

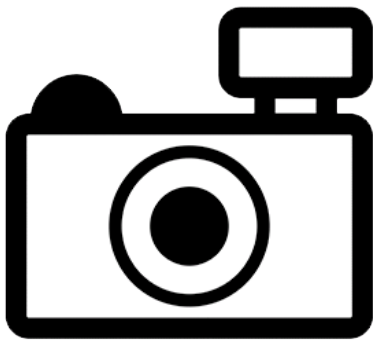
Zagros Tooth-carp (*Aphanius vladkovi*)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, July 2017

Revised, August 2017

Web Version, 11/29/2017



No Photo Available

1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2017):

“Asia: Iran.”

Status in the United States

This species has not been reported as introduced or established in the United States.

Means of Introductions in the United States

This species has not been reported as introduced or established in the United States.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2017):

“Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia

Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Actinopterygii
Class Teleostei
Superorder Acanthopterygii
Order Cyprinodontiformes
Suborder Cyprinodontoidae
Family Cyprinodontidae
Subfamily Cyprinodontinae
Tribe Orestiini
Genus *Aphanius*
Species *Aphanius vladykovi* Coad, 1988”

“Current Standing: valid”

Size, Weight, and Age Range

From Froese and Pauly (2017):

“Max length : 6.1 cm TL male/unsexed; [Alavi-Yeganeh et al. 2011]; 7.6 cm TL (female); common length : 4.0 cm TL male/unsexed; [Huber 1996]; max. published weight: 3.70 g [Keivany and Soofiani 2004]; max. published weight: 3.70 g”

Environment

From Froese and Pauly (2017):

“Freshwater; benthopelagic; pH range: 6.2 - 6.5; non-migratory.”

From Keivany and Soofiani (2004):

“*Aphanius vladykovi* is commonly found in fresh water with a conductivity of 240–280 μS (in aquaria they survived salinities up to 30 ppt). [...] The habitat bottom is generally muddy, interspersed with pebbles. The water is clear in the Modar-Dokhtar spring and running slowly, but cloudy in the river.”

“The species is euryhaline and eurythermal and mostly found in neutral to basic waters. Although tolerant to hypoxia, it is usually found in well-oxygenated waters.”

Climate/Range

From Froese and Pauly (2017):

“Subtropical; 22°C - 29°C [Coad 1988], preferred ?”

From Keivany and Soofiani (2004):

“Temperature is almost stable in the spring (12.9-13.5°C), but in rivers it was found at a temperature as high as 19°C [...]”

From Coad (1988):

“The type locality lies at an altitude of ~2380 metres on a small plain between high ranges at the easternmost edge of the Zagros Mountains [...]”

Distribution Outside the United States

Native

From Froese and Pauly (2017):

“Asia: Iran”

Introduced

No introductions of this species have been reported.

Means of Introduction Outside the United States

No introductions of this species have been reported.

Short Description

From Froese and Pauly (2017):

“Dorsal soft rays (total): 12-15; Anal soft rays: 12 - 15”

From Coad (1988):

“[...] clearly distinguished from all other members of the genus *Aphanius* sensu stricto in Iran and the Middle East by the higher number of lateral line scales (36-47). [...] Male colour on the dorsal fin is much darker and the anal fin is light compared to *A. sophiae*, the species which most closely resembles the new species. Females lack the typical large spot at the base of the caudal fin found in *A. sophiae*.”

Biology

From Froese and Pauly (2017):

“Collected from [...] shallow water at about 4 cm depth; cloudy water over mud and pebbles; with *Myriophyllum* [Coad 1988] and *Potamogeton* sp. which are the dominant aquatic plants used as spawning substrate [Keivany and Soofiani 2004].”

From Keivany and Soofiani (2004):

“The main recognisable food item found in guts of all the specimens from Modar-Dokhtar spring was the freshwater crustacean, *Gammarus* sp., which is abundant in the spring pool. However, in one specimen caught in the river, we could recognize some algae, *Cyclops* sp., snail eggs, and even fish larvae.”

“The absolute fecundity ranged from 220 to 650 (415 ± 169).”

“Mature fish in aquaria performed courtship behavior including color changes in males (darker dorsal fin, brighter stripes and lighter yellow body pigmentation), chasing the female by the male and pushing it to a corner, pectoral fin flipping, and shivering [...]”

“According to our findings, this fish is a partial spawner that releases small batches of eggs between March and June. The release of eggs is greatest in early April [...]”

