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An Update Of The Population Status Of *Petalurus hesperia* At
Previously Identified Sites In And Around Perth

By Steven Bastick
January 1995

Summary

This report outlines the results of the investigation of previously recorded sites where the *Petalurus hesperia* has been sighted.

Introduction

Petalurus hesperia belongs to a small family of dragonflies that are the remnants of a once larger family that date back to Jurassic times when it is thought they were dominant in numbers (Watson, 1965). There are now only ten species recognised worldwide of which four exist in Australia. Of these four only *P. hesperia* exists in West Australia (Williams, 1993).

P. hesperia is the fourth largest dragonfly in the world and the male is recognised easily via the presence of a pair of petal-like appendages at the end of the tail. The female lacks the petal structures but is basically the same in size shape and markings. Other easily recognisable features are:

1. its size reaching 10cm in length and 9cm in wingspan and
2. the eyes which are separate and do not meet in the middle

The *P. hesperia* larvae are semi aquatic and live in burrows in peaty swamps or bogs. When they are fully grown the larvae climb out of the water onto reeds where the adult dragonfly emerges from the pupal skin (exuvae) (Watson, 1965). The exuvae left behind by the dragonfly can also be used as a sign of *P. hesperia* presence.

P. hesperia is very localised in distribution due to the need for specialised breeding areas and the sedentary nature of the adult. It is thought to be limited to the headwaters of a number of freshwater streams in the Darling Scarp. Hence *P. hesperia*'s need for specialised habitat together with evidence of low population numbers at recognised sites (Williams, 1993) suggests that *P. hesperia* is rare and may even deserve to be classed as endangered.

Methods

The sites surveyed were selected from a list by Williams (1993) of areas where P. hesperia has been located historically.

The sites were visited between December 20 and December 30. At each site two to four hours were spent walking along the length of stream where the previously identified population was said to exist. P. hesperia does not necessarily exist directly next to te running water and has been found up to 100 metres away, hence surrounding vegetation was also surveyed. P. hesperia is generally not a hawking dragonfly and tends to spend a majority of its time perched on the vertical woody stems of trees and and large plants (Watson, 1965) so much effort was put in to the scrutiny of these features.

Summary of results

Manjedal Brook, Manjedal Scout Camp

This area (indicated on map 1) was surveyed on December 20 and December 22. The first survey yielded only, three less than certain, identifications of P. hesperia and the second visit resulted in one definite sighting of a male in an area where fast flowing water was present. These results when compared to numbers sighted in previous years may indicate that a decline in population has occurred however more research is required.

Lesmurdie

Three hours of surveying at this site on December 20 resulted in no P. hesperia being sighted. This may be a result of extensive degradation in flora, fauna and water quality due to encroaching urban development.

Bullcreek

This area (see map 2) was surveyed on December 20 and December 21. Two adults were sighted on the first visit (see map 2 for location) and none were seen on the second visit. This result suggests a decline in population numbers and enforces the assumption that populations of P. hesperia are dangerously low.

South Dandalup Dam and Serpentine Dam

These two sites were visited on December 30 and no sightings were recorded. However the large areas of both these sights and the large amount of streams present coupled with the sedentary nature of the species makes these results less than inconclusive.

A full report of methods used and results obtained from
investigating the various sites

Manjedal Brook, Manjedal Scout Camp

Tuesday 20 December 1994

On the above date an initial check of the site was made by myself and Paul Brown. From 9.15 am to 11.15 am we surveyed the section of Mandejal Brook running from the dam, where the road leading to the BBQ site and camp crosses the brook, to the point where surrounding forest is succeeded by farmland (see map 1). The weather on this day was sunny, hot (25 - 32 deg. C), dry with a medium strength breeze present.

