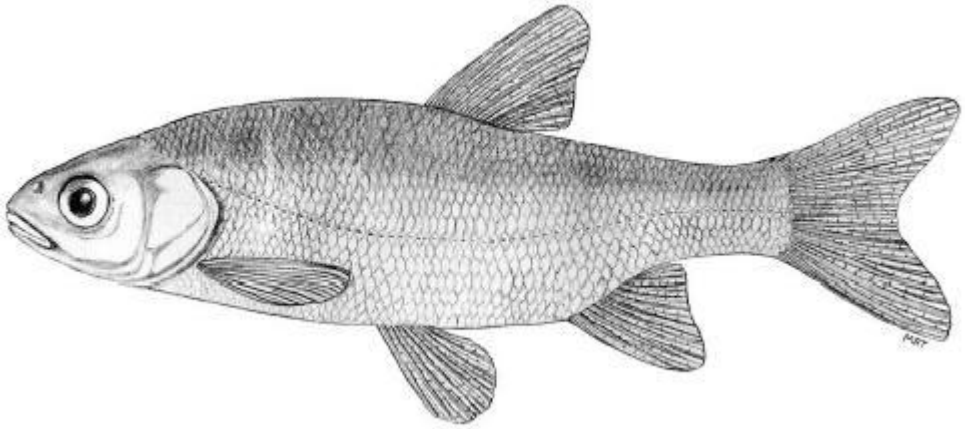
Ide (*Leuciscus idus*)
Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, February 2011
Revised June 2015



Credit: USGS

1 Native Range, and Status in the United States

Native Range
From Nico et al. (2015):

"Native from northern Europe through Siberia (Berg 1949; Robins et al. [1991])."

Status in the United States
From Nico et al. (2015):

"This species was introduced to a private pond in East Lyme Township, New London County, and the Connecticut and Thames Rivers in Connecticut (Whitworth et al. 1968; Schmidt 1986; Whitworth 1996). It was discovered in a private pond in Holden, Penobscot County, Maine in late March 1983 (Courtenay et al. 1984; Page and Burr 1991). In Maryland, it was introduced into the Potomac River near Baltimore and Washington, D.C., and possibly into the Monocacy River (McDonald 1893; Schwartz 1963; Lee et al. 1976, 1980 et seq.; Starnes 2002, Starnes et al. 2011). Silvio O. Conte National Fish and Wildlife Refuge, Massachusetts (USFWS 2005). This species was unsuccessfully stocked in Nebraska in 1884 (Morris et al. 1974). It was recorded from New York (Bean 1903); the earlier introduction was in Long Island, and it was collected in the Chenango River, a tributary of the Susquehanna River, between Hamilton and Norwich, New York, in the early 1950s (Courtenay et al. 1984) and also Cortland County ca. 1954 (Courtenay, personal communication). It has been reported from several ponds in Pennsylvania including sites in Delaware and York counties; there also were unconfirmed records from other private waters of that state (Lee et al. 1980 et seq.; Cooper 1983; Courtenay et al. 1984). This species

was introduced to a pond off the Clinch River, Tennessee (Saylor, personal communication). It was reportedly stocked in Texas during the late 1800s and collected in Cottle, Grayson, and Red River Counties (Howells [1992]; Red River Authority of Texas 2001[a,b,c]). The species has been recorded from the Potomac River and possibly other areas of Virginia (Jenkins and Burkhead 1994; also see Smith and Bean 1899; Starnes 2002)."

"There are reports of introductions of this species into un-specified waters of the following states in the early1890s: Arkansas, Florida, Georgia, Illinois, Indiana, Kansas, Louisiana, Massachusetts, Minnesota, Missouri, Ohio, New Jersey, and North Carolina (U.S Fish Commission Reports for 1893 and 1894)."

Means of Introductions in the United States

From Nico et al. (2015):

