

European Perch (*Perca fluviatilis*)

Ecological Risk Screening Summary

Web Version – September 2014



Photo: © Keshl, M. From EOL (2014)

1 Native Range, and Status in the United States

Native Range

From Global Invasive Species Database (2012):

“Native range extends throughout Europe.”

Status in the United States

This species has not been reported from the US.

Means of Introductions to the United States

This species has not been introduced to the US.

Remarks

From Global Invasive Species Database (2012):

“*Perca fluviatilis* (perch) are a widespread species of predatory freshwater fish that are prized for angling. Their natural range is throughout much of Europe, but they have been introduced to a number of countries around the world as a sport fish. The effect of *Perca fluviatilis* on native aquatic fauna has led to it being designated as invasive in many locations.”

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2012):

“Kingdom Animalia
 Phylum Chordata
 Subphylum Vertebrata
 Superclass Osteichthyes
 Class Actinopterygii
 Subclass Neopterygii
 Infraclass Teleostei
 Superorder Acanthopterygii
 Order Perciformes
 Suborder Percoidei
 Family Percidae
 Genus *Perca*
 Species *Perca fluviatilis* Linnaeus, 1758

Taxonomic Status: Valid”

Size, Weight, Age

From Froese and Pauly (2010):

“Max length : 60.0 cm SL male/unsexed; (Kottelat and Freyhof 2007); common length : 25.0 cm TL male/unsexed; (Muus and Dahlström 1968); max. published weight: 4,750 g (Berg 1965); max. reported age: 22 years (Beverton and Holt 1959).”

Environment

From Froese and Pauly (2010):

“Freshwater; brackish; demersal; pH range: 7.0 - 7.5; dH range: 8 - 12; anadromous (Riede 2004); depth range 1 - 30 m (Frimodt 1995), usually 3 - 4 m (Smolian 1920)”

Climate/Range

From Froese and Pauly (2010):

“Temperate; 10°C - 22°C (Riehl and Baensch 1991); 74°N - 38°N, 91°W - 168°E”

Distribution Outside the United States

From Global Invasive Species Database (2012):

Native

“Native range extends throughout Europe.”

Introduced

“Introduced to Australia, China, Cyprus, Italy, Morocco, New Zealand, Spain and South Africa (FishBase 2004). The species is not a true native of Ireland (although it was introduced 100s of years ago) and it is still absent from parts of Scotland.”

Means of Introduction Outside the United States

From Global Invasive Species Database (2012):

“*Stocking*: Perch may be stocked as a sport fish in some locations.”

“*Natural dispersal (local)*: Perch could expand their distribution within a water body by swimming to new areas.”

Short description

From Froese and Pauly (2010):

“Dorsal spines (total): 14 - 20; Dorsal soft rays (total): 13-16; Anal spines: 2; Anal soft rays: 7 - 10; Vertebrae: 39 - 42. Diagnosed from other species of Percidae in Europe by having the following unique characters: pelvic and anal fins yellow to red; posterior part of first dorsal fin with dark blotch; and flank with 5-8 bold dark bars, usually Y-shaped. Differs further by the combination of the following features: two dorsal fins, clearly separated from each other; and 56-77 scales along lateral line (Kottelat and Freyhof 2007). Body greenish-yellow; 5-9 transverse black bands on the sides; first dorsal fin gray, black spot at the tip; second dorsal greenish-yellow; pectorals yellow; other fins red. First dorsal fin markedly higher than the second. Caudal fin emarginate (Berg 1965).”

Biology

From Froese and Pauly (2010):

“Inhabits a very wide range of habitats from estuarine lagoons, lakes of all types to medium-sized streams. Feeding larvae occur in open water. This is an opportunistic diurnal feeder which preys mainly during sunrise and sunset, using all available prey. Larvae and small juveniles usually feed on planktonic invertebrates. During first summer, many juveniles move near shores to feed on benthic prey. Often feeds on fishes at about 12 cm SL. May undertake short spawning migrations. Males attain first sexual maturity at 1-2 years and females at 2-4 years of age. Spawns in February-July (Kottelat and Freyhof 2007). Eggs grouped in long white ribbons (up to 1 m) are found over submerged objects (Pinder 2001). Its flesh is excellent and not so bony. Utilized fresh and frozen; eaten pan-fried and baked (Frimodt 1995). May be captured with natural or artificial bait (Billard 1997).”

