Murray River National Park

Including Rilli Island, Media Island and Kapunda Island

Management Plan Amendment 2010

Murray River National Park conserves flora and fauna habitat across a transitional landscape from Mallee scrubland to the impressive floodplains of the river system.

Department of Environment and Natural Resources

Government of South Australia

www.environment.sa.gov.au

This plan of management amendment was adopted on **13 October 2010** and was prepared pursuant to section 38 of the *National Parks and Wildlife Act 1972.*

AMENDMENTS

Considerations and Strategies within the *Murray River National Park Management Plan* (1994)

ADDITION: (pp. ix, following Administration and before Policies)

Conservation Values

Murray River National Park was proclaimed to conserve a significant proportion of South Australia's floodplain environments which are not represented widely in other reserve systems. The park's conservation values include:

- Protects native vegetation associations in the transition zone between Mallee and River Murray floodplain.
- Protects a priority area of South Australian River Murray floodplain [1], which provides habitat for a variety of fauna, including water fowl and colonial bird species, and are important fish breeding areas.
- Provides habitat for one flora species and several fauna species of conservation significance.

ADDITION: (pp. ix, following Conservation Values and before Kangaroo Management)

Visitor Facilities

Murray River National Park provides the opportunity for a variety of recreational activities such as walking, canoeing, bird watching and camping in a near natural environment. Designated camping areas with toilet and parking facilities as well as walking trails and a self-guided drive trail are established over several areas within the park.

It is anticipated that low impact facilities in the park may be developed or upgraded to enhance visitor experiences and opportunities and ensure environmental impacts of visitors are kept to a minimum. There is also increased interest in the local community to develop low impact eco-tourism activities within the park. DENR will evaluate proposals for low impact sustainable eco-tourism activities and associated facilities through a consultative process with key regional stakeholders and against the zoning of the park and objectives of the plan.

All developments will be undertaken in a way that preserves the inherent character of the park, will be low impact, minimal in nature and compatible with the natural landscape and heritage values.

Objective

Provide sustainable camping areas and low impact visitor sites that offer opportunities for public enjoyment in a way that preserves the park's natural values.

Strategies

- Designate and manage sustainable camping areas and day visit areas to provide visitors with a quality experience while preserving natural and cultural values, consistent with the zoning of the park in this management plan.
- Evaluate proposals for low impact, sustainable, eco-tourism activities through a consultative approvals process against the zoning of the park and the objectives of this management plan.
- Support approved eco-tourism proposals and their implementation.

---

[1] Department of Water, Land and Biodiversity Conservation (2005) Environmental flows for the River Murray Strategy. Department of Water Land and Biodiversity Conservation.

ADDITION: (pp. ix, following Visitor facilities and before Policies)

Kangaroo Management

Three kangaroo species, Western Grey (*Macropus fuliginosus melanops*), Red Kangaroo (*Macropus rufus*), and Euro (*Macropus robustus*) are present in Murray River National Park. Western Grey and Red Kangaroos currently occur in high population densities on the River Murray floodplain. A kangaroo monitoring program has been used in the Katarapko section of the Murray River National Park since 2001 and suggests that the population density of the Western Grey Kangaroo is increasing, with 16/km² recorded in 2001 and 43/km² in 2008[2]. The Red Kangaroo data is more variable, and averaged[3] 36/km² over the survey period. The density of Euros is considered low. Excepting Euros, the density data suggest the kangaroo populations have the potential to become overpopulated on the park, particularly during extended periods of poor rainfall. Kangaroo overpopulations have the potential to significantly affect native vegetation condition, recovery following disturbance and regeneration. The Department for Environment and Natural Resources (DENR) will continue routine kangaroo surveys in Murray River National Park to monitor population size and density as part of a total grazing pressure management program.

Potential large scale restoration works are planned for the Murray River National Park and the management of grazing pressure will affect the success of such projects.

