

Kutum (*Rutilus frisii*)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, May 2011
Revised, June 2019
Web Version, 3/19/2021

Organism Type: Fish
Overall Risk Assessment Category: Uncertain

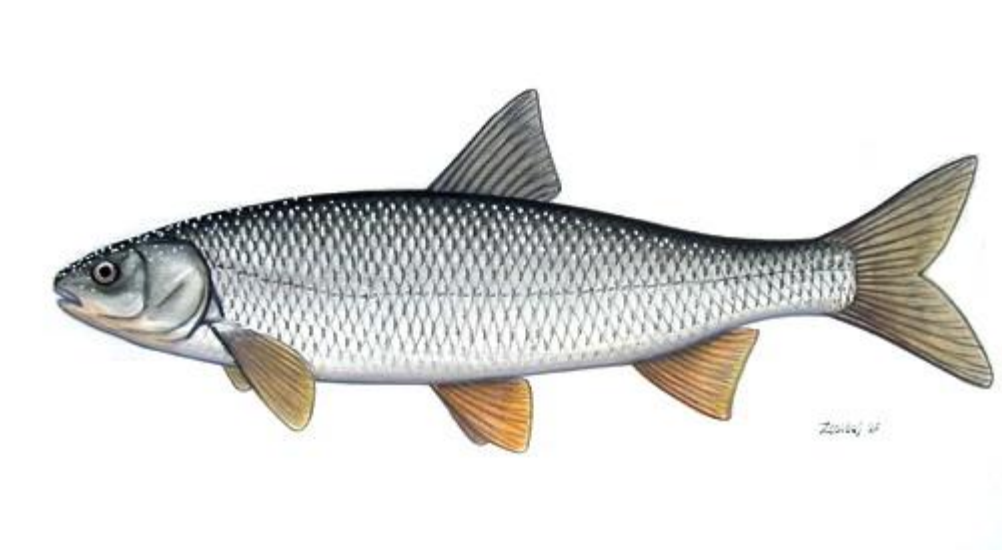


Image: Márton Zsoldos. Licensed under CC BY-SA 3.0 Unported. Available: https://upload.wikimedia.org/wikipedia/commons/e/e0/Rutilus_frisii_gy%C3%B6ngy%C3%B6s_konc%C3%A9r.jpg. (June 2019).

1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2021):

“Eurasia [Azerbaijan, Bulgaria, Georgia, Moldova, Romania, Russia, Slovakia, Turkey, Ukraine]: Black and Azov Sea basins, absent from Danube and Kuban drainages; landlocked [sic] populations in Don, resulting from dam construction; Caspian basin from Terek to Atrek drainages, very rarely in northern Caspian basin (Volga [earlier up to Perm], Ural); Lake Iznik in Sea of Marmara basin in Anatolia.”

From Freyhof and Kottelat (2008):

“Black and Azov Sea basins, absent from Danube and Kuban drainages; Has not been recorded from Dniestr, Dniepr and South Bug since 1985 (may now be extirpated); In the Don it is found in the Tsymlyansk Reservoir (landlocked) and lower reaches and Sea of Azov. In the Caspian basin, it is extirpated from Volga and Ural but still abundant along the western and southern coast from Kuma to Gorgan Bay, where it enters most rivers and freshened lagoons to spawn.”

Status in the United States

There are no records of *Rutilus frisii* in the wild or in trade in the United States.

From Mississippi Secretary of State (2019):

“All species of the following animals and plants have been determined to be detrimental to the State's native resources and further sales or distribution are prohibited in Mississippi. No person shall import, sell, possess, transport, release or cause to be released into the waters of the state any of the following aquatic species or hybrids thereof. [...] Family Cyprinidae, all species of the Genera *Scardinius* and *Rutilus*”

R. frisii falls within Group I of New Mexico's Department of Game and Fish Director's Species Importation List (New Mexico Department of Game and Fish 2010). Group I species “are designated semi-domesticated animals and do not require an importation permit.” Species within family Cyprinidae have the additional restriction of “Not to be used as bait fish.”

