

# CASE STUDY: JACK DEMPSEY CICHLID

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**A case study of an aggressive, illegally released aquarium fish.**

## Species

Jack Dempsey cichlid (*Cichlasoma octofasciatum*).

## Origin

North and Central America.

## Australian occurrence

NSW – in a popular swimming pool (an isolated flooded quarry) on the far north coast near Yamba.<sup>1</sup>

## Potential environmental impacts

The features that make cichlids popular pets are also those that contribute to their invasive potential: 'they are hardy, adaptable and breed prolifically'.<sup>2</sup> In their native range Jack Dempsey cichlids inhabit swampy areas with warm, murky water. Of great concern is that they are highly aggressive fish (named after the heavyweight boxer Jack Dempsey) and are likely to dominate and compete with native fish populations. They eat almost anything smaller than themselves, including fish, invertebrates and frogs.<sup>3</sup> As a relatively large carnivore they could directly impact on a wide range of native fish.<sup>4</sup> Females lay about 500-800 eggs per clutch and both parents aggressively protect the eggs. The introduction of disease into wild fish populations is also of great concern.<sup>5</sup> Many pathogens and parasites have been recorded in imported ornamental fish in quarantine and post-quarantine in Australia. Jack Dempsey cichlids can tolerate low oxygen levels, so can inhabit degraded waters.<sup>6</sup>

## Potential social and economic impacts

These potential impacts include costs of control, impacts on recreationally valued fish and the spread of disease into economically or recreationally valued fish.



Jack Dempsey cichlids are adaptable, prolific breeders. Photo: Nikonian Novice | CC BY-ND 2.0

## Likely pathways

Probably illegally released from an aquarium when the owner no longer wanted them.

## BIOSECURITY ISSUES

### Summary

Attempts to eradicate Jack Dempsey cichlids from NSW have been unsuccessful. They are one of about 30 aquarium fish species now established in Australian waterways.<sup>7</sup> They highlight the importance of preventing new incursions due to the extreme difficulty of eradicating feral fish populations.

### Risk assessment and contingency planning

More than two-thirds of naturalised fish in Australia have come from the aquarium trade. Several hundred ornamental fish species are permitted for import into Australia, including more than 250 freshwater species.<sup>8</sup> In 2004-05, 15 million fish were imported.<sup>9</sup> Corfield et al. (2008) note that risk assessments rely on overseas information and are likely to be of limited value in many cases in predicting the likelihood of environmental impacts in Australian waters. We do not know of any contingency planning for aquarium fish incursions. As well as the risks of aquarium fish establishing in the wild, the risks of them introducing

new fish pathogens and parasites has not been adequately addressed.<sup>10</sup> Whittington and Chong (2007) advise that 'the number of species traded and the number of sources permitted need to be dramatically reduced to facilitate hazard identification, risk assessment and import quarantine controls.'

### Response to incursion

When Jack Dempseys were discovered in the flooded quarry near Yamba in 2004, the NSW government attempted eradication by explosives, a technique successfully used in WA, after which Australian bass were released into the pool to prey on any remaining larvae or juveniles.<sup>11</sup> Unfortunately, some Jack Dempseys survived. The government concluded, 'It is possible that the fish are very hardy and some survived the blasts, or alternatively they may have been deliberately re-introduced.' No further eradication attempts have been made.

### Threat abatement

Non-native fish species are 'implicated in the decline of 42% of Australian native fish and several frog species'.<sup>12</sup> In 2011 the national Threatened Species Scientific Committee judged that 'The introduction in Australian inland waters of native or non-native fish that are outside their natural geographic distribution' met the



Just like their namesake Jack Dempsey, the boxing champion, Jack Dempsey cichlids are highly aggressive.

criteria for a key threatening process (KTP), but the environment minister rejected the advice of the committee to list it as a KTP.<sup>13</sup> The refusal to list (or even assess invasive species KTPs)<sup>14</sup> has become a pattern at the federal level, undermining the capacity to take a national approach to many very serious invasive species threats.

## CHANGES NEEDED

### Risk reduction

- A national strategy as well as stronger regulation of the aquarium fish trade are needed to reduce the risks of aquarium fish establishing in Australian waterways.
- Key threatening processes should be listed based on scientific advice rather than being at ministerial discretion.
- Jack Dempsey cichlids should be eradicated and funding be made available to eradicate other recently established exotic fish species.

## ABOUT OUR CASE STUDIES

Our case studies illustrate the need for changes in how Australia prevents the establishment of new invasive species. They were compiled using publicly available information at the time of the last update. We would welcome new information or updates to biosecurity response for inclusion in future updates.

## CONTACT US

- Visit [invasives.org.au](http://invasives.org.au) for more

information about the Invasive Species Council and to get in touch.

## REFERENCES

Corfield J, Diggles B, Jubb C, McDowall R, Moore A, Richards A, Rowe D. 2008. Review of the impacts of introduced ornamental fish species that have established wild populations in Australia. Prepared for the Australian Government Department of the Environment, Water, Heritage and the Arts.

Department of the Environment and Energy. 2017. List of Specimens taken to be Suitable for Live Import as amended on 20 May 2017 made under section 303EB of the Environment Protection and Biodiversity Conservation Act

1999. (<https://www.legislation.gov.au/Details/F2017C00434>)

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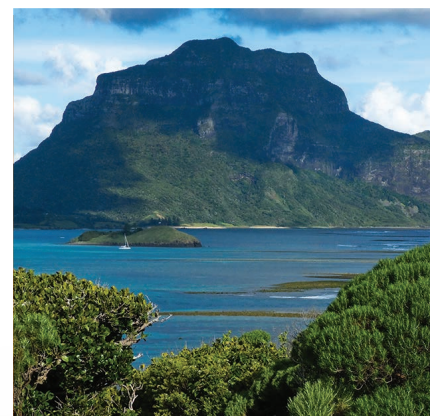
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Moore A, Marton N, McNee A. 2002. A Strategic Approach to the Management of Ornamental Fish in Australia. Bureau of Rural Sciences.

## ENDNOTES

- 1 Department of Primary Industries (nd).
- 2 Department of Primary Industries (nd).
- 3 Department of Primary Industries (2004).
- 4 Corfield et al. (2008).
- 5 Whittington and Chong (2007).

- 6 Corfield et al. (2008).
- 7 Corfield et al. (2008).
- 8 Department of the Environment and Energy (2017).
- 9 Corfield et al. (2008).
- 10 Whittington and Chong (2007).
- 11 Department of Primary Industries (nd).
- 12 Moore et al. (2010).
- 13 Threatened Species Scientific Committee (2011).
- 14 The Invasive Species Council made two nominations that were refused for assessment on the basis that 'novel biota' were being assessed as a KTP. This effectively shuts down the capacity to use the national threat abatement process to assist with addressing invasive species problems not already listed.



Stronger biosecurity is vital to protect the highly endemic wildlife of Australia and its many special wild places. This is Lord Howe Island, where invasive species have already caused several extinctions. Photo: Robert Whyte