Wetlands

of south-western Queensland

Queensland Government
Environmental Protection Agency
Queensland Parks and Wildlife Service

Artesian springs

Landform and water regime

Artesian springs occur in association with mounds (mound springs) and as areas of seepage not associated with mounds. Mounds comprise soil, and carbonate precipitates, and may be 1–10 m high and 2–100 m in diameter. Unconfined springs may be tens of metres wide/long.

Water supply is from the Great Artesian (subterranean) Basin, often in association with minor faults. It occurs continuously, under hydrostatic pressure. Inundation is permanent, though some reduction in extent of seepage areas may occur in summer due to evaporation. Many (about 75%) of the springs have become extinct in the last 100 years. Depth of water is typically less than 0.2 m. Water in artesian springs normally is fresh (non-saline).

Reed Phragmites *thicket around Allawonga Spring, Marion Downs station*
(G. Ford, Environmental Protection Agency)

Typical vegetation

Some examples support tall dense stands of reed *Phragmites* sp. or cumbungi *Typha domingensis*. Others support low dense sedgeland or grasses. Some are largely devoid of tall emergent vegetation.

Associated wetland types

Artesian springs are not necessarily associated with other wetland types. Their occurrence is determined by geology.

Distribution in south-western Queensland

This wetland type is widespread in south-western Queensland (more than 200 examples mapped), occurring in all biogeographic regions except Darling Riverine Plains.

Prominent examples of this type

- The Mulligan River group of springs (west of Bedourie).
- The Springvale group (north-east of Bedourie) which includes the Elizabeth Springs.
- The Barcaldine group (north of Aramac) which includes the Edgbaston springs.
- The Eulo group (west and south-west of Eulo).

(The Springsure group is mostly north and east of the area defined as south-western Queensland.)

Occurrence in protected areas

This wetland type occurs in only two, possibly three, national parks in south-western Queensland, notably Currawinya National Park (which includes some of the Eulo springs).

Principal conservation values

- Regarded as one of the rarest landforms in Australia (mound springs).
- Provide the only known habitat for four species of fish (see below), most of which are endangered, and for several species of invertebrate (eg. snails) and at least one plant species.
- Provide small but permanent wetland environments in an arid landscape.
- Of considerable scientific interest due to the tendency to support endemic flora and fauna.

Characteristic plant species

Trees and shrubs:

black teatree *Melaleuca bracteata*
river cooba *Acacia stenophylla*

Grasses, sedges and forbs:

reed *Phragmites* sp.
cumbungi *Typha domingensis*
spring grass *Sporobolus pamelae* (VQ)
Leersia hexandra
native millet *Echinochloa* spp.

Artesian springs *cont...*

spiny sedge *Cyperus gymnocaulos*
common fringe-rush *Fimbristylis dichotoma*
bore-drain sedge *Cyperus laevigatus*
sedge *Schoenus falcatus*
Eryngium fontanum (EN)
samphire *Halosarcia indica*

Submerged plants:

salt pipewort *Eriocaulon carsonii* (EN)
water milfoil *Myriophyllum* spp.
pondweed *Potamogeton pectinatus*
duckweed *Lemna* spp.
bladderwort *Utricularia dichotoma*

(VQ = Vulnerable species under Queensland legislation; EN = Endangered species under national legislation.)

Characteristic waterbird species

Artesian springs are too small to provide substantial habitat for waterbirds. Australian spotted crake *Porzana fluminea* and clamorous reed-warbler *Acrocephalus stentoreus* probably occur in the tall reeds or sedgeland.

Other fauna

The following fishes are endemic to artesian springs in south-western Queensland:

- red-finned blue-eye *Scaturiginichthys vermeilipinnis* (EN).
- Elizabeth Springs goby *Chlamydogobius micropterus* (EN).
- Edgbaston goby *Chlamydogobius squamigenus*. (EQ).
- Myross hardyhead *Craterocephalus* new species.

(EN = Endangered species under national legislation; EQ = Endangered species under Queensland legislation.) Additional species, such as desert goby *Chlamydogobius eremius*, occur in some of the springs.

The artesian springs also support 12 endemic species of hydrobiid snails (eg. *Jardinella isolata*). Other fauna include prawns *Cardina thermophila*, oligochaete worms and undescribed ostracods, amphipods and other invertebrates.

Threats to the conservation values

- Reduced artesian water flow, due to lowered hydrostatic pressure arising from extraction of water from bores in the Great Artesian Basin.
- Trampling of mounds , fouling of water and churning of associated swamps by livestock.
- Occurrence of exotic species, notably weeds and fishes (mosquitofish *Gambusia holbrooki*).

Management responses required

- Continuation of the program of capping of some artesian bores in the Basin.
- Fencing of priority springs to exclude livestock (some has been completed).
- Development of management plans for priority springs and recovery plans for endangered species (some have been prepared).

The Queensland Artesian Springs Recovery Team oversees remedial actions.

Sedgeland at Elizabeth Springs, Springvale station (B. Wilson, Environmental Protection Agency)

Gaps in knowledge

This wetland type has been intensively mapped (200+ springs) and surveyed in south-western Queensland. Further research on some aspects of biological diversity may be required, particularly at lesser known springs.

Further reading

Wilson, BA. 1995. Artesian springs of the Great Artesian Basin in Queensland. Unpublished report to Queensland Department of Environment and Heritage and Australian Nature Conservation Agency.

Blackman, JG. *et al.* 1996. Queensland. In, ANCA. *A Directory of Important Wetlands in Australia, 2nd edition.* Australian Nature Conservation Agency, Canberra. Site accounts for Aramac Springs (p. 295) and Elizabeth Springs (p. 345).

Ponder, WF. 1986. Mound springs of the Great Artesian Basin. In De Decker, P. and Williams, WD. eds. *Limnology in Australia*. CSIRO, Melbourne.

For further information, contact:

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