# YORKRAKINE TRAPDOOR SPIDER (*Kwonkan eboracum*) CONSERVATION PLAN

## 2008-2013

Yorkrakine Trapdoor Spider (Photo: *Barbara York Main*)

***Rowan Inglis**

*Conservation Officer (Fauna), Department of Environment & Conservation ,Yilgarn & Avon Mortlock Districts, PO Box 332, Merredin WA 6415

Australian Government | Government of Western Australia | AVON CATCHMENT COUNCIL | Department of Environment and Conservation | WWF

## FOREWORD

This species conservation plan has been developed by the Department of Environment and Conservation Western Australia (DEC) on behalf of the Avon Catchment Council.

This plan relates to the management of the species within the Avon River Basin. The implementation of recommendations and associated costs contained within this plan do not reflect current funding capacity. The availability of funding will determine the capacity to implement.

Information in this Species Conservation Plan was accurate at April 2008. This plan will operate from May 2008 to May 2013 but will remain in force until withdrawn or replaced.


## ACKNOWLEDGEMENTS

Meg Green (former Ecologist, DEC Wheatbelt Region) contributed significantly towards the compilation of the first draft for this conservation plan.

Professor Barbara York Main (University of Western Australia), Dr. Mark Harvey (Western Australian Museum), Mick Davis (WWF – Australia) and Monica Russel (Edith Cowan University) provided historical and current information regarding trapdoor spider biology and locations.

Paul Blechynden, David Jolliffe and Brett Beecham (DEC Wheatbelt staff) as well as Professor Barbara York-Main provided valuable advice and comments during the preparation of this conservation plan.


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## CONTENTS

## SUMMARY

| | |
|---|---|
| **Yorkrakine Trapdoor Spider** | *Kwonkan eboracum* Main 1983 |
| **Family:** | Nemesiidae. |
| **NRM Region:** | Avon. |
| **Current status of taxon:** | Critically Endangered. |
| **Description:** | The Yorkrakine Trapdoor Spider, *K. eboracum* is a small to medium sized spider, with a carapace length of 4.3mm in the male and 7mm in the female (Figure 1). Generally these spiders are a shiny yellow colour, with prominent dark brown bands on the abdomen. The legs are long and thin, and the body and legs are sparsely haired (Main 1983; Harvey and Main, 2000).<br><br>This species has distinct sexual dimorphism, and the females appear very similar to other members of the *Kwonkan* genus. Males of this species differ from other *Kwonkan* species by the possession of one medium retrolateral spine on metatarsus 1 (Main, 1983). |
| **Breeding habitat:** | Burrows in areas that support low hummock-shaped shrubs which provide both litter and a ground-level canopy. |
| **Feeding habitat:** | Ground litter surrounding burrows. |
| **Habitat critical for survival:** | The habitat critical to survival and important populations of *K. eboracum* comprises of [1]areas that support low hummock-shaped shrubs that provide both litter and a ground-level canopy. |

[1] Areas of Yorkrakine Trapdoor spider habitat are particular evident within the Shires of Tammin, Kellerberrin and Wyalkatchem)

**Conservation plan objective:**

To maintain, and if possible enhance, the condition of *in situ* populations of *Kwonkan eboracum*.

**Recovery Criteria:**

**Criteria for success:**
The number of populations has increased and/or the number of mature individuals has increased by fifteen percent or more over the term of the plan.

**Criteria for failure:**
The number of populations has decreased and/or the number of mature individuals in the known populations has decreased by fifteen percent or more over the term of the plan.

**Conservation Actions:**

1. Establish a Mygalomorph Conservation Team
2. Determine the population characteristics of known populations & ongoing monitoring
3. Undertake a threat assessment for each population
4. Address threats to specific populations
5. Conduct surveys to identify new populations
6. Promote awareness

**Conservation Team:** The formation of a Mygalomorph Conservation Team is recommended as part of this and other Mygalomorph conservation plans.

**Conservation plan time frame:**

This plan will be [2]implemented, updated and continually evaluated over a 5 year period from 2008-2013.