From Texas Parks and Wildlife (2020):

“The organisms listed here are legally classified as exotic, harmful, or potentially harmful. No person may possess or place them into water of this state except as authorized by the department. Permits are required for any individual to possess, sell, import, export, transport or propagate listed species for zoological or research purposes; for aquaculture (allowed only for Blue, Nile, or Mozambique tilapia, Triploid Grass Carp, or Pacific White Shrimp); or for aquatic weed control (for example, Triploid Grass Carp in private ponds). [...] All species and hybrids of species of genera: [...] *Rutilus* (Roaches);”

Means of Introductions in the United States

There are no records of *Rutilus frisii* in the wild or in trade in the United States.

Remarks

No additional remarks.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From Fricke et al. (2019):

“Current Status: Valid as *Rutilus frisii* (Nordmann 1840).”

From ITIS (2019):

Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Actinopterygii
Class Teleostei
Superorder Ostariophysi
Order Cypriniformes
Superfamily Cyprinoidea
Family Cyprinidae
Genus *Rutilus*
Species *Rutilus frisii* (Nordmann, 1840)

Size, Weight, and Age Range

From Froese and Pauly (2021):

“Maturity: Lm ?, range 43 - 50 cm

Max length : 70.0 cm TL male/unsexed; [Muus and Dahlström 1968]; common length : 60.0 cm TL male/unsexed; [Wheeler 1992]; max. published weight: 8.0 kg [Kottelat and Freyhof 2007]; max. reported age: 12 years [Wheeler 1992]”

Environment

From Froese and Pauly (2021):

“Freshwater; brackish; benthopelagic; depth range 50 - ? m.”

From Freyhof and Kottelat (2008):

“Large brackish estuaries and their large, freshened plume waters, coastal lakes connected to rivers and lowland stretches of large rivers. In estuaries, in deep layers, down to 20 m.”

Climate

From Froese and Pauly (2021):

“Temperate; 56°N - 36°N, 22°E - 54°E”

Distribution Outside the United States

Native

From Froese and Pauly (2021):

“Eurasia [Azerbaijan, Bulgaria, Georgia, Moldova, Romania, Russia, Slovakia, Turkey, Ukraine]: Black and Azov Sea basins, absent from Danube and Kuban drainages; landlocked [sic] populations in Don, resulting from dam construction; Caspian basin from Terek to Atrek drainages, very rarely in northern Caspian basin (Volga [earlier up to Perm], Ural); Lake Iznik in Sea of Marmara basin in Anatolia.”

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Introduced

According to Froese and Pauly (2021) *Rutilus frisii* has been introduced into Iran, Turkey, and the Former USSR. It is listed as probably established in Iran, probably not established in Turkey, and not established in the Former USSR.

From Froese and Pauly (2021):

“Possibly introduced to the Kor River basin [southern Iran] and fish-farmed in the Caspian basin [in Iran] [Coad 1995]. Reported from the Caspian Sea [Iranian Fisheries Company and Iranian Fisheries Research Organization 2000].”

Means of Introduction Outside the United States

According to Froese and Pauly (2021) *Rutilus frisii* was introduced through aquaculture and stocking.

Short Description

From Froese and Pauly (2021):

“Dorsal soft rays (total): 11-12; Anal soft rays: 12 - 14. Can be diagnosed from its congeners in Black and Caspian Sea basins by having the following characters: body almost cylindrical, depth 19-26% SL; 53-64 + 3 scales on lateral line; abdomen posterior to pelvic rounded; snout

rounded, stout; mouth subterminal; dorsal fin with 9-10½ branched rays; iris and fins grey or slightly yellowish; breeding males with large, scattered tubercles on top and side of head [Kottelat and Freyhof 2007].”