A possible sighting was made at 10am approximately 20m east of the flying fox cable. The exact location is indicated on map 1 and is marked sighting 1. However a 100% identification could not be made. The individual was perched on the vertical trunk of a Blackbutt (Eucalyptus patens) (50cm diameter) 1m from the waters edge, approximately 3m above the waters surface for approximately 10mins. The specimen was seen to have a pale cross striping on the abdomen, however this may have been mistaken for light reflecting of the segmentation of the body parts. The size and behavioural characteristics were all indicative of the P. hesperia. After leaving the tree the specimen landed on a large reed and then flew out of sight.

Two more less than 100% identification were made at 10.40am, 50m east of the first sighting. The exact location is given on map 1 and is marked sighting 2. The two dragonflies were seen flying together 2-3m above the ground for about 20secs in an area similar in vegetation to that of the first.

Another species of dragonfly was also sighted on this day at 10.30am. The individual had a light yellow body and tail tip. The leading edges of the wings were also yellow and the head and thorax a duller yellow brown. It was spotted flying 20-50m from the creeks edge on the Down road. It was not P. hesperia.

A second permanent stream 1.5km north of Mandejal Brook looked to have vegetation which may be suitable for P. hesperia habitat. However, only 1km of creek line was uncleared between clear private property blocks.

Thursday 22 December

On this date a second investigation of the same area of the brook was made between 11.00am and 3.00pm. The investigation was conducted by myself. The weather on this day was hot (approx. 40 deg C) and conditions were particularly good for species identification.

Despite the good conditions only one positive sighting was made. This occurred at 2.00pm when a large individual (approx 9cm in length) was sighted perched on the vertical stem of a small woody tree approximately 2m above the ground directly over a section of the brook where the water was flowing rapidly over a granite outcrop. The location of this sighting is indicated on map 1 and is marked as sighting 3. The individual was male and spent approximately 5 minutes perched on the stem before flying off to a distance of approximately 30m away from the stream. It then returned a few minutes later to the exact same perch.

Lesmurdie

Tuesday 20 December 1994

The area surveyed on this day was the length of creek in Whistle Pipe Gully from Lesmurdie Falls to approximately 300m upstream. The weather was hot and conditions good for P. hesperia sighting. The investigation was conducted by Paul Brown and myself. This area is surrounded by urban area and is showing extensive signs of degradation in flora fauna and water quality. The area was surveyed between 12.30pm and 1.30pm. No P. hesperia were sighted.

Bullcreek

Tuesday 20 December

The area surveyed on this day was the length of creek between Forster Court and the point where the creek meets the Canning River and was investigated by myself and Paul Brown. The weather was hot, sunny and dry. The survey was conducted between 1.45pm and 2.45pm. One definite sighting and capture was made and another sighting was also made. The specimen was captured on the northern side of the Leach Hwy in an open sandy area approximately 60m west of the creek, 5m out from the edge of the remnant vegetation and 100m from the edge of Leach Hwy (see map 2). The captured specimen was seen perched on the stem of a replanted bush and 1m above the ground. The specimen was male as indicated by the petal-like appendages at the rear of the abdomen.

The second individual was sighted about 10m north of the first (see map 2) perched 1m above the ground on a wooden post. It had no petal structures indicating that it was female and was slightly larger than the first.

Wednesday 21 December

On this day the area was surveyed, by myself, between the hours of 10.30am and 3.00pm. No P. hesperia were sighted on this day indicating that population numbers are extremely low. This decline in numbers from previous years could be explained by extensive urban development in the area. Also no specimens were observed at the location, that was previously pin-pointed by JAL Watson (1957), adjacent to Rossmoyne Senior High School. A possible explanation for the lack of P. hesperia at this

location could be that the area has recently been subject to fire.

South Dandalup Dam

Friday 30 December

On this day an investigation of some of the streams that feed South Dandalup Dam from the north was made by myself and Travis Edwards. The conditions on this day were extremely hot (approx 40 deg C) and good for sighting of P. Hesperia. Between the hours of 10.00am and 1.00pm we searched the areas around the streams that are accessible from North East Road. No sightings were made however the inaccessibility of these areas coupled with the sedentary nature of the species makes the drawing of any conclusions from the lack of sightings impossible.

