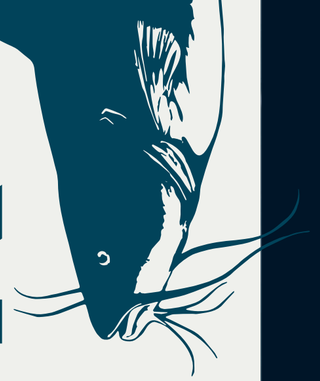
frisk



fish risk

Freshwater fish Invasions risk assessment: identifying invasion routes

Portuguese rivers contain a unique natural heritage

There are about 45 native fish species, such as barbels, nases or loaches. Of these fish species, ten occur only in Portugal, being the case of the Portuguese nase or the Nabão lamprey. Some of the native fish are much appreciated gastronomically, as being the case of brown trout, European eel or sea lamprey. Other native fishes are important indicators of good ecological quality of rivers.

Every two years, a new non-native fish species arrives to Portuguese freshwaters

Non-native fishes are naturally from other regions or countries and were introduced by people. Many of these fishes, such as largemouth bass, pikeperch and common carp are preferred for sport fishing. However, the management of sport fishing has become very difficult with the continuous introduction of new non-native species.

The occurrence of some non-native fishes could lead to changes in ecosystems, with economic costs for the society

In addition to the competition and predation of native species caused by non-native fish, it is scientifically proven that the higher abundance of catfishes, carp or bleak decreases water quality, implying higher costs in water treatment for public supply. Non-native fishes can also be a vector of diseases or parasites that can be transmitted to other fish already existing in Portugal.

In the FRISK project aims to discover “the invasion routes” done by non-native fish

For a better management of recreational fisheries and freshwater ecosystems of Portugal, it is essential to prevent the arrival of new non-native fishes and reduce the dispersion of already existing non-native fishes in Portugal. With the FRISK project, we aim to predict where future non-natives will be introduced. To achieve this, we will compare the historical progression of non-natives fishes in Portugal and Spain with the population genetic closeness. We also want to know the preferred fishing localities by recreational fishermen and understand better their habits. Finally, in the Tagus river we aim to estimate the dispersion of European catfish and pikeperch from a tagging study.

Your help is very important to improve fisheries management and conservation of our rivers

Share with us your fishing catches! Help us to improve the species knowledge, thus obtaining the most updated information about what is happening in our rivers!

We want your participation in fish species registering

Register your fishing results at www.biodiversity4all.org

We need your collaboration, please register on the website and enter information about species, locality, date and photo.

You could also see the profile of other fishermen and search for species that were found elsewhere in a given locality.

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www.facebook.com/FRISKPROJECT

Restocking? Only by the competent authorities
Restocking is an exceptional tool for fisheries management. However, we continue to witness to several illegal introductions that put at risk recreational fisheries, and could cause severe ecological and economical impacts in rivers and dams. Restocking can only be undertaken, or authorized, by the INCF. More information is available on the Institute’s webpage.

MARE · ICNF Instituto da Conservação da Natureza e das Florestas · EDIA · BioDiversity4All www.biodiversity4all.org

Financiamento FCT Fundação para a Ciência e a Tecnologia

FRISK – Determinação de rotas de invasão de peixes introduzidos em ecosistemas dulciaquícolas: avaliação de risco (ref. PTDC/AAG-MAA/0350/2014)

non-native fish in Portugal

EUR – Europe
N-AM – North America
S-AM – South America
ASI – Asian

1 Carp – EUR
Common carp (*Cyprinus carpio*) is sought for sport fishing and used in aquaculture, being common in dams and occasionally in rivers.

2 Tench – EUR
Tench (*Tinca tinca*) is used in aquaculture, and nowadays is very rare in Portugal. Its introduction is probably very old.

3 Goldfish – ASI
Goldfish (*Carassius auratus*) has been transported by the Portuguese navigators. It is common in dams and occasionally in rivers.

4 Rainbow trout – N-AM
Rainbow trout (*Oncorhynchus mykiss*) has been officially introduced for fisheries, and currently is used in aquaculture. It occurs in dams located in mountainous areas.

5 Iberian Gudgeon – EUR
Iberian gudgeon (*Gobio lozanoi*), native to the Basque country, was introduced as live bait for trout fishing. It is very abundant in rivers.

6 Mosquitofish – N-AM
Mosquitofish (*Gambusia holbrooki*) was introduced to Portugal to fight malaria. It is extremely abundant in lentic waters of the southern rivers.

7 Chameleon cichlid – S-AM
Chameleon cichlid (*Australoheros facetus*) is an ornamental species occurring in the rivers of southern Portugal. It is territorial and very aggressive.

8 Pike – EUR
Northern pike (*Esox lucius*) is sought for sport fishing. This predator occurs in dams in the north and in some major rivers of Portugal.

9 Largemouth Bass – N-AM
Largemouth bass (*Micropterus salmoides*) was officially introduced to develop recreational fisheries in the south part of Portugal. It is common in dams.

10 Mummichog – AM-N
Mummichog (*Fundulus heteroclitus*) occurs in estuarine zones of the Guadiana and Ria Formosa. It is believed that it arrived in Portugal accidentally.

11 Pumpkinseed sunfish – N-AM
Pumpkinseed sunfish (*Lepomis gibbosus*) arrived in Portugal from Spanish populations, being widely used and dispersed in fisheries.

12 Pikeperch – EUR
Pikeperch (*Sander lucioperca*) appeared in the Ave River and was later introduced in several dams of the country for recreational fisheries.

13 Black bullhead – N- AM
Black bullhead (*Ameiurus melas*) appeared in international rivers. It is abundant in dams and lentic waters.

14 Bleak – EUR
Bleak (*Alburnus alburnus*) in less than 10 years invaded almost all the country (from south to north). It is very abundant in dams and rivers.

15 European catfish – EUR
European catfish (*Silurus glanis*) arrived in Portugal from Spanish populations in the Tagus river. It is much appreciated in recreational fisheries.

16 Roach – EUR
Roach (*Rutilus rutilus*) was introduced initially in the Ave river occurring in several northern rivers (Cávado and Douro).

17 Gibel carp – EUR
Gibel carp (*Carassius gibelio*) is locally abundant in the main rivers and dams. Its populations are constituted mostly females.

18 Channel catfish – N-AM
Channel catfish (*Ictalurus punctatus*) arrived in the Alqueva reservoir from Spanish populations. It is used in sport fishing and aquaculture.

19 European perch – EUR
European perch (*Perca fluviatilis*) occurs in a small dam of Beira Baixa, and it is likely to expand to the Tagus River.

20 Minnow – EUR
Minnow (*Phoxinus sp.*) has been recently detected in a tributary of the Douro river. It has not been possible to determine which species occurs in Portugal.

1 2 3 — 4 5 6 — 7 — 8 9 — 10 11 — 12 13 14 15 16 — 17 18 19 — 20

< 1800 | **1898** | **1921** | **1932** | **1940** | **1950** | **1953** | **1975** | **1978** | **1997** | **1999** | **2000** | **2006** | **2007** | **2012** | **2013** | **2016**

The given dates correspond to the likely years of introduction of each fish

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