Toolibin Lake ... a resistant survivor

(Artwork: Satellite image of upper Blackwood River catchment showing nine wetland lakes)

Toolibin Lake is a seasonal freshwater wetland located in the Upper Blackwood catchment. Thickets of swamp sheoak and paperbarks grow across the lakebed. The vegetation relies on the seasonal cycle of wetting and drying to survive. When the lake is full, these extensive stands of living vegetation provide a refuge for many waterbirds.

Freshwater wetlands with extensive stands of sheoak and paperbarks across the lakebed were once common throughout the Wheatbelt region. Toolibin Lake is one of the few lakes in the wheatbelt that, although suffering from brackish waters and some tree deaths, continues to survive the threat of salinity with a relatively intact ecological community.

The Symptoms

Clearing of native vegetation for agriculture has caused widespread salinity in the West Australian wheatbelt. In the Toolibin catchment, clearing commenced in the 1890's and today there is less than 10% of the original vegetation remaining.

It was evident that Toolibin Lake was being affected by salinity in the early 1970's when trees began dying along the western shore. Other lakes in the Wheatbelt region had shown the effects of salinity over 30 years previously. Although Toolibin had shown resistance to salinity, it was not immune from its affects.

There are no easy solutions preventing the level of salinity in Toolibin from increasing. Today an integrated, whole-of-catchment approach to water management is required to halt the spread of salinity at Toolibin Lake.

Please contact the Toolibin Recovery Catchment Officer in Narrogin on 9881 9200 for further information.

"... (the lakes) were all mostly swamp sheoak and stuff like that, with just a complete canopy. When you got in underneath it on a hot summer's day it was just like going into a refrigerator - it was beautiful in there. Absolutely covered from one end to the other, it was almost impossible to get a little punt through it. You could get through with a canoe alright, with something sharp-nosed, but it was absolutely thick."

Ray Rigby remembering wheatbelt freshwater lakes in the 1930s.

GOVERNMENT OF WESTERN AUSTRALIA

DEPARTMENT OF Conservation AND LAND MANAGEMENT

Conserving the nature of WA

Salt sickness ... the prognosis

The Source of Salt

Most of the salt responsible for salinity in the Western Australian wheatbelt originates from far away. Rain and wind transports low concentrations of salt from the ocean to the wheatbelt. Over thousands of years, vast quantities of salt have accumulated in the wheatbelt soils.

Water Balance

Prior to clearing for agriculture, the landscape was covered in deep rooted, perennial vegetation. The native vegetation used most of the rainfall. Only small amounts of rainfall would soak into the ground and percolate past the roots of the plants. Lakes such as Toolibin would fill rarely and only after heavy rainfall.

Since clearing, most of the native vegetation has been replaced with annual crops and pastures. These plants do not grow all year round and have shallow root systems. Consequently, larger volumes of rainfall now soak deep into the ground. With less groundcover, water runoff has also increased and lakes such as Toolibin fill more frequently.

Salty Groundwater

Water is stored in the porous materials beneath the ground surface. When this porous material is saturated, the underground water is called groundwater. The top of the groundwater is called the groundwater table. Since the land has been cleared for agriculture, the volume of rainfall becoming groundwater has increased and the groundwater table is rising.

