

*Salmo trutta*  [简体中文](#) [正體中文](#)

**System:** Freshwater

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Actinopterygii	Salmoniformes	Salmonidae

## Common name

thalasopestrofa (Greek), salmon trout (English), truita (Catalan), an breac geal (Gaelic, Irish), aure (Norwegian), lassföhren (German), ørret (Norwegian), sjøaure (Norwegian), truta-fário (Portuguese), bachforelle (German), blacktail (English), breac geal (Gaelic, Irish), brook trout (English), denizalabaligi (Turkish), denizalasi (Turkish), finnock (English), galway sea trout (English), gillaroo (English), gwyniedyn (Welsh), pstruh obecný (Czech), trucha común (Spanish), urriði (Icelandic), herling (English), hirling (English), truta marisca (Portuguese), k'wsech (Salish), lachsforelle (German), losos taimen (Russian, Latvia), losos' taimen (Russian), mahiazad-e-daryaye khazar (Farsi), trout (English), meritaimen (Finnish), morska postrv (English, Slovenia), morskaya forel' (Russian), öring (Swedish), orkney sea trout (English), truite brune (French), pastrav de mare (Romanian), peal (English), pstruh morský (Czech), salmo trota (Italian), sea trout (English), sewin (English), siwin (Welsh), sjourrioi (Icelandic), Europäische Forelle (German), pstruh obecný severomorský (Czech), pstruh obyčajný (Slovak), ørred (Danish), taimen (Finnish), troc (Polish), troc wedrowna (Polish), trota fario (Italian), trucha (Spanish), trucha marina (Spanish), truite brune de mer (French), truite de mer (French), truite d'europe (French), truta-de-lago (Portuguese), truta-marisca (Portuguese), whiting (English), whitling (English), zeeforel (Dutch), meerforelle (German), orange fin (English), brown trout (English), kumzha (Russian), forelle (German), lachförcch (German), havørred (Danish), havsöring (Swedish), sjøørret (Norwegian)

## Synonym

*Salmo trutta abanticus* , Tortonese, 1954  
*Salmo eriox* , Linnaeus, 1758  
*Salmo trutta* , Linnaeus, 1759  
*Salmo trutta trutta* , Linnaeus, 1761  
*Trutta fluviatilis* , Duhamel, 1771  
*Trutta marina* , Duhamel, 1771  
*Trutta salmonata* , Ruty, 1772  
*Salmo albus* , Bonnaterre, 1788  
*Trutta salmanata* , Ström, 1784  
*Salmo gadoides* , Lacepède, 1803  
*Salmo phinoc* , Shaw, 1804  
*Salmo stroemii* , Gmelin, 1788  
*Salmo sylvaticus* , Gmelin, 1788  
*Salmo albus* , Walbaum, 1792  
*Salmo cornubiensis* , Walbaum, 1792  
*Salmo fario loensis* , Walbaum, 1792  
*Salmo saxatilis* , Paula Schrank, 1798  
*Salmo cumberland* , Lacepède, 1803  
*Salmo cambricus* , Donovan, 1806  
*Salmo montana* , Walker, 1812  
*Salmo taurinus* , Walker, 1812  
*Salmo spurius* , Pallas, 1814  
*Salmo caecifer* , Parnell, 1838  
*Salmo levenensis* , Yarrell, 1839  
*Salmo orientalis* , McClelland, 1842  
*Fario argenteus* , Valenciennes, 1848  
*Salar ausonii* , Valenciennes, 1848  
*Salar bailloni* , Valenciennes, 1848  
*Salar gaimardi* , Valenciennes, 1848  
*Salar spectabilis* , Valenciennes, 1848  
*Salar ausonii parcepunctata* , Heckel & Kner, 1858  
*Salar ausonii semipunctata* , Heckel & Kner, 1858  
*Salmo fario major* , Walecki, 1863  
*Salmo islayensis* , Thomson, 1873  
*Salmo caspius* , Kessler, 1877  
*Salmo brachypoma* , Günther, 1866  
*Salmo gallivensis* , Günther, 1866  
*Salmo mistops* , Günther, 1866  
*Salmo orcadensis* , Günther, 1866  
*Salmo polyosteus* , Günther, 1866  
*Trutta marina* , Moreau, 1881  
*Salmo lacustris septentrionalis* , Fatio, 1890  
*Salmo trutta ezenami* , (non Berg, 1948)  
*Salmo trutta ciscaucasicus* , Dorofeyeva, 1967