"The ide was first imported in 1877 by the U.S. Fish Commission (Baird 1879). It has been stocked intentionally by the U.S. Fish Commission (historically), and by a state agency (recently), and through escapes from commercial and government ponds (Lee et al. 1980 et seq.). In 1889, an estimated 20 ide, along with other foreign cyprinids, escaped into the Potomac River from fish ponds in Washington, D.C., during a flood event (McDonald 1893). Similarly, Schwartz (1963) stated that it may have escaped from commercial ponds at Thurmont, Maryland into the Monocacy River; but he did not provide a date nor other details. Ide were also consigned to applicants in Virginia from 1892 to 1894 (Jenkins and Burkhead 1994). According to Courtenay et al. (1984, 1986), the U.S. Fish Commission gave no specific reason for importing and distributing this species, although they assumed that the intended use was both as an ornamental and food fish. Bean (1903) indicated that this species was introduced into American ponds for ornamental purposes. Schwartz (1963) stated that it may have escaped from commercial ponds at Thurmont, Maryland into the Monocacy River; but he did not provide a date or other details. Reports of ide culture in Arkansas are incongruous. Fletcher and Hallock (1992) reported that Arkansas fish farmers were raising ide for bait in the early 1990s. However, recent discussions with University of Arkansas personnel, fish farmers, and other local experts indicate there are no known records of ide culture in Arkansas and that they are doubtful the the species was ever raised commercially there (N. Stone, Univ. of Ark., pers. comm., 2005). In the early 1980s this species was reportedly being used as a bait fish in Tennessee (Courtenay et al. 1984, 1986). Because this species is sometimes misidentified as goldfish, Courtenay et al. (1984) argued that there was an increased probability of its spread and possible establishment."

Remarks

From Nico et al. (2015):

"The ide has been recorded from nine states, but the documentation of its true status in the United States is poor and often contradictory. Courtenay and Stauffer (1990), Courtenay et al. (1991) and Courtenay (1993) listed it as established in Maine; Page and Burr (1991) stated that the species is locally established in a pond in Maine. However, in some early accounts the only known Maine population was thought to have been eradicated (e.g., Courtenay et al. 1984, 1986). In fact, Courtenay et al. (1986) stated that the Maine Department of Inland Fisheries and Wildlife eradicated the population in May 1983. According to Whitworth et al. (1968) one small

pond in Connecticut has maintained a population since 1962 or 1963; Schmidt (1986) also listed *L. idus* as introduced to lowland lacustrine habitat in the Connecticut River drainage. Subsequently, Courtenay et al. (1984, 1986) and Whitworth (1996) stated that the population in Connecticut had been eradicated. It was formerly established in one or a few water bodies in Pennsylvania and New York; however, according to Courtenay et al. (1984, 1986), those populations are no longer extant. The fish that escaped from Washington, D.C. ponds in 1889 apparently persisted for some time. That escape also apparently resulted in the species being listed as occurring in several states along Potomac River, including Virginia and Maryland. Although the literature seems to suggest that the ide population in the Potomac was self sustaining, it is not known when ide actually disappeared completely from the Potomac drainage. For instance, Schwartz (1963) apparently considered the ide to be established in the Potomac River; and Hocutt et al. (1986) listed it as introduced to the Potomac River. However, Musick (1972) doubted that this species still survived there, and both Jenkins and Burkhead (1994) and Starnes et al. (2011) also concluded that there was no evidence indicating the ide persists in the Potomac drainage. Stockings of this species during the late 1800s were unsuccessful in both Nebraska (Morris et al. 1974) and Texas (Howells [1992]). There is only a single record documenting its occurrence in open waters of Tennessee (Saylor, personal communication). Howells ([1992]) indicated that the U.S. Bureau of Fisheries (i.e., the U.S. Fish Commission) distributed the species to private individuals for introduction, but the actual introduction sites are largely unrecorded. The species never became established in Texas and has not been reported since their original introduction (Howells [1992]).”

“In its native range, the ide is migratory and found in both freshwater and brackish water habitats (Muus and Dahlström 1978). The fish typically prey on larval and adult insects, snails, and other invertebrates; larger individuals also take small fish (Phillips and Rix 1985). The golden orfe or golden ide is a domestic form with portions of the body and fins pinkish-gold or red-orange. This colorful variety has received some degree of attention as an ornamental pond fish since its first introduction into this country near the turn of the century (e.g., Bean 1896, 1903). This specie still is occasionally kept in garden ponds, sometimes in combination with goldfish and koi, or with other orfe varieties, such as the blue orfe (Smith 1995). Dill and Cordone (1997) stated that this fish is not known to have been introduced into wild waters of California; however, they also indicated that the domesticated form, the golden orfe, has been present in garden pools and commercial aquaculture facilities in that state for a number of years.”