[2] The degree of implementation will depend on the availability of future funding and resources

## 1. INTRODUCTION

The Yorkrakine Trapdoor Spider (*Kwonkan eboracum*) belongs to the suborder Mygalomorphae, commonly known as "Trapdoor" and "Funnel-web" spiders. They are primarily terrestrial burrowing spiders which occasionally make tubular silk nests on tree trunks. Mygalomorphs are able to persist in small isolated areas due to their low dispersion powers, long life cycle and sedentary life style (Main, 1987a).

Mygalomorph spiders take several years to reach reproductive maturity, and females can live up to and exceeding twenty years. Mature males leave their burrows during moist conditions in search of females, and die shortly after mating (Main, 1985 Yen & Butcher, 1997). Females lay their eggs in a silk cocoon in the burrow, and after spending several months confined to the parent burrow, spiderlings emerge approximately one year after the parental mating (Main, 1982).

In areas that experience drought, mygalomorph spiderlings disperse from their mother's nest during or following rainy weather, and establish a new burrow in rain-softened soil. During this process, juveniles are vulnerable to predation by birds, mammals, lizards, frogs and other arthropods (Main, 1985).

Predators of *K. eboracum* include other arthropods (eg. Centipedes and Scorpions) which enter burrows, Goannas and Bandicoots which dig out burrows and pompilid wasps, some of which specialize in preying upon burrowing spiders (Main, 1985). Due to their specialised habitat requirements, a major threat to *K. eboracum* is loss or alteration of habitat. Physical disturbance to these microhabitats can cause local extinction of populations (Main, 2002).

## 2. YORKRAKINE TRAPDOOR SPIDER ECOLOGY AND LIFE HISTORY

### 2.1 History and taxonomic relationships

The Yorkrakine Trapdoor Spider (*Kwonkan eboracum)* was first described by Barbara York Main in 1983 from a specimen collected in 1956. This is one of six described species belonging to the genus *Kwonkan*, five of which are endemic to south-western Western Australia. The species name *eboracum* comes from the property 'Eboracum' (22 km northeast of Tammin) at which the first described adult female of this species was found (Main, 1983). The common name comes from the location at which the first described adult male was found in 1969 at Yorkrakine Rock (east of Tammin). Two male specimens were collected in pitfall traps from the type locality in 1999 - 2000 by Harvey & Main although there is some variation from the Yorkrakine Rock regarding speciation.

### 2.2 Description

The Yorkrakine Trapdoor Spider, is a small to medium sized spider, with a carapace length of 4.3mm in the male and 7mm in the female (Figure 1). Generally these spiders are a shiny yellow colour, with prominent dark brown bands on the abdomen. The legs are long and thin, and the body and legs are sparsely haired (Main 1983; Harvey and Main, 2000).

This species has distinct sexual dimorphism, and the females appear very similar to other members of the *Kwonkan* genus. Males of this species differ from other *Kwonkan* species by the possession of one medium retrolateral spine on metatarsus 1 (Main, 1983).

**Figure 1:** Yorkrakine Trapdoor Spider, *K. eboracum.* (Photo: Barbara York Main)

### 2.3 Distribution, Habitat and Movements

The preferred habitat of *Kwonkan* species appears to be soils supporting low hummock-shaped shrubs that provide both litter and a ground-level canopy (Harvey & Main, 2000).

Only two specimens of this species have been collected, and they were the original type specimens from which the species was described in 1983. All of these locations are near Tammin in the Western Australian wheatbelt, and are less than 10 km apart (Harvey & Main, 2000). The female specimen was located on private property (Eboracum) while the male specimen was located at Yorkrakine Rock (now Yorkrakine Rock Nature Reserve) (Figure 2). A second male specimen was collected in early 2000 from a roadside in the Shire of Tammin, not far from the type locality. The locations of these specimens and associated details are summarized in *Appendix 1*.

