

# ***Protochondrostoma genei* (a cyprinid, no common name)**

## **Ecological Risk Screening Summary**

U.S. Fish & Wildlife Service, July 2020

Revised, July 2020

Web Version, 2/8/2021

Organism Type: Fish

Overall Risk Assessment Category: High



Photo: Giacomo Radi. Licensed under Creative Commons Attributions 3.0 Unported. Available: [https://commons.wikimedia.org/wiki/File:Protochondrostoma\\_genei.jpg](https://commons.wikimedia.org/wiki/File:Protochondrostoma_genei.jpg). (July 2020).

## **1 Native Range and Status in the United States**

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### **Native Range**

From Froese and Pauly (2020a):

“Europe: Adriatic basin, from Soca to Vomano drainages in Italy and Slovenia.”

From Crivelli (2006):

“Restricted to northeastern Italy including the river basins: Vomano, Tronto, Esino, Cesano, Metauro, Foglia, Po, Adige, Brenta, Piave, Livenza, Tagliamento and Isonzo. [...]. It is apparently extinct in the river Soča, the Slovenian stretch of River Isonzo. In this river this species is still reported in few populations [...]. It no longer exists in the Adriatic basin of Slovenia in the river Vipava, a tributary of the Soča (M. Povz pers. comm.)”

## Status in the United States

*Protochondrostoma genei* has not been reported in the wild or in trade in the United States.

*Protochondrostoma genei* 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.” With the added restriction of “Not to be used as bait fish.”

## Means of Introductions in the United States

*Protochondrostoma genei* has not been reported in the wild or in trade in the United States.

## Remarks

From Crivelli (2006):

“This species is widespread and common in many localities. It is, however, declining or disappearing from a number of places due to the introduction of several alien species. Currently it is assessed as Least Concern.”

“A common species but it is known to be declining in some localities. It has nearly disappeared in the middle and lower course of Po basin due to interaction with introduced species, such as *Silurus glanis*, *Leuciscus idus*, *Aspius aspius* and *Chondrostoma nasus*.”

“The introduction of *Chondrostoma nasus* is a major current threat having been responsible of the near extirpation of this species [*Protochondrostoma genei*] from Slovenia 20 years ago.”

Information searched for this assessment were conducted using the current valid name of this species *Protochondrostoma genei* and the synonyms *Leuciscus genei* and *Chondrostoma genei*.

## 2 Biology and Ecology

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### Taxonomic Hierarchy and Taxonomic Standing

According to Fricke et al. (2020), *Protochondrostoma genei* (Bonaparte 1839) is the current valid name of this species. The original name of this species was *Leuciscus genei* (Bonaparte 1839). Froese and Pauly (2020a) list *Chondrostoma genei* as a synonym of *Protochondrostoma genei*.

From Froese and Pauly (2020b):

“Biota > Animalia (Kingdom) > Chordata (Phylum) > Vertebrata (Subphylum) > Gnathostomata (Superclass) > [...] Actinopterygii (Class) > Cypriniformes (Order) > Cyprinidae (Family) > Leuciscinae (Subfamily) > *Protochondrostoma* (Genus) > *Protochondrostoma genei* (Species)”

## **Size, Weight, and Age Range**

From Froese and Pauly (2020a):

“Max length : 30.0 cm TL male/unsexed; [Muus and Dahlström 1968]; common length : 15.0 cm TL male/unsexed; [Muus and Dahlström 1968]”

## **Environment**

From Froese and Pauly (2020a):

“Freshwater; benthopelagic.”

## **Climate**

From Froese and Pauly (2020a):

“Temperate; 48°N - 42°N, 4°E - 15°E”

## **Distribution Outside the United States**

### **Native**

From Froese and Pauly (2020a):

“Europe: Adriatic basin, from Soca to Vomano drainages in Italy and Slovenia.”