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 Ostariophysi
Order Cypriniformes
Superfamily Cyprinoidea
Family Cyprinidae
Genus Leuciscus
Species Leuciscus idus (Linnaeus, 1758)"

"Taxonomic Status: valid"

Size, Weight, and Age Range

From Froese and Pauly (2015):

"Max length : 85.0 cm SL male/unsexed [Kottelat and Freyhof 2007]; common length : 30.0 cm TL male/unsexed; [Muus and Dahlström 1968]; max. published weight: 4,000 g [Muus and Dahlström 1968]; max. reported age: 18 years [Wüstemann and Kammerad 1995]"

Environment

From Froese and Pauly (2015):

"Freshwater; brackish; benthopelagic; pH range: 7.0 - 7.5; dH range: 10 - 15; potamodromous [Riede 2004]; depth range 15 - ? m [Stephenson and Momot 1991]"

Climate/Range

From Froese and Pauly (2015):

"Temperate; 4°C - 20°C [Riehl and Baensch 1991]; 73°N - 37°N, 7°E - 136°E"

Distribution Outside the United States

Native

From CABI (2015):

"*L. idus* is native to most of mainland Europe and Western Asia (see Berg, 1964; Nico and Fuller, 2008)."

Introduced

From CABI (2015):

"*L. idus* was introduced to the UK in 1874, where the golden ornamental variety became common in lakes (Lever, 1977). *L. idus* was introduced to The Netherlands from France and Germany as an ornamental fish and it is cultured on a large scale for ornamental purpose (Groot, 1985)."

"It has been introduced to New Zealand from the UK and the USA during the 1980s and has been captured in the wild, and occurs and reproduces in several small lakes in northern New Zealand (McDowall, 1990), however, the range of expansion is unknown (Chadderton et al., 2003)."

"It is likely to be more widely distributed [than] indicated"

Means of Introduction Outside the United States

From GISD (2010):

"**Introduction pathways to new locations**
Pet/aquarium trade: Golden orfe are valued as ornamental pond fish
Smuggling: There have been instances of orfe being illegally introduced to new locations by anglers.

Local dispersal methods
For ornamental purposes (local): Golden orfe are valued as ornamental pond fish
Intentional release: Orfe may be introduced to new locations for ornamental purposes or angling.
Natural dispersal (local): Populations can expand their range within connected waterbodies by swimming."

Short description

From Froese and Pauly (2015):

"Dorsal spines (total): 3; Dorsal soft rays (total): 8 - 11; Anal spines: 3; Anal soft rays: 8 - 11; Vertebrae: 47. Diagnosed from congeners in Europe by the following characters: lateral line with 56-58 + 3 scales; pharyngeal teeth 3,5-5,3; mouth terminal; dorsal fin with 8½ branched rays; anal fin with 10-11½ branched rays; all fins except dorsal fin with reddish tinge; pigmentation on lateral scales lacking regular black mesh [Kottelat and Freyhof 2007]. Caudal fin with 19 rays [Spillman 1961]."

Biology

From Froese and Pauly (2015):

"Usually inhabits large lowland rivers and nutrient-rich lakes. Adults are solitary while juveniles are gregarious. Undertakes migration to tributaries to spawn in moderate current on gravel or submerged vegetation. Feeds on various aquatic and terrestrial animals and plant material. Larger individuals feed mainly on fishes. Feeding larvae and juveniles thrive in a wide variety of shoreline habitats and leave the shores for deeper waters when growing. Reported to sometimes hybridizes with Aspius aspius [Kottelat and Freyhof 2007]. Its flesh is not tasty [Billard 1997]. Aquarium keeping: at least 10 individuals; minimum aquarium size >200 cm; not recommended for home aquariums [BMELF 1999]."

Human uses

From Froese and Pauly (2015):

"Fisheries: commercial; gamefish: yes; aquarium: commercial"

Diseases

From Froese and Pauly (2015):

"Trichodinosis, Parasitic infestations (protozoa, worms, etc.)
Bacterial Infections (general), Bacterial diseases
Pseudocapillaria Infestation 1, Parasitic infestations (protozoa, worms, etc.)"

From McAllister et al. (1985):

"Carp pox, a putative viral disease exotic to North America, occurred in golden ide 1 yr after the fish were imported into the United States from the Federal Republic of Germany. The raised, white, plaque-like lesions, which occurred on about 5% of the fish, healed spontaneously and caused no mortality. Electron micrographs showed herpesvirus-like particles associated with lesion specimens; however, no infectious viruses were detected in tests with seven warmwater fish cell lines."

From Dixon (2012):

"Spring viraemia of carp (SVC) is a rhabdovirus infection capable of inducing an acute haemorrhagic and contagious viraemia in several carp species and of some other cyprinid and ictalurid fish species."