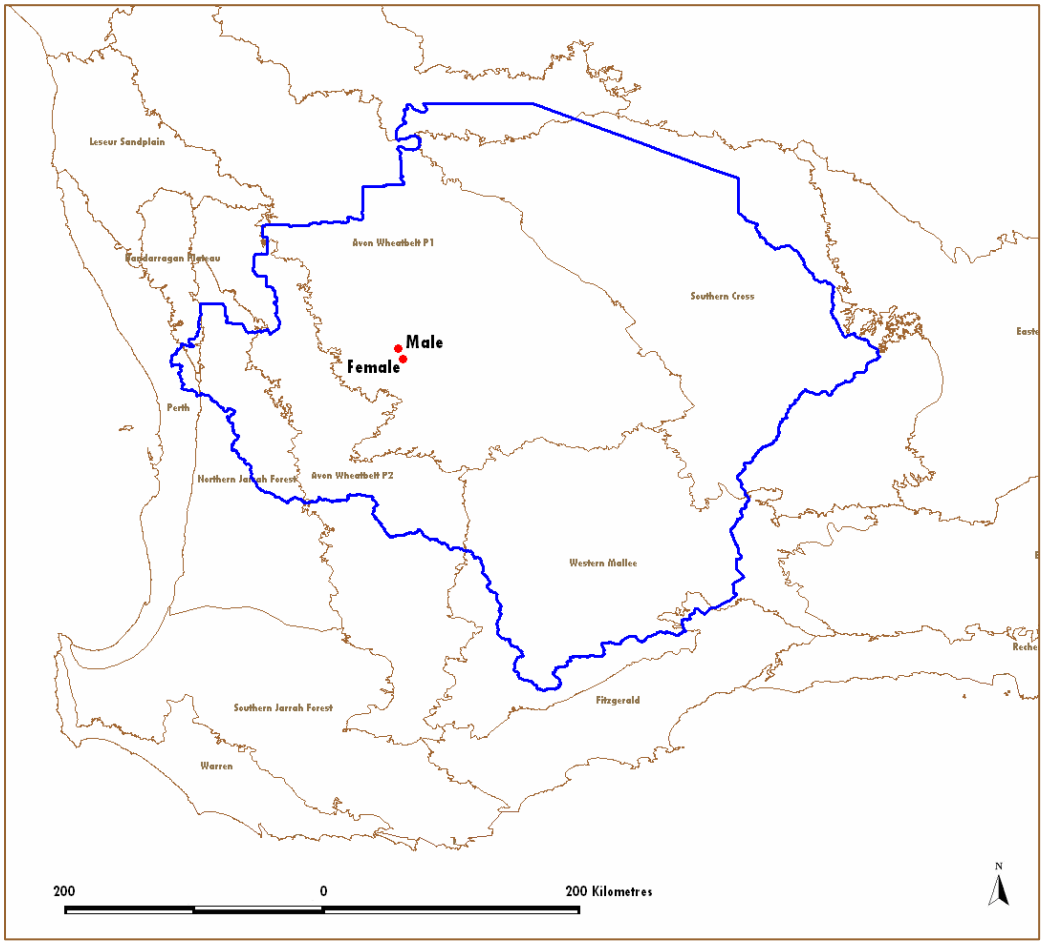


**Figure 2.** Location of the two sites where specimens of *K. eboracum* have been collected in south-west Western Australia (Main, 1983). The red points represent the GPS localities of the sites, the blue line marks the Avon NRM Boundary, and the brown divisions show the different IBRA subregions. The female was found in 1956 and the male in 1969 and 2000.

The type locality of *K. eboracum* consists of a heath shrubland on yellow sand (Main, 1983), adjacent to open Salmon gum (*Eucalyptus salmonophloia*) and Gimlet (*E. salubris*) woodland. However, this location has been cleared since the type specimen was collected, and there now remains only a narrow road verge of the original habitat. This remaining habitat has a few scattered *Eucalyptus* trees and an open understorey of hummock-like shrubs (*Acacia*, *Allocasuarina* and native grasses) (Burbidge, 2004).

The site from which the male type specimen was collected is now listed as part of Yorkrakine Rock Nature Reserve. This nature reserve is vested with the Conservation Commission of Western Australia (CCWA) and is managed by the Department of Environment and Conservation (DEC). The habitat of this specimen is uncertain as it is not known exactly where in the reserve it was located (Harvey & Main, 2000).

### 2.4 Biology and Ecology

Yorkrakine Trapdoor Spiders live in shallow (less than 20 cm deep) burrows lined with silk (Harvey & Main, 2000; Burbidge, 2004).