Biology

From Froese and Pauly (2021):

“A semi-anadromous species which occurs in large brackish estuaries and their large, freshened plume waters, coastal lakes connected to rivers and lowland stretches of large rivers. Can tolerate salinities up to 7-12 ppt. Landlocked populations live in lakes or reservoirs. Larvae and early juveniles take zooplankton, algae and insect larvae as food while adults feed on molluscs, *Rhithropanopeus* crabs and other benthic invertebrates. Feeding ceases while migrating, spawning and overwintering. Breeds in small rivers or streams with heavy current on gravel bottom. Begins migration to rivers in second half of October (Black Sea, rarely in Caspian Sea). When rivers are covered with ice, spawning migration stops and continues when ice breaks up or even under ice in February-April. Spawns in April-May. Adults migrate back to estuaries to forage immediately after spawning. Juveniles move to estuaries during first summer in August. Landlocked populations undertake migration in springs from lakes or reservoirs or middle stretches of rivers to tributaries or upper reaches [Kottelat and Freyhof 2007].”

“Lays eggs which adhere to rocks and gravel, rarely on submerged plants. Eggs hatch in 10-16 days at 12-19°C [Kottelat and Freyhof 2007].”

Human Uses

From Froese and Pauly (2021):

“Fisheries: commercial; aquaculture: commercial”

Diseases

No records of OIE-reportable diseases (OIE 2021) were found for *Rutilus frisii*.

According to Poelen et al. (2014) *Rutilus frisii* can be host to *Dactylogyrus sphyrna*, *Dactylogyrus crucifer*, *Paradiplozoon chazaricum*, *Dactylogyrus suecicus*, *Dactylogyrus rarissimus*, *Dactylogyrus nasalis*, *Dactylogyrus nanus*, *Dactylogyrus nybelini*, *Dactylogyrus cornu*, *Dactylogyrus frisii*, *Dactylogyrus haplogonus*, *Diplozoon* sp., *Paradiplozoon homoion*, *Gyrodactylus laevis*, *Anisakis schupakovi*, *Contracaecum squalii*, *Desmidocercella numidica*, *Aspidogaster limacoides*, *Posthodiplostomum cuticola*, *Clinostomum complanatum*, *Phyllodistomum elongatum*, *Asymphylodora kubanicum*, *Caryophyllaeus laticeps*, *Paradilepis scolecina*, *Acanthocephalus anguillae*, *Ligula intestinalis*, *Diplostomum spathaceum*, *Raphidascaris acus*, and *Corynosoma strumosum*.

Threat to Humans

From Froese and Pauly (2021):

“Harmless”

3 Impacts of Introductions

Although *Rutilus frisii* is reported as introduced into Iran, Turkey, and the former USSR, no documented impacts of these introductions could be found.

R. frisii is regulated in Mississippi, New Mexico, and Texas.

4 History of Invasiveness

Rutilus frisii is reported as introduced, via aquaculture and fishing, into Iran, Turkey, and the former USSR. Documented impacts of these introductions could be found. The history of invasiveness is classified as Data Deficient.

5 Global Distribution



Figure 1. Known global distribution of *Rutilus frisii* with observations reported from Iran, Russia, Serbia, Turkey, and Ukraine. Map from GBIF Secretariat (2019). The location in Serbia (eastern most point) was not used to select source points for the climate match, the observation is within the Danube River basin which is excluded from the species' range by Froese and Pauly (2021).

The native range of *Rutilus frisii* is reported to also include areas of Azerbaijan, Bulgaria, Georgia, Moldova, Romania, and Slovakia (Froese and Pauly 2021). No georeferenced observations for those portions of the range were available to use in selecting source points for the climate match.

6 Distribution Within the United States

There are no records of *Rutilus frisii* in the wild or in trade in the United States.

