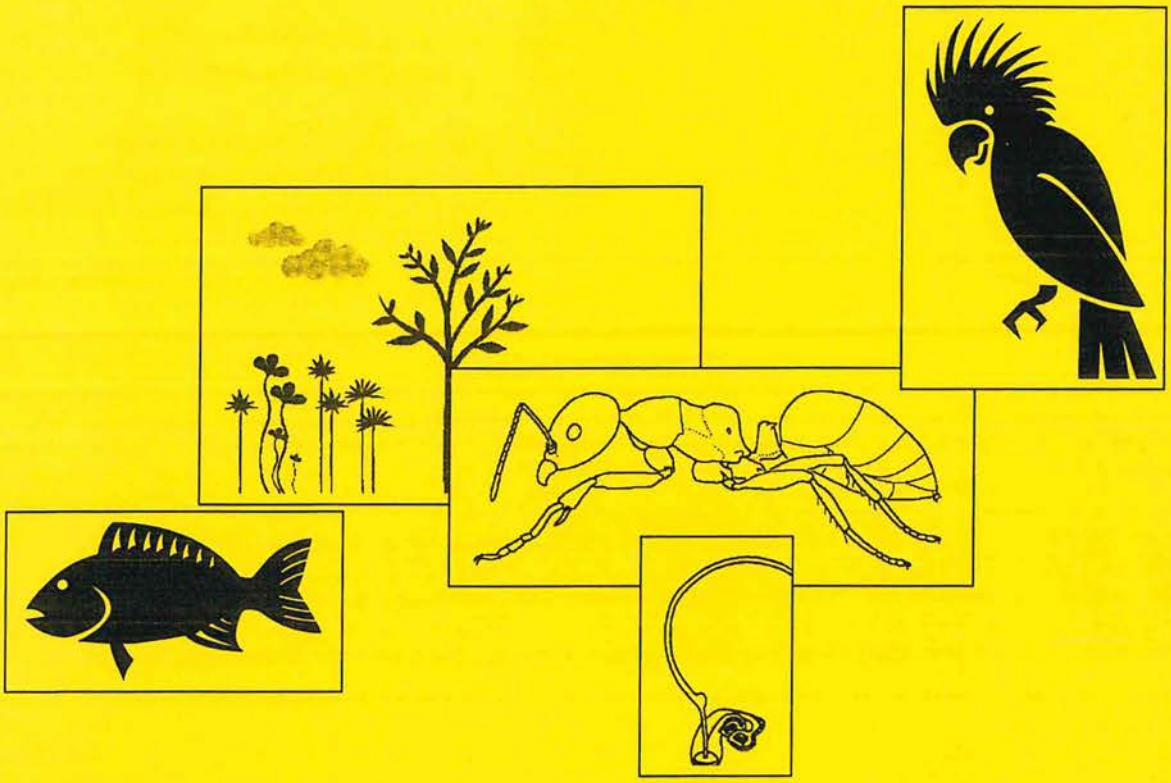
Faculty of Science and Engineering

2011

Biology Work Experience 301



Report

Suyee Ku

Department of Environment and Agriculture

Curtin
University of Technology

Curtin University

Faculty of Science
and Engineering
Department of Environment and
Agriculture
School of Science

Telephone +61 8 9266 7041
Facsimile +61 8 9266 2495
Email environbio@curtin.edu.au
Web curtin.edu.au

Dear Val English

Curtin University Environmental Biology Work Experience Program

Suyee Ku who has been undertaking a project within your organization and has now completed the Work Experience Report required by our Department. A copy of this report is attached.

In order that we may assess the performance of the student, I seek some feedback on the aptitude and efficiency of the student, and how well he executed the tasks that were set.

I will therefore be most grateful if you could write me a letter (or email on J.Majer@curtin.edu.au), in which you provide some feedback on these matters. A copy of the Student's report is attached.

Finally, I would like to take this opportunity to thank you for participating in our Work Experience program. I hope that you will be willing to do so in future years.

