Dwarf Galaxias *(Galaxiella pusilla)*

Other common names: Eastern Little Galaxias

Conservation status *South Australia:* Vulnerable (VU B1b(i,ii,iii)c(i,ii)).
National: Vulnerable (*EPBC Act 1999*). *Interstate:* listed as Threatened in Victoria (Vulnerable) and Tasmania.

Taxonomy and identification A tiny, bullet shaped species reaching a maximum size of only 4.8cm, commonly 2-3cm. Distinguished from juveniles of other species by a lack of scales (e.g. compared to Gambusia) and faint to iridescent body stripes and a small single dorsal fin with origin slightly in front of the anal fin (e.g. compared to Mountain Galaxias). Males have orange to red lateral body stripes during the spawning season, while females develop purple flanks.

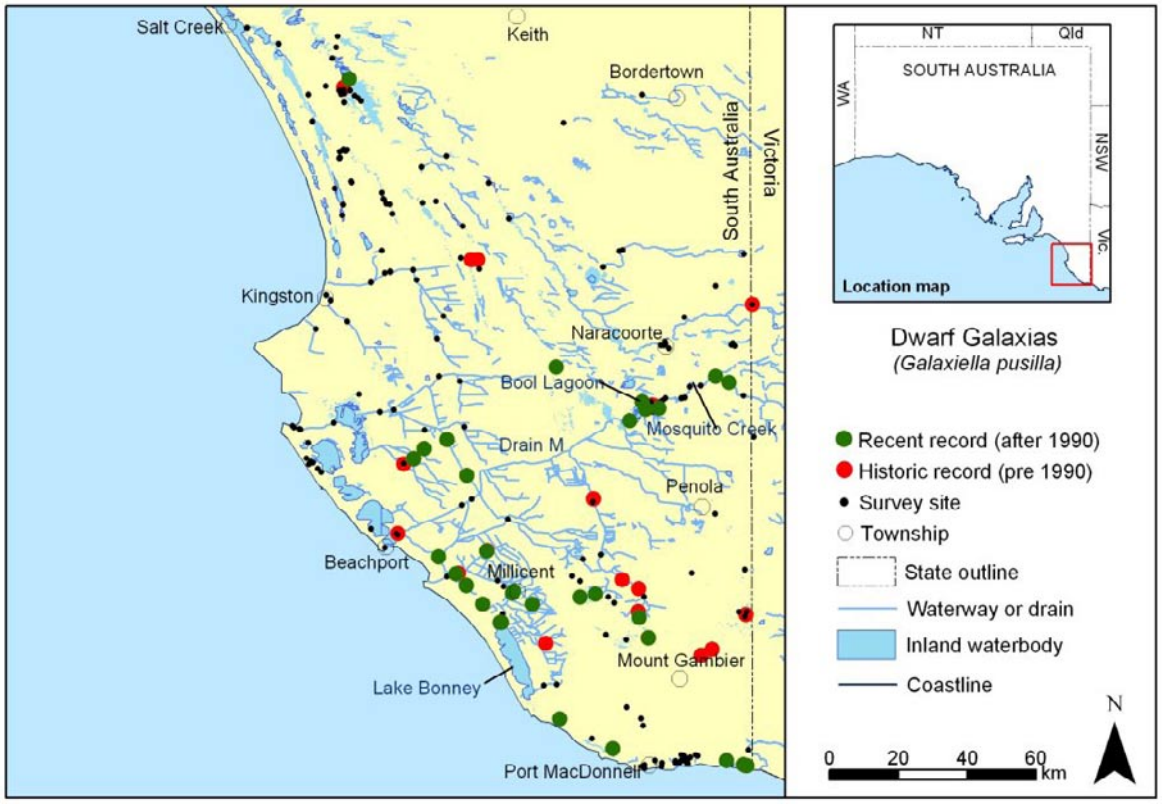
Former distribution Widespread in swamp and wetland habitat throughout SE SA including the Naracoorte Creek system (Mullinger Swamp), Mosquito Creek/Bool Lagoon system, Bakers Range Watercourse through to Cortina Lakes, Dismal Swamp Corridor through to Mt Burr, the Millicent/ Lake Bonney area, and the Lower South East[23,40,101]. Due to its small size and lack of specific searches the species presence was not recognised until the 1970s (e.g. records from Bool Lagoon in 1974), but subsequent publications revealed earlier records (Mingbool area near Mount Gambier)[202].

Current distribution A reasonably comprehensive survey in 2001-2002 revealed the species to still be widespread in the region, but reasonably patchy and with limited natural (secure) habitat[23]. Strongholds appear to be in the areas of Bool Lagoon, coastal springs of the Lower South East, Millicent/Mt Burr area and Drain L system, with patchy records in the Bakers Range and Upper South East. The species was not located in the Mingbool area, Naracoorte Creek system or Deep Swamp system (east of Kingston) where there had been previous records. Recent assessment (2008) indicates further decline, with potential loss from the Upper South East[94] (VU B1b(i,ii)).

