WOODLANDS OF THE SWAN COASTAL PLAIN

(Eastern side)

Three unique woodlands occur on heavy soils between Waterloo (near Bunbury) and Bullsbrook. These woodlands contain particular associations of plant species that have been extensively cleared. They are believed to have been some of the most extensive communities on the eastern side of the Swan Coastal Plain, but through widespread clearing they are now rare and have been listed as 'Threatened Ecological Communities'. As only about 100 hectares remains of each of the woodland communities, and because of the level of threats to them, they have been ranked as Critically Endangered.

Marri (*Eucalyptus calophylla*) dominates two woodland communities of the eastern side of the Swan Coastal Plain. The wettest of these sites is dominated by marri and kingia (*Kingia australis*). The community is named '*Eucalyptus calophylla*—*Kingia australis* woodlands on heavy soil', but is sometimes called Swan Coastal Plain Community type 3a. Other key species in this community are couch honeypot (*Dryandra lindleyana*), pepper and salt (*Philotheca spicata*), balga (*Xanthorrhoea preissii*) and several species of herbs.

The driest of the marri communities is dominated by marri and balgas. The community is named '*Eucalyptus calophylla*—*Xanthorrhoea preissii* woodlands and shrublands', but is sometimes called Swan Coastal Plain Community type 3c. This community can also include the occasional wandoo (*Eucalyptus wandoo*), and usually contains prickly moses (*Acacia pulchella*), couch honeypot, margin-leaf pea (*Gompholobium marginatum*), white myrtle (*Hypocalymma angustifolia*) and herbs.

The third of these woodlands, occurs on the transitional landform and soil zone between the Darling Scarp and the Swan Coastal Plain. It is described as the 'eastern shrublands and woodlands' but is sometimes called Swan Coastal Plain Community type 20c. The community occurs sometimes as a shrubland, or can be a woodland of slender banksia (*Banksia attenuata*) and firewood banksia (*Banksia menziesii*), sometimes with sheoak (*Allocasuarina fraseriana*). The shrub layer usually includes common woollybush (*Adenanthos cygnorum*), *Hibbertia huegelii*, dwarf sheoak (*Allocasuarina humilis*), common brown pea (*Bossiaea eriocarpa*), yellow buttercups (*Hibbertia hypericoides*) and blueboy (*Stirlingia latifolia*). Foxtail mulga grass (*Neurachne alopecuroidea*) and a suite of herbs and sedges also usually occur in the community.

The major threat to all three woodland communities is clearing, as there are very few (or none in the case of community types 3a and 20c) occurrences found in secure conservation reserves. Other threats include weed invasion, dieback caused by the plant pathogens *Phytophthora* species, too frequent fire, illegal rubbish dumping and changes to local hydrology caused by clearing in the catchment.

Community type 3a (marri -*Kingia australis* woodlands on heavy soils) in Kenwick.

Occurrence of community type 3c (marri-*Xanthorrhoea preisii* woodlands on heavy soils) in Swanview.

Community type 20c (eastern shrublands and woodlands) in Swanview.
Photos – Val English

For further information please contact the Department's Swan or Central Forest Region offices on (08) 9368 4399 and (08) 9725 4300.

Recovery

of threatened ecological communities

The Department of Conservation and Land Management (the Department) is committed to ensuring that Critically Endangered Ecological Communities are not totally destroyed. This is done through the preparation of an Interim Recovery Plan (IRP), which outlines the recovery actions that are required to urgently address those threatening processes most affecting the ongoing survival of threatened ecological communities in the wild and begin the recovery process.

WOODLANDS OF THE SWAN COASTAL PLAIN

(Eastern side)

The Department has set up Threatened Flora and Communities Recovery Teams for the Swan and Central Forest Regions to coordinate the implementation of recovery actions that address the greatest threats to the survival of the woodland communities in the wild. Recovery Teams consist of representatives from the Department, community groups, private landowners, local shires and various government agencies. Recovery actions that have been, and will be, progressively implemented to protect the threatened ecological communities include:

Protection from current threats:

Weed control; rubbish removal; fencing; conducting further surveys; and regular monitoring of the health of each community.

Protection from future threats:

The development of strategies to manage fire; acquiring areas as conservation reserves; rehabilitation; ensuring that all relevant people are aware of the community's presence and the need to protect it, and that all are familiar with the threats identified in the Interim Recovery Plan.

IRPs will be deemed a success if the there is an increase in the area and/or number of occurrences of the communities under conservation management, the diversity and composition of native species and processes are maintained, and there is reduction in the numbers of exotic species and threatening processes.