Yours sincerely,

Jonathan Majer

Prof Jonathan Majer
Department of Environment and Agriculture

Curtin Biology
Work Experience 301

Department of Environment and Conservation (DEC) Kensington

January- February 2011

Diary of Activities

Suyee Ku
13961831

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Abbreviations and Acronyms

DEC	Department of Environment and Conservation
IRP	Interim Recovery Plan
DNC	Director of Nature Conservation
SCP20b	Swan Coastal Plain community type 20b

Diary of Activities

During my month of work experience at the Department of Environment and Conservation (DEC) Species & Communities Branch in Kensington, I was assigned two interim Recovery Plans (IRPs) to work on. Recovery Plans are prepared to guide the future conservation management of threatened species or threatened ecological communities (TECs). The Recovery Plans I worked on were concerned with Threatened Ecological Communities. IRPs contain recovery actions that should be implemented to address threatening processes affecting the survival of threatened taxa. There are two types of Recovery Plans, interim and full Recovery Plans. IRPs generally last for five years. At the end of this period, the IRP will be reviewed and if the classification of the TEC has not improved, a full Recovery Plan may be required, which remains in force for ten years.

TECs exist when an ecological community is threatened. An ecological community is a naturally occurring biological assemblage occurring in a particular type of habitat. Communities exist as occurrences, which are discrete examples of the community existing over an area. TECs are classified into four categories of threat; 'Presumed Totally Destroyed', 'Critically Endangered', 'Endangered' or 'Vulnerable' (*Definitions, Categories and Criteria for Threatened and Priority Ecological Communities* 2010). Presumed totally destroyed occurrences have not been located in the last 50 years as a result of extensive modification or destruction of the community. These communities are presumed unable to recover its species composition or structure in the foreseeable future. Critically Endangered communities face a high risk of destruction in the immediate future or are already severely degraded, but are still capable of being rehabilitated. These communities are originally of limited distribution and/or have been subject to a major contraction in area. Endangered communities also have a limited distribution or have been reduced in area, and is in danger of significant modification or destruction in the near future. Communities that face significant modification in the medium to long-term future are classified as Vulnerable. They may still be widespread but it is likely they will move into a higher risk category if threatening processes continue to occur within the community.

An Interim Recovery Plan is a comprehensive document, its main content consisting of descriptions of occurrences, threatening processes and recovery actions. Its structure is as follows; foreword, summary and background of TEC, descriptions of recovery actions and predicted costs, acknowledgments, references and appendices. The foreword sets out DEC's commitments, cites relevant legislation, states IRP objectives and its authors, as well as the document's date of approval, recommended citation and acknowledgements.

The summary contains brief descriptions of TEC characteristics, such as vegetation, location and habitat requirements. Its category of threat is included in this section, as well as a list of the recovery actions and recovery team responsible for their implementation. The DEC district and local authorities the community falls under are named. International obligations and social and economic impacts of the IRP are mentioned, as well as indigenous matters to be considered and benefits to other species or communities as a result of plan implementation. IRP objectives are also stated, which aim to maintain or improve the condition of the community and reduce its level of threat, with criteria for success and failure set out for guidance.

The background section includes a much more detailed description of the community, covering its history, characteristics, significant threats and conservation significance. It also includes an occurrence table, which contains information on location, tenure, purpose, major threats and estimated area of an occurrence. A comments column in the table contains miscellaneous information on the occurrence, including its conservation status, connection to Aboriginal sites, fencing status and vegetation condition according to Bush Forever scales. The table also contains information on groundwater levels. Levels close to the surface indicate high dependence of vegetation on water, lower levels indicate moderate dependence or a distant linkage to groundwater. This table is a quick reference point for information on occurrences. Occurrences are given one or more site codes. Site codes represent a quadrat within an occurrence. Quadrats are 10x10m squares within which all plant species are recorded, acting as a representative for all plant species found in the occurrence. Text descriptions for each occurrence follow the table.

Historical and current threatening processes are also included under the background section. Main threatening processes which affect TECs are clearing, altered fire regimes, dieback, weeds, salinity, grazing, disturbance due to recreational or maintenance activities and hydrological changes. The effects of these processes are described in detail, as well as recommendations of some management actions.

Following this section are recommended recovery actions for the TEC. Completed actions are mentioned here if the IRP is replacing a previous version. Objectives of recovery actions are set out, and criteria for success and failure are repeated. Recovery actions may include weed and dieback monitoring, construction of fences, sign installation, acquisition of communities on private land, minimising further clearing, carrying out further research, developing a fire management strategy and disseminating information and liaising with land managers on the importance of conservation. Final recovery actions recommend publishing annual reports on success of management actions, for the purpose of informing the community. The necessity of a full Recovery Plan may emerge if TEC

classification remains the same. Recovery actions are summarized in a table containing information on predicted costs, responsible authorities, affected occurrences and completion dates.