7 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Rutilus frisii* was medium for the majority of the contiguous United States. Areas of high match could be found in the Great Lakes basin, throughout the Rocky Mountains, and in patches in the Plains States. Areas of low match were found along the Atlantic and Gulf coasts, as well as inland in the southeast. Areas along the border with Mexico and the northern Pacific Coast also had low match. Everywhere else had medium match. The Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.259, high (scores 0.103 and greater are classified as high). Alabama, Arkansas, Connecticut, Delaware, Florida, Georgia, Kansas, Kentucky, Louisiana, Massachusetts, Maryland, Mississippi, North Carolina, New Jersey, Oklahoma, Rhode Island, South Carolina, Tennessee, Texas, Virginia, and West Virginia had low individual climate 6 scores. Maine, Missouri, and New Hampshire had medium individual scores and all other States had high scores.

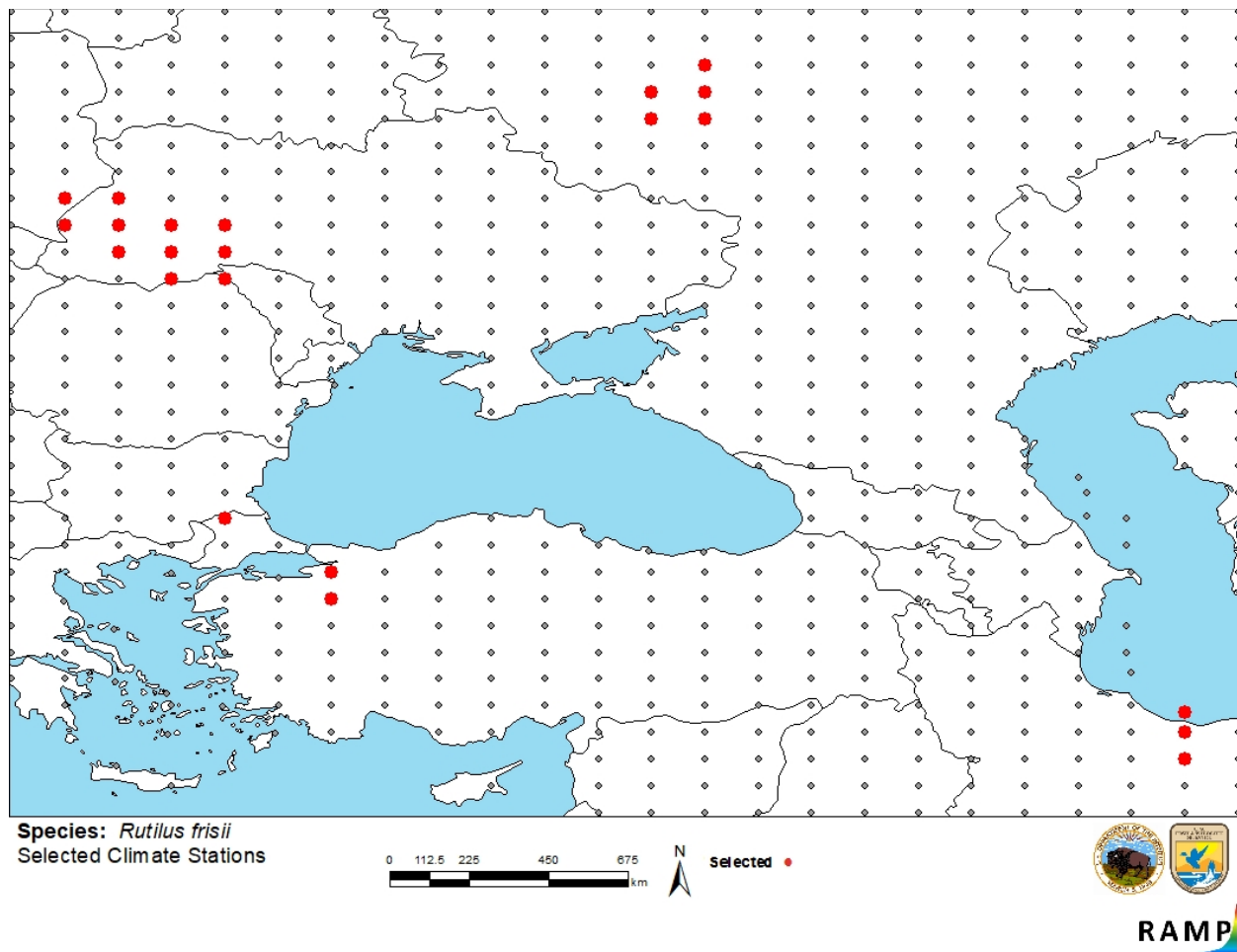


Figure 2. RAMP (Sanders et al. 2018) source map showing weather stations in Eurasia selected as source locations (red; Iran, Poland, Romania, Russia, Turkey, Ukraine) and non-source locations (gray) for *Rutilus frisii* climate matching. Source locations from GBIF Secretariat (2021). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