From Crivelli (2006):

“Restricted to northeastern Italy including the river basins: Vomano, Tronto, Esino, Cesano, Metauro, Foglia, Po, Adige, Brenta, Piave, Livenza, Tagliamento and Isonzo. [...] It is apparently extinct in the river Soča, the Slovenian stretch of River Isonzo. In this river this species is still reported in few populations [...]. It no longer exists in the Adriatic basin of Slovenia in the river Vipava, a tributary of the Soča (M. Povz pers. comm.).”

### **Introduced**

From Froese and Pauly (2020a):

“Introduced to Tuscany and Latium in Centa, Magra, Arno, Ombrone and Tevere basins [Italy].”

From Carosi et al. (2017):

“For example, a few specimens of *A. arborella* and *P. genei* were unintentionally translocated into the Tiber basin in the 1960s from the watercourses of the Padano-Veneto district [Italy]. Since then, these two reophilic ciprinids have spread throughout the entire basin and with high densities (Lorenzoni et al., 2006).”

## Means of Introduction Outside the United States

From Carosi et al. (2017):

“For example, a few specimens of *A. arborella* and *P. genei* were unintentionally translocated into the Tiber basin in the 1960s from the watercourses of the Padano-Veneto district [Italy].”

## Short Description

From Froese and Pauly (2020a):

“The only species in genus which differs from species of *Chondrostoma* in Apennine Peninsula by having broad dark midlateral stripe from head to caudal base, arched mouth, lower lip with thin but well developed cornified sheath, 50-62 scales along lateral line; 8½ branched dorsal rays, 14-19 gill rakers, slender body, depth 20-27% SL, and pectoral, pelvic, anal and caudal fins at least with red basis [Kottelat and Freyhof 2007].”

## Biology

From Froese and Pauly (2020a):

“Found in middle reaches of rivers and main tributaries, in piedmont, with moderate to swift current, over gravel bottom. Occurs in groups. Omnivorous, feeding mainly on aquatic insects and epilithic algae. Undertakes small spawning migration in large groups towards main tributaries. Spawns in swift current on gravel [Kottelat and Freyhof 2007]. Reported to spawn in March-May [Crivelli 1996] and in May-June [Kottelat and Freyhof 2007].”

From Crivelli (2006):

“Prefers running waters in the foothill zone of mountainous regions, with gravely or sandy substrates. It is also found in lakes. Warm water adapted.”

## Human Uses

From Froese and Pauly (2020a):

“Fisheries: of no interest”

## Diseases

**No OIE-reportable diseases (OIE 2020) were found to be associated with this species.** No records regarding diseases of *Protochondrostoma genei* were found.

## Threat to Humans

From Froese and Pauly (2020a):

“Harmless”

## 3 Impacts of Introductions

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From Crivelli (2006):

“In central Italy it has been introduced and has itself become a pest and is now the main threat to *Rutilus rubilio* and *Leuciscus lucimonis*.”

From Giannetto et al. (2012):

“In the present study, the use of relative weight to assess the impact of the presence of NNS [nonnative species] on the condition of the key NS [native species] freshwater species of the Tiber River basin was tested. On the basis of the results, *T. muticellus* resulted the most sensitive species to the presence of NNS and its condition got worse in presence of *A. alborella*, *B. barbuis*, *C. auratus*, *P. genei* and *P. parva*; [...].”

From Bianco and Ketmaier (2001):

“This cyprinid [*Leuciscus leucumonis*] was found only in the Ombrone basin. It has disappeared from the main basin and has been found at only four localities (upper River Farma, La Gonna Brook, Lanzo Brook and River Gretano) with reduced populations. Competition with *C. genei* seems to be the main reason of its progressive decline.”

From Bianco and Ketmaier (2003):

“The brook chub [*Leuciscus lucumonis*] is very sensitive to pollution, habitat modification and competition with aliens. Its disappearance is mainly due to the introduction of *Chondrostoma genei* (Bonaparte 1839), a species endemic to northern Italy, heavily stocked in central Italy.”

