

## Mozambique tilapia (*Oreochromis mossambicus*) distribution in Australia

**Introduction:** The Mozambique tilapia is a species of deep-bodied fish belonging to the family Cichlidae. The ecological impacts of introduced Mozambique tilapia have been studied extensively in many parts of the world. It can out-compete native fish and invertebrates due to its aggressive behaviour and wide ecological tolerances<sup>1</sup>. It is also capable of causing habitat degradation through nest-building activities, and transferring pathogens and parasites to native fish<sup>1</sup>. In Australia, more research is needed to fully understand its economic, social and ecological effects. However, habitat modification, spreading disease and biodiversity reduction are some of the likely impacts.

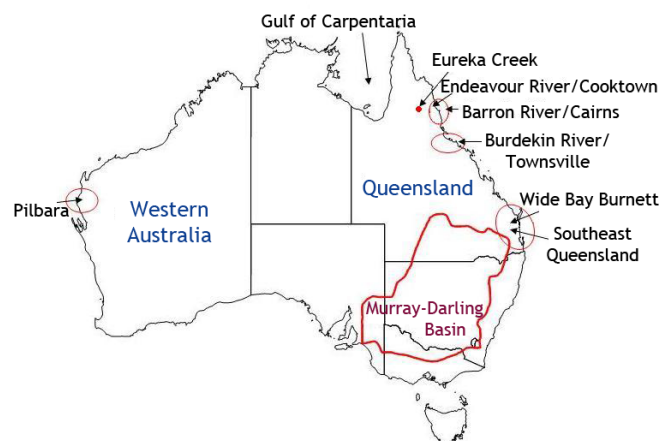
**Original distribution:** Native to eastern Africa, the distribution of Mozambique tilapia extends from the coastal countries of Malawi and Mozambique in the north, inland through Zimbabwe and west to Botswana, down to southeastern South Africa<sup>1</sup>. Throughout this range, the species is generally found in the middle and lower sections of waterways where it inhabits pools and lagoons as well as flowing waters. Mozambique tilapia are not often found in the upper reaches of these systems because of their inability to swim past natural barriers such as large rapids and waterfalls.

“ Mozambique tilapia have spread rapidly in countries where they have been introduced and may be causing losses in native biodiversity ”

**Worldwide distribution:** Mozambique tilapia have been introduced to about 90 countries, primarily as an aquaculture species, an ornamental fish, and for biological control of insects and aquatic plants<sup>1</sup>. They can tolerate a wide range of ecological conditions, which has led them to become a widespread, invasive pest in many areas. For example in the United States, Mozambique tilapia have established self-sustaining

populations in several states including Florida, Texas, California, Arizona and North Carolina<sup>2</sup>.

**Introduction into Australia:** The first documented discoveries of introduced Mozambique tilapia in Australian waterways were in southeast Queensland and north Queensland during the 1970s. Populations were then found in the Pilbara drainage division of Western Australia in 1981. The precise origin of introduction is unknown, but is thought to have been through aquarists illegally importing fish from Indonesia and/or Singapore<sup>1</sup>. Once in Australia, breeding populations were established and the species found its way into farm dams, presumably for use as a food fish. From there, either deliberately or accidentally, it was released into the wild where there are now self-sustaining populations.



Australian distribution of introduced Mozambique tilapia. The Murray–Darling Basin and Gulf of Carpentaria are currently unaffected, but under threat. Map prepared by Department of Employment, Economic Development and Innovation (DEEDI), Queensland

**Current Australian distribution:** Mozambique tilapia are present in many eastern catchments in southern, central and northern Queensland<sup>3</sup>. The species is also expanding its range in the Pilbara drainage division of Western Australia.

**Southeast Queensland:** Mozambique tilapia were first reported in the Brisbane region (North Pine and Leslie Harrison dams and associated tributaries) in the 1970s. More recently, records show a much wider distribution in southeast Queensland. Populations now exist in the lower Albert and Logan rivers, waterways around the Gold Coast, Brisbane River (including Lake Wivenhoe and

Lake Somerset), Bremer River and parts of the Lockyer Valley, Maroochy River (Ewen Maddock Dam), Caboolture River, and waterways around Deception Bay. Abundances vary locally between these populations. However, the majority are well established and likely to persist into the future.

