

# Vimba Bream (*Vimba vimba*)

## Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, August 2018

Revised, November 2018

Web Version, 11/3/2021

Organism Type: Fish

Overall Risk Assessment Category: Uncertain



Photo: A. Harkos. Licensed under CC BY 3.0. Available:

<https://www.fishbase.de/photos/ThumbnailsSummary.php?Genus=Vimba&Species=vimba#>.

(August 2018).

## 1 Native Range and Status in the United States

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### Native Range

From Froese and Pauly (2018):

“Eurasia: Caspian, Black, Marmara and Baltic Sea basins (Sweden and Finland north to 63°N), North Sea basin from Elbe to Ems drainages. In Anatolia: in Marmara basin, south to Great Menderes and Lake Egridir and east to Kizilirmak drainage. Absent between Kizilirmak and Çoruh drainages. Extirpated in Crimea.”

### 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

No additional remarks.

## 2 Biology and Ecology

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### Taxonomic Hierarchy and Taxonomic Standing

From Eschmeyer et al. (2018):

“Current status: Valid as *Vimba vimba* (Linnaeus 1758). Leuciscidae: Leuciscinae.”

From ITIS (2018):

Kingdom Animalia

Subkingdom Bilateria

Infrakingdom Deuterostomia

Phylum Chordata

Subphylum Vertebrata

Infraphylum Gnathostomata

Superclass Actinopterygii

Class Teleostei

Superorder Ostariophysi

Order Cypriniformes

Superfamily Cyprinoidea

Family Cyprinidae

Genus *Vimba*

Species *Vimba vimba* (Linnaeus, 1758)

### Size, Weight, and Age Range

From Froese and Pauly (2018):

“Max length : 50.0 cm TL male/unsexed; [Muus and Dahlström 1968]; common length : 20.0 cm TL male/unsexed; [Muus and Dahlström 1968]; max. published weight: 1.4 kg [The Swedish National Association of Anglers 2000]; max. reported age: 15 years [Kottelat and Freyhof 2007]”

From Okgerman et al. (2011):

“Catches commonly attain lengths of 20-30 cm and weigh 250- 500 g; in rare cases they are 40-50 cm and 1-3 kg.”

## **Environment**

From Froese and Pauly (2018):

“Freshwater; brackish; benthopelagic; anadromous [Riede 2004]. [...] 10°C - 20°C [assumed to be recommended aquarium temperature] [Baensch and Riehl 1991];”

## **Climate**

From Froese and Pauly (2018):

“Subtropical; [...] 64°N - 35°N, 12°E - 53°E”

## **Distribution Outside the United States**

### **Native**

From Froese and Pauly (2018):

“Eurasia: Caspian, Black, Marmara and Baltic Sea basins (Sweden and Finland north to 63°N), North Sea basin from Elbe to Ems drainages. In Anatolia: in Marmara basin, south to Great Menderes and Lake Egridir and east to Kizilirmak drainage. Absent between Kizilirmak and Çoruh drainages. Extirpated in Crimea.”

### **Introduced**

From Froese and Pauly (2018):

“Introduced in Rhine.”

From Freyhof (1999):

“The native range of vimba is very close to the River Rhine and shows comparable fish communities. Some fish species had the chance to enter the River Rhine after the glaciation and others missed that chance. Vimba could be considered as not being a truely [sic] exotic fish species for the River Rhine, but rather a later immigrant.”

From FAO (2018):

“*Vimba vimba* introduced to France from unknown”

“Status of the introduced species in the wild : Probably established”

“*Vimba vimba* introduced to Netherlands from Not specified”

“Status of the introduced species in the wild : Probably established”

“*Vimba vimba* introduced to USSR, Former Area of from unknown”

“Status of the introduced species in the wild : Not established”

## **Means of Introduction Outside the United States**

From Hänfling et al. (2009):

“Recent records west of its natural distribution such as in the Rhine drainage are most likely due to introductions (Freyhof, 1999). Stock translocations and introductions were also carried out in the former U.S.S.R.”