The two male specimens were collected during early summer and late autumn; however males of other species have been collected during summer. It is not known how seasonally dependant *K. eboracum* are, but it is assumed that juveniles disperse during the winter, as with other mygalomorphs (Harvey & Main, 2000).

### 2.5 Conservation Status

The Yorkrakine Trapdoor Spider (*K. eboracum*) is listed under the Western Australian *Wildlife Conservation Act 1950* as Schedule 1 Fauna (fauna that is rare or likely to become extinct) and is ranked as Critically Endangered under the World Conservation Union (IUCN) Red list criteria A1c, B1+2c, C1+2a.

## 3. HABITAT CRITICAL TO SURVIVAL AND IMPORTANT POPULATIONS

Habitat means the biophysical medium or media: (a) occupied (continuously, periodically or occasionally) by an organism or group of organisms; or (b) once occupied (continuously, periodically or occasionally) by an organism, or group of organisms, and into which organisms of that kind have the potential to be reintroduced (*Environment Protection and Biodiversity Conservation Act 1999*).

Habitat critical to survival and important populations of Yorkrakine Trapdoor Spiders comprises:

- Areas currently occupied by the spiders;
- Areas not currently occupied by the spiders but adjacent to areas that are currently occupied by the spiders;
- Areas of suitable vegetation within the recorded range in which undiscovered spider populations may exist and; and
- Areas of suitable habitat previously occupied by *K. eboracum* but that are currently unoccupied.

The habitat critical to survival and important populations of *K. eboracum* comprises of [3]areas that support low hummock-shaped shrubs that provide both litter and a ground-level canopy.

## 4. GUIDE FOR DECISION MAKERS

The availability of accurate data of known *K. eboracum* populations and sites with a high prospect of supporting *K. eboracum* populations is essential to decision-making.

Section five provides details of current and potential threats to *K. eboracum*. Any ground disturbance works (clearing, firebreaks, road works involving roadside vegetation or changes to drainage, burning, drainage etc) in the immediate vicinity of known *K. eboracum* populations will require assessment. Proponents should demonstrate that the work will not have an impact on this species.

Ground disturbance or other operations which may have a direct or indirect impact on the habitat or hydrology of known *K. eboracum* population will require an Environmental Impact Assessment (EIA) to ensure that the species is not adversely affected. A pre-disturbance survey to determine the presence/absence of *K. eboracum* in habitat that may reasonably be expected to contain a *K. eboracum* population is encouraged (note: there is no statutory requirement for such a survey to be undertaken).

Encouraging landowners / managers to conserve populations occurring on their properties is critical to the protection of these populations. When a new population is identified on private property the land owner will be contacted in person by DEC staff to discuss the management needs of the *K. eboracum* populations as well as any concerns the owner may have. A letter will be provided to the land owner as a formal notification of the presence of the population and a request to advise DEC of any change in ownership.

[3] Areas of Yorkrakine Trapdoor spider habitat are particular evident within the Shires of Tammin, Kellerberrin and Wyalkatchem)

Working closely with landowners will improve the capacity to identify and address any land use related threats.

Where the land manager is a local or state government authority, the letter will require the agency to implement measures to ensure that the population will not be adversely affected by land use. These measures will include advising DEC of any land use that may impact on the survival of the population.

The DEC provides advice on the location and protection of threatened species and communities to telecommunication, water and power providers to ensure that these areas are managed as Environmentally Sensitive Areas (ESA). DEC will ensure this information includes information on the relatively immobile nature of these fauna species.

The DEC is responsible for assessing notifications of intent to clear under the clearing of native vegetation provisions of the Environmental Protection Act 1986. This process considers the potential impact of the proposed work on threatened fauna species.

DEC also provides advice to the Commissioner for Soil and Land Conservation in respect to notifications of intent to drain and the potential impact that these proposals may have on threatened species and other conservation values.

The sedentary nature of these species increases their vulnerability to disturbance. Therefore a Regulation 15 license to take fauna for educational or public purposes is required if disturbance will occur in or immediately adjacent to these populations. Applications for this license are made through the Department of Environment and Conservation. Failure to obtain a license may result in a breach of the Wildlife Conservation Act 1950.