Human Uses

From Marshall (2016):

“There was another really good selection of killies for sale [at the N.E.Y.B.K.A. Open Show in York, U.K.] that included [...] *Aphanius vladykovi* [...]”

Diseases

From Raissy et al. (2011):

“A total of 142 individuals of *A. vladykovi* were examined for parasites in spring and summer 2009. Eight parasite species were collected: *Trichodina* sp., *Gyrodactylus* sp., *Diplostomum spathaceum*, *Allocreadium isoporum*, *Allocreadium pseudaspaii*, *Ornithodiplostomum* sp., *Contracecum* sp., and *Acanthocephalorhynchoides cholodkowskyi*. In all fish examined, *Ornithodiplostomum* sp. was recovered from throughout the host body, including in abdominal fats, brain, esophagus and intestinal wall, liver, testes, ovary, muscles, and vitreous humor. *Aphanius vladykovi* is a new host record for *A. isoporum*, *A. pseudaspaii*, and *Contracecum* sp.”

From Keivany and Soofiani (2004):

“[...] we found it very susceptible to *Trichodiniasis* and *Ichthyophthiriasis*.”

No OIE-reportable diseases have been documented for this species.

Threat to Humans

From Froese and Pauly (2017):

“Harmless”

3 Impacts of Introductions

No introductions of this species have been reported.

4 Global Distribution



Figure 1. Known global distribution of *A. vladikovii* (light color indicates land mass). Map from GBIF (2017).

5 Distribution Within the United States

This species has not been reported as introduced or established in the United States.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match (Sanders et al. 2014; 16 climate variables; Euclidean distance) was medium across most of California and the Intermountain West. The climate match was low elsewhere in the contiguous U.S. Climate 6 score indicated that the contiguous U.S. was a medium climate match overall. Scores between 0.005 and 0.103 are classified as medium match; Climate 6 score for *A. vladikovii* was 0.012.

