# WA Rangelands

**Subterranean Aquifers**

**Evolutionary Refugia**

Freshwater subterranean aquifers supporting endemic stygofauna occur within the Pilbara and Yilgarn regions. Sites occur within calcretes, alluvial formations associated with alluvial or palaeochannel aquifers, fractured rock aquifers, and karst limestone. More detailed information on the determination of sites is provided in the Environmental Assessment Guideline No. 12 published by the WA EPA in June 2013.

# Surface Waters

# The following list of significant evolutionary and ecological refugia was compiled by Adrian Pinder, WA Department of Parks and Wildlife, July 2014.

### Pilbara region

### There are a large number of permanent river pools and springs in the Pilbara. The following are the most well known. A dedicated mapping exercise is needed to provide a comprehensive list.

**Evolutionary refugia**

### Karijini National Park

### Permanent gorge pools, streams and springs A number of species within Karijini NP are known from few or no other sites, including mesic-adapted species).

**Millstream National Park**

**Permanent river pools**

These refugia comprise a series of deep river pools (Deep Reach Pool, Crossing Pool, Palm Pool and Livistonia Pool) fed by an alluvial aquifer. Sites include those fed directly by the aquifer, downstream pools fed by surface flow, several discrete springs, including the warm Chinderwarriner Spring, and channel alluvium. The Millstream damselfly (*Nososticta pilbara*) is an important endemic species. The Millstream aquifer also supports a threatened stygofauna community.

**Weeli Wolli Spring**

Groundwater discharge into a small permanently flowing creek. Listed as a Threatened Ecological Community (TEC). Currently receives 40GL/annum mine discharge.

**Ecological refugia**

**River Pools and Springs**

**Carawine Gorge on the Oakover River**

A deep scour pool (> 5 metres) is present against a tall east-facing cliff.

**Running Waters**

Warm spring discharge supporting steep-sided pools (<2 metres deep) with a dense riparian Melaleuca canopy.

**Skull Springs**

Hyporheic waters discharging where subsurface geology creates barriers to flow from several shallow permanent (<1 metre) pools and braided streams within the broad sandy channel of the Davis River.

**Bamboo Springs**

Series of interconnected creek pools fed by shallow calcretes aquifer fed.

**Koodaideri Spring**

Series of pools fed by groundwater discharging from rock face in gorge.

**Chalyarn Pool**

Pool on creek at junction with Robe River. Hyporheic flow impeded by bedrock.

**Glen Herring Pool**

Pool and associated surface flows created by bedrock structures impeding hyporheic flows.

**Whiskey Pool**

Long deep lowland river pool formed by downstream bedrock structures.

**Wallarook Pool on Duck Creek**

Deep steep sided pool within gallery woodland fed by spring discharge.

**Kangan Pool on Sherlock River**

Exposed but broad and deep pool formed where Sherlock River meets a tributary, forms right angle bend up against hills on the northern edge of the Chichester Range.

**Yandabiddy Pool on Angelo River**

Spring-fed deep rocky pool.

**Fourteen Mile Pool and Moorimoordinia Pool**

Pools at entrance to Fortescue Marsh. Permanent clear to turbid pools Fill when Fortescue River floods and retain water for extended periods. Moorimoordinia also called ‘Native well’ indicating it was a permanent waterhole used by traditional owners.

### Temporary wetlands important for particular biotic elements

**Fortescue Marsh**

Filled by cyclonic rains in the upper Fortescue River. 100km long terminal basin for the upper Fortescue, fresh when full becoming saline as it dries. 100000s of waterbirds use the site when flooded. Some endemic invertebrates and plants present. A very significant wetland in Western Australia

### Western Deserts

**Ecological refugia**

**Rudall River wetlands, including Desert Queen Baths**

The latter is rocky spring discharge feeding into a series of small but permanent pools in a shallow gorge. Pools associated with hyporheic discharge in sandy creeks are also present.

**Dragon Soak**

**Durba Springs**

Spring in Durba Hills in Gibson Desert.

### Temporary wetlands important for particular biotic elements

**Lake Gregory**

One of the most important western arid zone sites for waterfowl breeding. Episodic but when full supports 100000s waterfowl and several breeding species.

**Mandora Marsh**

Supports significant waterbird populations when filled by cyclonic rains and flows down Salt Creek. There are a number of mound springs but these have a mostly widespread fauna.

**Lake Disappointment**

Very large saline playa, known for large numbers of breeding banded stilts when flooded. Filled by infrequent (episodic) rain events.