

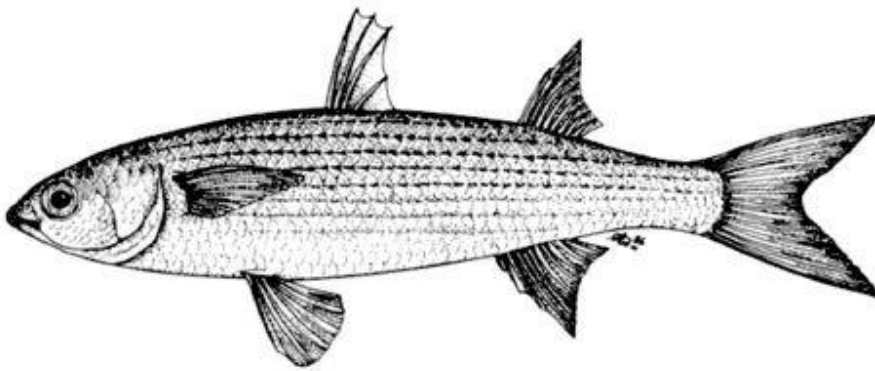
Leaping Mullet (*Chelon saliens*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, April 2011

Revised, August 2018

Web Version, 9/4/2018



FAO

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1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2018a):

“Eastern Atlantic: Mediterranean Sea, the Black Sea, Sea of Azov and Atlantic coasts from Morocco to France.”

Status in the United States

This species has not been reported as introduced or established in the United States. There is no indication that this species is in trade in the United States.

Means of Introductions in the United States

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

Remarks

From Eschmeyer et al. (2018):

“*saliens*, *Mugil* [...] Current Status: Valid as *Chelon saliens* (Risso 1810).”

From Froese and Pauly (2018b):

“Synonymised names

Liza saliens (Risso, 1810)

Liza saliens furcata Popov, 1930

Mugil saliens Risso, 1810

Mugil verselata Nardo, 1847”

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From Froese and Pauly (2018b):

“Biota > Animalia (Kingdom) > Chordata (Phylum) > Vertebrata (Subphylum) > Gnathostomata (Superclass) > Pisces (Superclass) > Actinopterygii (Class) > Perciformes (Order) > Mugiloidei (Suborder) > Mugilidae (Family) > *Chelon* (Genus) > *Chelon saliens* (Species)”

“Status accepted”

Size, Weight, and Age Range

From Froese and Pauly (2018a):

“Maturity: L_m 21.3, range 17 - 22 cm

Max length : 40.0 cm SL male/unsexed; [Bauchot 1987]; common length : 30.0 cm TL male/unsexed; [Frimodt 1995]”

Environment

From Froese and Pauly (2018a):

“Marine; brackish; demersal; depth range 10 - ? m [Thomson 1986].”

Climate/Range

From Froese and Pauly (2018a):

“Subtropical; 67°N - 27°N, 18°W - 42°E”

Distribution Outside the United States

Native

From Froese and Pauly (2018a):

“Eastern Atlantic: Mediterranean Sea, the Black Sea, Sea of Azov and Atlantic coasts from Morocco to France.”

Introduced

From Froese and Pauly (2018a):

“Introduced to Iran and is now naturally occurring in the Caspian Sea basin [Baltz 1991].”

Froese and Pauly (2018a) also state that *Chelon saliens* was introduced to Israel and Iran from an unknown location and these populations have established themselves. They also state that populations have been established in the Caspian Sea (Azerbaijan, Kazakhstan and Turkmenistan), introduced from the Black Sea.

Means of Introduction Outside the United States

From Froese and Pauly (2018a):

“Reason [for introduction to Israel]: aquaculture”

All other introductions are unknown as to reason of introduction.

Short Description

No information available.

Biology

From Froese and Pauly (2018a):

“Adults usually in schools inhabit coastal waters [Thomson 1986]; sometimes in lagoons and estuaries [Kottelat and Freyhof 2007]. Juveniles around 2.0 cm SL move to coastal lagoons and estuaries in summer and autumn [Kottelat and Freyhof 2007]. Adults are herbivorous feeding on algae and vegetal detritus while juveniles feed on zooplankton until about 3 cm SL, then on benthic organisms until 5 cm SL [Frimodt 1995, Kottelat and Freyhof 2007]. Reproduce in summer [Ben-Tuvia 1986]. Oviparous, eggs are pelagic and non-adhesive [Breder and Rosen 1966]. Utilized for roe, but also fresh, smoked and frozen [Frimodt 1995].

