phone: (08) 9222 5304
- See publications for more information:
  1. Angell, K.W., 1999, Fertilisers for pastures on sandy soils of the Swan Coastal Plain, AGWEST, Bulletin 4357
  2. Angell, K.W., 1999, Perennial grasses – their role in the Ellen Brook Catchment, AGWEST, Farmnote No. 20/99
  3. Angell, K.W., Scott, P. and Smith, A., 1994, Managing saline, high rainfall valleys and flats, AGWEST, Farmnote No. 25/94
  4. McFarlane, D. and Belford, B, 1993, Waterlogging and inundation: why they could be costing you money, AGWEST, Farmnote No. 78/93
  5. Pen, L.J., 1999, Managing Our Rivers, Water and Rivers Commission

June 2000
File name: NutrientPoster.p65