## **Short Description**

From Froese and Pauly (2018):

“Dorsal spines (total): 3; Dorsal soft rays (total): 8-9; Anal spines: 3; Anal soft rays: 16 - 22. Diagnosed from its congeners in Europe by the following characters: anal fin with 16-21½ branched rays; back keeled behind dorsal base; in spawning season, males blackish brown with orange cheek and sometimes belly [Kottelat and Freyhof 2007]. Caudal fin with 19 soft rays. Scalar formula: 49-64, 6-10 [Keith and Allardi 2001].”

## **Biology**

From Froese and Pauly (2018):

“Inhabits brackish estuaries, large to medium rivers and some large subalpine lakes. Sedentary populations inhabit even in small rivers or barbel zone. Feeds mainly on small molluscs and insect larvae. Breeds in riffles in shallow, fast-flowing streams and rivers on gravel. Semi-anadromous populations forage in freshened parts of sea and migrate for long distances to spawn. Lacustrine populations move to fast-flowing tributaries. Spent adults return to foraging habitats [Kottelat and Freyhof 2007].”

From Freyhof and Kottelat (2008):

“Lives up to 15 years. Spawns for the first time at 3-5 years. Spawns in May-July (April in Terek and some subalpine lakes) when temperature rises above 15°C. [...] Individual females spawn several times during a period of 2-3 weeks. Usually spawns for several years. Spent adults return to foraging habitats. Feeds predominantly on small molluscs and insect larvae.”

From Hänfling et al. (2009):

“The cyprinid vimba *Vimba vimba* (L.) is a migratory fish that occurs in fresh waters as well as brackish waters. The semi-migratory form enters fresh water only for reproduction in spring. After spawning, it migrates to estuaries and brackish waters to feed until the next reproductive season. Landlocked lake populations migrate to lake tributaries for spawning, as do the recently established populations from dam lakes and electric power-plant reservoirs such as Tsymlyansk and Krasnodar reservoirs in Russia.”

## **Human Uses**

From Froese and Pauly (2018):

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

From Häneling et al. (2009):

“*Vimba vimba* had and still has in some regions, especially in the Sea of Azov basin, a significant economic value.”

## **Diseases**

**Koi herpesvirus disease is on the list of “OIE-Listed diseases, infections and infestations in force in 2018” listed by OIE (2018).**

From Kempfer et al. (2009):

“Many fish reared in polycultures are potentially dangerous in terms of KHV [koi herpes virus] epidemiology as they increase the number of pathways of virus spreading. We have also compiled a list of farmed and wild fish species where the presence of KHV DNA was confirmed by PCR or nested PCR. These fish species were either artificially or naturally KHV infected: goldfish (*Carassius auratus auratus*), crucian carp (*C. carassius*), grass carp (*Ctenopharyngodon idella*), bighead carp (*Aristichthys nobilis*), silver carp (*Hypophthalmichthys molitrix*), tench (*Tinca tinca*), wels catfish (*Silurus glanis*), vimba (*Vimba vimba*), and Prussian carp (*C. carassius gibelio*).”

## **Threat to Humans**

From Froese and Pauly (2018):

“Harmless”

## **3 Impacts of Introductions**

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The following information pertains to potential impacts of *Vimba vimba* introductions.