## Similar species

*Salmo salar*

## Summary

*Salmo trutta* has been introduced around the world for aquaculture and stocked for sport fisheries. It is blamed for reducing native fish populations, especially other salmonids, through predation, displacement and food competition. It is a popular angling fish.

## Species Description

Brown trout get their name from the brown or golden brown hue on their bodies. Some of the other characteristics: their sides are silvery or yellow and bellies are white or yellowish; dark spots, sometimes encircled by a pale halo, are plentiful on the back and sides; spotting also can be found on the head and the fins along the back; rusty-red spots also occur on the sides; the small adipose (or fatty) fin in front of the tail has a reddish hue; sea-run brown trout have a more silvery colouration and the spotting is less visible.

Brown trout closely resemble Atlantic salmon and rainbow trout, but salmon have no red colouration on the adipose fin and rainbow trout have lines of black spots on the tail. Young brown trout (parr) have 9-14 dark narrow parr marks along the sides and some red spotting along the lateral line.

Brown trout can grow to be quite large, especially sea-run fish. Fish weighing up to 31kg (68 lb) have been recorded in Europe (Fisheries & Oceans Canada, 2004). Wild trout reach sizes of 9kg (20 lbs).

## Notes

Mainly diurnal, (FishBase, 2003).

## Lifecycle Stages

Life history and spawning behaviour is similar to salmon, (FishBase, 2003). Spawning takes place in shallow freshwater ( Kroon, F. pers. comm, Jan 2004). "Female covers the eggs by restirring the sand and fine gravel. After hatching at 12mm, larval brown trout remain in the gravel for 2-3 weeks until they are about 25mm long, when they emerge to begin feeding in the water column. Brown trout are territorial and begin establishing territories as juveniles. Juvenile trout from lake populations move from their natal inlets to lakes during the first 2 years of life." (FishBase, 2003). Juvenile brown trout either migrate to the ocean or stay in freshwater ( Kroon, F. pers. comm, Jan 2004).

## Uses

Fisheries: commercial, aquaculture: commercial, gamefish, aquarium. Marketed fresh and smoked; eaten fried, broiled, boiled, cooked in microwave, and baked (FishBase, 2003).

## Habitat Description

Brown trout are primarily a freshwater species, but can spend time in the sea, they hide in shallow water weed beds and rocky, boulder-strewn areas, and prefer a water temperature of 18-23 degrees C (65-75 degrees F). Brown trout prefer cold, well-oxygenated upland waters although their tolerance limits are lower than those of rainbow trout (FishBase, 2003).

## Reproduction

"Matures in 3-4 years. Reproduces in the rivers. Female produces about 10,000 eggs \" (FishBase, 2003)

## Nutrition

Feeds on aquatic and terrestrial insects, molluscs, crustaceans and small fish (FishBase, 2003).

## General Impacts

Brown trout have been implicated in reducing native fish populations (especially other salmonids) through predation, displacement, and food competition (Taylor *et al.* 1984, in Fuller, 1999). Although it rarely occurs, in America the brown trout is one of the few foreign species able to hybridize with natives, (Fuller, 1999).

## Management Info

**Preventative measures:** The use of potentially invasive alien species for aquaculture and their accidental release/or escape can have negative impacts on native biodiversity and ecosystems. [Hewitt et al, \(2006\) Alien Species in Aquaculture: Considerations for responsible use](#) aims to first provide decision makers and managers with information on the existing international and regional regulations that address the use of alien species in aquaculture, either directly or indirectly; and three examples of national responses to this issue (Australia, New Zealand and Chile). The publication also provides recommendations for a 'simple' set of guidelines and principles for developing countries that can be applied at a regional or domestic level for the responsible management of Alien Species use in aquaculture development. These guidelines focus primarily on marine systems, however may equally be applied to freshwater.

