

Northern Whitefish (*Coregonus peled*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, March 2011
Revised, September 2014 and July 2015

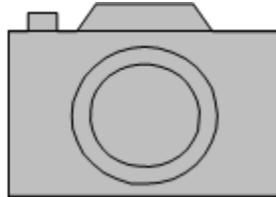


Photo not available.

1 Native Range, and Status in the United States

Native Range

From Froese and Pauly (2015):

“Europe and Asia: lakes and rivers from Mezen to Kolyma River, Russia.”

Status in the United States

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

Means of Introductions in the United States

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

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 Protacanthopterygii
Order Salmoniformes
Family Salmonidae
Subfamily Coregoninae
Genus *Coregonus* Linnaeus, 1758 – whitefishes
Species *Coregonus peled* (Gmelin, 1789) – peled”

“Taxonomic Status: valid”

Size, Weight, and Age Range

From Froese and Pauly (2015):

“Maturity: Lm ?, range 22 - 36 cm

Max length : 50.0 cm TL male/unsexed; [Berg 1962]; max. published weight: 5.0 kg [Berg 1962]; max. reported age: 13 years [Kottelat and Freyhof 2007]”

Environment

From Froese and Pauly (2015):

“Marine; freshwater; brackish; demersal; anadromous [Riede 2004].”

Climate/Range

From Froese and Pauly (2015):

“Polar; 74°N - 64°N”

Distribution Outside the United States

Native

From Froese and Pauly (2015):

“Europe and Asia: lakes and rivers from Mezen to Kolyma River, Russia.”

Introduced

From Freyhof and Kottelat (2008):

“Hybrids involving *C. peled* introduced in many reservoirs and lakes (Onega) throughout Russia, eastern and central Europe.”

Means of Introduction Outside the United States

From Savini et al. (2010):

“Salmonids (*O. mykiss*, *S. fontinalis*, *C. peled*, *C. lavaretus*), ictalurids (*Ameiurus nebulosus*, *A. melas*, *I. punctatus*), percids (*Sander lucioperca*), and centrarchids (*Lepomis gibbosus*, *M. salmoides*) freshwater fishes were initially stocked in lakes and rivers for sport fishing. Later,

hatchery programs took place both for performing a systemic restocking in open waters or for food production (i.e. salmonids) (Molony et al., 2003).”

Short description

No information available.

Biology

From Froese and Pauly (2015):

“Freshwater and estuarine. Lacustrine, fluvial and anadromous forms exist [Berg 1962]. Lives up to 13 years (6 in dwarf form). Feeds on zooplankton (mostly crustaceans), benthic animals (especially insect larvae and mussels, also algae) and insects from surface [Kottelat and Freyhof 2007].”

From Freyhof and Kottelat (2008):

“Different populations of different forms greatly differ in growth rate. Spawns for the first time at 3-6 years, males one year earlier than females. Females ripen very fast just before spawning; most females spawn each year. Spawns in autumn-early winter depending on local climate, over hard sand (shallows in lakes), sand, gravel or stone bottom (in rivers). In northern lakes, spawns under ice. Depth at spawning sites depends on ice thickness and changes in water level, commonly 1-3 m. Spawning lasts 12-16 days at 2-3°C.”

Human uses

From Froese and Pauly (2015):

“Fisheries: commercial; aquaculture: commercial”

Diseases

From Froese and Pauly (2015):

“Enteric Redmouth Disease, Bacterial diseases.”

Threat to humans

From Froese and Pauly (2015):

“Potential pest”

3 Impacts of Introductions

From Kirtiklis and Jankun (2006):

“Artificial spawning (reproduction), a popular method in fisheries, has caused the unintentional hybridization between native European whitefish (*Coregonus lavaretus*) and introduced peled

(*Coregonus peled*). The resultant hybrids are fertile and their morphological identification is impossible.”

“The hybrids are fertile, although some 15% of hybrid spawners develop reproductive anomalies.”

From Witkowski and Grabowska (2012):

“The introduction of peled, *Coregonus peled* (Gmelin, 1789), in lakes where the native European whitefish, *Coregonus lavaretus* (L.), occurred, resulted in hybridisation of the two species. Their hybrids occur in as many as 70% Mazurian lakes (Mamcarz 1992) and it is now difficult to find genetically pure populations of native forms of the whitefish. The process has been intensifying ever since, because peled shows a strong migration drive and invades an increasing number of lakes.”

From Holcik (1991):

“Introduction of the peled whitefish (*Coregonus peled*) led to hybridization with the native *Coregonus lavaretus* to such an extent that in 70% examined lakes in Poland, and in most fishery farms in Czecho-Slovakia, only the hybrids occur.”