## 4 History of Invasiveness

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*Protochondrostoma genei* has been introduced outside of its native range in Italy where it has become established. Negative impacts of introduction have been reported from reliable sources. This species has become a pest species and is associated with the decline of multiple species in their introduced range. The history of invasiveness is High.

## 5 Global Distribution

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**Figure 1.** Known global distribution of *Protochondrostoma genei*. Observations are reported from Italy, Germany, and France. Map from GBIF Secretariat (2020). Locations in Germany and France will not be included in the climate match as they represent preserved specimens and not established populations.

## 6 Distribution Within the United States

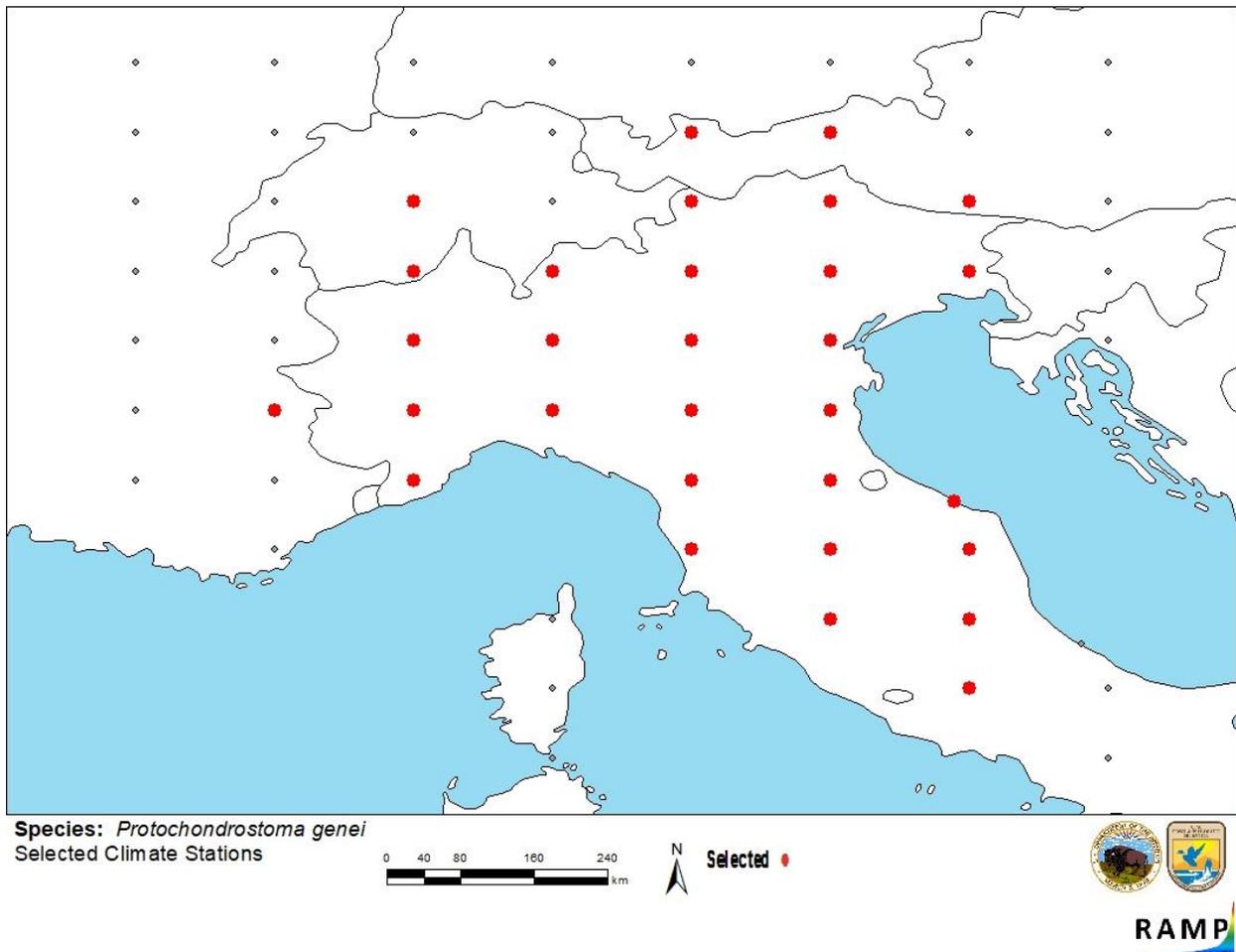
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*Protochondrostoma genei* has not been reported in the wild in the United States.