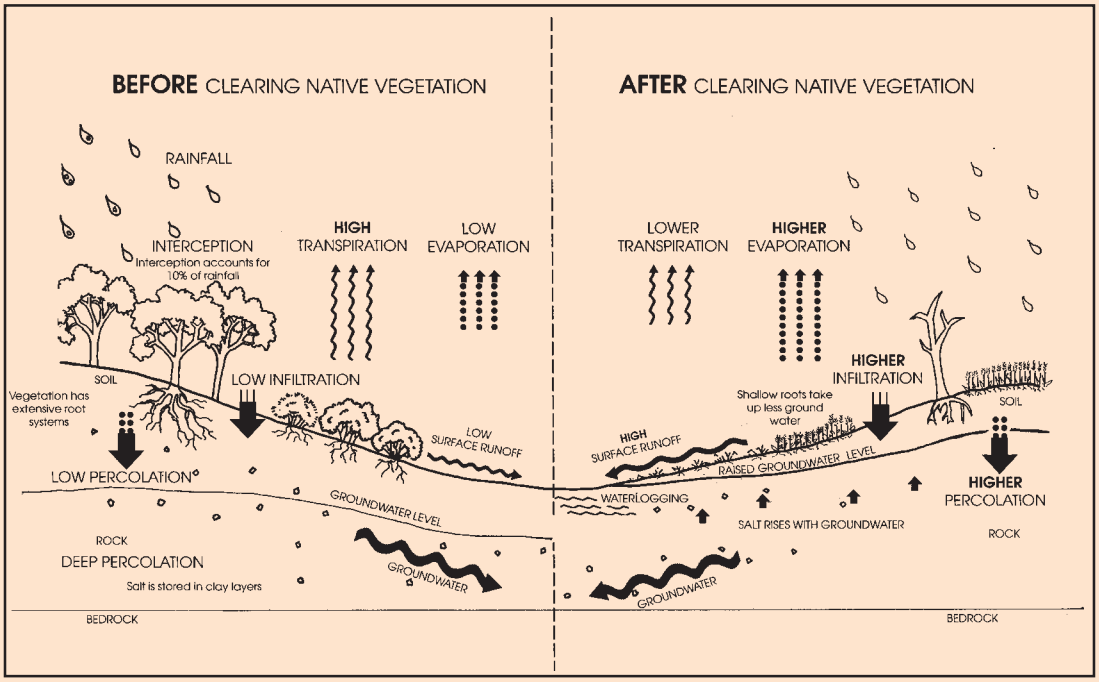
As the groundwater table rises, the salts stored in the soil are dissolved and the groundwater becomes salty. Once the salty groundwater has risen close to the surface, plant roots use the groundwater. This concentrates the salts and damages the vegetation. Evaporation concentrates the salts further. Eventually, salt scalds can form on the soil surface.

Salty Rivers & Lakes

The rising groundwater can saturate the surface soils. The saturated soils combine with the reduced groundcover to greatly increase surface water runoff. The runoff dissolves salts stored on the soil surface, increasing the salinity of surrounding streams, rivers and wetlands.

Toolibin Lake

The health of Toolibin Lake is suffering from salinity. The remaining stands of living vegetation across the lakebed continue to be threatened by salty groundwater, salty runoff and increased inundation. An integrated treatment for Toolibin Lake is needed to combat all three threats.



Saving the plants

The vegetation in and around Toolibin Lake was reported to be healthy up until 1975. Toolibin Lake has extremely high conservation significance as one of the last inland lakes in the south-west of Australia with reasonable water quality and extensive woodlands of living swamp sheoak *(Casuarina obesa)* and melaleuca species.

Plant loss

Species of casuarina and melaleuca occur naturally on sites that are subjected to extended periods of waterlogging. However, waterlogging tolerances can be severely reduced in the presence of saline soils.

Other species such as flooded gum *(Eucalytus rudis)*, York gum *(E. loxophleba)* and sedge species have a lower tolerance to saturation of the root zone than does swamp sheoak *(Casuarina obesa)*. The combined interaction of waterlogging and salinity is considered to be responsible for the death of flooded gums and sedges.

Saving the animals

Waterbirds

Toolibin Lake is a special waterbird conservation area supporting 42 species of waterbirds. This is the greatest number of waterbirds for any surveyed wetland in south-western Australia. Toolibin Lake also provides vital breeding habitat for up to 24 species of waterbirds. It is classified as a “Wetland of International Importance” under the Ramsar convention and is listed on the Register of the National Estate.

The freshwater during flooding and thick vegetation on the lakebed provides excellent habitat for waterbirds. Toolibin Lake is a place for uncommon bird species including the freckled duck and the yellow-billed spoonbill. Other species include musk duck, great egret, great cormorant and great crested grebe.

Aquatic invertebrates

The 700 invertebrate species that have been collected from wheatbelt wetlands are an attraction to waterbirds and frogs.

The richness of invertebrate species declines with salinity. As a rule of thumb, doubling the salinity halves the number of aquatic invertebrate species. If all wetlands in the wheatbelt become saline, up to 31% of invertebrates would disappear from the area.