Serpentine Dam

Friday 30 December

On this day an investigation of some of the streams that feed the northernmost spur of the Serpentine Dam was made by myself and Travis Edwards. These watercourses are accessible via the Solus Road which runs off the Albany Highway. This investigation was conducted from 2.00pm to 5.00pm and as in the other investigation made on this day at South Dandalup Dam no sightings were made but this result is inconclusive.

References

- Watson, J.A.L., (1965), Petalurids Most Primitive Living Dragonflies, Animals Magazine, Vol 6 (5), 128-131.
- Williams, M.R., (1993), Conservation Status of Petalurus hesperia Watson in Western Australia. Unpublished report to CALM.

WESTERN PETALURA DRAGONFLY COLLECTION RECORD

Collector: Miss M. Hawkin (or Hawking)

Date: 10 November 1956

Site: Lesmurdie

Collection: Zoology Department, University of Western Australia (Paratype male)

Details: This paratype male specimen was found at Lesmurdie, 12-13 miles east south east of Perth. Only a single male specimen was obtained. This is the original specimen described by Watson (1957). It was obtained in open fields adjacent to the boggy headwaters of Woodlupine Brook, Lesmurdie. Similar habitat to the Karragullen site where Watson found the holotype (Watson 1958). At all three localities Watson (1958) found *P. hesperia* lives in association with other mud-dwelling Odonata: *Argiolestes pusillus* Tillyard, *Synthemis macrostigma occidentalis* Tillyard, *Orthetrum caledonicum* (Brauer) and *Nannophya dalei occidentalis* (Tillyard).

Comments:

Notes: From notes within Watson (1957) and Watson (1958)

WESTERN PETALURA DRAGONFLY COLLECTION RECORD

Collector: Dr. J.A.L. (Tony) Watson, Zoology Department, University of W.A.

Date: 30 November 1957 (Paratype); 01 December 1957 (Holotype)

Site: South west of Karragullen

Collection: Western Australian Museum No. 1958-3 (Holotype male)
Zoology Department, University of Western Australia (Paratype male)

Details: This holotype and paratype male specimen found 1.75 miles south west of Karragullen and 13.5 miles south east of Perth. Grid reference 102294 on Kelmscott 1 mile per inch map.

At Karragullen the insects were found in a permanent, partially cleared, swamp bordering a spring. The cleared portion was under grass, with isolated patches of *Scirpus* and *Gahnia*, but the uncleared area supported dense thicket of the tea tree *Agonis*.

At all three localities Watson (1958) found *P. hesperia* lives in association with other mud-dwelling Odonata: *Argiolestes pusillus* Tillyard, *Synthemis macrostigma occidentalis* Tillyard, *Orthetrum caledonicum* (Brauer) and *Nannophya dalei occidentalis* (Tillyard).

Comments:

Notes: From notes within Watson (1958)

WESTERN PETALURA DRAGONFLY COLLECTION RECORD

Collector: Dr. J.A.L. (Tony) Watson, Division of Entomology, CSIRO Canberra
L. M. Saunders, Zoology Department, University of Western Australia

Date: 04 December 1957 - 25 specimens

Site: Bull Creek

Collection: Zoology Department, University of Western Australia

Details: Four male (1 teneral), one female (teneral) and 20 exuviae (9 male and 11 female) collected at Bull Creek Riverton.

At Bull Creek it breeds in swampy ground alongside the creek itself. The swamp is densely vegetated with *Lepidosperma*, *Gahnia*, *Cladium* and other rushes under a brocken tree cover of *Melaleuca*, *Agonis* and *Eucalyptus*. The swamp contains a black peaty mud which is kept wet throughout the year by seepage from the adjacent hill slopes.

At all three localities Watson (1958) found *P. hesperia* lives in association with other mud-dwelling Odonata: *Argiolestes pusillus* Tillyard, *Synthemis macrostigma occidentalis* Tillyard, *Orthetrum caledonicum* (Brauer) and *Nannophya dalei occidentalis* (Tillyard).