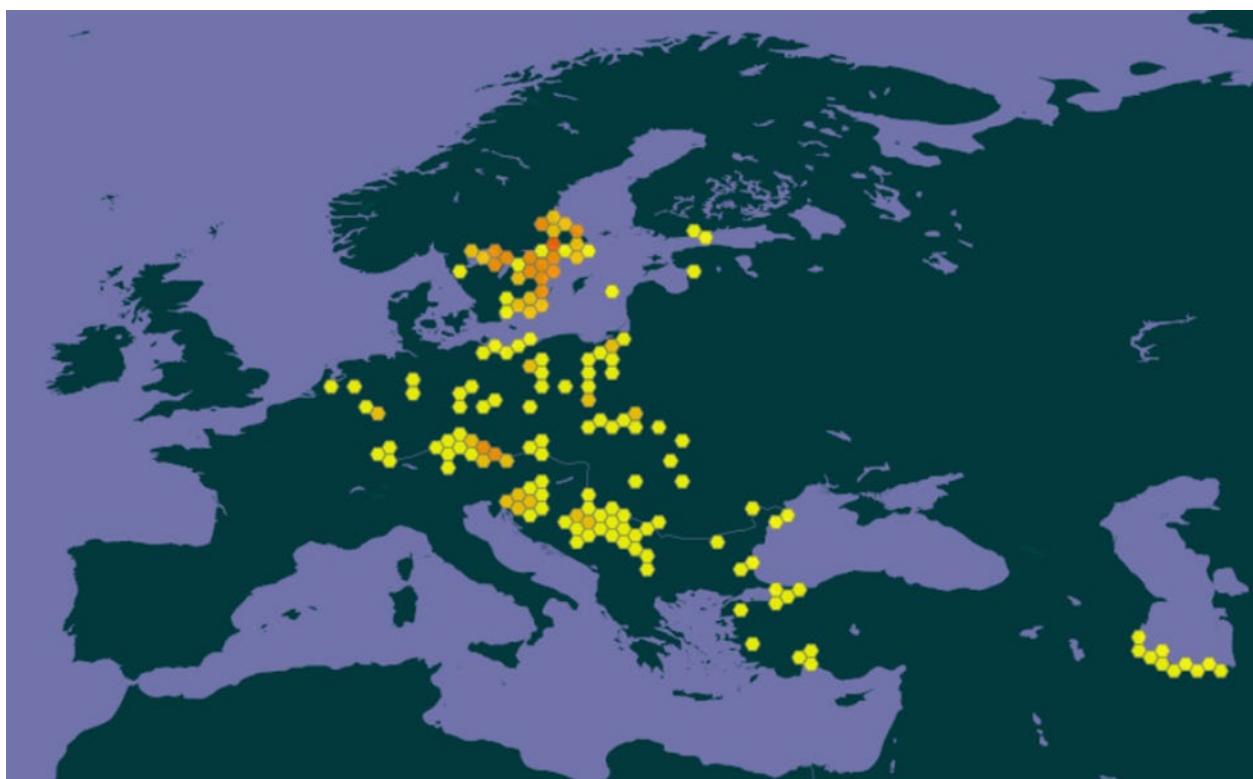
From Freyhof (1999):

“Probably, this cyprinid will expand its distribution and get more abundant in the next decades. It is not expected that the expansion of vimba will have a negative effect on the fish fauna of the River Rhine and its tributaries.”

## 4 History of Invasiveness

*Vimba vimba* has been reported as introduced in France and the Netherlands (River Rhine). FAO (2018) indicates that these introductions have likely resulted in established populations, but establishment has not been confirmed. *Vimba vimba* has also been introduced in the USSR where establishment did not occur. No documented impacts of these introductions were available however potential impacts of these introductions in the River Rhine are not expected to be negative in nature due to the similarities between fish communities in the River Rhine and the native range of *V. vimba*. This species is present in trade commercially and as a sport fish. No specific figures were available relating to trade quantities. The history of invasiveness is classified as Data Deficient.

## 5 Global Distribution



**Figure 1.** Known global distribution of *Vimba vimba*. Observations are reported throughout Central and Northern Europe as well as the Caspian and Black seas. Map from GBIF Secretariat (2018). Points occurring in marine environments were not used for the climate match analysis (section 7) because the climate matching is not valid for marine waters.