"Naturally occurring SVC infections have been recorded from the following cyprinid species: common carp (*Cyprinus carpio carpio*) and koi carp (*Cyprinus carpio koi*), crucian carp (*Carassius carassius*), silver carp (*Hypophthalmichthys molitrix*), bighead carp (*Aristichthys nobilis*), grass carp (white amur) (*Ctenopharyngodon idella*), goldfish (*Carassius auratus*), orfe (*Leuciscus idus*), and tench (*Tinca tinca*) and bream (*Abramis brama*) (Basic et al., 2009; Dixon, 2008). … The virus has also been isolated from the non-cyprinid sheatfish (also known as European catfish or wels) (*Silurus glanis*) and from pike (*Esox lucius*) … (Koutná et al., 2003)."

"SVCV has also been reported to have been isolated from Nile tilapia (*Sarotherodon niloticus*) (Soliman et al., 2008) and rainbow trout (*Oncorhynchus mykiss*) (Jeremic et al., 2006; Haghighi Khiabanian Asl et al. [2008])."

"Other cyprinid species have been shown to be susceptible to SVCV by experimental bath infection, including roach (*Rutilus rutilus*) (Haenen & Davidse, 1993) whilst zebra fish (*Danio rerio*) and the golden shiner (*Notemigonus crysoleucas*) have been infected with SVCV by intraperitoneal injection (see Dixon, 2008). It is reasonable to assume that other cyprinid species in temperate waters may be susceptible to infection. Other species can also be infected experimentally, e.g. guppy (*Lebistes reticulatus*). The pumpkinseed (*Lepomis gibbosus*) has been reported to have been experimentally infected with SVCV, but there are no supporting data."

Spring viraemia of carp is an OIE-reportable disease.

Threat to humans

From Froese and Pauly (2015):

"Harmless"

3 Impacts of Introductions

From Nico et al. (2015):

"Impact of Introduction: Unknown. Seeley (1962) recommended against the introduction of the ide into California. Based on his review of the literature, he indicated the species had the potential of becoming established in state rivers, lakes, and reservoirs, and also of entering brackish and estuarine waters. Because of its tolerance to a wide range of conditions, Seeley believed that it had the potential of becoming more of a problem than either goldfish or common carp."

From GISD (2010):

"There is no information regarding the impacts of orfe (ide) in New Zealand as it is confined to one location. Most concerns appear to be based on the fact that it is in the same family as the highly invasive European carp (*Cyprinus carpio*), which has caused damage to some aquatic ecosystems where it has been introduced Australia, New Zealand and the USA. However, orfe can tolerate a higher level of salinity than any other cyprinid fish so may be able to colonise brackish water and estuarine habitats. These are often critical bottlenecks for anadromous (migrating up rivers from the sea to breed in fresh water) species. The potential for orfe to cause problems in countries where its natural controls are absent is of concern (David Rowe pers.comm., 2005)."

From CABI (2015):

"*L. idus* is considered a potentially invasive fish that could damage native aquatic ecosystems, though there is lack of information regarding its impacts. The ability of *L. idus* to tolerate wide range of habitats including fresh, brackish, and sea water led to it being recognized it as a potential invasive species, similar to several other invasive members of the Cyrinidae (carp) family. However, there are no recorded negative environmental impacts caused by this species to date."

4 Global Distribution

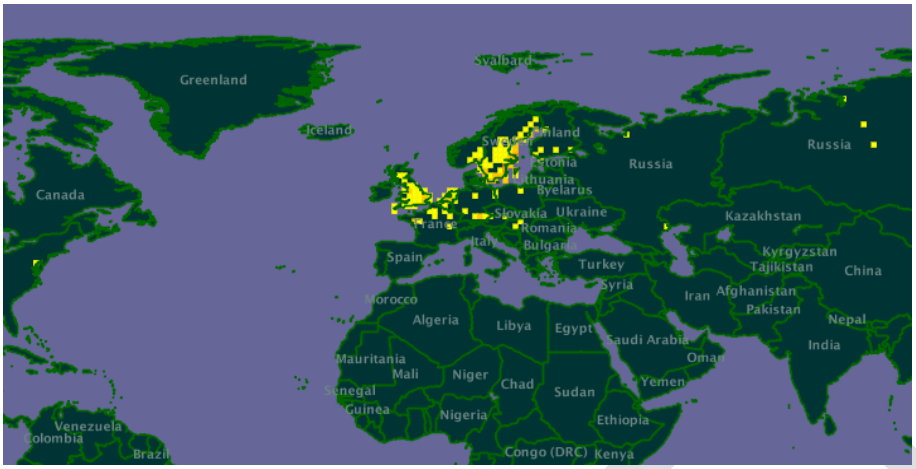


Figure 1. Global distribution of *L. idus*. Map from GBIF (2010). One location in Africa had incorrect coordinates and was not used.