## 5. THREATS

Yorkrakine Trapdoor Spiders possess certain characteristics that make them more susceptible to threats than other wheatbelt fauna. These include poor dispersal capabilities, confinement to disjunct habitats and low fecundity. These characteristics require a similar management approach to the conservation actions undertaken for Declared Rare Flora.

The limited knowledge of the ecology of this species and the nature of individual populations restricts the capacity to conserve these species. The implementation of the conservation actions described in section 12 of this plan will address this knowledge gap and the threats to the survival of this species.

The main threatening processes (not necessarily in order of priority) are:

1. Lack of ecological resources to support viable populations,
2. Impacts of introduced plants and animals,
3. Inappropriate fire regimes,
4. Salinity/altered hydrology, and
5. Impacts of competing land use (mining).

These threats singularly and collectively contribute towards reduced ecological viability of populations and their habitats.

### 5.1 Lack of ecological resources to support viable populations

Lack of ecological resources to support viable populations relates to the:

- Availability of basic resources for survival & reproduction, where availability of food, shelter and access to mates limits population size. The survival of populations can be directly threatened when restricted gene flow and insufficient habitat are below the levels necessary to maintain a viable population.
- Restricted gene flow and insufficient habitat can increase a population's susceptibility to other threats. For example a small remnant may be totally consumed by fire providing no available habitat for the species to persist in before the affected habitat returns to suitable pre-fire condition.

Land clearing associated with agriculture, mining and infrastructure has resulted in habitat loss and fragmentation of habitat which in turn results in the lack of ecological resources available to support viable populations.

Habitat fragmentation reduces the capacity of the species to increase population size, restricts gene flow through preventing the movement of individuals and makes the population more susceptible to other disturbance events. It is likely that the highly fragmented landscape of the Western Australian wheatbelt, may account for the limited occurrence of this species.

### 5.2 Impacts of introduced plants and animals

Introduced animal species have the capacity to cause local extinctions of *K. eboracum* populations. Grazing by livestock results in compaction of the soil and a reduction in leaf litter, which affects the ability of the spiders to burrow and forage. Livestock can also cause direct damage to burrows and their entrances (Main, 2001).

Grazing by rabbits causes a reduction in the ground cover that is necessary for the survival of this spider species. Rabbits may also disturb the soil profile in some spider habitats, and their diggings can directly destroy trapdoor spider burrows (Burbidge *et al*., 1999).

Invasion by introduced plant species cause a change in the structure of vegetation communities, which in turn may affect the survival of *K. eboracum*.

### 5.3 Inappropriate fire regimes

Fire represents a direct threat to *K. eboracum* as intense wildfires have the capacity to result in direct mortality to individuals. Fire also represents an indirect threat through the reduction in the ground litter required for reconstructing burrows and to support the litter-dependant invertebrate food source for *K. eboracum*.

The ecological functions of fire include: removing competition, making light / nutrients available, reduces levels of parasites, triggering seed release / germination and maintains balance and diversity of the various components of flora communities.

While fire regimes provide a number of important ecological functions, inappropriate fire regimes may threaten the survival of *K. eboracum* populations.

Inappropriate fire regimes relate to:

- Frequency Fires that are too frequent or too infrequent
- Season Fires occurring when a species is particularly vulnerable
- Intensity Fires are too intense resulting in high mortality
- Spatial Fires are too large resulting in no unburnt refuge areas

**5.4. Impacts of competing resource use (Gravel extraction & mining)**

Mining and gravel extraction represents a threat to known *K. eboracum* populations either directly (destruction of habitat/burrows) or indirectly (nearby mining causing a change in hydrological cycles).

Areas subjected to mining and gravel extraction are sometimes used as waste disposal sites (official and unofficial). This practice constitutes a further threat through increased fire risk, creation of harbourage for invasive species and chemical contamination via disposal of pesticide and herbicide containers that may contain residues of contracted chemicals.

**5.5 Salinity/Altered Hydrology**

Salinity and changes in hydrology (surface and ground water) are threats to *K. eboracum* due to the effect they have upon habitats. Both salinity and altered hydrology can cause changes in vegetation structure and soil composition, which can affect the ability of *K. eboracum* to forage, burrow and breed.

Inundation of the upper soil profile through flooding or rising ground water may result in burrows becoming waterlogged and unusable.