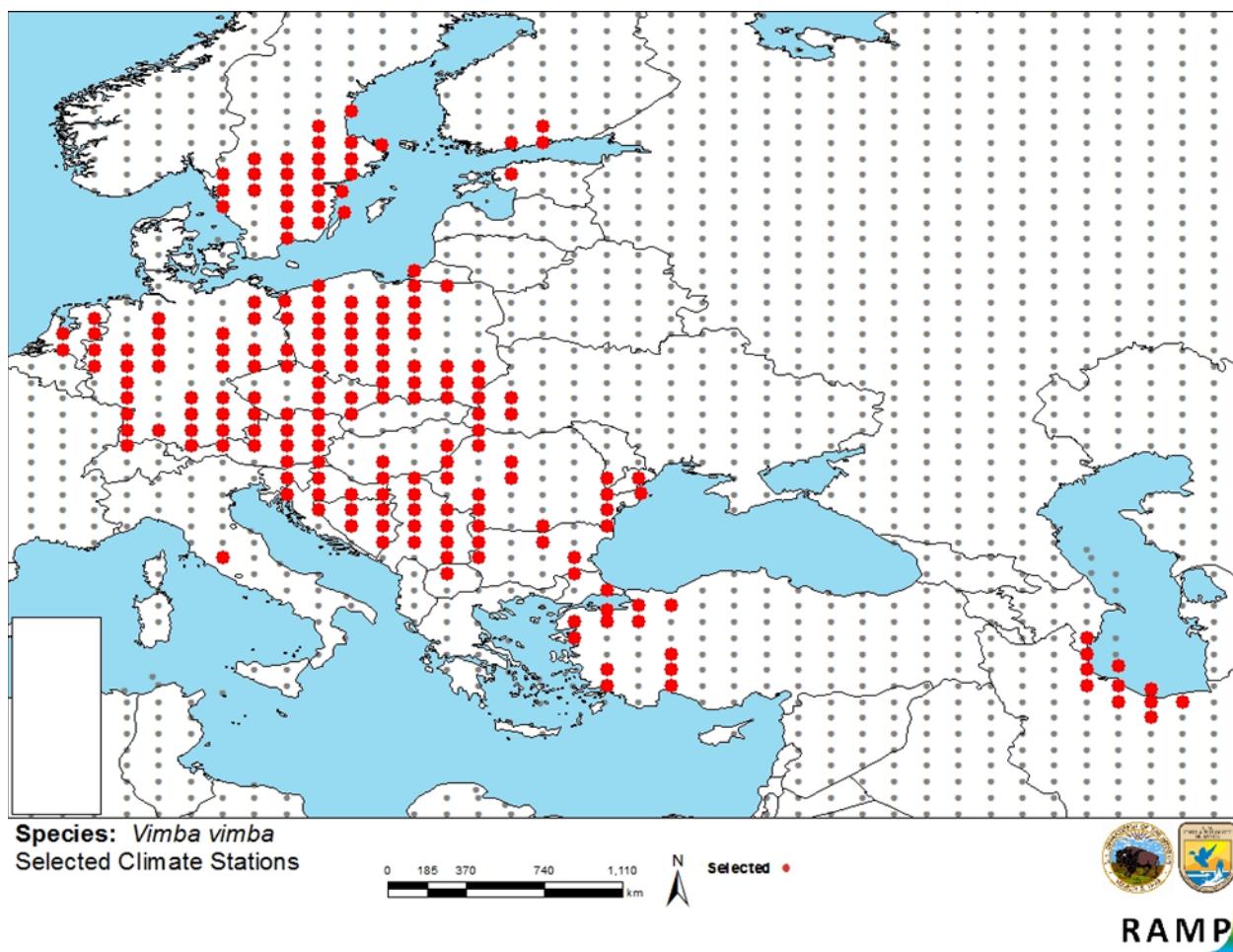
## 6 Distribution Within the United States

