Department of Environment and Conservation
Our environment, our future

SUMMARY ANNUAL REPORT

THREATENED SPECIES AND/OR COMMUNITIES RECOVERY TEAM

PROGRAM INFORMATION	
Recovery Team name	Aquatic Root Mat Community of Caves of the Swan Coastal Plain (Yanchep)
Reporting Period (Calendar Year)	**Calendar year 2007**

Current membership

	Member	Representing
1. Chair	**Paul Brown**	DEC, Gnangara Sustainability Strategy
2. EXEC OFFICER	**Fiona Felton (Jan-Nov 07) / Natalia Huang (Dec 07)**	DEC, Swan Coastal District
3.	**Andrew Paton**	Department of Water
4.	**Jill Pryde**	DEC, Species and Communities Branch
5.	**Brenton Knott**	UWA
6.	**Andrew Storey**	UWA
7.	**Wayne Bartley**	Water Corporation
8.	**Alison Pritchard**	DEC, Yanchep National Park Manager (Acting)
9.	**Lex Bastian**	Speleologists Association

Dates meetings were held	26th June 2007 The Technical Working Group for the Cave Rewatering Project met four times in 2007. Members include Paul Brown, Fiona Felton/Natalia Huang, Brenton Knott and Wayne Bartley.
One to two paragraph summary of achievements suitable for *WATSNU*	The groundwater within the Yanchep Caves continues to be adversely impacted by the dry climate and resultant drop in the Gnangara Mound groundwater levels. A major rewatering project was tested in 2005 and a filtering system to remove iron and manganese from bore water was built in 2007. However, the mechanical interface between the filtering and distribution system has caused delays in commissioning and the system will not be switched on until 2008. A taxonomic review of key cave stream invertebrates is well advanced and this will better define the component fauna of this TEC.
List of actions undertaken by Recovery Team (from actions in Recovery Plan)	**1. Establish a Recovery Team** The Recovery Team was established in 1997 with a broad inter-agency membership and has been running continuously since.

2. Monitor cave fauna and respond to results of monitoring as appropriate

Cave invertebrate fauna have been monitored annually by DoE-DoW since 1999 through Dr Brenton Knott and Dr Andrew Storey from the University of WA. The 2007 report will be submitted to DoW in 2008.

3. Urgently implement recommendations in Management Plans for Yanchep National Park likely to benefit root mat communities

A Yanchep National Park Cave Management Committee has been established and determines public access requirements and management of individual caves. This committee is facilitated by the DEC and has a number of Speleologist Association members represented on it. The Committee meets three times a year and is kept informed of Recovery Team actions and proposals. Yanchep National Park has a Community Advisory Committee that is also kept informed and their comments sought on recovery actions. The Recovery Team Chair attended one Cave Management Committee and one Community Advisory Committee meeting in 2007.

A new Park Management Plan is under preparation for release of a draft in 2008/2009 and this Plan will include revised recommendations relating to the Yanchep Caves and TEC.

5. Disseminate information about the community

An article on the filtration system was printed in the local Sun City News in November 2007. Fiona Felton (Executive Officer/Technical Officer) conducted a TV interview with Today Tonight in April 2007 regarding the efforts made to sustain the TEC. The Yanchep Caves Rewatering Project was featured on the TV documentary “Fish out of Water” hosted by Ian Thorpe. The Yanchep National Park also has an extensive school activity program and visitor tours. All tours into Crystal Cave (four times a day) discuss the Yanchep Caves Root Mat Community and the recovery actions being undertaken.

6. Undertake research

In 2007, Danny Tang from UWA commenced work to undertake a taxonomic review of *cyclopoids* and *harpacticoids*, and will ensure a voucher specimen and taxonomic photograph collection is developed. The product will be a published manuscript with stygofauna descriptions in an international scientific journal and in a manual for local use.

An economic analysis of the Park user’s propensity to pay to protect the Yanchep Caves TEC was undertaken in 2007 by CSIRO and a student from UWA. This report will be published in 2008.

7. Review data monthly from transect bores near areas of private abstraction

See Action 8.

8. Continue to assess the adequacy of the bore network

Groundwater levels and selected water quality attributes are checked and collated across the Gnangara Mound by the DoW monthly. Data is available to the DEC. A review of vegetation transect and monitoring bore locations was completed during the review of EPA Section 46 conditions by the DoW in late 2007. A

	further vegetation transect was established near Loch McNess and an additional three bores have been established in the Park. **9. Manage water levels in likely catchment areas for cave streams** Thinning of large areas of Pinjar pine plantation by FPC is expected in 2007-2008 which may eventually have a positive effect on groundwater recharge. The Gnangara Sustainability Strategy (GSS) will further evaluate the land management in the groundwater catchment area of the Yanchep Caves during 2008/09. This will include evaluation of recharge from prescribed burning native woodlands and the long term land use of the Pinjar pine plantation. **10. Monitor water levels in cave streams that contain the root mat community, and initiate short-term management solutions where necessary** The DEC monitors water levels using the observation bores within the caves on a weekly basis to establish long-term trends. The monitoring manual produced by Fiona Felton was completed in 2006, with modifications made in 2007. All staff involved in monitoring water levels follow the procedure in this manual. Localised small-scale rewatering systems are in place in Crystal, Cabaret, Boomerang, Water and Carpark Caves. These are monitored three times a week to ensure they are functioning effectively. A new monitoring network for root-mat distribution in the cave streams in Crystal, Cabaret, Boomerang and Carpark Caves was established in 2007. **11. Design and establish a semi-permanent system for remote monitoring and watering of caves** The Yanchep Caves Recovery Project (the large-scale rewatering system) was established in 2005. The system was completed and run into Crystal Cave, but was de-commissioned due to the production of a red iron precipitate within the cave. Trials were carried out to remove this precipitate which resulted in the appointment of Worley Parsons and subsequent recommendation for the GE filtration system. This system has a DMI65 media, a catalytic coated sand media, which removes both iron and manganese based on laboratory trials. In September 2007, all filtration system infrastructure was installed at the Yanchep Beach Road site. Technical problems with the interface between the distribution system and filter system have severely delayed the commissioning of the project. It is expected that filtered water will be pumped into Crystal Cave in 2008, as soon as all issues have been resolved and iron and manganese levels are at satisfactory levels. **13. Manage water quality in likely catchment areas for cave stream. Management strategy to be included in full Recovery Plan for the community.** Although water quality within the catchment does not appear to be affecting the cave streams, the DEC and the DoW maintain regular water quality monitoring and strictly manage operations that have the potential to pollute the groundwater. **15. Ensure land use planning and development control processes effectively safeguard against potentially adverse impacts upon the cave systems**