Events such as climate change and changes in the local hydrology of an area (resulting in a drying or excessive wetting of the habitat) must be considered as threats. The impact of surface and ground water management proposals on *K. eboracum* populations needs to be considered. Similarly it may be necessary to implement surface and or ground water management to conserve known populations threatened by altered hydrology.

## 6. INTERNATIONAL OBLIGATIONS

The Yorkrakine Trapdoor Spider (*K. eboracum*) has not been listed under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

## 7. AFFECTED PARTIES

The main parties likely to be affected by this species Conservation Plan are:

- Avon Catchment Council (ACC);
- Department of Environment and Conservation (DEC);
- Landowners / managers where *K. eboracum* populations are found on their property;
- Local Government Authorities;
- Mining companies (mining exploration and / or production activities which may potentially impact on *K. eboracum* populations); and
- Public utility agencies (e.g. Western Power, Westnet rail and Water Corporation) whose activities may potentially impact on *K. eboracum* populations.

## 8. INDIGENOUS PEOPLE

According to the Department of Indigenous Affairs Aboriginal Heritage site register, no registered sites of Aboriginal significance are recorded at or near populations / occurrences of *K. eboracum*. Where actions recommended by the plan have the potential to impact on Noongar cultural values, further consultation will be undertaken to ensure such impact is avoided. Opportunities for Noongar individuals / groups to be involved with implementing actions including cultural interpretation and awareness of *K. eboracum* will be considered.

The advice of (one or more of the following):

- The relevant NRM indigenous reference group (s)
- South West (Yamatji – Midwest ) Aboriginal Land and Sea Council, and/or
- Department of Indigenous Affairs, and/or
- Native title claimants
- Specific groups/individuals identified as having an interest

….will be sought to assist in the identification of Noongar cultural values for land occupied by threatened species, or groups with a cultural connection to land that is important for *K. eboracum* conservation. Continued liaison with the Noongar community will identify areas in which collaboration will assist implementation of conservation plans. Consultations with indigenous groups will be made through the ACC's Aboriginal NRM Coordinator.

## 9. BENEFITS

The conservation actions carried out to protect the habitat of *K. eboracum* will contribute to the preservation of the biodiversity of these areas, and protection against further degradation. This will contribute to the protection of biodiversity in Western Australia.

As predators, occurrence of *K. eboracum* indicates the presence of a sufficient number of other invertebrates. Because they are at the apex of food pyramids, these spiders are good indicators of the general balance of communities, and can be used to assess the status of other invertebrates in their community (Main, 1987a).

## 10. SOCIAL AND ECONOMIC IMPACTS

The implementation of this Conservation Plan is not expected to cause adverse economic impacts. Section 4 (Guide for decision makers) describes the process for identifying and assessing work that may impact on threatened fauna species.

No adverse social impacts are expected to result from the implementation of this Conservation Plan. The plan provides potential social benefits in terms of awareness raising and community capacity building programs.

## 11. CONSERVATION OBJECTIVES AND CRITERIA

### 11.1 Conservation plan objective:

To maintain, and if possible enhance, the condition of in situ populations of *Kwonkan eboracum.*

### 11.2 Recovery Criteria:

**Criteria for success:**

The number of populations has increased and / or the number of mature individuals has increased by fifteen percent or more over the term of the plan.

**Criteria for failure:**

The number of populations has decreased and / or the number of mature individuals in the known population has decreased by fifteen percent or more over the term of the plan.

### 11.3 Evaluation

The plan will be reviewed within five years of its implementation. The implementation of these conservation actions and any changes to these actions will be documented accordingly.

## 12. CONSERVATION ACTIONS

The purpose of conservation actions is to provide operational guidelines for the implementation of on-ground actions. A number of conservation actions were commenced in 2006 as part of the ACC's 'Back from the Edge' program. This program has resulted in a number of significant successes including the discovery of 24 new populations of threatened spider species and an increase in the public's awareness of these species.

Determining current population and site-specific information (population size, type and severity of threats) is the first step in conserving this species.

