

# Denmark River - Salinity Situation Statement

## Salinity recovery of the Denmark River – promising signs and a way forward

The key findings of the salinity situation statement are that:

- Annual salinity at the Mt Lindesay gauging station peaked at 1520 mg/L TDS in 1987 and has, on average, been declining since.
- Salinity in an average year is now about 700 mg/L at Mt Lindesay.
- Plantations established since 1988 are expected to further reduce the salinity of the river water but not enough to reach the drinking water target.
- There are feasible options to meet the 500 mg/L TDS target including tree planting, pasture establishment, revegetation and engineering works.
- Meeting the 500 mg/L target still means variability from about 400–800 mg/L.
- Most management options focus actions in the Upper Denmark catchment.

## Salinity trends

The Denmark River is a water source for Denmark with potential to become a major new water supply to the developing Denmark–Albany area. The current annual yield is 400 000 kL (0.4 GL) but might increase to 20 GL from a new damsite.

More than 40% of the upper catchment was cleared by the 1970s. Since then, river water has been mostly too saline for public water supply. The Quickup Dam was constructed as an alternative water supply in 1990.

Without intervention the average annual salinity was calculated to peak at around 1400 mg/L TDS at the Kompup gauging station and 700 mg/L at the Mt Lindesay gauging station.

Government, community and industry actions together have resulted in a measurable reduction in stream salinity — a rarity in a major river system.

This is the first major catchment in Australia where a downward trend in salinity is being observed in response to direct intervention through on-ground works — primarily revegetation.

## What is the Denmark Salinity Situation Statement?

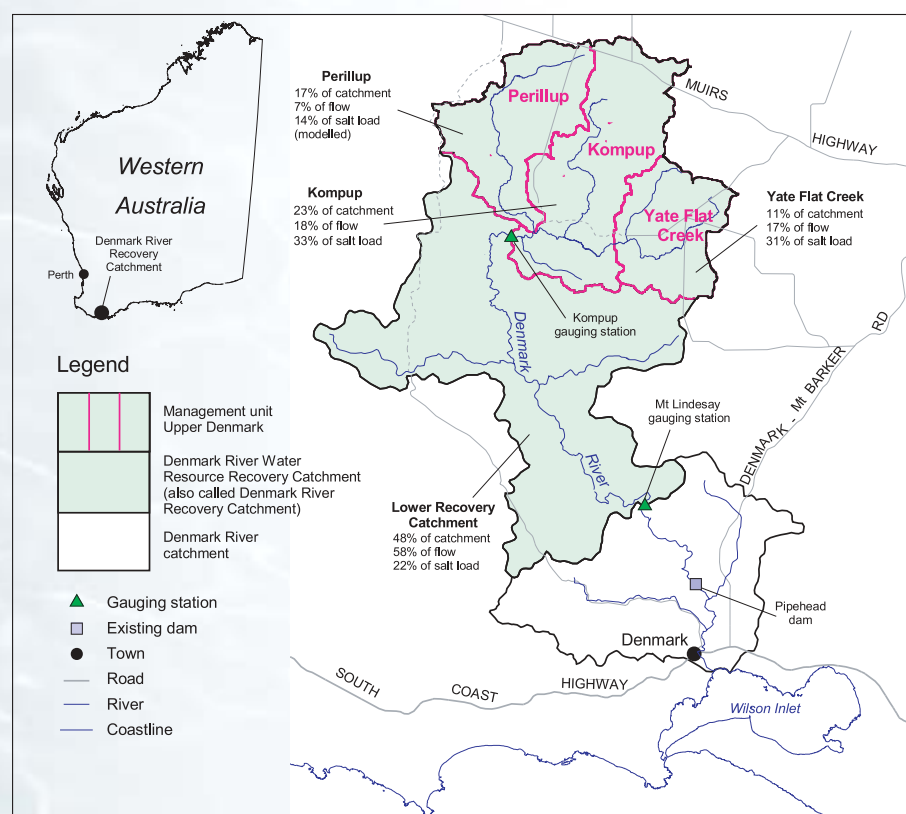
The Denmark Salinity Situation Statement is a major modelling study which:

- reviewed the salinity situation
- modelled the effects of the actions to date
- suggests management options.