4 Global Distribution

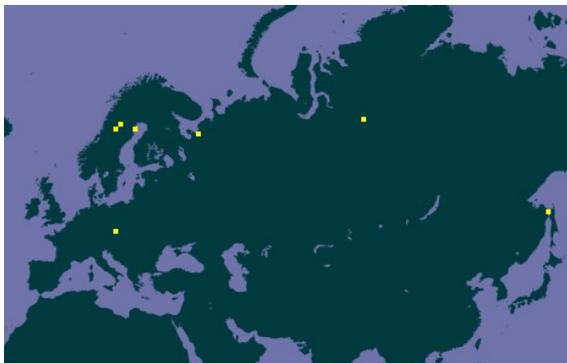


Figure 1. Map of known global distribution of *Coregonus peled*. Map from GBIF (2015). Location in far southeastern Russia was not included in climate matching (Sec. 6) because it was incorrectly located.

5 Distribution within the United States

This species is not currently believed to be in United States waters.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match (Sanders et al. 2014; 16 climate variables; Euclidean Distance) was high in far northern Minnesota and North Dakota, and in isolated locations in the Rocky Mountains.

Medium match occurred around the Great Lakes, and in parts of the Midwest and Interior West. Low match covered the East, South, and West Coast. Climate 6 match indicated that the contiguous U.S. has a high climate match. The range for a high climate match is 0.103 and greater; climate match of *Coregonus peled* is 0.316.