[Copp et al, \(2005\) Risk identification and assessment of non-native freshwater fishes](#) presents a conceptual risk assessment approach for freshwater fish species that addresses the first two elements (hazard identification, hazard assessment) of the UK environmental risk strategy. The paper presents a few worked examples of assessments on species to facilitate discussion. The electronic [Decision-support tools- Invasive-species identification tool kits that includes a freshwater and marine fish invasives scoring kit](#) are made available on the Cefas (Centre for Environment, Fisheries & Aquaculture Science) page for free download (subject to Crown Copyright (2007-2008)).

## Pathway

primarily bred and stocked for recreational fishing

**Principal source:** FishBase, 2003. [Salmo trutta trutta](#) Sea trout.

**Compiler:** National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

Updates with support from the Overseas Territories Environmental Programme (OTEP) project XOT603, a joint project with the Cayman Islands Government - Department of Environment

**Review:** Dr. Frederieke Kroon, Research Scientist. CSIRO Land and Water Long Pocket Laboratories, Indooroopilly, QLD Australia.

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## ALIEN RANGE

[1] ARGENTINA	[1] ATHI-GALANA-SABAKI RIVER
[1] ATLANTIC - NORTHWEST	[4] AUSTRALIA
[1] BHUTAN	[1] BOLIVIA
[5] CANADA	[1] CHILE
[1] COLOMBIA	[1] CYPRUS
[1] CZECH REPUBLIC	[1] ECUADOR
[1] ETHIOPIA	[1] FALKLAND ISLANDS (MALVINAS)
[1] FIJI	[2] FRENCH SOUTHERN TERRITORIES
[1] INDIA	[1] IRAN, ISLAMIC REPUBLIC OF
[1] JAPAN	[1] JORDAN
[2] KENYA	[1] LESOTHO
[1] MADAGASCAR	[1] MALAWI
[1] MOROCCO	[1] NEPAL
[1] NEW ZEALAND	[1] PACIFIC - NORTHEAST
[1] PAKISTAN	[1] PANAMA
[1] PAPUA NEW GUINEA	[1] PERU
[1] PUERTO RICO	[1] SOUTH AFRICA

[1] SOUTH AMERICA  
 [1] SWAZILAND  
 [1] TANZANIA, UNITED REPUBLIC OF  
 [48] UNITED STATES

[1] SRI LANKA  
 [1] SWITZERLAND  
 [1] TIGRIS RIVER  
 [1] ZIMBABWE

**Red List assessed species 23: CR = 3; EN = 8; VU = 6; NT = 2; DD = 3; LC = 1;**

[Diplomystes chilensis](#) **DD**  
[Euastacus bidawalis](#) **EN**  
[Euastacus claytoni](#) **EN**  
[Euastacus diversus](#) **EN**  
[Euastacus kershawi](#) **LC**  
[Euastacus wiowuru](#) **NT**  
[Galaxias pedderensis](#) **CR**  
[Lepidomeda vittata](#) **VU**  
[Neochanna apoda](#) **VU**  
[Paragalaxias mesotes](#) **VU**  
[Prototroctes maraena](#) **NT**  
[Salmo rhodanensis](#) **DD**

[Engaeus nulloporius](#) **DD**  
[Euastacus bispinosus](#) **VU**  
[Euastacus crassus](#) **EN**  
[Euastacus eungella](#) **CR**  
[Euastacus neodiversus](#) **EN**  
[Euastacus yarreansis](#) **VU**  
[Hymenolaimus malacorhynchus](#) **EN**  
[Litoria spenceri](#) **CR**  
[Ombrastacoides pulcher](#) **VU**  
[Podiceps gallardoi](#) **EN**  
[Pseudobarbus quathlambae](#) **EN**