Recovery actions are carried out by the relevant DEC District in which the TEC is located, and by the South West Region Threatened Flora and Communities Recovery Team, which includes DEC's WA Species and Communities Branch, local government authorities and community groups. DEC funding for implementation of actions may be constrained due to budget or prioritisation of other issues. It is a shared responsibility of the recovery team to secure funds. Reports are made annually to DEC's Corporate Executive.

The appendix contains a table of vascular plants recorded in occurrences as well as information on their ecological characteristics. These are fire response of species, months to first, peak and flowering decline, longevity of species and dieback response. The table is extensive as there are many plant species present.

FIRST WEEK

The first Interim Recovery Plan I worked on was concerned with Swan Coastal Plain community type 20b (SCP20b). This community is described as *Eucalyptus marginata - Banksia attenuata* woodlands with a shrub layer of *Hakea stenocarpa, Conostylis setosa* and *Johnsonia* aff *pubescens (Interim Recovery Plan 2011-2016 for Banksia attenuata and/or Eucalyptus marginata woodlands of the eastern side of the Swan Coastal Plain* 2011*)*. It is a species rich community with low weed frequency. 36 occurrences exist on the eastern side of the Swan Coastal Plain, occurring on sands at the base of the Scarp between Byford and Yarloop of the Pinjarra Plain and the Ridge Hill Shelf. An example of an occurrence can be seen in Figure 1. Main threats affecting this community are clearing, fire, weeds and recreational use. This community type was assessed as endangered in 1996. I was required to update and complete the IRP by researching for and adding information. Information was obtained through ArcGIS and the DEC TEC database as well as contacting various environmental officers.

Figure 1. Swan Coastal Plain community type 20b occurrence
Source: DEC 2011

An important document used while writing IRPs was 'A floristic survey of the Southern Swan Coastal Plain' by Gibson et al. (1994). It is a study where remnant vegetation on the southern half of the Swan Coastal Plain were mapped, in order to gain broader knowledge on conservation status of species and communities. The name SCP20b is taken from this document. 509 quadrats were established across the Plain, recording the existence of 1485 species of flowering plants. Of these, 1313 were native

plants and the rest were weeds. 30 community types were found to exist on the southern half of the Swan Coastal Plain. Communities were grouped according to similarities in species composition. After statistical analysis, these communities were separated into four major floristic groups. The first group occurs on the Pinjarra Plain and Ridge Hill Shelf, the second are seasonal wetlands, the third occurs mostly on Bassendean dunes and the fourth are on Spearwood and Quindalup dunes. SCP20b belongs to the third group. Gibson et al. (1994) has compiled a map of SCP20b's occurrences in the Swan Coastal plain, and these are the occurrences the Recovery Plan is trying to conserve.

Another document of importance are the Bush Forever books. Bush Forever is a Western Australian government initiative aiming to protect 51 200 hectares of regionally significant bushland over ten years (*Bush Forever Volume 1 Policies, Principles and Processes* 2000). This includes 287 sites and encompasses 26 vegetation complexes. Bush Forever has created a vegetation condition scale by which TEC occurrences are mapped. There are five conditions. Pristine bushland are as the name suggests, with vegetation suffering no obvious signs of disturbance. The scale Excellent infers intact vegetation structure, disturbance concentrated in individual species and the presence of non-aggressive weed species. Bushland in Very Good condition have altered vegetation structure and obvious signs of disturbance, which may be in the form of fire, aggressive weeds, dieback, logging or grazing. Bushland which have had their vegetation structure significantly altered but has the ability to regenerate are in Good condition. The aforementioned forms of disturbance are more intense if present. Degraded bushland will require intensive management if it is to reach Good condition, as their basic vegetation structure has been severely impacted by disturbance. Completely Degraded bushland has lost its vegetation structure as well as all or nearly all its native species. Flora may consist of isolated trees, shrubs and weed or crop species (*Bush Forever Volume 1 Policies, Principles and Processes* 2000).