Human Uses

From Froese and Pauly (2018a):

“Fisheries: minor commercial; aquaculture: commercial”

Diseases

From Froese and Pauly (2018a):

“Gyrodactylus Infestation 6, Parasitic infestations (protozoa, worms, etc.)”

Ovcharenko (2015) reports *C. saliens* (as *Liza saliens*) as a host of the following parasites: *Ichthyophonus* sp., *Trichodinella inversa*, *Trichodina lepsi*, *Trichodina micromaculata*, *Trichodina partidisci*, *Trichodina puytoraci*, *Tetrahymena pyriformis*, *Myxobolus exiguous*, *Myxobolus muelleri*, *Myxobolus exiguous*, *Zschokkella dogieli*, *Pseudalataspora pontica*, *Zschokella mugilis*, and *Alataspora* sp.

From Zorriehzahra et al. (2016):

“In conclusion, based on the results obtained in this study from pathogenic and clinical signs; histopathological, virological and bacteriological results; molecular analysis; TEM; IHC; IFAT and haematological findings in naturally-infected wild mullets and experimentally infected guppy and sturgeon, VNN [viral nervous necrosis] virus should be considered as the main causative agent for the disease outbreak in wild mullet along the southern coastline of the Caspian Sea.”

No OIE-reportable diseases have been documented for *C. saliens*.

Threat to Humans

From Froese and Pauly (2018a):

“Harmless”

3 Impacts of Introductions

According to Froese and Pauly (2018a), there are no known impacts of the established populations that were introduced into Israel and Iran. Populations introduced to the Caspian Sea are reported as having some beneficial socioeconomic impacts as a commercially important species. No information is available on ecological effects of introductions to the Caspian Sea.

4 Global Distribution



Figure 1. Known global distribution of *Chelon saliens*, reported from Africa, Europe, and Asia. Map from GBIF Secretariat (2017). Occurrences in southern Africa and Senegal were excluded from the climate matching analysis as they do not represent a known established population. Occurrences near Milan, Italy, were also excluded from the climate matching analysis because they represent where *C. saliens* was recorded in a fish market, not a natural habitat. Georeferenced occurrences were not available for parts of the species range along the Atlantic coast of Europe, or in Azerbaijan, Kazakhstan, and Turkmenistan.

Because the climate matching analysis is not valid for marine waters, no marine occurrences were used in the climate matching analysis. Brackish water occurrences were included, including the Black Sea and estuaries.

5 Distribution Within the United States

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

6 Climate Matching

Summary of Climate Matching Analysis

This climate match only applies to the brackish and fresh water portions of the species range. It does not apply to marine environments where *Chelon saliens* reproduces and is usually found.

The Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.176, which is a high score. The range for a high climate match is 0.103 and above. There was a high match in large areas of the West; on outer Cape Cod, Massachusetts; and in a small area of the central Appalachian Mountains. There were low matches from Minnesota to Montana south into the Central Plains states; along the northern Pacific Coast; along the Gulf Coast from Louisiana to Florida; and in northern New England. The remainder of the contiguous United States had a medium match. The climate match may be underestimated because georeferenced occurrences were not available for parts of the species range along the Atlantic coast of Europe, or in Kazakhstan, and Turkmenistan.