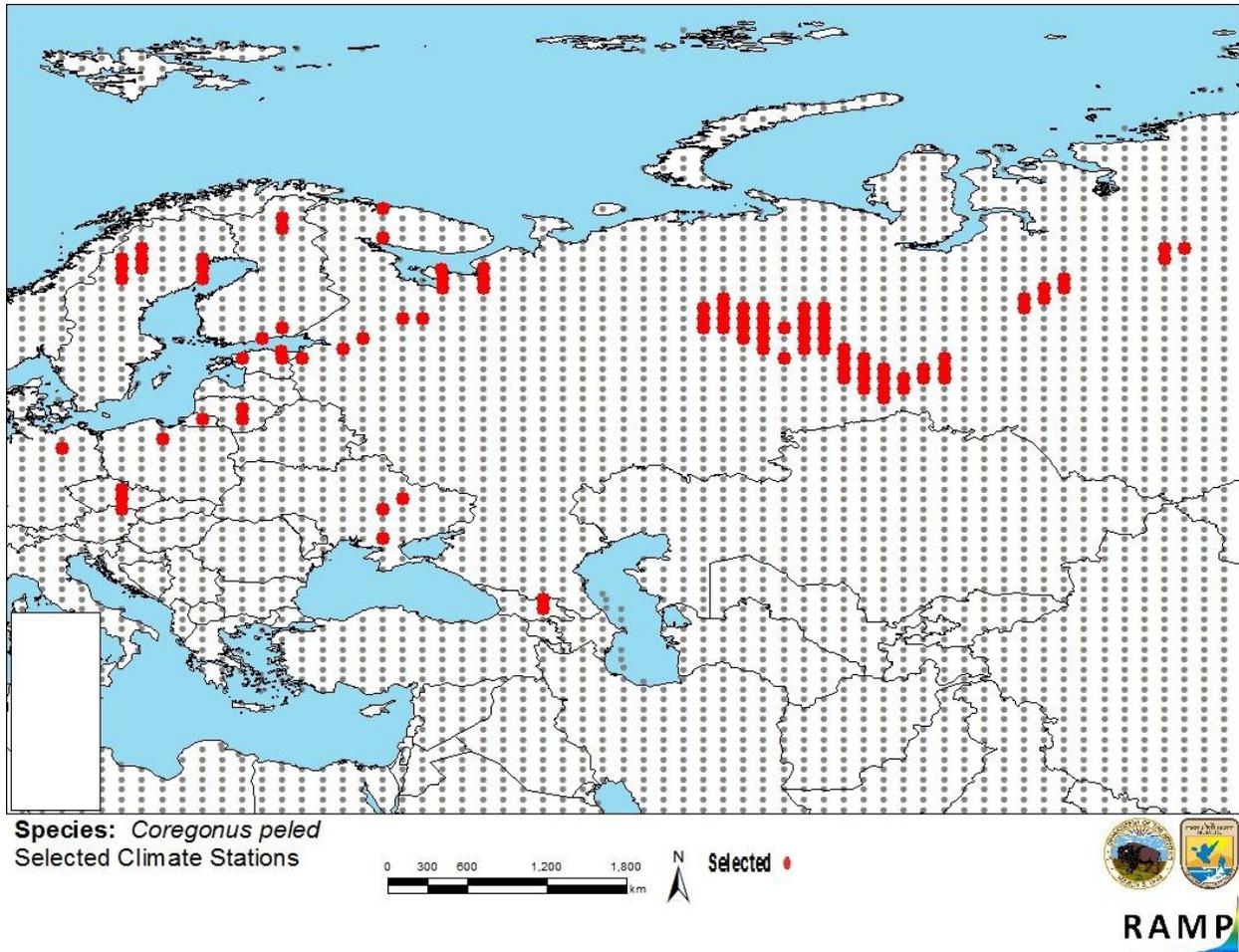


Figure 2. RAMP (Sanders et al. 2014) source map showing weather stations selected as source locations (red) and non-source locations (gray) for *Coregonus peled* climate matching. Source locations from Łuczyński et al. (1999), FGFRI (2008), and GBIF (2015).

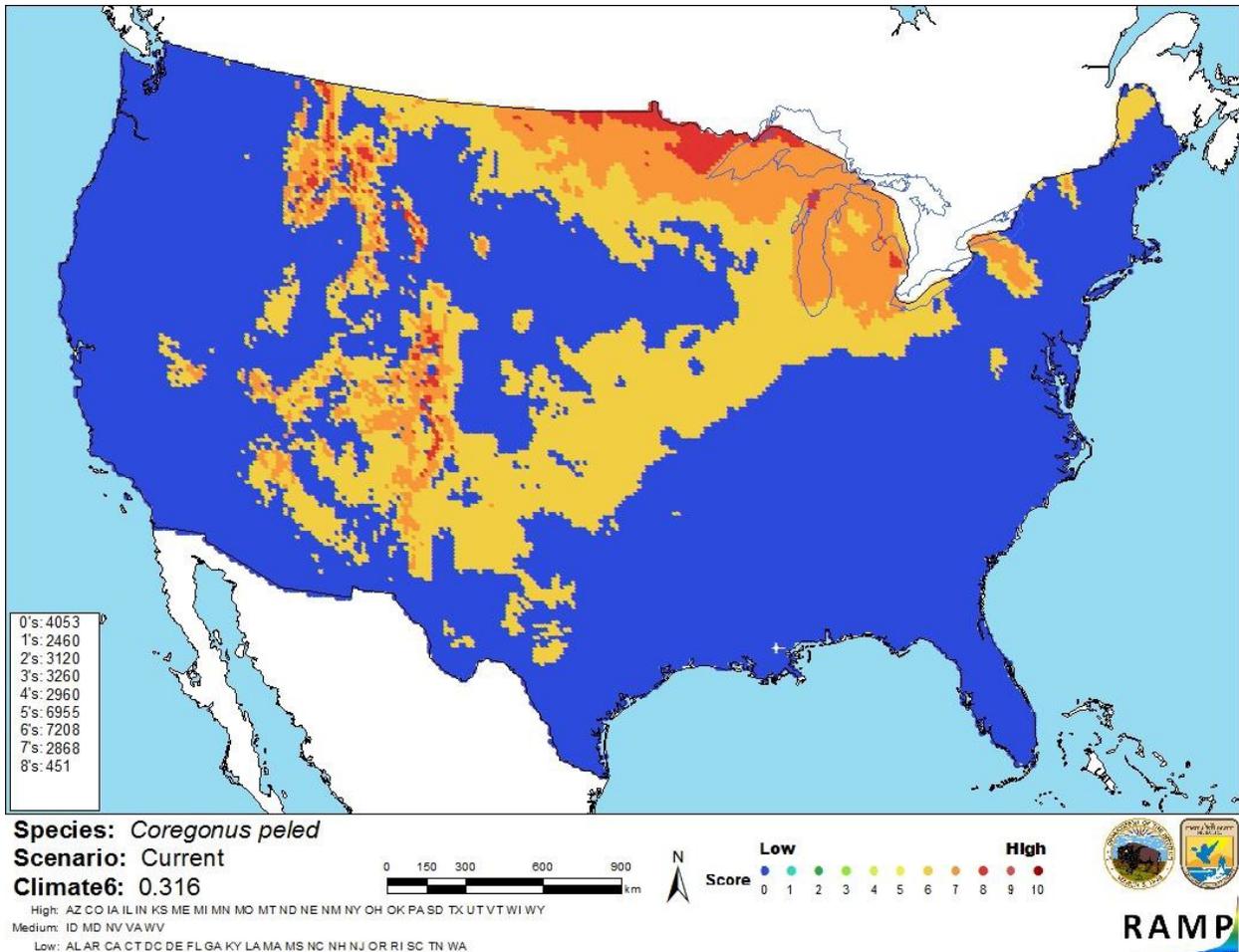


Figure 3. Map of RAMP (Sanders et al. 2014) climate matches for *Coregonus peled* in the continental United States based on source locations reported by Łuczyński et al. (1999), FGFRI (2008), and GBIF (2015). 0= Lowest match, 10=Highest match. Counts of climate match scores are tabulated on the left.