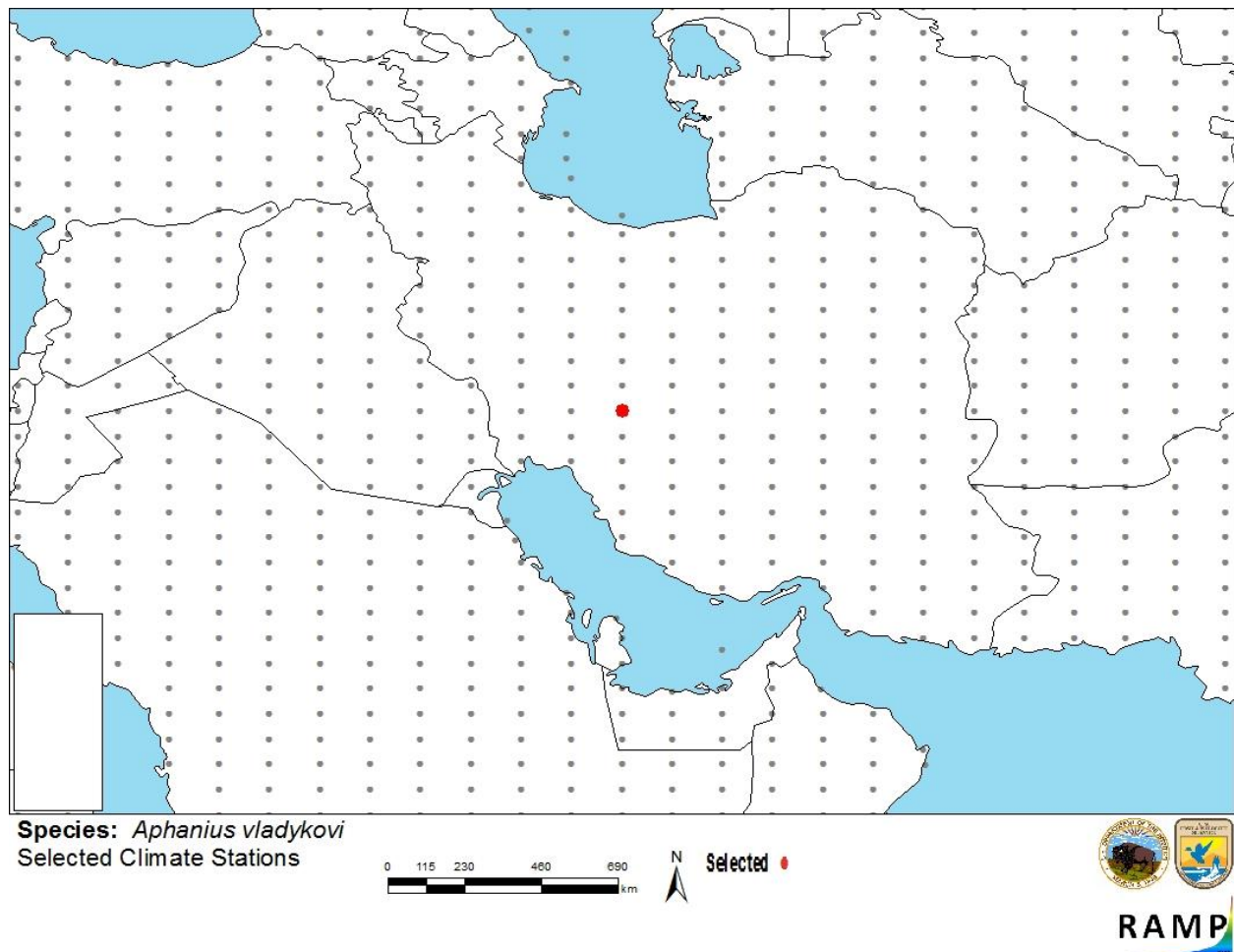


Figure 2. RAMP (Sanders et al. 2014) source map showing weather stations selected as source locations (red) and non-source locations (gray) for *A. vladkovi* climate matching. Source locations from GBIF (2017).