If research and monitoring determines that an overpopulation of kangaroos in Murray River National Park is impacting negatively on the conservation values of the park, including native vegetation and revegetation programs, kangaroo population control programs will be implemented. A range of management options will be considered for a control program. Culling will only be conducted if it is considered to be the only practicable method to manage the impacts of an overpopulation of kangaroos on the conservation values of Murray River National Park. Population control programs will be reviewed regularly to ensure that the objectives of the program are being met.

Objective

To manage the impacts of overgrazing by kangaroo populations on recovering native vegetation and revegetation projects.

Strategies

- Monitor vegetation condition and seedling establishment in recovering and revegetated areas within the park.
- Monitor kangaroo populations as part of total grazing pressure in the park.
- If an assessment identifies that vegetation is negatively affected by grazing pressure, implement population control programs developed for the park, including a kangaroo management program.

DELETE: (pp. 2)

1.3 Hydrology

The River Murray catchment upstream from Loxton covers an area of approximately 1 million square kilometres. Much of the catchment receives little rainfall, thus the flow regime before river regulation was strongly influenced by rainfall and snow melt in the high country of New South Wales and Victoria, which led to peak discharges typically in spring and summer (Caldwell Connell 1981). The reserve is well within the very large non-contributing section (zero run-off) of the Murray catchment area and is also well downstream of the point of maximum discharge at about Yarrawonga, below which transmission losses are greater than accretions of runoff (Burton 1974).

---

[2] Department for Environment and Heritage (2009) Results of Katarapko Island Kangaroo Surveys 2008.

[3] Department for Environment and Heritage (2009) Results of Katarapko Island Kangaroo Surveys 2008. Average density of the survey data from 2001-2008

Before regulation of flow by dams and weirs, the typical seasonal flow regime was superimposed on irregular long-term changes in flow, since most of the catchment is arid country where rainfall is erratic. Some extremely low flows were experienced in the Upper Murray during droughts.

River regulations and massive diversions for irrigation and other uses have had significant effects on the flow regime in the Upper Murray. By 1974 the average annual flow reaching South Australia had been reduced to about 60 percent, the intensity and duration of high flows had also been reduced, while flows were increased during dry times (Johnson 1974). Regulation has also changed the seasonal pattern of flow, reducing discharge in winter and early spring, and increasing summer and autumn flows, particularly in the upper river reaches.

The hydrology of a portion of the reserve has been significantly altered by the construction of embankments in 1964 to form an evaporation basin in the southern portion of Katarapko Island (Figure 2). This basin receives saline irrigation water from the Loxton irrigation area which is stored until river flows are sufficient to absorb it without creating salinity problems downstream. Management of the basin has had the following three main effects on the area contained (Cardwell Connell 1981).

(a) Elevated water levels

Water flows into the basin throughout the year with peak inflows in the hotter months. Releases from the basin to the river are made during periods of high river flow and, providing salinity is favourable, continue until water levels on either side of the outlet are equal. Releases have usually been made during periods when the river is rising so that outflows have been limited. Since management of the basin began, an average water level 1.5 metres above the adjacent river level has been maintained.

(b) Reduced flooding frequency

Before 1964 the lagoons within the evaporation basin would have been flushed by river water on average in nine out of every ten years. The frequency of flushing and flooding of low-lying areas has been approximately halved since construction of the basin. The frequency with which other higher areas within the basin are flooded has also been reduced, but by a smaller proportion.

(c) Prolonged inundation

The period of inundation of the enclosed floodplain has been extended during and after floods due to the restricted outflow.

Outside the evaporation basin, much of the floodplain in the reserve is frequently flooded. About every two years floodwaters cover many low-lying areas including some lignum flats and the areas surrounding wetlands.

Information on groundwater in the reserve and the influence of the evaporation basin on levels and salinity has been summarised from Cardwell Connell (1981). The sedimentary alluvial strata underlying the reserve contain a number of discrete aquifer systems. Groundwater in the higher Pliocene sands aquifer and probably the lower Murray Group aquifer are in direct hydraulic continuity with the River Murray at Loxton. The depth and quality of groundwater below the floodplain in the reserve is therefore probably directly influenced by both systems. Other factors influencing natural groundwater levels below the floodplain are prevailing river levels, evapotranspiration, and local inputs from flooding and rain. During periods of low flow at Loxton, the natural water-table has been between 2 and 6 metres below the surface of the floodplain. Natural groundwater salinities below the floodplain are typically between 20,000 and 40,000 parts per million.