Weed infestations in community type 3a (marri-*Kingia australis* woodlands on heavy soils) in Wungong. Photo – Robyn Phillimore

Mounds of dumped soil in community type 3a (marri-*Kingia australis* woodlands on heavy soils) in Wungong. Photo – Robyn Phillimore

Occurrence of community type 3a in Forrestfield showing *Kingia australis* in foreground. Photo – Val English

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DEPARTMENT OF Conservation AND LAND MANAGEMENT
Conserving the nature of WA

Natural Heritage Trust
Helping Communities Helping Australia

CRITICALLY ENDANGERED THROMBOLITES

Microbialites are formed by a complex group of microbes that photosynthesise and precipitate out calcium carbonate (limestone) to form odd rock-like structures. These structures are evidence of the oldest life on Earth and are therefore of great scientific interest. They provide evidence of historical environments through information held within their structure. Worldwide, these structures are restricted to a few areas including the Bahamas, Bermuda and Western Australia. Western Australia contains the oldest microbialite fossils, at 3.5 billion years. The State also contains the greatest number and most varied types of living microbialites in the world.

Thrombolites in Lake Clifton. Photo – Val English

Microbiolites come in different forms. Those with a clotted internal appearance are called 'thrombolites'. Thrombolites have existed for at least 570 million years (since early in the Phanerozoic era). They were the most dominant living marine structures at this time as they were more resistant to grazing and burrowing animals. Around 395 million years ago however, faster-growing marine organisms such as corals and macroalgae led to the decline of the thrombolites as a result of competition for space.

Thrombolites are known from several lakes in the south west of WA—including Lake Richmond in Rockingham, and Lake Clifton south of Mandurah. They are also subject to a number of threats and are listed as Threatened Ecological Communities.

Thrombolites are continuously growing and are dependent upon a continuous discharge of groundwater into their habitat. This groundwater needs to be low in salinity, high in alkalinity and low in nutrients. Nutrients leaching into the groundwater from agricultural and urban land use in the catchments is also impacting on the water quality in both of the Lakes. Algal blooms have already been observed in Lake Richmond and Lake Clifton.

The use of the lake's catchments for agriculture or housing, results in an increase in groundwater usage. This can cause an upwelling of the saline water that underlies the fresh groundwater, and has the potential to impact on the salinity of the lakes. This may have caused the large increase in the salinity of Lake Clifton recorded in the early 1990s.

Other threats to the thrombolites include crushing by visitors, pollutants, altered groundwater flowthrough, increased runoff due to clearing in the catchments, alterations to surrounding vegetation, smothering by weed infestations or by sediment, and at Lake Richmond rubbish dumping, the influx of rubbish through drains, and road construction.

The Department of Conservation and Land Management (the Department) has set up the Swan Region Threatened Flora and Communities Recovery Team to coordinate the implementation of recovery actions that address the greatest threats to threatened communities in the wild. The management of Lake Richmond is actively undertaken by the Rockingham Regional Environment Centre. A specific Recovery Team for the Thrombolites of Lake Richmond has also been set up, and another which will specifically oversee the implementation of the recovery actions for the Lake Clifton thrombolites, will be established in the future.

For further information please contact the Department's Swan Region Office on (08) 9405 1222.

Recovery
of threatened ecological communities

CALM is committed to ensuring that Threatened Ecological Communities are not totally destroyed. This is done through the preparation of an Interim Recovery Plan (IRP), which outlines the recovery actions that are required to urgently address threatening processes most affecting the ongoing survival of Threatened Ecological Communities in the wild and begin the recovery process.

IRPs are prepared by the Department and implemented by Regional or District Recovery Teams consisting of representatives from the Department, community groups, private landowners, local shires and various government organisations.

CRITICALLY ENDANGERED THROMBOLITES

Recovery actions that have been, and will be, progressively implemented to protect the Threatened Ecological Communities include:

Protection from current threats:

Construction of boardwalks, weed control, and the removal of rubbish; transfer of care, control and management of the portion of the lake that was privately owned at Lake Richmond to the Crown for Conservation and Public Recreation, regular monitoring of water quality and levels, and general health of the community in both Lake Richmond and Lake Clifton.

Protection from future threats:

For Lake Richmond - rehabilitation of native vegetation buffers and development of a drainage strategy; and for both lakes, ensuring that relevant authorities, landowners and the Department's personnel are aware of the presence of the thrombolite communities and the need to protect them, and that all are familiar with the threats that will be identified in the Interim Recovery Plans.

IRPs will be deemed a success if the water quality and levels are maintained or improved in Lake Richmond and Clifton, and the vigour and extent of the microbial communities including the composition of the microbial species are maintained.

Weeds encroaching into the vegetated buffer for the thrombolite community at Lake Richmond. Photo – Val English

Crushing by recreational users is a serious threat to the thrombolites. Photo – Val English

The boardwalk constructed at Lake Clifton helps prevent crushing of the thrombolites. Photo – Stephen Dutton

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