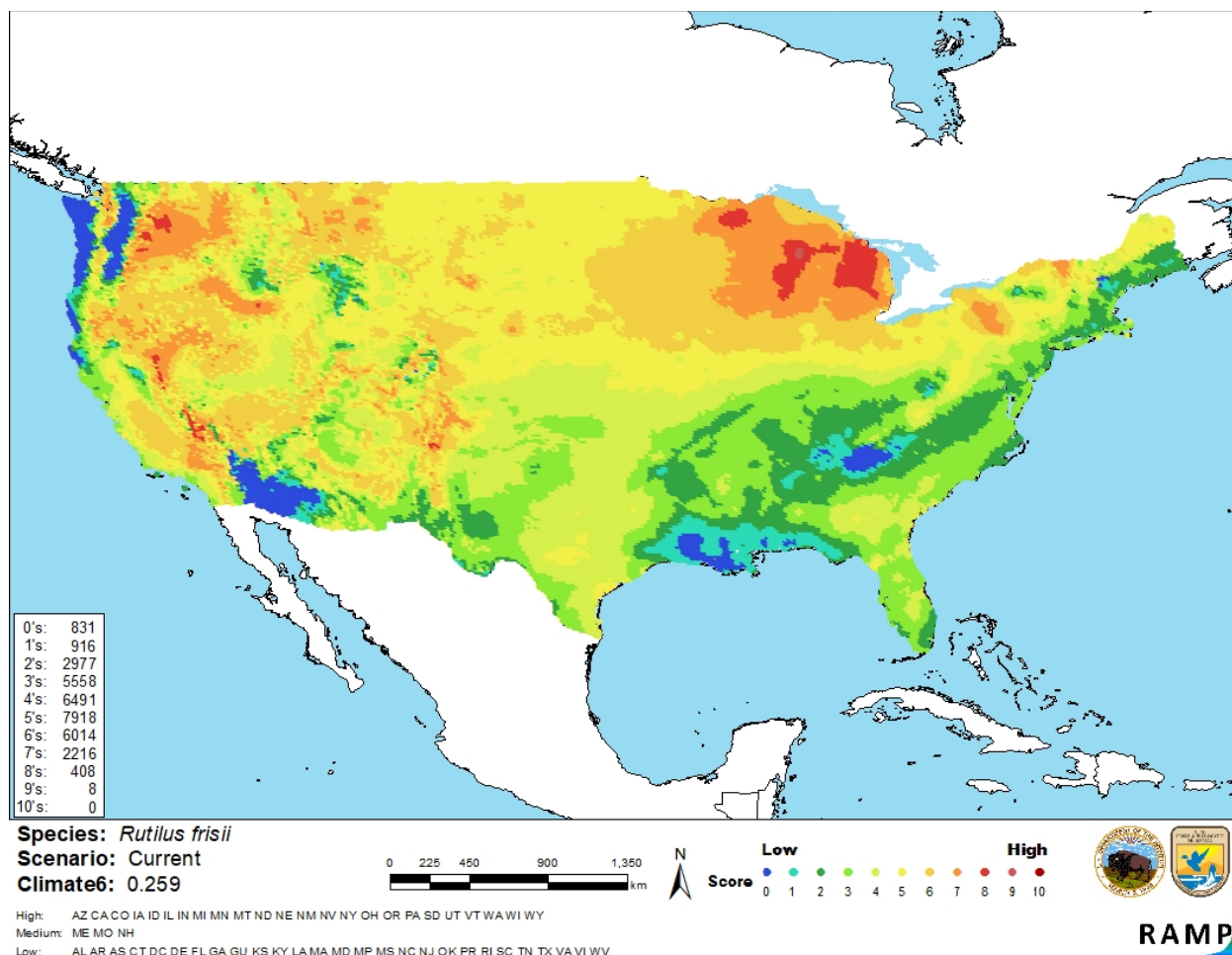


Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for *Rutilus frisii* in the contiguous United States based on source locations reported by GBIF Secretariat (2021). Counts of climate match scores are tabulated on the left. 0/Blue = Lowest match, 10/Red = Highest match.

The High, Medium, and Low Climate match Categories are based on the following table:

Climate 6: (Count of target points with climate scores 6-10)/ (Count of all target points)	Overall Climate Match Category
$0.000 \leq X \leq 0.005$	Low
$0.005 < X < 0.103$	Medium
≥ 0.103	High

8 Certainty of Assessment

The certainty of assessment for *Rutilus frisii* is low. There was some information available about *Rutilus frisii*, but most was from one source. *Rutilus frisii* has been introduced outside of its native range, but there are no records of the impacts of introductions, or lack thereof. A large

portion of the species' reported range was not represented in the climate match, reducing the certainty in the interpretation of the climate match results.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Kutum (*Rutilus frisii*) is a semi-anadromous fish native to the Black and Azov Sea basins in Azerbaijan, Bulgaria, Georgia, Moldova, Romania, Russia, Slovakia, Turkey, and Ukraine. This species is involved in both commercial fisheries and aquaculture. *R. frisii* is regulated in Mississippi, New Mexico, and Texas. The history of invasiveness is Data Deficient. It has been introduced outside of its native range in Iran, Turkey, and the Former USSR, but it only became established in Iran. There are no documented impacts of its introduction. The overall climate match for the contiguous United States was high. Areas of high match were found in the Great Lakes basin and around the Rocky Mountains. Areas of low match were found in the southeast and most coastal areas. The certainty of assessment is low due to a lack of information on invasiveness and the gap in range coverage by georeferenced observations. The overall risk assessment category for *Rutilus frisii* is Uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 4): Data Deficient**