The overall effect of the evaporation basin on groundwater has been to raise the water-table within the basin by between 1 and 1.5 metres depending on the survey water levels maintained. Apart from surface flow water moves out of the lagoons by seepage of groundwater toward the river and Katarapko Creek and by evapotranspiration of groundwater. A survey in 1980 found that the water table is within 2 metres of the, surface in some low-lying areas, a critical zone where salt accumulation can occur close to the surface due to capillary rise and evaporation of groundwater.

REPLACE WITH: (pp. 2)

1.3 Hydrology

Increased water storages and regulatory structures, and water harvesting activities throughout the Murray-Darling Basin have resulted in a significant reduction in the frequency, duration and height of natural flood events. Under natural conditions, a flow to South Australia of 60,000 ML/day occurred on average every two years for a period of almost four months. This rate has been reduced to once every five years and last on average for two and half months. Under natural conditions, larger flows of 80,000 ML/day, which cover approximately 80% of the Katarapko floodplain, occurred on average every two to three years and lasted for a period of over three months. This rate is now reduced to once every eight years on average for two and half months[4]. The ecological impacts of reduced over-bank flooding include; diminished extent and loss of conditions required for reproduction and regeneration in some species, loss or redistribution of habitats, and reduced exchange of organic material, carbon, nutrients and sediment between the floodplain and river, which affects aquatic productivity. In addition, the natural flushing of salt from floodplain soils and their recharge with freshwater has also been decreased.

The river, main anabranch systems and some wetlands within Katarapko have become permanently inundated as a result of the construction of Locks and Weirs 4 and 3 in 1929 and 1925, respectively. Both Eckert Creek inlet and Katarapko Creek Stone Weir were constructed during the same era. Weir construction raised the water level of the river approximately three metres and allowed the maintenance of stable water levels to favour water extraction, navigation, and to minimise saline inflows from riverbanks and wetlands directly connected to the river. Ecological impacts consist of: no natural summer drying leading to loss of ephemeral habitats; reduced range of bank habitats; loss of in-stream habitat diversity necessary to maintain biological diversity; barriers to fish passage; degradation of natural low-flow channel shape; reduction in hydrologically diverse aquatic habitats (flowing water); and, thermal stratification that results in anoxic bottom water which favours cyanobacteria. Artificially high water levels have also raised saline groundwater levels into the root zone of floodplain vegetation, causing dieback and soil scalding.

Flow restrictions between the main river channel and the floodplain through construction of levee banks and blockages on anabranch creeks and floodplain channels feeding temporary wetlands has also impacted on the health of the floodplain and waterway hydrology. These structures pose a barrier to fish movement in-stream and across the floodplain. Thirty barriers have been documented throughout the floodplain of Katarapko, which include structures such as Log Crossing and Katarapko Creek Stone Weir.

Objectives

Improve the connectivity between river, creek, wetland and floodplain environments.

Improve environmental flow management for in-channel, wetland and floodplain environments.

Strategies

- Create fish passage through creek systems in the park.
- Manage in-stream flows, pool levels and wetting and drying cycles to improve ecological functioning of creek systems in the park.
- Implement environmental watering activities to inundate priority floodplain areas in the park.
- Modify existing and/or build new floodplain and wetland hydrological infrastructure to achieve improved ecological outcomes.

[4] Mike Harper, Manager, Floodplain and Wetland Program, DEH, pers. comm., 2009

For further information please contact:

Department of Environment and Natural Resources Phone Information Line (08) 8204 1910, or see SA White Pages for your local Department of Environment and Natural Resources office. Online information available at: www.environment.sa.gov.au