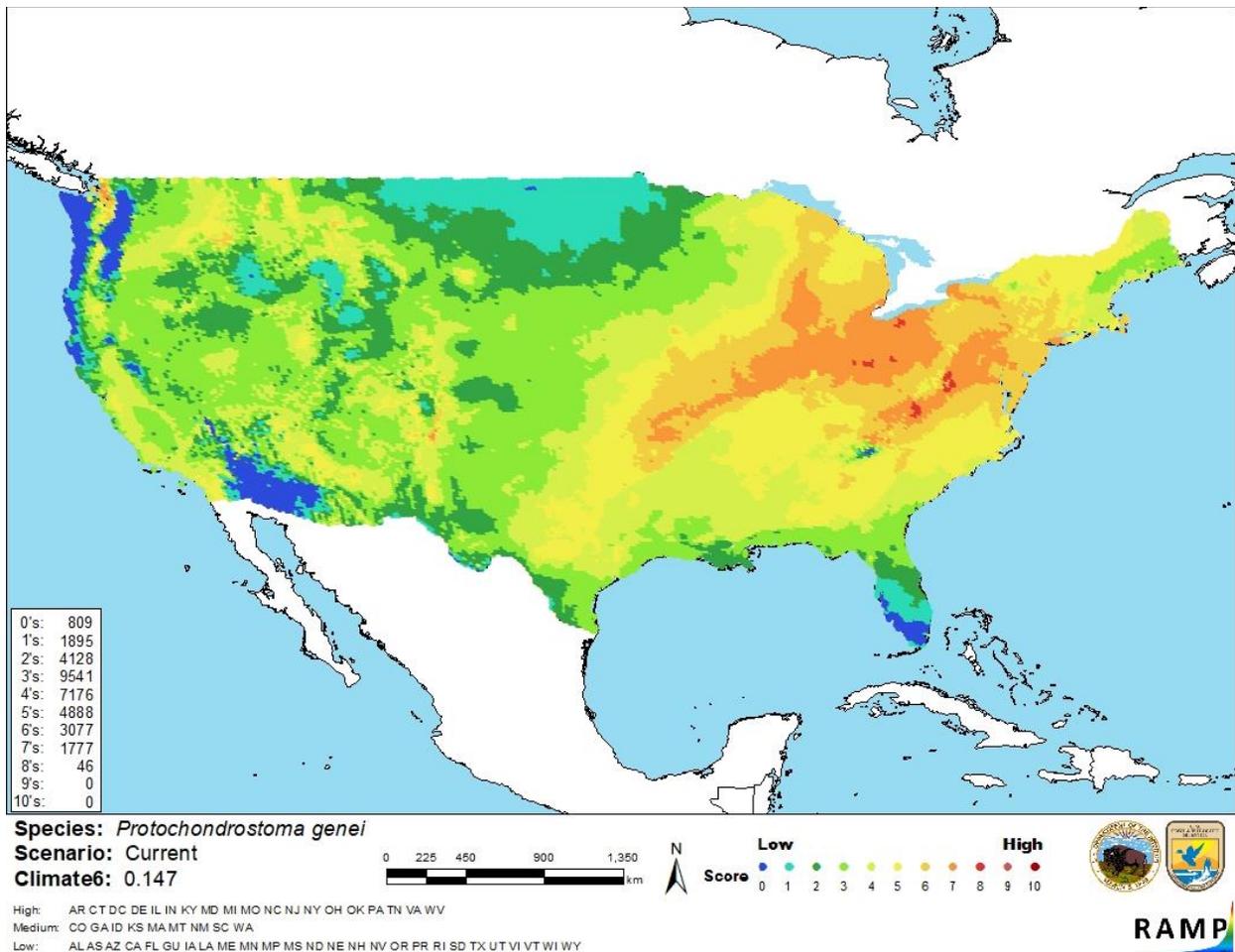
# 7 Climate Matching

## Summary of Climate Matching Analysis

The climate match for the contiguous United States is generally medium in the West and high in the East. The highest areas of match were found around the Great Lakes and the Appalachian region. The overall Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.147, high (scores 0.103 and greater are classified as high). The following States had high individual Climate 6 scores: Arkansas, Connecticut, Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, Missouri, North Carolina, New Jersey, New York, Ohio, Oklahoma, Pennsylvania, Tennessee, Virginia, and West Virginia.



**Figure 2.** RAMP (Sanders et al. 2018) source map showing weather stations in the Adriatic basin of Europe selected as source locations (red; Italy, Switzerland, Austria, France) and non-source locations (gray) for *Protochondrostoma genei* climate matching. Source locations from GBIF Secretariat (2020). 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 *Protochondrostoma genei* in the contiguous United States based on source locations reported by GBIF Secretariat (2020). 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
$0.000 \leq X < 0.005$	Low
$0.005 < X < 0.103$	Medium
$\geq 0.103$	High

## 8 Certainty of Assessment

The certainty of assessment is High. There is quality information available about the biology and ecology of *Protochondrostoma genei*. Records of introduction were found. Information on impacts was from peer-reviewed sources providing information on the negative effects of the

introduction. Multiple sources document the same conclusion, which allows for the certainty of assessment to be High.

## 9 Risk Assessment

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### Summary of Risk to the Contiguous United States