## Where to from here?

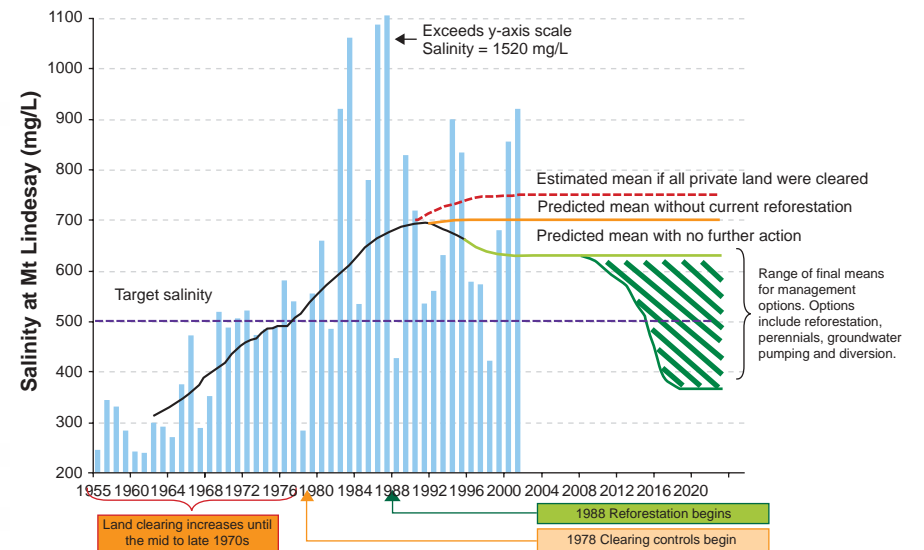
The Salinity Situation Statement focuses on conceptual salinity reduction options. This was important to understand the extent of the land use changes needed to achieve the salinity target. The next steps are to talk to the stakeholders about the options and evaluate the social, economic and environmental implications of each prior to finalising a salinity recovery plan.

The final step would be to implement this plan and to recover a major river from salinity — a national first!



Salt and flow contributions to the Denmark River.

Denmark River salinity



## A partnership approach

The Recovery Catchment Program is an excellent example of local community, industry and government working in partnership to improve water quality and to establish viable and ongoing alternative agricultural enterprises in the catchment. The program is led by the Department of Environment.

The Kent-Denmark Recovery Team, formed in 1998, is chaired by a landholder. It is an active partnership between the community of the Kent and Denmark and key government agencies. It has experienced members from the Steering Team that oversaw the Focus Catchments Program in the Kent catchment.

## Management options

Plant more trees

Plant substantial areas to perennial pastures

Establish a groundwater pumping scheme

Build dams to divert saline water

## How effective are these management options expected to be?

Management option	Modelled Mt Lindesay salinity (mg/L)	Modelled Mt Lindesay volume (GL/yr)
Base case	697	29.0
Case 2 Actual plantations established by 2001	631	23.5
Case 3.1 Actual plantations plus trees on all remaining cleared land	368	18.2
Case 3.2 Actual plantations plus deep-rooted perennials (e.g. lucerne) on all cleared land *	380	18.1
Case 3.3 Actual plantations plus shallow-rooted perennials (e.g. kikuyu) on all cleared land *	714	18.5
Case 4 Groundwater pumping in the absence of ongoing rotations of plantations **	528	27.9
Case 5 Groundwater pumping with ongoing rotations of actual plantations **	476	22.8
Case 6 Diversion of high saline flows at the Mt Lindesay gauging station	500	26
Case 7 Diversion of high saline flow at the Kompup gauging station	500	25

\* The figures for lucerne and kikuyu assume that their leaf area is the same year around as the maximum leaf area of annual pastures.

\*\* Groundwater pumping discharge requires safe disposal.

## Where can you go for more information?

For more information contact Brett Ward, Department of Environment, Albany on 9841 0113 or [brett.ward@environment.wa.gov.au](mailto:brett.ward@environment.wa.gov.au) For copies of the Salinity Situation Statement (WRT 30) contact the Information Centre at the Department of Environment (08) 9278 0464. Copies of the brochure and the complete report Salinity Situation Statement – Denmark River are also available at [www.wrc.wa.gov.au](http://www.wrc.wa.gov.au)

March 2004