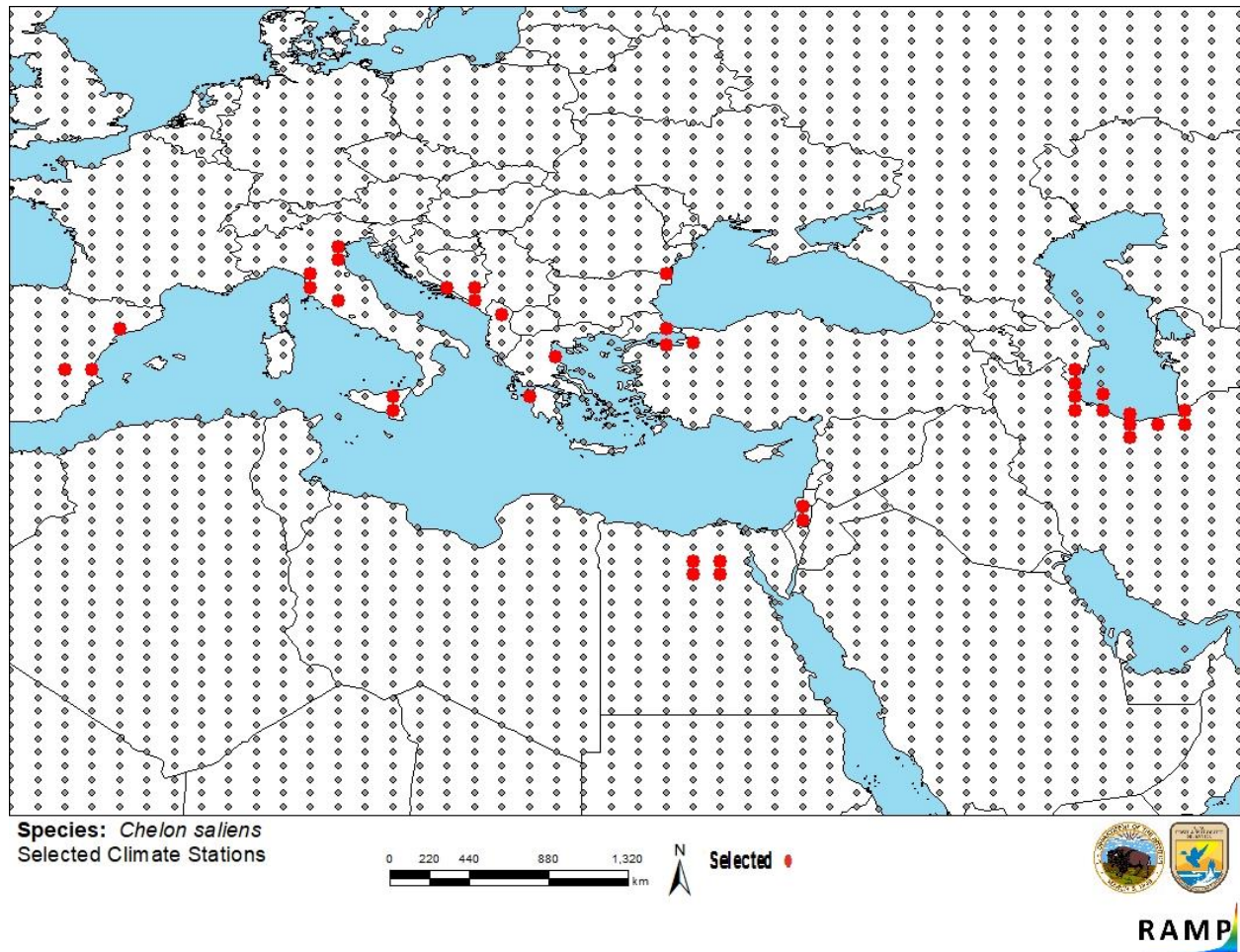


Figure 2. RAMP (Sanders et al. 2018) source map of northern Africa, southern Europe, and western Asia showing weather stations selected as source locations (red; Spain, Italy, Bosnia and Herzegovina, Montenegro, Albania, Greece, Romania, Turkey, Egypt, Israel, Iran, and Azerbaijan) and non-source locations (gray) for *Chelon saliens* climate matching. Source locations from GBIF Secretariat (2017).