## BIBLIOGRAPHY

18 references found for *Salmo trutta*

### Management information

[Centre for Environment, Fisheries & Aquaculture Science \(CEFAS\), 2008. Decision support tools-Identifying potentially invasive non-native marine and freshwater species: fish, invertebrates, amphibians.](#)

**Summary:** The electronic tool kits made available on the Cefas page for free download are Crown Copyright (2007-2008). As such, these are freeware and may be freely distributed provided this notice is retained. No warranty, expressed or implied, is made and users should satisfy themselves as to the applicability of the results in any given circumstance. Toolkits available include 1) FISK- Freshwater Fish Invasiveness Scoring Kit (English and Spanish language version); 2) MFISK- Marine Fish Invasiveness Scoring Kit; 3) MI-ISK- Marine invertebrate Invasiveness Scoring Kit; 4) FI-ISK- Freshwater Invertebrate Invasiveness Scoring Kit and AmphISK- Amphibian Invasiveness Scoring Kit. These tool kits were developed by Cefas, with new VisualBasic and computational programming by Lorenzo Vilizzi, David Cooper, Andy South and Gordon H. Copp, based on VisualBasic code in the original Weed Risk Assessment (WRA) tool kit of P.C. Pheloung, P.A. Williams & S.R. Halloy (1999).

The decision support tools are available from:

<http://cefas.defra.gov.uk/our-science/ecosystems-and-biodiversity/non-native-species/decision-support-tools.aspx> [Accessed 13 October 2011]

[The guidance document](http://www.cefas.co.uk/media/118009/fisk_guide_v2.pdf) is available from [http://www.cefas.co.uk/media/118009/fisk\\_guide\\_v2.pdf](http://www.cefas.co.uk/media/118009/fisk_guide_v2.pdf) [Accessed 13 January 2009].

[Champion, P. Clayton, J. and Rowe, D. 2002. Alien Invaders Lake Managers Handbook. Ministry for the Environment.](#)

**Summary:** Available from: <http://www.mfe.govt.nz/publications/water/lm-alien-invaders-jun02.pdf> [Accessed 3 February 2005]

[Clearwater, Susan J.; Chris W. Hickey and Michael L. Martin. 2008. Overview of potential piscicides and molluscicides for controlling aquatic pest species in New Zealand. Science for conservation 283. March 2008. New Zealand Department of Conservation](#)

**Summary:** Available from: <http://www.doc.govt.nz/upload/documents/science-and-technical/sfc283entire.pdf> [Accessed 20 March 2008]

[Copp, G.H., Garthwaite, R. and Gozlan, R.E., 2005. Risk identification and assessment of non-native freshwater fishes: concepts and perspectives on protocols for the UK. Sci. Ser. Tech Rep., Cefas Lowestoft, 129: 32pp.](#)

**Summary:** The discussion paper presents a conceptual risk assessment approach for freshwater fish species that addresses the first two elements (hazard identification, hazard assessment) of the UK environmental risk strategy. The paper presents a few worked examples of assessments on species to facilitate discussion.

Available from: <http://www.cefas.co.uk/publications/techrep/tech129.pdf> [Accessed 1 September 2005]

[Hewitt, C.L., Campbell, M.L. and Gollasch, S. 2006. Alien Species in Aquaculture. Considerations for responsible use. IUCN, Gland, Switzerland and Cambridge, UK. viii + 32 pp.](#)

**Summary:** This publication aims to first provide decision makers and managers with information on the existing international and regional regulations that address the use of alien species in aquaculture, either directly or indirectly; and three examples of national responses to this issue (New Zealand, Australia and Chile).