5 Distribution within the United States

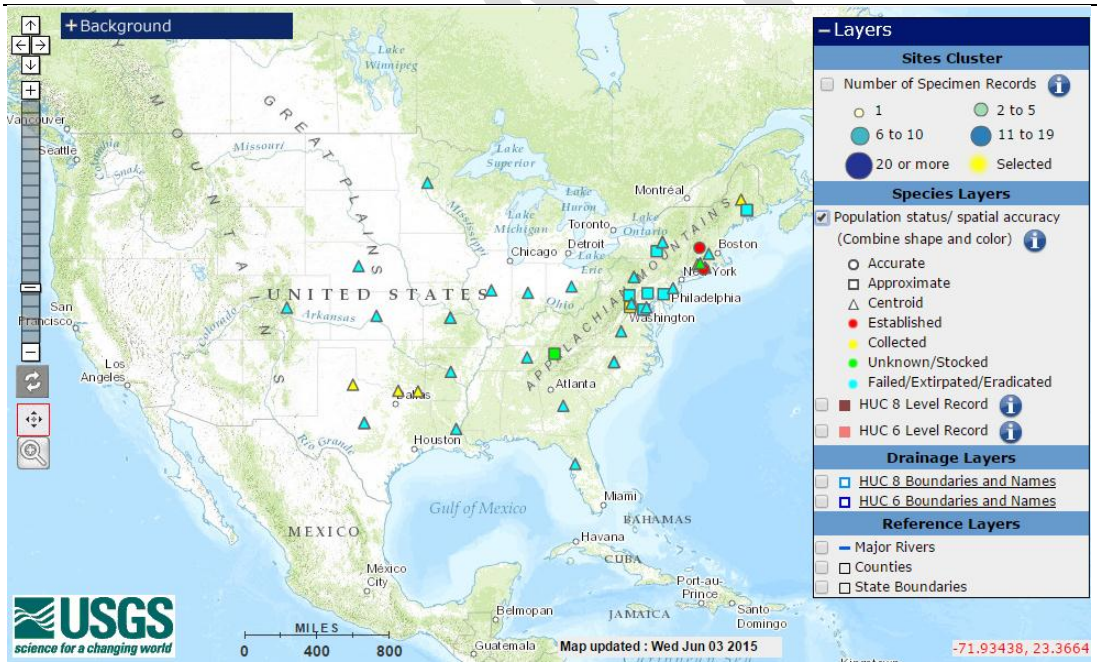


Figure 2. Distribution of *L. idus* in the US. Map from Nico et al. (2015).

6 CLIMATCH

Summary of Climate Matching Analysis

The climate match (Australian Bureau of Rural Sciences 2010; 16 climate variables; Euclidean Distance) was high in the northeastern states, including the Great Lakes region. High matches

also occurred in several western and northwestern states. Most of the Midwest had medium matches. Low to medium matches covered the West Coast and southeastern states. The Gulf of Mexico coast from Texas to Florida was a very low match. Climate6 match indicated that the continental United States has a high climate match. The range for a high climate match is 0.103 and greater; climate match of the *L. idus* is 0.359.