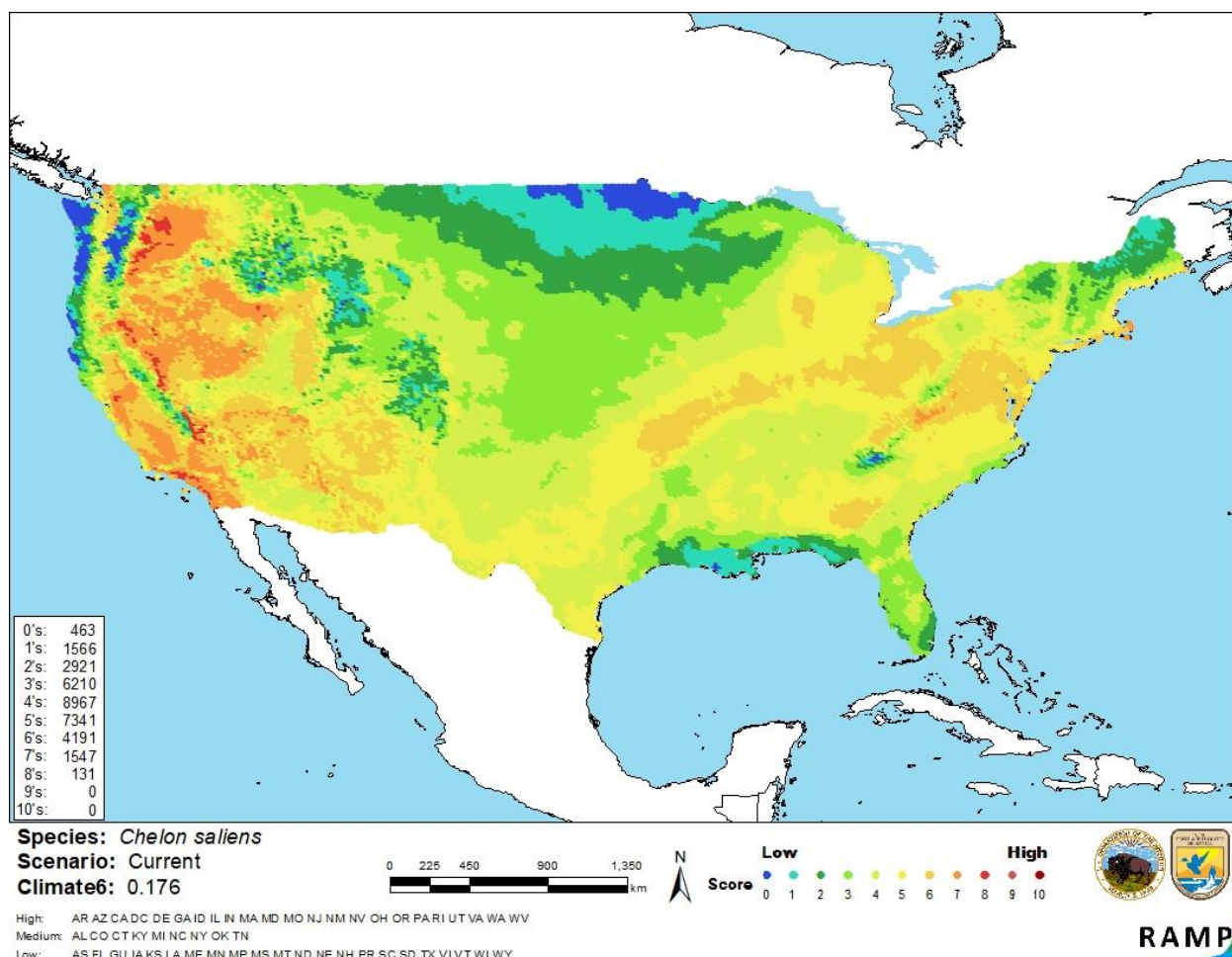


Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for *Chelon saliens* in the contiguous United States based on source locations reported by GBIF Secretariat (2017). 0= Lowest match, 10= Highest match.

The “High”, “Medium”, and “Low” climate match categories are based on the following table:

Climate 6: Proportion of (Sum of Climate Scores 6-10) / (Sum of total Climate Scores)	Climate Match Category
$0.000 \leq X \leq 0.005$	Low
$0.005 < X < 0.103$	Medium
≥ 0.103	High

7 Certainty of Assessment

Some information is known on the biology and ecology of *Chelon saliens*. It can live in marine and brackish environments. This fish has been reported as introduced and established into Israel, Iran, and the Caspian Sea (Azerbaijan, Kazakhstan and Turkmenistan). No adverse impacts have been recorded from these introductions, although no studies that investigate ecological impacts are available. Another source of uncertainty in this assessment is the ability of the species to reproduce, because the climate matching analysis does not cover the marine habitats where

C. saliens typically breeds. Due to lack of information on impacts and climate matching uncertainty, the certainty of assessment is low. More information is needed to increase the assessment certainty.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Leaping mullet (*Chelon saliens*) is a fish native throughout the Eastern Atlantic from France to Morocco, and throughout the Mediterranean, Black Sea and Sea of Azov. This species lives in marine and brackish environments, typically reproducing in marine environments. It is used in commercial aquaculture and fisheries. *C. saliens* has been introduced into Israel, Iran, Azerbaijan, Kazakhstan, and Turkmenistan, where it has established populations. The introduction to Israel was for aquaculture. No negative impacts have been reported from these introductions, but there are no studies available investigating ecological impacts. Some economic benefits have been reported from the Caspian Sea populations, as they are commercially important. This species is susceptible to viral nervous necrosis and is a host to numerous parasites. The climate match with the contiguous United States is high overall, with the highest matches in the West. Certainty of assessment is low due to lack of studies about potential negative impacts from introduction and not being able to prepare a climate match for the marine portion of *C. saliens*' life cycle. The overall risk for this species is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): None Documented**
- **Climate Match (Sec. 6): High**
- **Certainty of Assessment (Sec. 7): Low**
- **Overall Risk Assessment Category: Uncertain**

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.

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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.

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