7 Certainty of Assessment

The biology and ecology of *C. peled* are fairly well-known. Negative impacts from introductions of this species are documented in the scientific literature. No further information is needed to evaluate the negative impacts the species is having where introduced. Certainty of this assessment is high.

8 Risk Assessment

Summary of Risk to the Continental United States

C. peled is a fish species native to Europe and Asia. Introductions to countries outside its native range have sometimes resulted in established populations. *C. peled* has negative impacts on native *Coregonus* sp. through hybridization. Climate match with the contiguous U.S. is high with significant matches occurring in the Great Lakes. Overall risk for this species is high.

Assessment Elements

- History of Invasiveness (Sec. 3):** High
- Climate Match (Sec.6):** Medium
- Certainty of Assessment (Sec. 7):** High
- Remarks/Important additional information** Host of Enteric Redmouth Disease and listed as a potential pest
- 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.

- Froese, R., and D. Pauly, editors. 2015. *Coregonus peled* (Gmelin, 1789). FishBase. Available: <http://www.fishbase.org/summary/4687>. (July 2015).
- Finnish Game and Fisheries Research Institute (FGFRI). 2008. Peled whitefish. Natural Resources Institute Finland, Helsinki, Finland. Available: http://www.rktl.fi/english/fish/fish_atlas/peled_whitefish/. (July 2015).
- Freyhof, J., and M. Kottelat. 2008. *Coregonus peled*. The IUCN Red List of Threatened Species, version 2015.2. Available: <http://www.iucnredlist.org/details/5374/0>. (July 2015).
- Global Biodiversity Information Facility (GBIF). 2015. GBIF backbone taxonomy: *Coregonus peled* (Gmelin, 1789). Global Biodiversity Information Facility, Copenhagen. Available: <http://www.gbif.org/species/2351136>. (July 2015).
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- Kirtiklis, L., and M. Jankun. 2006. Chromosome analysis in coregonid individuals in the interspecific hybridization zone. *Journal of Applied Ichthyology* 22(5):401-403.
- Łuczyński, M., A. Mamcarz, P. Brzuzan, and K. Demska-Zakęś. 1999. Introgressive hybridization of the introduced peled (*Coregonus peled*) with the native whitefish (*Coregonus lavaretus*) threatens indigenous coregonid populations: a case study. Pages 188-205 in S. Mustafa, editor. *Genetics in sustainable fisheries management*. Fishing News Books, Blackwell Science Ltd, Oxford, UK.
- Sanders, S., C. Castiglione, and M. Hoff. 2014. Risk Assessment Mapping Program: RAMP. U.S. Fish and Wildlife Service.
- Savini, D., A. Occhipinti-Ambrogi, A. Marchini, E. Tricarico, F. Gherardi, S. Olenin, and S. Gollasch. 2010. The top 27 animal alien species introduced into Europe for aquaculture and related activities. *Journal of Applied Ichthyology* 26(Suppl. 2):1-7.
- Witkowski, A., and J. Grabowska. 2012. The non-indigenous freshwater fishes of Poland: threats to the native ichthyofauna and consequences for the fishery: a review. *Acta Ichthyologica et Piscatoria* 42(2):77-87.

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.

Berg, L. S. 1962. Freshwater fishes of the U.S.S.R. and adjacent countries, volume 1, 4th edition. Israel Program for Scientific Translations Ltd, Jerusalem.

Kottelat, M., and J. Freyhof. 2007. Handbook of European freshwater fishes. Publications Kottelat, Cornol, Switzerland.

Mamcarz, A. 1992. Effect of introductions of *Coregonus peled* Gmel. on native *C. lavaretus* L. stocks in Poland. *Polskie Archiwum Hydrobiologii* 39(3-4):847-852.

Molony, B. W., R. Lenanton, G. Jackson, and J. Norriss. 2003. Stock enhancement as a fisheries management tool. *Reviews in Fish Biology and Fisheries* 13:409-432.

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.