My first task was to complete the IRP appendix table by researching for plant ecological characteristics on NatureMap. NatureMap is a DEC website containing up to date information on the distribution of WA's flora and fauna (*NatureMap* 2011). Ecological characteristics are as follows; fire response, months to first, peak and flowering decline, plant longevity and dieback response. There are 12 types of dieback responses, based on strength of evidence on a plant's level of resistance. Fire response varies from 100% scorch kill to survival. A species may survive and regenerate through basal sprouts, soil suckers, epicormics or large apical buds. Other species are obligate seeders, which do not survive a fire and will deposit their seeds in the soil, on the plant or leave no seeds at all. Ferns and allies will regenerate through spores and geophytes will survive fires (*NatureMap* 2011). Fire response information is useful in planning appropriate fire regimes for occurrences. Suitable intervals between controlled burns are important, as an occurrence subjected to frequent fires will lose its obligate seeder species if they do not have sufficient time to mature. Plants with juvenile periods of

two years or more are highlighted in the table, as attention should be drawn to these particular species. Fire regimes can then be planned around the maturity of these plants. A fire interval twice the juvenile period of the slowest maturing species is recommended. For fire sensitive communities, this figure may be tripled (*Interim Recovery Plan 2011-2016 for Scott River Ironstone Association* 2011).

The use of ArcGIS (geographic information system) is an integral part of the IRP writing process. It is a software which produces accurate geographic information, allowing the user to work with maps. ArcGIS was used to display a map of WA, focusing in on occurrences of SCP20b. Separate projects for different TECs can be created on ArcGIS. Files of information that are uploaded onto ArcGIS are called shapefiles. Shapefiles can be created, or accessed from DEC corporate data. Once uploaded they appear on maps as coloured areas, dots or lines, depending on what they are representing. Occurrences, water features, soil type, Aboriginal sites and areas which have been affected by fire or mapped for dieback appear as coloured areas, whereas tenure boundaries and roads appear as lines. Colour, pattern and line thickness can be adjusted on ArcGIS to create distinction between features. Features can be turned on and off to concentrate on a particular area of interest. Aerial photos can also be displayed.

ArcGIS was used to obtain fire history of SCP20b's occurrences. A shapefile of Swan Coastal Plain fire history was uploaded from DEC corporate data. Areas which had been burnt appeared as coloured areas on the map. Occurrences which overlapped with coloured areas indicated it had undergone partial burning. Details of the fire, of when and how it started, can be obtained by clicking on a coloured area with the information arrow, causing an information table to appear. Fire histories of occurrences were recorded in occurrence text descriptions in the IRP.

SCP20b's occurrences were spread out over a considerable area along the Swan Coastal Plain, and were therefore managed under various authorities. Environmental officers from different companies and local governments were contacted to obtain recent information on management and conservation of occurrences under their care. I contacted an officer from the City of Gosnells to learn of their past and current management actions, these included weed control programs and performance of regular dieback mapping. Dieback mapping determines the presence of infestation in a particular area, which can then be prioritised for phosphite treatment. Management actions were included under the appropriate occurrence description and referenced. Correspondence through emails were printed out and filed in SCP20b's folder.

Community folders contain all paperwork related to the community; for example correspondence, reports, documents and TEC/PEC occurrence report forms. Past and recent changes made to the community are documented here as well as records on progress of conservation actions, such as

dieback treatment, fencing, or transfer of ownership over an occurrence. TEC/PEC report forms are used for surveying existing occurrences or for the discovery of new occurrences.

SECOND WEEK

ArcGIS was used to determine dieback infestation of occurrences. Dieback shapefiles for the Swan Coastal Plain were loaded onto ArcGIS from DEC corporate data. Infested areas were colour coded based on levels of confidence; high, medium or low. Some areas were uninterpretable, as a result of too few or no visible indicator species present in the area. Areas that were not interpreted had not been mapped as it was a low priority area, being too small or was cleared. Colour coding for dieback was explained in metadata, which is a file containing supplementary information on a shapefile. Metadata describes what the shapefile is displaying in more detail, defines abbreviated codes and provides contact details for the shapefile's creator. Using ArcGIS to ascertain dieback infestation of occurrences was similar to the process of determining fire history. Mapped areas appeared as coloured areas on ArcGIS. An occurrence would usually overlap with several coloured areas, indicating the occurrence was mapped with several levels of confidence. Dieback infestation information was included in the text descriptions for occurrences.

The predicted costs of recovery actions had to be updated, as they may have increased over the past few years. I used figures from a recently DNC (Director of Nature Conservation) approved IRP as a guide. Differences between the two communities such as total area and levels of dieback infestation were taken into account while adjusting costs.