Comments:

Notes: From notes within Watson (1958)

WESTERN PETALURA DRAGONFLY COLLECTION RECORD

- Collector:** Dr. J.A.L. (Tony) Watson, Zoology Department, University of Western Australia
- Date:** 04 - 07 December 1957
- Site:** Bull Creek
- Collection:** Western Australian Museum No. 1958-4 (Allotype female) 4/12/57
Western Australian Museum No. 1958-6 (Allotype exuviae male) 7/12/57
- Details:** Allotype female and allotype exuviae specimens found at Bull Creek, Riverton, 6.5 miles south of Perth.
At Bull Creek it breeds in swampy ground alongside the creek itself. The swamp is densely vegetated with *Lepidosperma*, *Gahnia*, *Cladium* and other rushes under a broken tree cover of *Melaleuca*, *Agonis* and *Eucalyptus*. The swamp contains a black peaty mud which is kept wet throughout the year by seepage from the adjacent hill slopes.
At all three localities Watson (1958) found *P. hesperia* lives in association with other mud-dwelling Odonata: *Argiolestes pusillus* Tillyard, *Synthemis macrostigma occidentalis* Tillyard, *Orthetrum caledonicum* (Brauer) and *Nannophya dalei occidentalis* (Tillyard).
- Comments:**
- Notes:** From notes within Watson (1958)

WESTERN PETALURA DRAGONFLY OBSERVATION RECORD

Collector: Dr. Allen Davies

Date: 1990

Site: Manjedal Brook (Scout Camp)

Collection:

Details: Comparatively large numbers, about 20, were seen in 1990.

Comments:

Notes: From notes within Williams (1993).

WESTERN PETALURA DRAGONFLY OBSERVATION RECORD

Collector: Magnus Peterson, private contractor associated with the W.A. Museum.

Date:

Site: Karragullen

Collection: N/A

Details: Magnus Peterson has visited this locality, but found that the streamside vegetation had been cleared for agriculture and that the population is unlikely to persist.

Comments:

Notes: From notes within Williams (1993).

WESTERN PETALURA DRAGONFLY COLLECTION RECORD

Collector: Dr. J.A.L. (Tony) Watson, Division of Entomology, CSIRO Canberra

Date:

Site: Manjedal Brook (Scout Camp)

Collection:

Details: Dr. Watson collected a single exuvia at this site in summer 1991.

Comments:

Notes: From notes within Williams (1993)

WESTERN PETALURA DRAGONFLY COLLECTION RECORD

- Collector:** Tom E. Burbidge,
CALM Science and Information Branch, COMO. Phone: 3340305
- Date:** A single adult Male specimen collected 12 December 1991, 08.30 pm
- Site:** Bull Creek
- Collection:** Personal collection (T.E. Burbidge)
- Details:** Specimen collected at the main door way to the All Saints College chapel door 300-400 m south of intersection between Bull Creek and Leach Highway. Specimen was alive when caught at about 08.30 pm on the main door post to the chapel. It did not move, possibly because of the cooler temperatures at that time of night. Tom thought it was attracted to the chapel lights (including a large spotlight on the chapel cross) which are kept on every evening between sundown and midnight.
- Comments:** Tom Burbidge uses the chapel regularly, but has not seen a Western Petalura Dragonfly previously or since. He has never actively searched for the dragonfly at the Bull Creek or any other site.
- Notes:** Paul Brown discussed this issue with Tom Burbidge on the morning of 23 December 1994 and compiled these notes from that discussion. Notes completed 24 December 1994.

WESTERN PETALURA DRAGONFLY COLLECTION RECORD

Collector: Jan C. Taylor

Date: 5 January 1993 - Single specimen collected

Site: East of Alcoa alumina refinery near South Danalup Dam

Collection:

Details: From the Pinjarra Alumina Refinery Road, branching up the scarp along North Spur Road. Turn north up Scarp Road for about 2.5 km to where it crosses the fast flowing clear stream (Boomer Brook, tributery of Dardanup River). About 20 adults.

