

# Natural Resources, Environment, The Arts and Sport

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## Water Extraction

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To avoid the degradation of waterways seen in southern Australia, we need to plan water use carefully, and leave a large proportion of the water in the environment

#### Water Extraction

This is the term given to the use of water by people. Most of the water is used for domestic or industrial consumption, to irrigate crops or water stock.

There are a few common methods:

- Bores to extract ground-water. Used in most NT towns and rural areas (not Darwin). This water may be very old and only replaced very slowly at a minimal rate (as around Alice Springs).
- Large Dams on rivers. Darwin River and Manton dam are used for public water supply and recreation respectively.
- Pumping from rivers is the easiest method where there is all-year flow. Katherine town is supplied from the Katherine river during the dry season
- Small (farm) dams. These earthwork dams across drainage lines are common in southern Australia.
- Off-stream storage. This novel approach uses flood-water to fill vast tanks. It is used to irrigate crops in some parts of Australia.



Irrigating crops in the NT

#### The Threat

In this dry continent, almost all of the water that falls as rain is used by the environment, so that any we extract or intercept may have an effect. There are two classes of species that are potentially impacted: those that live in the water (e.g. fish) and those that need to access groundwater.

The effects can take various forms:

- Reduced flow in creeks and rivers. If too much water is removed, flows will reduce, and may cease earlier after rain than they would without extraction. This can even happen with bores if the groundwater usually enters the river as springs. Large dams also trap the first wet-season floods that normally trigger the annual growth cycle in rivers and floodplains.
- Lowered water table. Some plants need to tap into ground water to survive dry periods. In the NT this is the case for riparian (riverside) and rainforest trees, and for some eucalypt woodlands which also use moisture in the soil layer.
- Irrigation salinity occurs when irrigation causes the water table to rise close to the surface. Salts, leached down into the ground over millions of years, return with the water table.
- Large dams alter the physical properties of rivers, sometimes reducing flood levels, slowing flows upstream, decreasing the water temperature downstream, dependant upon offtake levels, stopping the upstream migrations of fish, unless appropriate fish passage is provided and downstream movement of litter and debris.



Daly River Black Bull Yard

### The scale of the problem

In many southern parts of Australia, waterways are in crisis, and very costly efforts are now being made to reduce environmental problems. In the NT, there has been little water extraction up to now. However, in some small areas, the natural systems are already heavily utilised, and there are several others where water use is increasing. In Alice Springs, the water used is being replaced more slowly than it is utilised and there is uncertainty about the long-term source of water. In Darwin's rural area, groundwater extraction may be lowering the water table to a greater extent than naturally occurs.

In the Daly region, there are ambitious plans for irrigated agriculture using the abundant groundwater under much of the area. A similar scheme is proposed near the mouth of the Keep River on the western boundary of the NT, using water captured in the massive Argyle dam.

New dams are planned on the Adelaide River to supply Darwin's future needs. There have been various other proposals for dams, especially in the Daly region, but at present, none is being seriously considered. There are few places that dams could be built in the NT because there are few deep valleys or water-retaining rocks.

### What can we do?

In order to minimise the impact of water extraction on wildlife, we must recognise the need to reserve water for the environment. Managing water use has some unique problems. Because water flows through the landscape, the effects of using water in one place can take place far away. Also, while one bore, pump or farm dam may not have a detectable impact, the cumulative effect of dozens of these across a catchment may have a very large effect. These problems emphasise the need to plan water use in a thorough manner. Most of the problems with water extraction relate to the proportion of the total available water that is used. If this proportion is kept within reasonable limits, both at local and catchment scales, the impacts will be minor and acceptable.

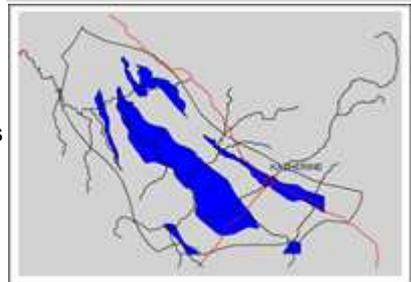
Both the Federal and NT governments have implemented programs to ensure that water use is planned regionally, is properly valued, and the environment is given an adequate share of the water. In the NT, Water Allocation Plans are being developed in the Daly region, Darwin Region, Alice Spring and Ti Tree.

There are also some principles that should be noted when planning to extract water from the environment:

- Experience around the world confirms that dams on main river channels are often harmful to the environment.
- On any farm, the use of water that fell as rain on that farm, is likely to have less impact than using water that fell outside the farm.
- Off-stream storage of wet-season flow probably has the least impact of any method for water capture.
- When water is not wasted, there is less chance of impact, on water dependant wildlife, of soil salinity and of pollution of waterways.

### Further Reading

The Draft Conservation Plan for the Daly Basin (this document is at the final stages of approval and will be released soon) discusses these issues.



**Groundwater in the Daly Basin. The blue areas are where bores will yield enough flow to irrigate crops.**