I was fortunate enough to be part of a field survey at Drummond Reserve in Toodyay. The goal of this survey was to locate and map new occurrences of the community type Wandoo woodland over low sedgeland. This community is classified as a Priority Ecological Community (PEC). Our second goal was to inspect a proposed translocation area. There was a proposal to translocate an *Acacia* species within Drummond Reserve to another area within the reserve. Plant translocation is carried out to aid conservation of a particular species, in an attempt to lower its extinction risk (*Plant translocation* 2011). Translocation can help establish new plant populations, restore extinct ones or to restock declining populations. From our inspection, we concluded that the proposed area was not ideal for translocation as it was in a PEC. Translocation involves heavy machinery and equipment, which could potentially damage the community.

Possible TECs that are poorly known and do not meet survey criteria are classified as Priority Ecological Communities (PECs). PECs are not adequately defined and are ranked under three levels of priority (*Definitions, Categories and Criteria for Threatened and Priority Ecological Communities* 2010). Priority one PECs will be surveyed and evaluated first to determine whether they are threatened communities. These communities have a very limited distribution, there may be approximately five occurrences in existence, or total area may be equivalent to 100 hectares. Its restricted area is one of the reasons Priority one communities are believed to be under threat, as well as its existence on lands that are under immediate threat, for example on agricultural lands which may be subjected to grazing or clearing. Priority two PECs have a less restricted distribution, there may be approximately ten occurrences in existence, or total area may be equivalent to 200 hectares. Not all occurrences are under immediate threat. Priority three PECs may have a few large widespread occurrences in existence, or total a significant number in area. These communities may or may not be under threat of destruction or degradation.

During the field survey, two new occurrences of Wandoo woodland over low sedgeland were found. These new occurrences were mapped. This involved holding a GPS while walking along the occurrence perimeter. GPS tracked every move that was made, recording the occurrence location once the occurrence was circled. Clumps of sedges constituted the occurrence's ground cover, therefore determining its perimeter involved including as many sedges as possible within the perimeter. Waypoints were recorded at intervals along the perimeter, to act as reference points. Once the occurrence location was mapped, the latitude and longitude were obtained from GPS as well as the number of satellites used during mapping. This information was recorded on a TEC/PEC occurrence report form.

A TEC/PEC occurrence report form is used to survey existing occurrences or to record the discovery of new occurrences during field surveys. The form is filled out in as much detail as possible, in order to provide a detailed description to officers who have not seen the occurrence. Firstly, the names of the surveyors and community type are recorded. A description of the community is given as well as its co-ordinates and tenure. Threats to the community are listed next. This may include grazing by kangaroos and cattle, weeds, exotic animals, clearing of vegetation or fire. An estimation of the area affected by a particular threat is made and its current and potential effect assessed. Recommended management actions are listed to help counteract threats. These may include fencing to prevent animals or people trampling vegetation, creating firebreaks to slow progress of a bushfire or implementing a weed control system. Occurrence condition is also assessed according to the Bush Forever scale. The physical characteristics of the occurrence are described next. Landform type, which may be a crest, slope, depression, ridge or wetland is recorded. Soil type, condition and colour are noted. The PEC we surveyed had a sandy loam. Other soil types are sand, clay, loam or peat. Rock

types may be granite, dolerite, limestone or laterite. Drainage patterns may range from permanent or seasonal inundation to being well-drained. Flora and fauna species observed in the occurrence are also recorded. Other important observations can be recorded in the comments section. A copy of an occurrence report form can be found in Appendix 1.

To gain information on occurrence characteristics, we traversed through occurrences to note anything of importance and take photographs of important features and observations. One of the occurrences had old tracks running through it. These tracks were abandoned a long time ago as vegetation and termite mounds had established themselves on the track. Stags of wandoo trees were observed. Signs of kangaroo activity in the occurrence was inferred from the presence of well-worn kangaroo tracks, faeces and diggings beneath a tree for shade. We also attempted to identify plant species within the occurrence. Dominant vegetation were wandoo trees and sedges. Specimens were taken of species we were unable to identify, to aid identification back at the office. Identification of plant species was more difficult in summer as leaves and flowers became dry and lost colour. All observations were recorded on the form.

After surveying the occurrences, we drove around the rest of the Reserve on the lookout for other occurrences. There were no more, however we found a possible and more suitable translocation site for the *Acacia* species. A few photographs were taken. I was also taken to the area in the Reserve where the *Acacia* species were currently being propagated.