Comments: Also observed adults at this site on 16 December 1992 although he indicated that they were less plentiful on the first visit that the second.

Notes: From letter from Jan Taylor dated 7 January 1993 and notes within Williams (1993)

WESTERN PETALURA DRAGONFLY COLLECTION RECORD

Collector: Matthew R. Williams, CALM Science and Information Division, Como.
Phone: 3340399

Date: 8 January 1993

Site: Manjedal Brook (Scout Camp)

Collection:

Details: Four specimens collected. Comparatively large numbers, about 20, were seen.

Comments:

Notes: From notes within Williams (1993)

WESTERN PETALURA DRAGONFLY COLLECTION RECORD

Collector: Jan C. Taylor

Date: 7 December 1994

Site: Logue Brook Dam

Collection: N/A

Details: Site is inland from Yarloop, not far from Logue Brook Dam. It is where the tributary of the Harvey River crosses the Nanga Road, some 1.5 km north of the junction with Willowdale Road and 2.2 km south of Driver Road. CALM Murray 1:50,000 plan, reference 63DL, adjoining ref tree 4.

Appears a fairly typical forest stream without any obvious extensive spring-fed boggy area, although the flow east is impeded by granite near the surface where the road crosses. The dragonflies are typically difficult to see until I got my eye in and could pick them up settling on vertical woody stems and small tree trunks in open areas. I found 4-5 *P. hesperia* altogether. the dense growth near the stream has tube like mammal tracks - quokkas or bandicoots.

Comments: J. Taylor first observed adult *P. hesperia* at this site in December 1988. However could not remember exactly its location until he relocated it on this visit. He indicates that he "missed it before because the vegetation had grown up so much."

Notes: From letter by Jan Taylor of 8 December 1994.

WESTERN PETALURA DRAGONFLY OBSERVATION RECORD

Collector: Paul Brown, CALM Swan Region Kelmscott. Phone: 3905977
Steven Bastick, CALM Volunteer, 538 Beach Rd, Hamersley, WA 6022.

Date: Tuesday 20 December 1994, 9.15 - 11.15 am

Site: Manjedal Brook (Scout Camp)

Collection: N/A

Details: We surveyed the section of Mandejal Brook running from the dam where the road leading to the BBQ site and came cross the brook to the point where surrounding forest is succeeded by farmland (Map 1). The weather of this day was sunny hot (28 - 32 degrees C), dry and a medium strength breeze was present.

A possible sighting was made at 10.00 am approximately 20 m east of the flying fox cable. The exact location is indicated on Map 1 and is marked as sighting 1. The individual was perched on the vertical trunk of a blackbutt for approximately 10 minutes. The blackbutt was 50 cm diameter, 1 m from the waters edge and the dragonfly perched approximately 3 m above the waters surface. The specimen was seen to have a pale cross striping on the abdomen, however this may have been mistaken for light reflecting of the segmentation of the body parts. The size and behavioural characteristics were all indicative of the *P. hesperia*. After vacating the tree the specimen landed on a large reed and then flew out of sight. The vegetation in the area was dominated by specimen 1.

At 10.40 am two possible *P. hesperia* were seen flying together 2-3 m above the ground for about 20 seconds in an area 50 m east of the first sighting. The second site had similar vegetation to that of the first. As the two dragonflies where in flight 100% identification could not be made. The exact location is given on Map 1 and is marked sighting 2.

Another species of dragonfly was also sighted on this day at 10.30 am. The individual had a light yellow body and tail tip. The leading edges of the wings were also yellow and the head and thorax a dulled yellow brown. It was spotted flying 25 - 50 m from the creeks edge on the Down Road. We believe it was not *P. hesperia*.

Comments: A second permanent stream 1.5 km north of Mandejal Brook appeared to have remnant vegetation that looked suitable for *Petalurus hesperia* habitat. However, only 1 km of creek line remained bushland between cleared private property blocks.

Notes: From note by Bastick (1994).