**Central Queensland:** Their distribution in central Queensland is more disjointed than in the southeast. Populations have been found in the Wide Bay/Burnett region, including the Boyne River (including Boondooma Dam) in the Burnett catchment, Kolan River and associated tributaries, and Burrum River at Woodgate near Bundaberg. They have also been found in Baffle Creek north of Bundaberg, at Agnes Waters near the township of 1770, and near Cape Upstart in the Don River catchment (Bowen). The population in the upper Burnett catchment (Boyne River) is of particular concern, since this is only two kilometres from the currently unaffected Murray–Darling Basin – Australia’s largest river catchment.

**North Queensland:** The first report of Mozambique tilapia in north Queensland was at Townsville around 1980, when fish were collected from several waterways around the city. Populations now live in the Burdekin River catchment<sup>1</sup>, (including the Burdekin Dam), Ross River (including Ross River Dam), Bohle, Black and Alice rivers and associated tributaries, and coastal streams draining into Cleveland Bay. Further north around Cairns and the Atherton Tablelands, there are populations in the Barron River and associated tributaries (including Tinaroo Dam), upper Herbert River catchment (Herberton weirs) and Endeavour River at Cooktown. In 2008, a single Mozambique tilapia was found in Eureka Creek, an upper tributary of the westerly flowing Mitchell River catchment. This discovery was made during an eradication program to remove another introduced tilapia species (*Tilapia mariae*, or black mangrove cichlid). Follow-up surveillance has failed to locate any more fish of either species in this system.

**Western Australia:** The first report of Mozambique tilapia in Western Australia came from the Gascoyne River in 1981. The species is now well established in the Pilbara drainage division with populations in the Chapman, Gascoyne, Minilya and Lyndon rivers<sup>4</sup>.

**Catchments/drainages at risk:** There is potential for Mozambique tilapia to spread to other parts of tropical and subtropical Australia. Areas at high risk of invasion are usually those where colonised and uncolonised catchments meet, or where there is inter-drainage transfer of water, such as through irrigation schemes. Drainages meeting these criteria and therefore at high

risk are the Gulf of Carpentaria and the Murray-Darling Basin. Apart from natural dispersal, a major source of spread is through the movement of fish between water bodies by people.

**Stopping the spread:** Management strategies to stop the spread of Mozambique tilapia are mainly focused on education and extension programs, spot eradications and installation of screens on water supply infrastructure. There is currently no ‘silver bullet’ option; however, research into alternative control and management options is ongoing<sup>5</sup>. In the short term, the highly invasive nature of the species makes it likely that it will continue to colonise new watercourses in subtropical and tropical Australia.



Adult male Mozambique tilapia. Image: DEEDI, Queensland

### Further information:

1. Australian Centre Tropical Freshwater Research (2007). [Pest Fish Profiles - \*Oreochromis mossambicus\*](#). James Cook University.
2. United States Geological Survey (2009). [Nonindigenous Aquatic Species, \*Oreochromis mossambicus\*](#).
3. Arthington AH and Blühdorn R (1994). Distribution, genetics, ecology and status of the introduced cichlid, *Oreochromis mossambicus*, in Australia. [Communications of the International Association of Theoretical and Applied Limnology 24:53-62](#).
4. Morgan DL, Gill HS, Maddern MG and Beatty SJ (2004). Distribution and impacts of introduced freshwater fishes in Western Australia. [New Zealand Journal of Marine and Freshwater Research 38:511-523](#).
5. Russell DJ, Thuesen PA and Thomson FE (2011). [Development of Management Strategies for the Control and Eradication of Feral Tilapia Populations in Australia](#). PestSmart Toolkit publication, Invasive Animals Cooperative Research Centre, Canberra.