Conservation actions will provide the following on-ground management advantages:

- Allow for site-specific operational guidelines to be compiled for each population. This will provide a framework to ensure that internal DEC operations and the activities of external agencies such as Westrail, local government, and mining companies are undertaken in a manner that ensures the Yorkrakine Trapdoor spider populations and their habitats are not adversely affected;

- Provide a basis for prioritising the implementation of conservation actions i.e. those populations that are under imminent threat.

  **Note:** Permission is to be obtained from land managers before conservation actions are undertaken.

The following conservation actions are presented in order of descending priority, but this should not prevent the implementation of 'lower' priority actions where opportunities arise and funding is available. The indicative budget and timeframes included in each conservation action depends on the availability of resources.

### 12.1 Establish a Mygalomorph Conservation Team

A Mygalomorph Conservation Team will be established with representatives from the Avon Catchment Council, community, government agencies and experts with a knowledge or interest in spider taxonomy, ecology and conservation. This team will focus on conservation efforts for *K. eboracum* as well as other threatened Mygalomorph spiders found in the Avon River basin. These species include:

- **Yorkrakine Trapdoor Spider** (*Kwonkan eboracum*)
- Shield-backed Trapdoor Spider (*Idiosoma nigrum*)
- Minnivale Trapdoor Spider (*Teyl* sp.)
- Tree-stem Trapdoor Spider (*Aganippe castellum*)

**Action:** Establish a Mygalomorph Conservation Team

**Completion date:** on-going

**Cost:** $2,500 / year

(This action has also been recommended in the other Trapdoor spider conservation plans). The budgeted amount listed in this action is a total amount for all four species.

### 12.2 Determine the population characteristics of known populations & ongoing monitoring

Ground work will be required in order to determine the population characteristics and confirm the continued existence of known *K. eboracum* populations. A search will be conducted at all known sites in the ACC NRM Region. Areas adjacent to the habitat of extant populations will also be surveyed in order to investigate whether these populations have dispersed out of their known area of occupancy.

On-ground monitoring should preferably be undertaken in the months following the first winter rains, when burrows are open and easier to locate. When it is not possible to survey at this time, consideration should be given to minimising the disturbance of burrows associated with on-ground monitoring activities.

The information obtained from the monitoring will be used to create and update *K. eboracum* distribution maps. The data will be stored at the DEC Yilgarn District office in Merredin and the DEC Species and Communities Branch in Perth.

| | |
|---|---|
| **Action:** | Determine the size of known *K. eboracum* populations |
| **Completion date:** | **on-going** |
| **Cost:** | $3,500 / year |

### 12.3 Undertake a threat assessment for each population

A threat / risk assessment for each population (including habitat health assessment) will be conducted during the population monitoring referred to in Section 12.2 of this plan.

The presence and significance of threats will be assessed, recorded and conservation actions recommended for each population. Threats considered will include the following (but not be limited to):

- introduced plants and animals;
- competing land use;
- pollution;
- inappropriate fire regimes; and
- salinity / waterlogging.

| | |
|---|---|
| **Action:** | Identify/confirm threats to each population |
| **Completion date:** | 2008 |
| **Cost:** | Incorporated into sections 12.2 and 12.3 |

### 12.4 Address threats to specific populations

Specific conservation actions are expected to be developed from the planned assessment of existing populations (conservation actions 12.2 and 12.3). Conservation actions may include fencing to exclude stock and/or rabbits, rabbit control, weed control, revegetation (to provide habitat and connectivity between habitats/populations), fire management and management of competing resource use.

Where it is necessary to protect a population from physical disturbance, areas can be demarcated using Environmental Sensitive Area (ESA) markers similar to those markers used to demarcate Declared Rare Flora (DRF) populations.

The costs described below are nominal and relate to minor work associated with the demarcating populations and controlling grazing / weeds. Addressing threats of salinity & altered hydrological processes may require action of a larger scale with greater costs.

**Action**: Undertake population specific conservation actions
**Completion date:** Ongoing
**Cost:** $1,000 / year

**12.5. Conduct surveys to identify new populations**

Areas of potential habitat will be identified through a process to map the critical habitat.

The critical habitat mapping can be undertaken by a GIS desktop assessment by using the following GIS datasets:

- Geology and soil types;
- Presence of remnant vegetation;
- Beards vegetation association;
- Rainfall;
- Associated flora and /or fauna species; and
- Any other habitat specific information that may be relevant.

