Otjikoto Tilapia (*Tilapia guinasana*)
Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, June 2015

Photo not available.

1 Native Range, and Status in the United States

Native Range
From Froese and Pauly (2015):

"Africa: endemic to Lake Guinas, Namibia."

Status in the United States
This species has not been reported in the U.S.

Means of Introductions in the United States
This species has not been reported in the U.S.

Remarks
From Bills (2007):

"Two major threats are ground water extraction and the introduction of alien fishes (primarily tilapiine cichlids). Impacts of tilapiines range from competition for food and space, predation to introgression. This species is assessed as Critically Endangered under criterion B as it has a highly restricted AOO <1 km² (the lake is only 50 m in diameter), is limited to a single location, and is threatened by ongoing groundwater extraction and the potential introduction of an alien species."

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing
From ITIS (2015):

"Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Osteichthyes
Class Actinopterygii

Subclass Neopterygii
Infraclass Teleostei
Superorder Acanthopterygii
Order Perciformes
Suborder Labroidei
Family Cichlidae
Genus Tilapia
Species Tilapia guinasana Trewavas, 1936"

"Taxonomic Status: valid"

Size, Weight, and Age Range

From Froese and Pauly (2015):

"Max length : 14.0 cm TL male/unsexed; [de Moor and Bruton 1988]"

Environment

From Froese and Pauly (2015):

"Freshwater; benthopelagic; pH range: 7.0 - 7.8; dH range: ? - 15."

Climate/Range

From Froese and Pauly (2015):

"Tropical; 22°C - 26°C (Ref. 2059); 19°S - 21°S"

Distribution Outside the United States

Native

From Froese and Pauly (2015):

"Africa: endemic to Lake Guinas, Namibia. … Also occurs in subterranean rivers."

Introduced

From Froese and Pauly (2015):

"Introduced to Lake Otjikoto and several reservoirs in Namibia."

"Botswana"

Means of Introduction Outside the United States

No information available.

Short description
From Froese and Pauly (2015):

"Individuals tend to display different color patterns ranging from pure black to mottled black and blue, pink and white [Agenbag 1998]."

Biology
From Froese and Pauly (2015):

"Found in deep sinkhole lakes (100 m deep or more, e.g. introduced population in Lake Otjikoto, Namibia) with moderately clear water and with water temperatures ranging from 19 to 27°C. Feeds mainly on algae and diatoms [de Moor and Bruton 1988]. Generally congregate, breed and feed from the near-vertical shores. Use narrow shelves for breeding, with established and defended territories, both parents guard and tend eggs. Threatened due to depletion of local groundwater resources and impact of introduced species [Skelton 1993]."

"Nests are built on narrow rocky ledges and competition for these nest sites is very strong."

Human uses
From Froese and Pauly (2015):

"Aquarium: commercial"

Diseases
No OIE-notifiable diseases have been reported for this species.

Threat to humans
From Froese and Pauly (2015):

"Harmless"

3 Impacts of Introductions
From van Jaarsveld (2013):

"*Tilapia guinasana* is a habitat specialist, and successful breeding depends on a high pH (hard water), and rocky ledges (in the absence of predators). As it competes with other fish, and due to its lack of camouflage, it is easily picked out by predatory birds or other fish species. Therefore, due to its sensitive habitat requirements it is unlikely to became an invasive species such as its close relative the banded Tilapia or Vleikurpur (*Tilapia sparrmanii*)."

4 Global Distribution

Figure 1. Global distribution of *T. guinasana*. Map from GBIF (2014).

5 Distribution within the United States

This species has not been reported in the U.S.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match (Sanders et al. 2014; 16 climate variables; Euclidean Distance) is medium in a small area of the Southwest along the border with Mexico. All other parts of the contiguous U.S. have a low climate match. Climate 6 proportion indicated that the contiguous U.S. has a low climate match overall. The range for a low climate match is 0.000 to 0.005; the climate match of *T. guinasana* is 0.001.