Available from: <http://data.iucn.org/dbtw-wpd/edocs/2006-036.pdf> [Accessed 22 September 2008]

[IUCN/SSC Invasive Species Specialist Group \(ISSG\), 2010. A Compilation of Information Sources for Conservation Managers.](#)

**Summary:** This compilation of information sources can be sorted on keywords for example: Baits & Lures, Non Target Species, Eradication, Monitoring, Risk Assessment, Weeds, Herbicides etc. This compilation is at present in Excel format, this will be web-enabled as a searchable database shortly. This version of the database has been developed by the IUCN SSC ISSG as part of an Overseas Territories Environmental Programme funded project XOT603 in partnership with the Cayman Islands Government - Department of Environment. The compilation is a work under progress, the ISSG will manage, maintain and enhance the database with current and newly published information, reports, journal articles etc.

[Mendoza, R.E.; Cudmore, B.; Orr, R.; Balderas, S.C.; Courtenay, W.R.; Osorio, P.K.; Mandrak, N.; Torres, P.A.; Damian, M.A.; Gallardo, C.E.; Sanguines, A.G.; Greene, G.; Lee, D.; Orbe-Mendoza, A.; Martinez, C.R.; and Arana, O.S. 2009. Trinational Risk Assessment Guidelines for Aquatic Alien Invasive Species. Commission for Environmental Cooperation. 393, rue St-Jacques Ouest, Bureau 200, Montréal \(Québec\), Canada. ISBN 978-2-923358-48-1.](#)

**Summary:** In 1993, Canada, Mexico and the United States signed the North American Agreement on Environmental Cooperation (NAAEC) as a side agreement to the North American Free Trade Agreement (NAFTA). The NAAEC established the Commission for Environmental Cooperation (CEC) to help the Parties ensure that improved economic efficiency occurred simultaneously with trinational environmental cooperation. The NAAEC highlighted biodiversity as a key area for trinational cooperation. In 2001, the CEC adopted a resolution (Council Resolution 01-03), which created the Biodiversity Conservation Working Group (BCWG), a working group of high-level policy makers from Canada, Mexico and the United States. In 2003, the BCWG produced the Strategic Plan for North American Cooperation in the Conservation of Biodiversity. This strategy identified responding to threats, such as invasive species, as a priority action area. In 2004, the BCWG, recognizing the importance of prevention in addressing invasive species, agreed to work together to develop the draft CEC Risk Assessment Guidelines for Aquatic Alien Invasive Species (hereafter referred to as the Guidelines). These Guidelines will serve as a tool to North American resource managers who are evaluating whether or not to introduce a non-native species into a new ecosystem. Through this collaborative process, the BCWG has begun to implement its strategy as well as address an important trade and environment issue. With increased trade comes an increase in the potential for economic growth as well as biological invasion, by working to minimize the potential adverse impacts from trade, the CEC Parties are working to maximize the gains from trade while minimizing the environmental costs. Available from: English version: [http://www.cec.org/Storage/62/5516\\_07-64-CEC%20invasives%20risk%20guidelines-full-report\\_en.pdf](http://www.cec.org/Storage/62/5516_07-64-CEC%20invasives%20risk%20guidelines-full-report_en.pdf) [Accessed 15 June 2010]

French version: [http://www.cec.org/Storage/62/5517\\_07-64-CEC%20invasives%20risk%20guidelines-full-report\\_fr.pdf](http://www.cec.org/Storage/62/5517_07-64-CEC%20invasives%20risk%20guidelines-full-report_fr.pdf) [Accessed 15 June 2010]

Spanish version: [http://www.cec.org/Storage/62/5518\\_07-64-CEC%20invasives%20risk%20guidelines-full-report\\_es.pdf](http://www.cec.org/Storage/62/5518_07-64-CEC%20invasives%20risk%20guidelines-full-report_es.pdf) [Accessed 15 June 2010].