Land use changes and developments are assessed by the DEC for potential impacts on caves and cave streams. As part of the Gnangara Sustainability Strategy (GSS), land use values will be managed in a manner which will minimise the impact of development on the cave systems.

18. Wherever possible create a buffer between the caves and any tracks or trails

This action is taken into consideration in the day to day workings of the National Park. Where appropriate, unused tracks have been closed and rehabilitated. All road upgrades include full assessment of all underlying cave systems.

19. Manage fire regimes

The fire regime within the Yanchep National Park Management Plan is managed in such as way as to avoid damage to the Tuart trees above and around the caves with the TEC and also to assist in ground water recharge. In recent years, prescribed burning has specifically targeted areas upstream of the caves within the groundwater catchment in an attempt to promote greater recharge and to assist in increasing or holding local groundwater levels until a more permanent rise in regional levels can be achieved. In 2005 a large wildfire burnt across the top of most of the caves with root mat communities present; subsequent Tuart regeneration appears healthy.

20. Report on success of management strategies for cave communities

During 2007, the following reports were received and/or prepared by the Recovery Team:

a. 2006 Annual Report for the Yanchep Cave Recovery Team, by Fiona Felton and Paul Brown

b. MMG-6 Gravity Filter system, by GE Infrastructure Pty Ltd

c. 2007 Annual Invertebrate Monitoring Report by DoW through UWA

It is proposed that in 2008, the DEC will prepare full documentation of the infrastructure associated with the Yanchep Caves Recovery Project and Danny Tang will submit the manuscript on the taxonomy of selected invertebrates from the Yanchep Caves.

21. Identify and liaise with additional landholders/ land managers

There is extensive whole of Government informal and formal liaison on the declining groundwater levels on the Gnangara Mound with all key agencies (Water Corporation, DoW, FPC, Department of Planning and Infrastructure (DPI), CSIRO, the Department of Agriculture & Food and the Department of Premier and Cabinet). This liaison is facilitated through the Gnangara Coordinating Committee and the Gnangara Sustainability Strategy Taskforce which will provide an effective management strategy for the Gnangara Mound and its environmental values, water resources and land use by June 2009. This may result in increased recharge to assist in raising the groundwater levels and therefore help the Root Mat Community and other water dependent ecosystems to survive. The DEC is an active member of both groups through its Chair, Paul Brown.

Assessment of progress towards meeting criteria for success (from Recovery Plan)	Six of the 21 recovery actions were completed prior to 2007, while the remaining 15 recovery actions above were ongoing in 2007. Until the large-scale rewatering system is commissioned and operated successfully for a time in 2008, it will be difficult to assess the criteria for success for this unusual TEC.
Assessment against criteria for failure (from Recovery Plan)	The current Interim Recovery Plan (IRP) covers the period 2000-2003 and states that the criteria for failure is significant loss of area or further modification of the threatened ecological community, including the complete drying up of the root mats in any single cave, or loss of individual fauna species. It cannot be determined at this point if any individual fauna species or individual caves have been lost. The Recovery Team have discussed the concerns raised by Dr Edyta Jasinska regarding the potential extinction of the Crystal Cave Crangonyctoid. The Recovery Team can not determine at this point that the status of Crystal Cave crangonyctoid *Hurleya* sp. (WAM#642-97) has changed and can not definitely state that it is extinct. The following management actions relating to the Crystal Cave Crangonyctoid and seven caves containing this TEC have been undertaken in 2007: • The small 'well' style ponds have been retained in Crystal Cave throughout the past five years. • The development of environmentally appropriate filtering system for the rewatering of Crystal Cave has been designed, contracts let and filtering system installed. • There remain some compatibility issues with the established rewatering system and the filtering systems (valves, override systems) that should be rectified by the consultants shortly. Then the water will start being pumped back into Crystal Cave very shortly after. • Detailed monitoring protocols for the root mats and cave stability have been established in manual form. Pre-watering monitoring is complete. • Checking the water quality and quantity, cave stability, mechanical operation of equipment and appropriate final water levels for the new rewatering system will occur in the six weeks following system opening. Then the operation of the system will be following established processes. In addition, a contract has been let with UWA for the taxonomic assessment and publishing of descriptions of the cyclopoids, harpacticoids and amphipods of the Yanchep Cave and Mound Spring Threatened Ecological Communities. These three groups appear to be most likely to contain endemic species. The first two group's assessments have been completed using all available material and the manuscript will be complete by the middle of 2008.