Biology and habitat Occurs in shallow swampy habitat amongst emergent and submerged aquatic vegetation, primarily in swamp and wetland habitat, but also in numerous artificial drains which represent the only available habitat in some areas, and with some records in stream habitat (Mosquito Creek) and flooded lake edges (Lake Bonney)[23]. The species has been documented to occur in seasonal habitats, surviving swamp drying by seeking refuge in Swamp Yabby (Geocharax spp.) burrows for periods of up to five months[202] but survival at a regional context is likely best provided within a network of populations (metapopulation) where core refuges exist for recolonisation. Recolonisation is aided by a strong ability to navigate shallow surface water connections between habitats[55,202]. This species appears to be short-lived (longevity 1-2 years) and hence successive failures in habitat condition could lead to local extinctions. They spawn during cooler conditions in aquatic vegetation from around April to November. Adults are known to eat small crustaceans and vegetative matter[202].

Reasons for decline and threats Habitat loss from cumulative and progressive effects of widespread drainage of wetland and low-lying areas is likely to have had, and continue to have, a great impact on this species (e.g. loss of 90% of SE wetland habitats and alteration of most others[23,203,204])(VU B1b(iii)). A short lifecycle, altered regional hydrology and shallow occupied habitats leaves the species susceptible to extreme fluctuations in area of occupancy during climatically dry period. In addition, such adverse conditions may become more frequent and severe with climate change. This species is concurrently exposed to threatening processes which reduce quality of refuges may affect their ability to recover from such periods of stress (VU B1c(i,ii)). Other threatening processes are likely to include:

- Localised habitat damage from stock trampling wetland edges and seasonally dry habitats[202].
- Altered groundwater hydrology (e.g. from irrigation and plantations) lowering water tables potentially influencing the water holding ability of surface habitat and the ability of Dwarf Galaxias to reach refuge in Swamp Yabby burrows.
- Altered surface water connections by creating artificial barriers to Dwarf Galaxias movement may inhibit dispersal and recolonisation. Barriers do not need to be large structures given the small size of the fish (e.g. elevated roads, culverts, and drain spoilings may be significant dispersal barriers).
- Alien species: while the distribution of introduced species in the SE is currently restricted, future spread of species, primarily competition and aggression from Gambusia, is a concern based on experience interstate.
- Chemical pollutants: population losses were noted in the 1960s in the Mingbool region following application of pesticide (Lindane)[202]. Investigation is required into the impacts of other pesticides and herbicides employed in agriculture and local management (e.g. weed spraying).



Land tenure and conservation Occurs at Piccaninnie Ponds CP, Bool Lagoon GR, Hacks Lagoon CP, Reedy Creek CP, on land owned by DEH for conservation at Picks Swamp, other private lands managed for conservation (e.g. Ellis Swamp north of Lake Bonney), Forestry SA land (e.g. Mt Burr and Mingbool regions), drains in the Millicent region and Drain L system managed by the SEWCDB, and other private land with stock access (e.g. Mosquito Creek, coastal swamps).

Recovery objectives

- Secure core populations and regional metapopulations.
- Establish monitoring to develop an understanding of relationships to environmental conditions and hydrology, especially with any changes in management and/or conditions.
- Ensure that all key stakeholders are aware of populations and potential threats and improve awareness, particularly regarding species presence and ability to occur in seasonally dry habitats.

Conservation actions already initiated

- Initial broad scale distributional surveys and habitat assessment undertaken[23].
- Published ecological account provides significant information for management[202].
- Fencing on selected habitats (Picks Swamp, Ellis Swamp[205], parts of Mosquito Creek).

Required conservation actions

- Continue to identify then protect or undertake restoration at core dry period refuges.
- Protect and restore other known habitats.
- Protect and restore corridors for dispersal (e.g. fencing, reviewing road infrastructure).
- Temporal monitoring programs at current and historic sites to help determine population dynamics under different environmental and seasonal conditions. Urgent priority to assess the impacts of landscape drying from a prolonged period of below average rainfall since 2005.
- Improve habitat conditions to assist long term persistence at drain sites through adaptive habitat management (e.g. section fencing, hydrological alterations).
- Active management to prevent new pest fish introductions to Dwarf Galaxias habitat.
- Establish long-term government and community support structures (e.g. plans, educative materials) to promote the Dwarf Galaxias within regional planning and management, and aquatic protection and restoration programs.

Organisations responsible for conservation of species

DEH, DEWHA, SENRM Board, SEWCDB, USE Program, Forestry SA, regional Councils.

Organisations or individuals involved

NFA (SA), DEH, private landholders.