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

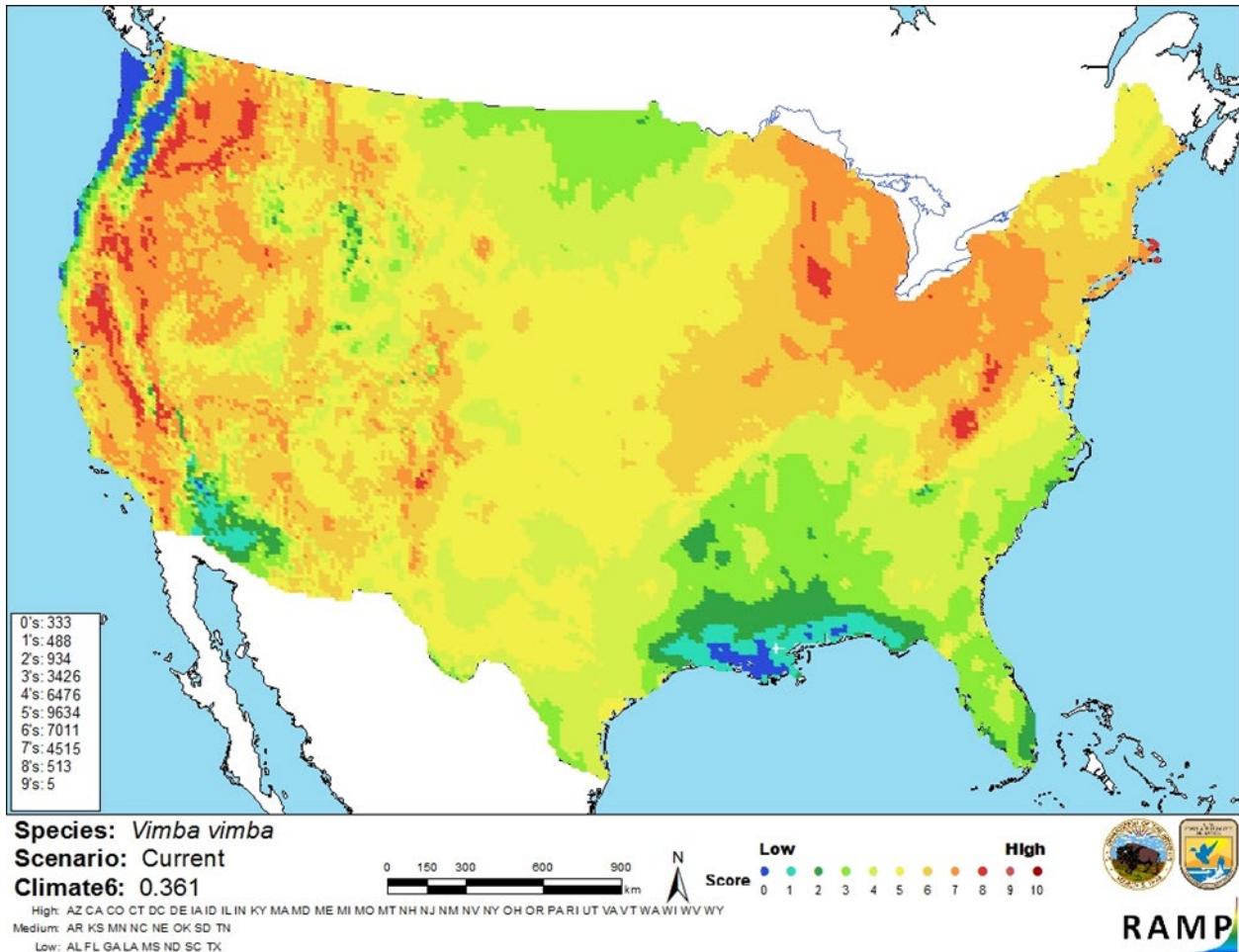
## 7 Climate Matching

### Summary of Climate Matching Analysis

Areas of high match were in the Rocky Mountains, California, around the Great Lakes Basin, and southern New England coastal areas. Much of the rest of the contiguous United States had a medium to medium-low climate match. Areas of low match were located along the Gulf Coast, peninsular Florida, the southern Atlantic Coast, desert southwest, northern plains, and in the Pacific Northwest. The Climate 6 score (Sanders et al. 2014; 16 climate variables; Euclidean distance) for the contiguous United States was 0.361, high. (Scores of 0.103 and greater are classified as high.) Most States had high individual Climate 6 scores. Arkansas, Kansas, Minnesota, North Carolina, Nebraska, Oklahoma, South Dakota, and Tennessee have medium individual scores. Alabama, Florida, Georgia, Louisiana, Mississippi, North Dakota, South Carolina, and Texas had low individual scores. The climate match presented here refers only to nonmarine environments where the species can survive.



**Figure 2.** RAMP (Sanders et al. 2014) source map showing weather stations in Europe selected as source locations (red) and non-source locations (gray) for *Vimba vimba* climate matching. Source locations from GBIF Secretariat (2018). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.



**Figure 3.** Map of RAMP (Sanders et al. 2014) climate matches for *Vimba vimba* in the contiguous United States based on source locations reported by GBIF Secretariat (2018). Counts of climate match scores are tabulated on the left. 0/Blue = Lowest match, 10/Red = Highest match.