THIRD WEEK

I started work on the Scott River Ironstone Association IRP this week, the second IRP I was required to work on. My task was to update it, as the plan had reached the end of its five year duration. New information had to be added as many studies and surveys had been carried out regarding the community since the former IRP was released. The report format also needed to be updated. New columns had to be added to the old occurrence table, as the new format was more informative, containing the extra columns of purpose, major threats, groundwater levels and comments. When the former IRP was released, not all ironstone occurrences had been surveyed as they were located on private property. Recently, access was granted by private landholders, and now all occurrences have been surveyed. These recent ground surveys revealed occurrences previously classified as ironstone communities as otherwise. The former IRP relied largely on aerial mapping of occurrences, which was not as accurate as ground surveys. The mistaken occurrences were included in the current IRP as

historical information. Some of the existing occurrences had reduced in size as a result of clearing, or had increased in size. A few site codes had changed or were new.

The distribution of this community is restricted to the Scott River Plain, which falls under the DEC Blackwood District. It consists of unique plant communities, which can be described as winter wet shrubland occurring on skeletal soils over ironstone (*Interim Recovery Plan 2011-2016 for Scott River Ironstone Association* 2011). Dominant species are *Melaleuca preissiana, Hakea tuberculata, Kunzea micrantha* and *Loxocarya magna.* There are a number of DRF species present as well. Historically, ironstone soils may have been associated with bogs, the iron being deposited by water percolating through the soil and/or iron oxides precipitating on the surface with fluctuating groundwater levels. These soils undergo inundation of fresh water during the winter months as a result of rainfall ponding or rising groundwater levels. An example of an occurrence can be seen in Figure 2.

Figure 2. Scott River Ironstone occurrence
Source: DEC 2011

Seasonal inundation of the Scott River ironstone has prevented flood-sensitive plants from establishing, contributing to the creation of a unique plant community. Many species in the community have restricted distributions, are obligate seeders or are dieback susceptible. It was classified as endangered in 1996, and approximately 20% of the its original range remains. Degradation continues to occur as a result of private landholders subjecting their land to grazing or clearing.

A new project was created on ArcGIS for the Scott River Ironstone community, and was used to obtain updated information on occurrence site codes, estimated areas and their purposes. Occurrence locations were uploaded from a shapefile and the required information gained by clicking on an occurrence with the information arrow, causing a table of information to appear. A tenure shapefile displayed demarcation lines between properties, and tenure information was obtained by clicking on properties that occurrences fell within. Occurrences may exist over two or more properties. Those that were located on private land were listed as managed by private landowners. Others were managed by local shires and DEC. Purposes included road reserves, recreational grounds or were for conservation. Major threats and Bush Forever condition of occurrences were obtained from the DEC TEC database. An occurrence may be in two different conditions as it may be subjected to a variety of uses. A section may be fenced off and protected while the rest is subjected to cattle grazing. Information were all entered into the occurrence table and the text descriptions.

The DEC TEC database contains information on all TECs in Western Australia. There is a record of each occurrence within a TEC and its characteristics. These characteristics include the occurrence's location, latitude and longitude, site code, area, surface geology and landform. Fire history, tenure information, flora and fauna species and field survey observations regarding the occurrence can also be accessed. Effects of current or possible threats within the occurrence and its Bush Forever condition comprises the field survey observations. Information is entered or updated in the database by authorised TEC ecologists. Records are updated when new information becomes available or when occurrence circumstances change.

As names of flora species constantly change as a result of reclassification, currency of species names in the IRP was checked in FloraBase. A few names had changed. The updated list was then used to research plant ecological characteristics on NatureMap. The old IRP format did not include this appendix table.

After revision of my SCP20b IRP additions by a senior TEC ecologist, more changes had to be made and new information added. The presence of a new occurrence was to be included in the IRP and my task was to write a description, sourcing information from the community's folder and the TEC database. I was also required to contact an environmental officer from Perth Airport to obtain information on current conservation actions implemented in two occurrences under their care. The annual environmental reports published by Perth Airport were helpful in providing general management actions for all their conservation precincts, but specific information was needed for the IRP. The two occurrences of interest only occupied an area of approximately one hectare within the precincts. Contacting an officer personally and enquiring after specific areas provided more accurate information. It was discovered that Perth Airport implemented pest control programs for rabbits and

weeds in occurrences, and locally provenanced stock and direct seeding was undertaken during revegetation. Information obtained personally were referenced as personal communications in the IRP. Emails were printed and filed in the correspondence folder.