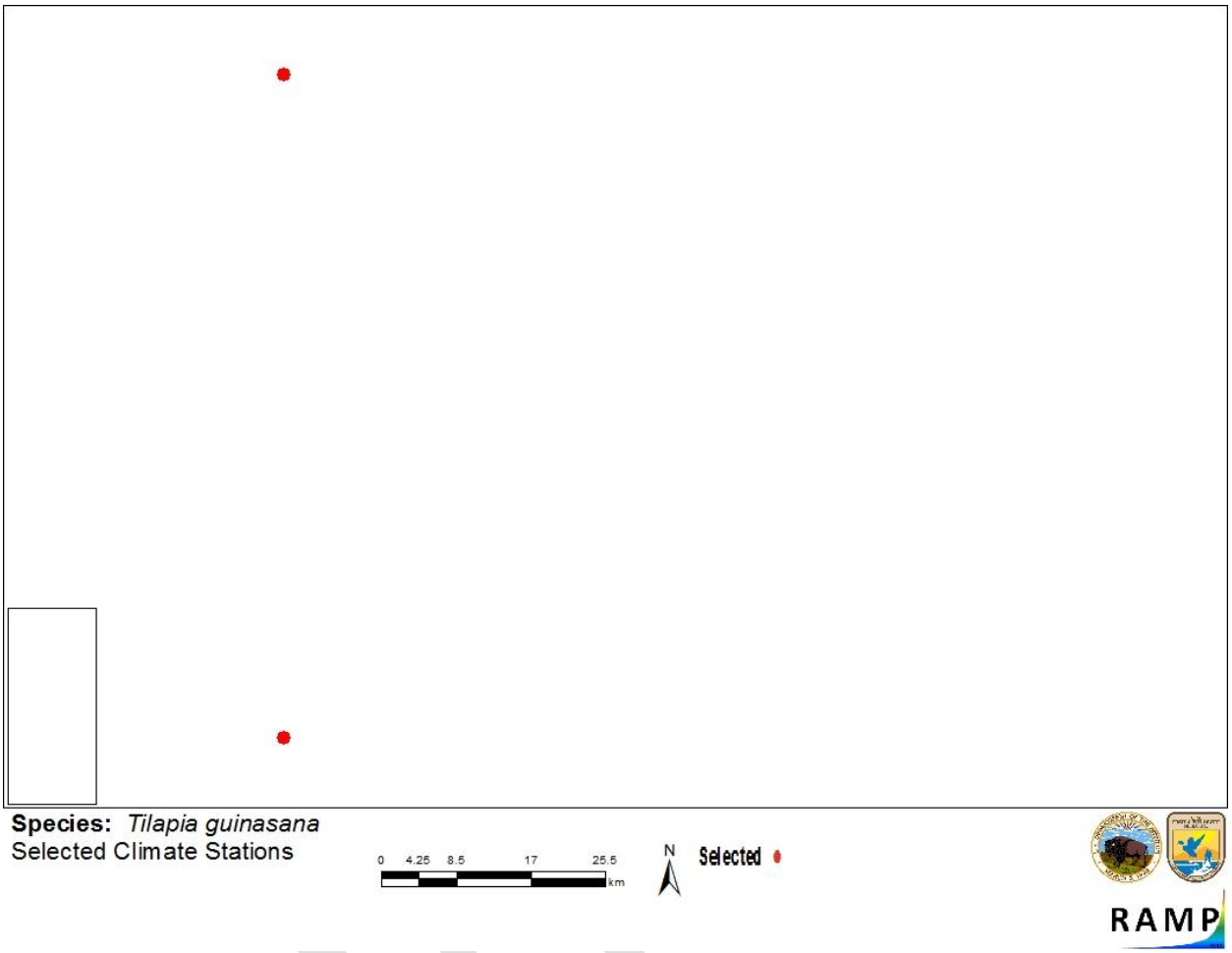

Figure 2. RAMP (Sanders et al. 2014) source map showing weather stations selected as source locations (red) and non-source locations (gray) for *T. guinasana* climate matching. Source locations from GBIF (2015). All source locations are in Namibia.