Human uses

From Froese and Pauly (2010):

“Fisheries: highly commercial; aquaculture: commercial; gamefish: yes”

Diseases

From Froese and Pauly (2010):

“Perch Rhabdovirus, Viral Disease”

Threat to humans

From Froese and Pauly (2010):

“Potential pest”

3 Impacts of Introductions

From Global Invasive Species Database (2012):

“General Impact

As a predator upon zooplankton, macroinvertebrates and fish, perch have the potential to significantly alter native freshwater communities (Closs et al. 2003).”

“Location Specific Impacts

Western Australia (Australia)

Competition: Perch have been implicated in the local extinction of the rare mud minnow (*Galaxiella munda* see in IUCN Red List of Threatened Species), as well as affecting the recruitment of a recreationally important decapod (*Cherax cainii*).”

“New Zealand

Modification of natural benthic communities: As a predator upon zooplankton, macroinvertebrates and fish, perch have the potential to significantly alter native freshwater communities (Closs et al 2003).”

“Predation: Perch are thought to predate on or compete with native freshwater fish (Closs et al 2003).”

From NSW DPI (2012):

“Redfin [*Perca fluviatilis*] are a popular sport fish with some anglers because of their fighting qualities and taste. However, they are also voracious predators of other fish and invertebrates, can destroy recreational fisheries in enclosed waters by building up large numbers of stunted fish and eliminating other species, and can devastate native fish populations by carrying the epizootic haematopoietic necrosis (EHN) virus. For these reasons, redfin are considered a serious pest and in December 2010 redfin were listed as a Class 1 noxious species in NSW.”

“Even though redfin have been in Australia for over 100 years, much of the information regarding their impacts is based on personal observations rather than scientific studies. Redfin are voracious predators which consume a wide variety of fish and invertebrates, including small native species such as pygmy perch, rainbowfish and carp gudgeon, and the eggs and fry of larger fish such as silver perch, golden perch, Murray cod and introduced trout.”

“This predation can seriously impact populations of native species and trout, and hence can also affect recreational fisheries for these species. For example, redfin were recorded as eliminating 20,000 newly released rainbow trout fry from a reservoir in south-western Australia in less than 72 hours. Redfin are capable of rapidly populating new waterways and in stable water bodies (such as lakes and dams) they can form very dense populations. Under these conditions, redfin become stunted as they deplete the food supply, becoming worthless for angling.”

“In such large numbers, they can also out-compete most other fish species. One of the most significant threats to native fish from redfin is their potential to spread the viral disease Epizootic Haematopoietic Necrosis (EHN). This disease, which was first isolated in 1985 and is unique to Australia, can cause mass mortality in juvenile redfin perch during the summer months.”

“A number of native species, including silver perch, Murray cod, mountain galaxias and particularly Macquarie perch, are highly susceptible to the disease, and EHN virus may be one factor responsible for the decline in various native species over the last couple of decades.”

From Froese and Pauly (2010), citing Kottelat and Whitten (1996):

“Introduced in the 1970s. Caused the disappearance of endemic fish *Asipiorhynchus laticeps* in Lake Bositen, Xinjiang. This species was introduced from the Ertrix River basin in the north Xiangjiang Autonomous Region to the Bosten Lake in the south Xiangjiang autonomous regions

for fish resource enhancement purpose. It became a dominate fish in the new environment (Bartley 2006).”

From Froese and Pauly (2010), citing Arthington (1989):

“Introduced to make wildlife more familiar to European colonizers (Arthington and McKenzie 1997). Reintroduced in 1868 (Welcomme 1988). Established in western Victoria, New South Wales, Tasmania, Western Australia and South Australian Gulf divisions; has displaced native species. In the 1980s, this species invaded the Murray River in south-western Australia (Hutchison and Armstrong 1993). Feed selectively on small endemic fishes and fish fry and may have affected the numbers of galaxiids, pygmy perch, *Nannoperca australis*, and the golden perch, *Macquaria ambigua* in southern rivers.”

4 Global Distribution



Figure 1. Global distribution of *P. fluviatilis*. Map from GBIF (2012). The map also showed locations in Canada and the U.S. These locations are most likely *P. flavescens* (native U.S. species) that were mistakenly identified and are not included in CLIMATCH analysis.

5 Distribution within the United States

No known U.S. occurrences have been reported for this species.

6 CLIMATCH

Summary of Climate Matching Analysis

The climate match (Australian Bureau of Rural Sciences 2010, 16 climate variables; Euclidean Distance) was high to medium for the entire U.S. Low matches only occurred in the Desert Southwest. Climate 6 match indicated that the U.S. has a high climate match. The range for a high climate match is 0.103 and greater, climate match of *P. fluviatilis* is 0.627.