The High, Medium, and Low Climate match Categories are based on the following table:

| Climate 6:<br>(Count of target points with climate scores 6-10)/<br>(Count of all target points) | Overall<br>Climate Match<br>Category |
|--|--------------------------------------|
| $0.000 \leq X \leq 0.005$  | Low                                  |
| $0.005 < X < 0.103$  | Medium                               |
| $\geq 0.103$   | High                                 |

## 8 Certainty of Assessment

There is adequate information available about the biology, ecology, and distribution of *Vimba vimba*. This species has been documented as introduced outside of its native range, but no information is available documenting impacts of these introductions. More information is needed

to adequately assess the risk this species poses to the contiguous United States. This species migrates between marine and freshwater environments. Because not all locations in the United States are conducive to such migration, inland establishment of this species may be limited according to habitat connectivity. However, *Vimba vimba* is known to have landlocked populations that complete the lifecycle in freshwater. Certainty of this assessment is low.

## 9 Risk Assessment

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### Summary of Risk to the Contiguous United States

*Vimba vimba*, the Vimba Bream, is a cyprinid fish species native to Europe. Some populations inhabit freshwater, while others are semi-anadromous and inhabit brackish water, but move to freshwater rivers to spawn. *V. vimba* is used in commercial fisheries and has been introduced outside of its native range for this purpose. No negative impacts of introductions of this species have been documented, so the History of invasiveness is classified as Data Deficient. *V. vimba* has an overall high climate match with the contiguous United States. The areas of highest match were located in the Western United States and the Great Lakes Basin. This species migrates between marine and freshwater environments. Because not all locations in the United States are conducive to such migration, inland establishment of this species may be limited according to habitat connectivity. However, *Vimba vimba* is known to have landlocked populations that complete the lifecycle in freshwater. Certainty of this assessment is low because no information is available on negative impacts of introductions of this species. The overall risk assessment category for this species is therefore uncertain.

### Assessment Elements

- **History of Invasiveness (Sec. 4): Data Deficient**
- **Overall Climate Match Category (Sec. 7): High**
- **Certainty of Assessment (Sec. 8): Low**
- **Remarks/Important additional information: None**
- **Overall Risk Assessment Category: Uncertain**

## 10 Literature Cited

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**Note:** The following references were accessed for this ERSS. References cited within quoted text but not accessed are included below in Section 11.

Eschmeyer WN, Fricke R, van der Laan R, editors. 2018. Catalog of fishes: genera, species, references. Available:  
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Froese R, Pauly D, editors. 2018. *Vimba vimba* (Linnaeus, 1758). FishBase. Available: <https://www.fishbase.de/summary/Vimba-vimba.html> (August 2018).

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[ITIS] Integrated Taxonomic Information System. 2018. *Vimba vimba* (Linnaeus, 1758). Reston, Virginia: Integrated Taxonomic Information System. Available: [https://www.itis.gov/servlet/SingleRpt/SingleRpt?search\\_topic=TSN&search\\_value=639696#null](https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=639696#null) (August 2018).

Kempter J, Sadowski J, Schütze H, Fischer U, Dauber M, Fichtner D, Panicz R, Bergmann SM. 2009. Koi herpes virus: do acipenserid restitution programs pose a threat to carp farms in the disease-free zones? *Acta Ichthyologica et Piscatoria* 39(2):119–126.

OIE. 2018. OIE-Listed diseases 2018. OIE- World Organisation for Animal Health. Available: <http://www.oie.int/animal-health-in-the-world/oie-listed-diseases-2018/> (August 2018).

Okgerman H, Elp M, Yardimci CH. 2011. Growth, the length-weight relationship, and reproduction in Vimba (*Vimba vimba* L. 1758) sampled from an oligo-mesotrophic lake in northwest Anatolia (Turkey). *Turkish Journal of Zoology* 35:87–96.

Sanders S, C. Castiglione, Hoff MH. 2014. Risk Assessment Mapping Program: RAMP. Version 2.81. U.S. Fish and Wildlife Service.

## 11 Literature Cited in Quoted Material

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**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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- Keith P, Allardi J, coordinators. 2001. *Atlas des poissons d'eau douce de France*. Muséum national d'Histoire naturelle, Paris. Patrimoines naturels 47:1–387.
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