I was also required to contact the Public Transport Authority to ascertain whether rail reserves under their authority were signposted for TEC. Putting up signs along reserves that are adjacent to roads, rails or are frequented by people is important, as these can be subjected to accidental damage. Attention needs to be drawn to their presence to minimize disturbance. It turned out the rail reserves were not signposted, however land managers stated they were aware of their presence and minimized disturbance while undertaking work. TEC signposting involves placing yellow L-shaped stakes at either end of a community (*Declared Rare Flora and road maintenance* 2011). These yellow stakes are also used for Declared Rare Flora (DRF) signposting, to indicate their presence within a roadside community. The installation of these stakes is usually the road manager's responsibility. DRF are native plant species under special protection by law as a result of their restricted distribution or high extinction risk. Severe penalties apply for illegal removal (*Declared Rare Flora and road maintenance* 2011).

Fencing is an important management action as it prevents entry to an area, therefore minimising occurrence disturbance. Various shire conservation management plans were checked to ascertain whether occurrences under their authority were fenced. This information could also found in the TEC database. It was recorded under the section 'Actions' which includes all activities DEC has carried out in relation to a particular occurrence. Aside from fencing, this may include signposting for DRF or changes of ownership.

FOURTH WEEK

I continued writing text descriptions for Scott Ironstone occurrences. An email was sent requesting recent data on groundwater levels and water quality from the Water Corporation. Groundwater levels can provide information on vegetation dependence on water. Only levels from bores within 500m of occurrences were used. A new shapefile was created on ArcGIS encompassing these bores only. This was done for both TECs I worked on. Only a few bores were present within the set boundary for Scott River ironstone, whereas there were over a hundred bores for SCP 20b. This was a result of the presence of domestic bores. Bores appeared as dots on ArcGIS. By clicking on a dot with the information arrow, information on depth of groundwater, depth of bore and date of survey was

displayed. A measuring tool was used to measure the distance between a quadrat within the occurrence and the bore. The water level, direction and distance of the bore from the quadrat was then entered into the occurrence table under the column 'Depth to groundwater (static metres below ground)'.

ArcGIS was used to ascertain whether any occurrences were located on Aboriginal sites. The Aboriginal sites shapefile from DEC corporate data displayed itself as coloured areas on the map. Two Aboriginal sites overlapped with occurrences, the Scott River and the Scott River Road Ochre Deposit. This information was entered into the comments column of the occurrence table.

A recent study on *Phytophthora* species discovered the existence of two new species occurring in the Scott River area. My task was to read the report and include any information of relevance and importance under the threats section of the IRP. Seasonal inundation of this community provides a favourable habitat for *Phytophthora* species. DEC Blackwood District officers were contacted to obtain information on conservation actions implemented in the community. Correspondence revealed that TEC signposts had been installed for two occurrences, and no phosphite treatment for dieback had been carried out yet.

My progress on the Scott Ironstone IRP was revised, and more tasks were set for me to complete. A hydrology report concerning ironstone communities in WA including the Scott Coastal Plain had been released after the publication of the former IRP. New information from this report was to be included into the new IRP. Further updating of the IRP format was done by transferring generic paragraphs from a recently DNC approved IRP. Generic paragraphs were found in the foreword, summary and acknowledgements. Species and location names were changed to suit the Scott Ironstone community. Descriptions of threats in the new format followed a certain structure, and that was changed too.

Obligate seeders with a juvenile period longer than 24 months were highlighted in the appendix table as it was considered a relatively long juvenile period, and attention should be drawn to these particular species. Ten species with this characteristic were found in the Scott Ironstone area. These species were listed under 'Altered Fire Regimes' in the threats section of the IRP, as irregular burning of occurrences containing these plants may cause their decline.

Working with DEC has increased my knowledge of environmental conservation and taught me many valuable skills. I learnt of the actions and methods DEC undertook to protect and conserve the environment. DEC is made up of many divisions and branches each concentrating on a specific area of environmental conservation. IRP preparation is only one of the responsibilities of the Species and Communities Branch, which falls under the Nature Conservation division. I learnt of the existence of

TECs in WA as well as the human induced threats affecting them. IRPs were prepared with an aim of conserving these communities, however costs of recovery actions were substantial and funding may not be adequate. Learning to use ArcGIS will be a useful skill to have in future jobs. Partaking in the field survey gave me a hands on experience as to how surveys are carried out, how occurrences are mapped and the use of GPS. The responsibilities of contacting environmental officers, researching for information and writing the report increased my knowledge and enhanced my communication and time management skills. I had a lot of guidance from DEC staff who were all very helpful.