WESTERN PETALURA DRAGONFLY OBSERVATION RECORD

Collector: Paul Brown, CALM Swan Region Kelmscott. Phone: 3905977
Steven Bastick, CALM Volunteer, 538 Beach Rd, Hamersley, WA 6022.
Phone 4474969

Date: Tuesday 20 December 1994, 12.30 - 1.30 pm.

Site: Lesmurdie

Collection: N/A

Details: The area surveyed on this day was the length of creek in Whistle Pipe Gully from Lesmurdie Falls to approximately 300 m upstream. The weather was hot and conditions good for *P. hesperia* sighting. This area is surrounded by urban area and is showing extensive signs of degradation in flora, fauna and water quality. No *P. hesperia* were sighted.

Comments: However other species of dragonflies were recorded and one specimen was captured. The first dragonfly seen possessed white wing tips a thin black abdomen with yellow bands and a brown head It was perched on a wild oat 30 cm above the ground 30 m west of the picnic site. The captured specimen is yet to be described.

Notes: From notes by Bastick (1994).

**WESTERN PETALURA DRAGONFLY COLLECTION/OBSERVATION
RECORD**

Collector: Paul Brown, CALM Swan Region Kelmscott. Phone: 3905977
Steven Bastick, CALM Volunteer, 538 Beach Rd, Hamersley, WA 6022.
Phone 4474969

Date: Tuesday 20 December, 1.45 - 2.45 pm.

Site: Bull Creek

Collection: CALM Como

Details: The area surveyed on this day was the length of creek between Forster Court and the point where the creek meets the Canning River. The weather was hot sunny and dry. A specimen of *P. hesperia* was captured on the northern side of the Leach Hwy in an open sandy area approximately 60 m west of the creek 5 m out from the edge of the remnant vegetation and 100 m from the edge of Leach Hwy (Map 2). The capture specimen was seen perched on the stem of a replanted bush about 1 m above the ground. The specimen was male as indicated by the petal-like appendages at the rear of the abdomen.

A second individual was sighted about 10 m north of the first (Map 2). It was perched 1 m above the ground on a wooden post. It had no petal structures and was slightly larger than the first, thus we believe it was a female.

Comments:

Notes: From notes by Bastick (1994)

**WESTERN PETALURA DRAGONFLY COLLECTION/OBSERVATION
RECORD**

Collector: Steven Bastick, CALM Volunteer, 538 Beach Rd, Hamersley, WA 6022.
Phone 4474969

Date: Wednesday 21 December, 10.30 - 3.00 pm

Site: Bull Creek

Collection: N/A

Details: No *P. hesperia* were sighted. It may appear that the population numbers at this site are extremely low. This decline in numbers from previous years could be explained by extensive urban development in the area.

Comments: Also no specimen were observed at the location that was previously pinpointed by JAL Watson, adjacent to Rossmoyne Senior High School. A possible explanation for the lack of *P. hesperia* at this location could be that the area has recently been subject to fire.

Notes: From notes by Bastick (1994)

WESTERN PETALURA DRAGONFLY OBSERVATION RECORD

Collector: Steven Bastick, CALM Volunteer, 538 Beach Rd, Hamersley, WA 6022.
Phone 4474969

Date: Thursday 22 December, 11.00 - 15.00 hours

Site: Manjedal Brook (Scout Camp)

Collection: N/A

Details: The weather on this day was hot (approximately 40 degrees C) and conditions were particularly good for species identification. Despite the good conditions only one positive sighting was made. This occurred at 2.00 pm when a large individual (approx 9cm in length) was sighted perched on the vertical stem of a small woody tree approximately 2 m above the ground directly over a section of the Mandejal Brook where the water was flowing rapidly over a granite outcrop. The location of this sighting is indicated on Map 1 and is marked as sighting 3. The individual was male and spent approximately 5 minutes perched on the stem before flying on for a distance of approximately 30m away from the stream. It then returned a few minutes later to the exact same perch.

Comments:

Notes: From note by Bastick (1994).