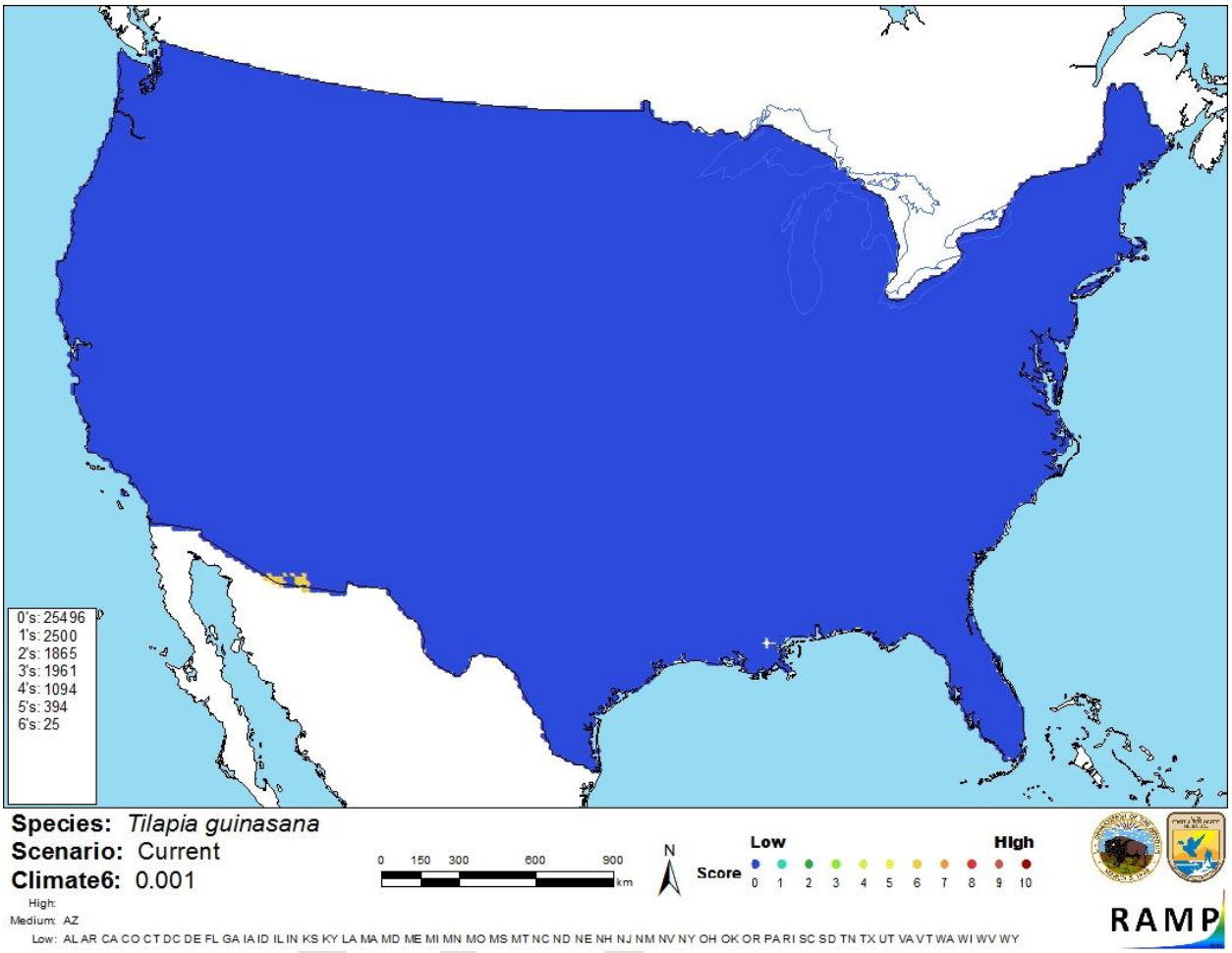

Figure 3. Map of RAMP (Sanders et al. 2014) climate matches for *T. guinasana* in the continental United States based on source locations reported by GBIF (2015). 0= Lowest match, 10=Highest match. Counts of climate match scores are tabulated on the left.

7 Certainty of Assessment

The biology and ecology of *T. guinasana* is not well-known. The species has been introduced to a small number of locations outside its native range, but there is no scientific literature on the impacts of the species in these locations. Certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Continental United States

T. guinasana is endemic to a single sinkhole lake in Namibia, although it has been introduced into other lakes and reservoirs in Namibia. The species has specialized habitat requirements and thus is not expected to have much invasive potential. However, given that no scientific literature is available on the impacts of this species, or lack thereof, in introduced habitats, its history of invasiveness is uncertain. Climate match to the contiguous U.S. is low, but this may be an underestimate because environmental factors other than climate tolerance may be responsible for

the restriction of the species to a single lake. Tropical and sub-tropical areas of the U.S. may be suitable habitat for this tropical species. Overall risk of this species is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3):** Uncertain
- **Climate Match (Sec.6):** Low
- **Certainty of Assessment (Sec. 7):** High
- **Overall Risk Assessment Category: Uncertain**

9 References

Note: The following references were accessed for this ERSS. References cited within quoted text but not accessed are included below in Section 10.

Bills, R. 2007. *Tilapia guinasana*. The IUCN Red List of Threatened Species, version 2015.2. Available: http://www.iucnredlist.org/details/63354/0. (June 2015).

Froese, R., and D. Pauly, editors. 2015. *Tilapia guinasana* Trewavas, 1936. FishBase. Available: http://www.fishbase.org/summary/6332. (June 2015).

Global Biodiversity Information Facility (GBIF). 2015. GBIF backbone taxonomy: *Tilapia guinasana* Trewavas, 1936. Global Biodiversity Information Facility, Copenhagen. Available: http://www.gbif.org/species/2370580. (June 2015).

Integrated Taxonomic Information System (ITIS). 2015. *Tilapia guinasana* Trewavas, 1936. Integrated Taxonomic Information System, Reston, Virginia. Available: http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=648969. (June 2015).

Sanders, S., C. Castiglione, and M. Hoff. 2014. Risk Assessment Mapping Program: RAMP. US Fish and Wildlife Service.

van Jaarsveld, E. 2013. Otjikoto tilapia. South African National Biodiversity Institute, Silverton, South Africa. Available: http://www.sanbi.org/creature/otjikoto-tilapia. (June 2015).

10 References Quoted But Not Accessed

Note: The following references are cited within quoted text within this ERSS, but were not accessed for its preparation. They are included here to provide the reader with more information.

Agenbag, S. 1998. Lake Otjikoto: history and mystery. [Bilingual English-German guide]. Windhoek, Namibia.

de Moor, I. J., and M. N. Bruton. 1988. Atlas of alien and translocated indigenous aquatic animals in southern Africa. South African Scientific Programmes Report No. 144. Committee for Nature Conservation Research National Programme for Ecosystem Research, Port Elizabeth, South Africa.

Skelton, P.H., 1993. A complete guide to the freshwater fishes of southern Africa. Southern Book Publishers, Halfway House, South Africa.