Those sites identified as having a high probability of supporting *K. eboracum* populations will be subject to a field survey to determine the presence of this species. Similarly other areas to be surveyed will include: sightings reported from the public or other groups and recommendations from experts.

A specific target will be set with regard to the number of new populations that are found. This target will be determined by the criteria (for e.g. number of new populations) that will be required to downgrade the current threatened conservation status of the Yorkrakine Trapdoor Spider to a lower conservation status category.

| | |
|---|---|
| **Action:** | **Conduct surveys to identify new populations** |
| **Completion date:** | ongoing |
| **Cost:** | $2,000 / year |

**12.6 Promote public awareness**

Knowledge of most invertebrates is generally limited, both in the scientific and public arenas. It is therefore necessary to promote awareness on the ecological importance of invertebrates. A public awareness campaign has been initiated to inform the wider community about the importance of *K. eboracum* and other Trapdoor spiders. This campaign is expected to assist in the discovery of new populations with landowners providing information about possible populations on their properties.

This campaign will aim to improve the public's appreciation of these animals while also encouraging the reporting of sightings of these animals.

A brochure containing information and images of *K. eboracum* and its burrow has been mailed out to all landowners in the Avon River Basin, and a poster sent to all schools in the region to further improve the profile. Future work may involve investigating reports of sightings, delivering presentations to school and community groups and producing more copies of the brochure / poster.

A one day "spider-blitz" was conducted in 2007 at East Yorkrakine Nature Reserve involving community members, research specialists and staff from DEC and WWF.

The spider-blitz was successful in raising public awareness of these species while also obtaining valuable information on the Shield-backed Trapdoor Spider (*Idiosoma nigrum*). Plans are underway to conduct another spider-blitz for *Teyl* sp. in 2008 and possibly other species / other locations in future years.

This action has also been recommended in three other trapdoor spider conservation plans. The budgeted amount listed in this action is a total amount for all four species and is not to be implemented four individual times.

**Action:** Promote public awareness
**Completion date:** on-going
**Cost:** $500 / year

## 13.0 SUMMARY OF CONSERVATION ACTIONS

| Action | 2008 | 2009 | 2010 | 2011 | 2012 | Total |
|---|---|---|---|---|---|---|
| 12.1 Establish a Mygalomorph Conservation Team | $2,500 | $2,500 | $2,500 | $2,500 | $2,500 | **$12,500** |
| 12.2 Determine the population characteristics of known populations & ongoing monitoring | $3,500 | $3,500 | $3,500 | $3,500 | $3,500 | **$17,500** |
| 12.3 Undertake a threat assessment for each population | Included in above costs | Included in above costs | Included in above costs | Included in above costs | Included in above costs | |
| 12.4 Address threats to specific populations | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | **$5,000** |
| 12.5 Conduct surveys to identify new populations | $ 2,000 | $ 2,000 | $ 2,000 | $ 2,000 | $ 2,000 | **$10,000** |
| 12.6 Promote public awareness | $500 | $500 | $500 | $500 | $500 | **$2,500** |
| Cost | **$9,500** | **$9,500** | **$9,500** | **$9,500** | **$9,500** | **$47,500** |

## 14.0 REFERENCES


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## **Appendix 1: Summary of vesting, purpose and tenure of locations where** *K. eboracum* **extant populations are known to occur**

| Pop. No. | Location | Shire | Vesting | Type | Tenure | Most Recent Record Date |
|---|---|---|---|---|---|---|
| **1** | ”Eboracum property” (adjacent) | Tammin | Shire of Tammin | Road reserve | Crown | 29/11/2000 |
| **2** | Yorkrakine Rock NR | Tammin | Conservation Commission of WA | Nature Reserve | Crown | 16/03/1969 |

## **Appendix 2: Summary of vesting, purpose and tenure of locations where other** *K. eboracum* **populations occur**

| Species | Pop. No. & Location | Shire | Vesting | Type | Tenure |
|---|---|---|---|---|---|
| *Kwonkan eboracum* | **3** 18km NNE of Tammin | Tammin | Main Roads | Road reserve | Crown |