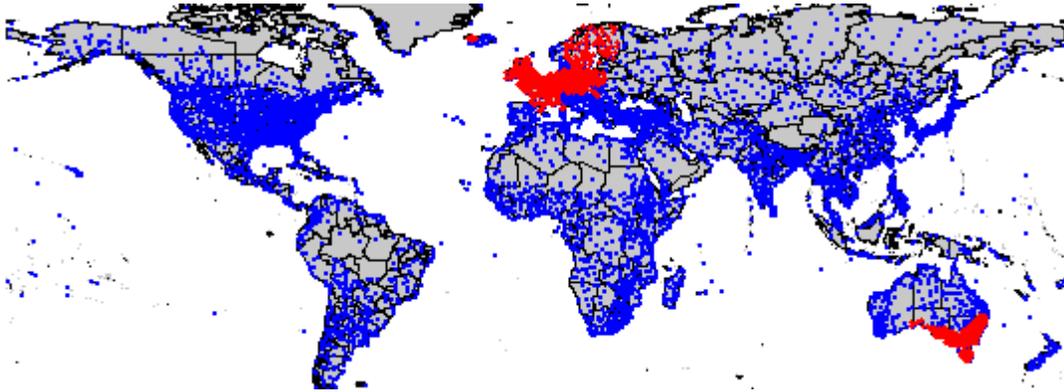


Figure 2. CLIMATCH (Australian Bureau of Rural Sciences 2010) source map showing weather stations selected as source locations (red) and non-source locations (blue) for *P. fluviatilis* climate matching. Source locations from GBIF (2012).

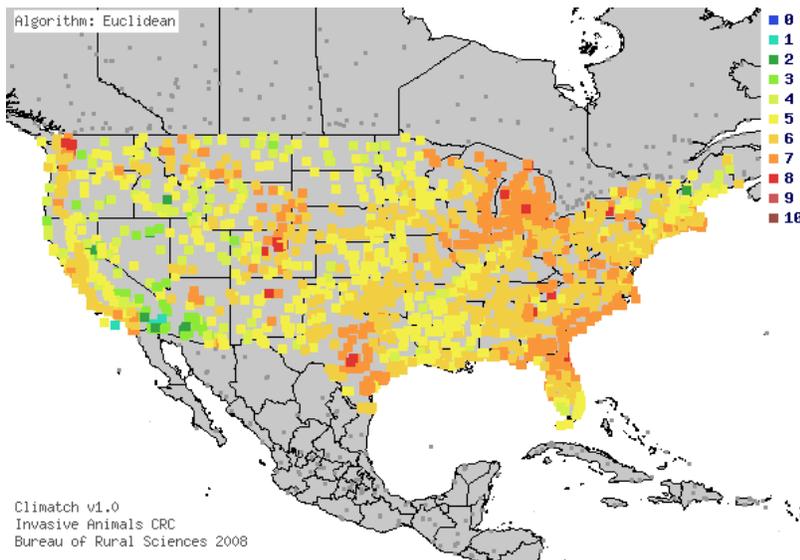


Figure 3. Map of CLIMATCH (Australian Bureau of Rural Sciences 2010) climate matches for *P. fluviatilis* in the continental United States based on source locations reported by GBIF (2012). 0= Lowest match, 10=Highest match.

Table 1. CLIMATCH (Australian Bureau of Rural Sciences 2010) climate match scores

CLIMATCH Score	0	1	2	3	4	5	6	7	8	9	10
Count	0	4	14	48	135	535	775	436	27	0	0
Climate 6 Proportion =							0.627 (High)				

7 Certainty of Assessment

Information on this species is abundant, both on its biology and on the impacts caused by introduction of this species. Certainty of this assessment is high.

8 Risk Assessment

Summary of Risk to the Continental United States

Establishment and impacts occurring in other countries. Climate matching is moderate to high, meaning that risk of invasion and establishment is significant enough to raise concern should the species get introduced to the United States. The biggest threat would likely be to native perch via competition and hybridization.

Assessment Elements

- **History of Invasiveness(See Section 3): High**
- **Climate Match (See Section 6): High**
- **Certainty of Assessment (See Section 7): High**
- **Overall Risk Assessment Category: High**

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.

Australian Bureau of Rural Sciences. 2010. CLIMATCH: <http://adl.brs.gov.au:8080/Climatch/>; (August 2010).

Encyclopedia of Life (EOL). 2014. *Perca fluviatilis*. Available: http://eol.org/data_objects/5817501. Photo license available: <http://creativecommons.org/licenses/by-nc/3.0/legalcode>. (September 2014).