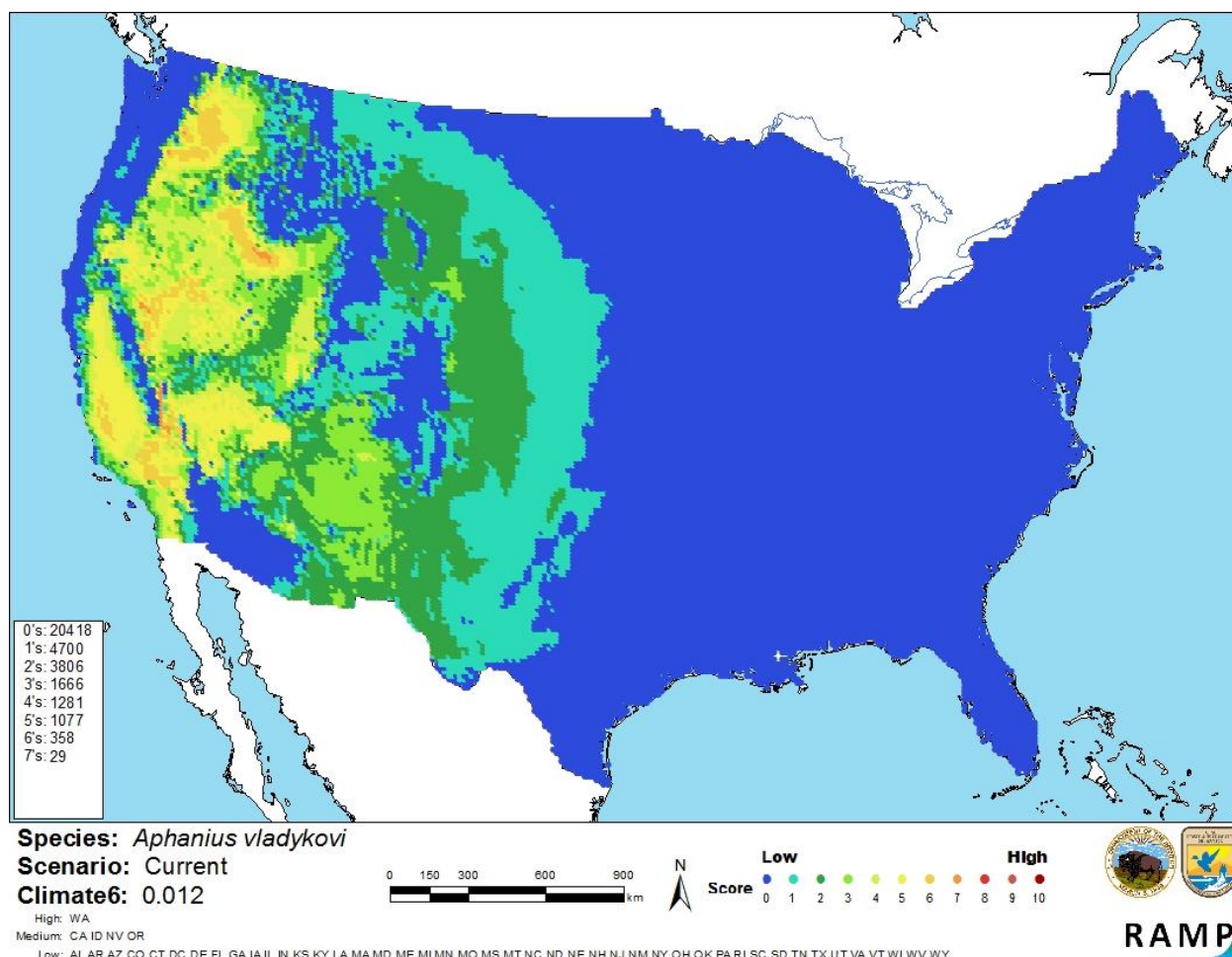


Figure 3. Map of RAMP (Sanders et al. 2014) climate matches for *A. vladkovi* in the contiguous United States based on source locations reported by GBIF (2017). 0=Lowest match, 10=Highest match.

The “High”, “Medium”, and “Low” climate match categories are based on the following table:

Climate 6: Proportion of (Sum of Climate Scores 6-10) / (Sum of total Climate Scores)	Climate Match Category
$0.000 \leq X \leq 0.005$	Low
$0.005 < X < 0.103$	Medium
≥ 0.103	High

7 Certainty of Assessment

The biology and ecology of *A. vladkovi* are poorly known. *A. vladkovi* has never been reported as introduced outside of its native range. The certainty of this assessment is low because the lack of information on the species and potential impacts of its introduction precludes any assessment other than “uncertain” risk.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Aphanius vladykovi has a small native range in the vicinity of the Zagros Mountains in Iran. *A. vladykovi* has not been documented outside of its native range, although it may appear in the aquarium trade. Without being able to observe introductions of *A. vladykovi* outside of its native range it is impossible to know the potential impacts of the species if introduced to the U.S. Climate match to the contiguous U.S. was medium. The overall risk posed by this species is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): Uncertain**
- **Climate Match (Sec. 6): Medium**
- **Certainty of Assessment (Sec. 7): Low**
- **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.

- Coad, B. W. 1988. *Aphanius vladykovi*, a new species of tooth-carp from the Zagros Mountains of Iran (Osteichthyes: Cyprinodontidae). *Environmental Biology of Fishes* 23(1/2):115-125.
- Froese, R., and D. Pauly, editors. 2017. *Aphanius vladykovi* Coad, 1988. FishBase. Available: <http://www.fishbase.se/summary/Aphanius-vladykovi.html>. (July 2017).
- GBIF (Global Biodiversity Information Facility). 2017. GBIF backbone taxonomy: *Aphanius vladykovi* Coad, 1988. GBIF Secretariat, Copenhagen. Available: <https://www.gbif.org/species/2348147>. (August 2017).
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- Keivany, Y., and N. M. Soofiani. 2004. Contribution to the biology of Zagros tooth-carp, *Aphanius vladykovi* (Cyprinodontidae) in central Iran. *Environmental Biology of Fishes* 71:165-169.
- Marshall, D. 2016. A report on the N.E.Y.B.K.A. Open Show 2016. Pages 6-8 in *Yorkshire Association of Aquarist Societies. Newsletter September 2016*.

Raissy, M., M. Ansari, and M. Moumeni. 2011. Parasite fauna of the Zagros tooth-carp, *Aphanius vladkovi* Coad, 1988 (Osteichthyes: Cyprinodontidae), in Gandoman Lagoon. *Comparative Parasitology* 78(1):104-106.

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

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.

Alavi-Yeganeh, M. S., S. J. Seyfabadi, Y. Keivany, B. Kazemi, and G. P. Wallis. 2011. Length-weight relationships in some populations and species of Iranian toothcarps. *Journal of Applied Ichthyology* 27:1401-1403.

Huber, J. H. 1996. Killi-Data 1996. Updated checklist of taxonomic names, collecting localities and bibliographic references of oviparous Cyprinodont fishes (Atherinomorpha, Pisces). Société Française d'Ichtyologie, Muséum National d'Histoire Naturelle, Paris, France.