[Rowe, D.K and Graynoth, E, 2002. Lake Managers Handbook- Fish in New Zealand Lakes. Ministry for the Environment, Wellington.](#)

**Summary:** Available from: <http://www.mfe.govt.nz/publications/water/lm-fish-in-nz-lakes-jun02.pdf>

[Varnham, K. 2006. Non-native species in UK Overseas Territories: a review. JNCC Report 372. Peterborough: United Kingdom.](#)

**Summary:** This database compiles information on alien species from British Overseas Territories.

Available from: <http://www.jncc.gov.uk/page-3660> [Accessed 10 November 2009]

[Yallop, R., The Australian \(Newspaper\), Jan 02, 2004.](#)

**Summary:** NSW, impact and management.

## General information

[DNR, Extension, Cornell University. Available from: http://www.dnr.cornell.edu/ext/fish/nyfish/Salmonidae/browntrout.html \[Accessed 1 October 2003\]](#)

**Summary:** Distribution Information USA.

[Duhamel, G., Gasco, N. et Davaine, P. 2005. Poissons des Îles Kerguelen et Crozet, guide régional de l'océan Austral. \(Patrimoines naturels 63\).](#)

[FishBase, 2003. Species profile \*Salmo trutta trutta\* Sea trout](#)

**Summary:** FishBase is a global information system with all you ever wanted to know about fishes. FishBase on the web contains practically all fish species known to science. FishBase was developed at the WorldFish Center in collaboration with the Food and Agriculture Organization of the United Nations (FAO) and many other partners, and with support from the European Commission (EC). Since 2001 FishBase is supported by a consortium of seven research institutions. You can search on [Search FishBase](#)

This species profile is available from:

<http://www.fishbase.org/Summary/SpeciesSummary.cfm?ID=238&genusname=Salmo&speciesname=trutta%20trutta> [Accessed 7 September, 2004]

[Frenot, Y., Chown, S.L., Whinam, J., Selkirk, P., Convey, P., Skotnicki, M., & Bergstrom, D. 2005. Biological invasions in the Antarctic: extent, impacts and implications. \*Bio. Rev.\* 80, 45-72.](#)

**Summary:** Article de synthèse sur les invasions biologiques (plantes, invertébrés et vertébrés) en antarctique.

Available from: <http://www.anta.canterbury.ac.nz/resources/non-native%20species%20in%20the%20antarctic/Talk%20%20Frenot.pdf> [Accessed 4 April 2008]

Freshwater Biodata Information System New Zealand (FBIS), 2005

**Summary:** The Freshwater Biodata Information System (FBIS) contains fish, algae, aquatic plant and invertebrate data and metadata gathered from New Zealand's freshwater streams, rivers and lakes. FBIS provides different ways to search for biodata: choose a predefined search from a list of common searches; use the map view to draw a box on a map and search for biodata; or create your own search for maximum search flexibility. FBIS is offered as a nationally available resource for the New Zealand public, institutions and companies who need access to a well-maintained long-term data repository.

Available from: <https://secure.niwa.co.nz/fbis/validate.do?search=common> [Accessed 5 August 2005]

[Fuller, Pam., 1999. Nonindigenous Aquatic Species, NAS. United States Geological Survey, USGS.](#)

**Summary:** Database that features profiles on Nonindigenous Aquatic species. Includes biology, distribution, impacts and reasons for introductions.

<http://nas3.er.usgs.gov/queries/FactSheet.aspx?SpeciesID=486> [Accessed 30 November 2009]

[Hasegawa, K. and Maekawa, K. 2006. The Effects of Introduced Salmonids on Two Native Stream-dwelling Salmonids Through Interspecific Competition, \*Journal of Fish Biology\* 68: 1123 - 1132.](#)



# GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: *Salmo trutta*

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[ITIS \(Integrated Taxonomic Information System\), 2005. Online Database \*Salmo trutta\*](#)

**Summary:** An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.

Available from:

[http://www.cbif.gc.ca/pls/itisca/taxastep?king=every&p\\_action=containing&taxa=Salmo+trutta&p\\_format=&p\\_ifx=plglt&p\\_lang=](http://www.cbif.gc.ca/pls/itisca/taxastep?king=every&p_action=containing&taxa=Salmo+trutta&p_format=&p_ifx=plglt&p_lang=) [Accessed March 2005]