- **Overall Climate Match Category (Sec. 7): High**
- **Certainty of Assessment (Sec. 8): Low**
- **Remarks/Important additional information: No additional remarks**
- **Overall Risk Assessment Category: Uncertain**

10 Literature Cited

Note: The following references were accessed for this ERSS. References cited within quoted text but not accessed are included below in Section 11.

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Fricke R, Eschmeyer WN, van der Laan R, editors. 2019. Eschmeyer's catalog of fishes: genera, species, references. California Academy of Science. Available: <http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp> (June 2019).

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- [OIE] World Organisation for Animal Health. 2021. OIE-listed diseases, infections and infestations in force in 2021. Available: <http://www.oie.int/animal-health-in-the-world/oie-listed-diseases-2021/> (March 2021).
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- Sanders S, Castiglione C, Hoff M. 2018. Risk Assessment Mapping Program: RAMP. Version 3.1. U.S. Fish and Wildlife Service.
- Texas Parks and Wildlife. 2020. Invasive, prohibited and exotic species. Austin: Texas Parks and Wildlife. Available: https://tpwd.texas.gov/huntwild/wild/species/exotic/prohibited_aquatic.phtml (November 2020).

11 Literature Cited in Quoted Material

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.

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- Kottelat M, Freyhof J. 2007. Handbook of European freshwater fishes. Cornol, Switzerland: Publications Kottelat; Berlin: Freyhof.
- Muus BJ, Dahlström P. 1968. Süßwasserfische. München, Germany: BLV Verlagsgesellschaft.

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