Froese, R. and D. Pauly. Editors. 2010. FishBase. World Wide Web electronic publication. www.fishbase.org, version (04/2010). <http://www.fishbase.org/Summary/speciesSummary.php?ID=358> (April 2012).

GBIF (Global Biodiversity Information Facility). 2012. <http://data.gbif.org/species/13551446/> (April 2012).

Global Invasive Species Database. 2012. *Perca fluviatus*. http://www.issg.org/database/species/impact_info.asp?si=548&fr=1&sts=sss&lang=EN; (April 2012).

ITIS (Integrated taxonomic information system). 2012. Available: http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=168470 (Last accessed August 22, 2012).

NSW DPI (New South Wales Department of Private Industries). 2012. Redfin Perch (*Perca fluviatilis*). <http://www.dpi.nsw.gov.au/fisheries/pests-diseases/freshwater-pests/species/redfin-perch>. (April 2012).

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 in

Arthington, A.H. 1989. Impacts of introduced and translocated freshwater fishes in Australia. p. 7-20. In S.S. de Silva (ed.) Exotic Aquatic Organisms in Asia. Proceedings of the Workshop on Introduction of Exotic Aquatic Organisms in Asia. Asia Fish. Soc. Spec. Publ. 3, 154 p. Asian Fisheries Society, Manila, Philippines.

Arthington, A.H. and F. McKenzie. 1997. Review of impacts of displaced/introduced fauna associated with inland waters. Australia: State of the Environment Technical Paper Series (Inland waters), Department of the Environment, Canberra (Australia). 69 p.

Bartley, D.M. (comp./ed.) 2006. Introduced species in fisheries and aquaculture: information for responsible use and control (CD-ROM). Rome, FAO.

Berg, L.S. 1965. Freshwater fishes of the U.S.S.R. and adjacent countries. Volume 3, 4th edition. Israel Program for Scientific Translations Ltd, Jerusalem. (Russian version published 1949).

Beverton, R.J.H. and S.J. Holt 1959. A review of the lifespans and mortality rates of fish in nature, and their relation to growth and other physiological characteristics. p. 142-180. In G.E.W. Wolstenholme and M. O'Connor (eds.) CIBA Foundation colloquia on ageing: the lifespan of animals. volume 5. J & A Churchill Ltd, London.

Billard, R. 1997. Les poissons d'eau douce des rivières de France. Identification, inventaire et répartition des 83 espèces. Lausanne, Delachaux & Niestlé, 192p.

Closs, G. P., B. Ludgate, and Goldsmith, R. J. 2003. Controlling European perch (*Perca fluviatilis*): lessons from an experimental removal. In: Managing invasive freshwater fish in New Zealand. Proceedings of a workshop hosted by Department of Conservation, 10-12 May 2001, Hamilton. 37-48.

Fishbase 2004. [*Source material did not give full citation for this reference –reference is most likely referring to Froese and Pauly (2010) above.*]

Frimodt, C. 1995. Multilingual illustrated guide to the world's commercial coldwater fish. Fishing News Books, Osney Mead, Oxford, England. 215 p.

- Hutchison, M.J. and P.H. Armstrong 1993. The invasion of a south-western Australian river system by *Perca fluviatilis*: history and probable causes. *Global Ecol. Biogeogr. Lett.* 3:77-89.
- Kottelat, M. and J. Freyhof. 2007. Handbook of European freshwater fishes. Publications Kottelat, Cornol, Switzerland. 646 p.
- Kottelat, M. and T. Whitten. 1996. Freshwater biodiversity in Asia, with special reference to fish. *World Bank Tech. Pap.* 343:59 p.
- Muus, B.J. and P. Dahlström. 1968. Süßwasserfische. BLV Verlagsgesellschaft, München. 224 p.
- Pinder, A.C. 2001. Keys to larval and juvenile stages of coarse fishes from fresh waters in the British Isles. Freshwater Biological Association. The Ferry House, Far Sawrey, Ambleside, Cumbria, UK. Scientific Publication No. 60. 136 p.
- Riede, K. 2004. Global register of migratory species - from global to regional scales. Final Report of the R&D-Projekt 808 05 081. Federal Agency for Nature Conservation, Bonn, Germany. 329 p.
- Riehl, R. and H.A. Baensch. 1991. Aquarien Atlas. Band. 1. Melle: Mergus, Verlag für Natur- und Heimtierkunde, Germany. 992 p.
- Smolian, K. 1920. Merkbuch der Binnenfischerei. Fischereiförderung GmbH, Berlin, Germany, p. 449, XXV.
- Welcomme, R.L. 1988. International introductions of inland aquatic species. *FAO Fish. Tech. Pap.* 294. 318 p.