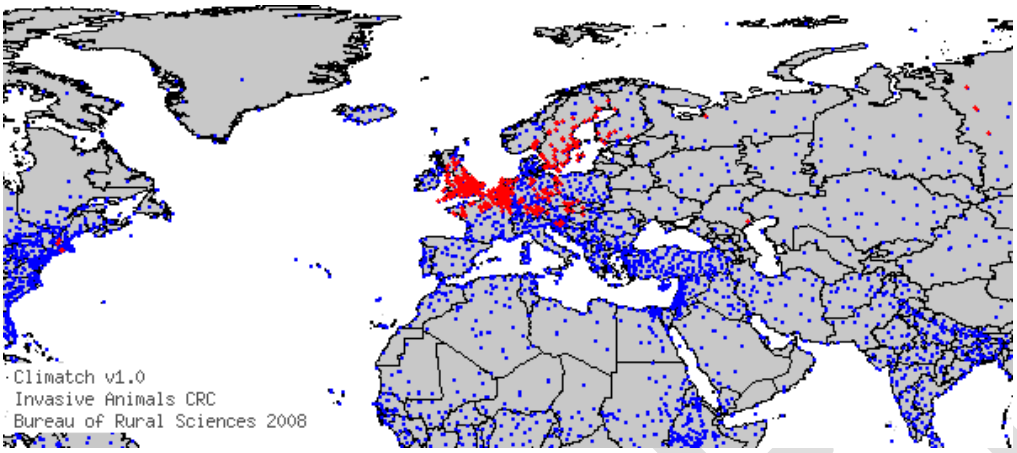


Figure 3. CLIMATCH (Australian Bureau of Rural Sciences 2010) source map showing weather stations selected as source locations (red) and non-source locations (blue) for *L. idus* climate matching. Source locations from GBIF (2010) and Nico et al. (2015). Only established locations were used.

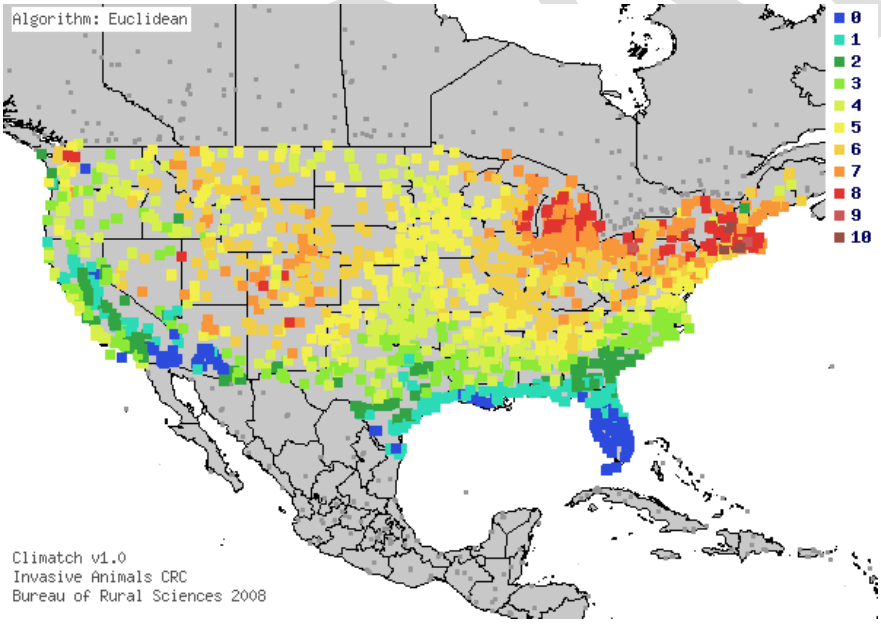


Figure 4. Map of CLIMATCH (Australian Bureau of Rural Sciences 2010) climate matches for *L. idus* in the continental United States based on source locations reported by GBIF (2010) and Nico et al. (2015). 0= Lowest match, 10=Highest match.

Table 1. CLIMATCH (Australian Bureau of Rural Sciences 2010) climate match scores.

CLIMATCH Score	0	1	2	3	4	5	6	7	8	9	10
Count	122	153	140	219	292	342	354	249	97	5	6
Climate 6 Proportion = 0.359 (High)											

7 Certainty of Assessment

Much confusion surrounds the status of *L. idus* populations in the US and elsewhere in terms of both its distribution and establishment. Authorities readily admit that the impacts of introduced populations of this species are unknown. For these reasons, the certainty of assessment is low.

8 Risk Assessment

Summary of Risk to the Continental United States

The climate match is extremely high, with medium and high matches covering much of the continental US. However, although *L. idus* has been introduced to many locations in the US, it is not thought to be established in most of them, indicating a low ability to invade new territories. *L. idus* is related to the highly-invasive European carp (*Cyprinus carpio*), but adverse impacts related to its introduction have yet to be demonstrated. *L. idus* is susceptible to spring viraemia of carp virus (SVCV), which is an OIE-reportable disease. *L. idus* thus presents high overall risk to waters with no history of SVCV because of the large number of fish species susceptible to this disease. For waters already exposed to SVCV, the amount of confusion surrounding this species establishment and impacts in the US leads to an uncertain overall risk.

Assessment Elements: For Waters With No History of SVCV

- **History of Invasiveness (Sec. 3):** High
- **Climate Match (Sec. 6):** High
- **Certainty of Assessment (Sec. 7)**: Low
- **Overall Risk Assessment Category: High**

Assessment Elements: For Waters With A History of SVCV

- **History of Invasiveness (Sec. 3):** Uncertain
- **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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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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