*Protochondrostoma genei* is a freshwater fish native to Italy and Slovenia. The population in Slovenia has exasperated due to the introduction of nonnative species. *P. genei* has been introduced itself to nonnative areas of Italy where it has become established. This species has become a pest species and is associated with the decline of multiple species in their introduced range. The history of invasiveness is therefore High. The overall climate match for the contiguous United States is High with the following States receiving individually high Climate 6 scores: Arkansas, Connecticut, Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, Missouri, North Carolina, New Jersey, New York, Ohio, Oklahoma, Pennsylvania, Tennessee, Virginia, and West Virginia. The certainty of assessment is high. The overall risk assessment for *Protochondrostoma genei* is High.

### Assessment Elements

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

## 10 Literature Cited

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

Bianco PG, Ketmaier V. 2001. Anthropogenic changes in the freshwater fish fauna of Italy, with reference to the central region and *Barbus graellsii*, a newly established alien species of Iberian origin. *Journal of Fish Biology* 59A:190–208.

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Carosi A, Ghetti L, Cauzillo C, Pompei L, Lorenzoni M. 2017. Occurrence and distribution of exotic fishes in the Tiber River basin (Umbria, central Italy). *Journal of Applied Ichthyology* 33(2):274–283.

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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.

## 11 Literature Cited in Quoted Material

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**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.**

- Crivelli AJ. 1996. The freshwater fish endemic to the Mediterranean region. An action plan for their conservation. Tour du Valat Publication.
- Kottelat M, Freyhof J. 2007. Handbook of European freshwater fishes. Berlin, Germany: Publications Kottelat, Cornol and Freyhof.
- Lorenzoni M, Mearelli M, Ghetti L. 2006. Native and exotic fish species in the Tiber river watershed (Umbria – Italy) and their relationship to the longitudinal gradient. *Bulletin Francais de la Peche et de la Pisciculture* 382:19–44.

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