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Department of Environment and Conservation
Our environment, our future

Threatened and Priority Ecological Community (TEC/PEC) Occurrence Report Form

Version 5.4 Nov 2010

Community: _____ **OBSERVATION DATE:** / /

New occurrence ☐ **Site ID:** _____ **CONS STATUS:** _____

OBSERVER/S: _____ **PHONE:** _____

ROLE: _____ **ORGANISATION:** _____

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place): _____

_____

_____

Reserve No: _____

DEC DISTRICT: _____ **LGA:** _____ Land manager present: ☐

DATUM:
GDA94 / MGA94 ☐
AGD84 / AMG84 ☐
WGS84 ☐
Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required)
DecDegrees ☐ DegMinSec ☐ UTMs ☐

Lat / Northing: _____

Long / Easting: _____

ZONE: _____

METHOD USED:
GPS ☐ Differential GPS ☐ Map ☐

No. satellites: ____ Map used: ____

Boundary polygon captured: ☐ Map scale: ____

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐
National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☐ Other Crown reserve ☐
Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole _____ to _____ Specify other: _____

AREA ASSESSMENT: Edge survey ☐ Partial survey ☐ Full survey ☐ Area observed (m²): _____

EFFORT: Time spent surveying (minutes): _____ No. of minutes spent / 100 m²: _____

THREATS - type, and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents.	**Cause/Agent:** Eg weed type, grazing species, recreation type	Area affected	Current impact (N-E)	Potential Impact (L-E)	Potential Threat Onset (S-L)
•		____%	____	____	____
•		____%	____	____	____
•		____%	____	____	____
•		____%	____	____	____
•		____%	____	____	____

*Rate current and potential threat impact: **N=Nil, L=Low, M=Medium, H=High, E=Extreme**

*Estimate time to potential impact: **S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)**

CONDITION OF OCCURRENCE (Bush Forever Scale)
(estimate % of area in each):

Pristine ☐ ____%
Excellent ☐ ____%
Very Good ☐ ____%
Good ☐ ____%
Degraded ☐ ____%
Completely Degraded ☐ ____%

RECOMMENDED MANAGEMENT ACTIONS: eg. roadside markers, weed control, etc.

_____

_____

_____

ACTIONS IMPLEMENTED (include date):

_____

_____

_____

Please return completed form to, DEC, Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983

RECORDS: Please forward to **TEC Database Administrator**, SCB.

Record entered by: _____ **Record Entered in Database** ☐ Date: ____/____/____

Department of Environment and Conservation
Our environment, our future

Threatened and Priority Ecological Community (TEC/PEC) Occurrence Report Form

Version 5.4 Nov 2010

HABITAT INFORMATION: **(Check more than one box for combinations or where necessary)**

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	
Crest ☐	Granite ☐	(on soil surface; eg gravel, quartz fields)	Sand ☐	Red ☐	V
Hill ☐	Dolerite ☐		Sandy loam ☐	Brown ☐	☐
Ridge ☐	Laterite ☐		Loam ☐	Yellow ☐	
Outcrop ☐	Ironstone ☐	0-10% ☐	Clay loam ☐	White ☐	☐
Slope ☐	Limestone ☐	10-30% ☐	Light clay ☐	Grey ☐	
Flat ☐	Quartz ☐	30-50% ☐	Peat ☐	Black ☐	
Open depression ☐	Specify other:	50-100% ☐	Specify other:	Specify other:	Sp
Drainage line ☐					
Closed depression ☐					
Wetland ☐	Specific **Landform** Element: (Refer to field manual for additional values)				

CONDITION OF SOIL: Dry ☐ Moist ☐ Waterlogged ☐ Inundated ☐ Cracked ☐ Saline ☐ Other:_____

VEGETATION CLASSIFICATION:
1. _____
2. _____
3. _____
4. _____

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No evidence of fire ☐

Actual Occurrence Landuse: _____

Adjacent Landuse: _____

Associated Flora and Fauna Species:	OTHER COMMENTS

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: ☐ Regional Office District Office ☐ Other: _____

Please return completed form to, DEC, Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983

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