

# Headwater Catfish (*Ictalurus lupus*)

## Ecological Risk Screening Summary

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<http://www.inaturalist.org/observations/679844>. (July 2017).

## 1 Native Range and Status in the United States

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### Native Range

From Froese and Pauly (2017):

“North America: USA to Rio Grande drainage including Pecos River system in southeast New Mexico and Devils River in southern Texas; also in northeastern Mexico.”

## Status in the United States

From Hendrickson and Cohen (2015):

“Currently inhabits clear, headwater streams in the Rio Grande drainage of New Mexico, Texas and Mexico, and Gulf slope streams of northeastern Mexico (Kelsch and Hendricks 1986; Sublette et al. 1990). Native to the Pecos and Rio Grande basins of Texas and New Mexico (Hubbs et al. 1991).”

“Native to the Pecos and Rio Grande basins of Texas; once found in the upper Nueces, San Antonio, Guadalupe, and Colorado basins, but appears to be extirpated from these systems (Kelsch and Hendricks 1990). Relatively uncommon but persistent in Independence Creek (tributary of the lower Pecos River, Rio Grande drainage) collections (Bonner et al. 2005). Edwards et al. (2002) found the species in the Rio Grande below the Rio Conchos confluence downstream through the lower canyons of the Big Bend region (in low abundance). Platania (1990) reported collection of 23 specimens only at Hinds Creek on upper San Felipe Creek in Del Rio. Species found in the Devils River, with relative abundance of less than 1% (Harrell 1978).”

From Clausen and Hammerson (2012):

“[...] Colorado River populations were likely the result of introductions (R. R. Miller, pers. comm., cited by Hubbs et al. 2008).”

“The species has been transplanted from Delaware River to Sitting Bull Canyon Creek (Eddy County, New Mexico), but success of this was unknown as of 1990 (Sublette et al. 1990).”

“Competition and/or hybridization with *Ictalurus punctatus* in the greatly disturbed streams of New Mexico has eliminated *Ictalurus lupus* from most of its original range (Sublette et al. 1990).”

From McClure-Baker et al. (2010):

“We obtained channel and headwater catfish from nearly all localities where headwater catfish occurred historically in the Rio Grande and Pecos and Nueces rivers. The exceptions include now-dry streams (Rio Felix and Berrendo creeks near Roswell, New Mexico, and Comanche and Leon springs near Fort Stockton, Texas) and a location where headwater catfish had been stocked in the 1980s (the Sitting Bull Falls area west of Carlsbad, New Mexico; M. Hatch, New Mexico Game and Fish Department, personal communication). We sampled immediately upstream and downstream of Sitting Bull Falls but failed to collect catfish.”

## Means of Introductions in the United States

From McClure-Baker et al. (2010):

“[...] headwater catfish had been stocked in the 1980s (the Sitting Bull Falls area west of Carlsbad, New Mexico; M. Hatch, New Mexico Game and Fish Department, personal communication).”

## Remarks

From Kelsch and Hendricks (1990):

“The headwater catfish *Ictalurus lupus* (Girard) is a little known member of the channel catfish, *Ictalurus punctatus*, species complex. It is sufficiently similar to *I. punctatus* that the two species are often difficult to distinguish. The character commonly used in keys to distinguish the two species is the number of anal rays; *I. punctatus* has 24 to 29, and *I. lupus* has 23 to 25 anal rays. This method of discrimination has proven unsatisfactory since many specimens have anal ray counts falling within the range of overlap. Recent osteological, external morphological, and electrophoretic evidence (Yates et al., 1984; Kelsch and Hendricks, 1986) has supported the independent species status of *I. lupus* and led to new methods of discrimination.”

## 2 Biology and Ecology

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### Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2017):

“Kingdom Animalia  
Subkingdom Bilateria  
Infrakingdom Deuterostomia  
Phylum Chordata  
Subphylum Vertebrata  
Infraphylum Gnathostomata  
Superclass Actinopterygii  
Class Teleostei  
Superorder Ostariophysi  
Order Siluriformes  
Family Ictaluridae  
Genus *Ictalurus*  
Species *Ictalurus lupus* (Girard, 1858) – headwater catfish, bagre lobo”

From Eschmeyer et al. (2017):

“Current status: Valid as *Ictalurus lupus* (Girard 1858). Ictaluridae.”

### Size, Weight, and Age Range

From Froese and Pauly (2017):

“Max length : 48.0 cm TL male/unsexed; [Page and Burr 1991]; 32.8 cm TL (female)”

From Hendrickson and Cohen (2015):

“In captivity, males have attained 431 mm TL, and females 328 mm TL (Dr. Paul Turner, pers. comm. *in*: Sublette et al. 1990).”

## **Environment**

From Froese and Pauly (2017):

“Freshwater; demersal.”

From Clausen and Hammerson (2012):

“Habitat includes sandy and rocky riffles, runs, and pools of clear creeks and small rivers; springs (Page and Burr 2011); clear temperate waters generally with a moderate gradient; headwater streams and fluctuating tailwaters of dams (Sublette et al. 1990).”

## **Climate/Range**

From Froese and Pauly (2017):

“Subtropical, preferred ?; 32°N - 26°N”

## **Distribution Outside the United States**

### **Native**

From Clausen and Hammerson (2012):

“[...] various localities in Coahuila, Durango, Nuevo Leon, and Tamaulipas, Mexico, southward to rios San Fernando and Soto la Marina (Kelsch and Hendricks 1986, Sublette et al. 1990, Miller 2005). Presently the species is widely distributed and moderately common in headwater and upstream sections of the Rio Grande, Pecos River, Rio San Fernando, Rio Soto la Marina, and the isolated Cuatro Cienegas basin (Kelsch and Hendricks 1986).”

### **Introduced**

This species has not been reported as introduced outside of the U.S.

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

This species has not been reported as introduced outside of the U.S.

## **Short Description**

From Hendrickson and Cohen (2015):

“Coloration: Back and sides olivaceous with a few scattered, diffuse black spots on the sides; abdomen silvery (Sublette et al. 1990).”

“Counts: 23-26 anal fin rays (Hubbs et al. 1991). Dorsal rays 6 (5-8), 1 dorsal spine, pectoral rays 8-10, 1 pectoral spine, pelvic rays 8, anal rays 23 (20-26), caudal rays 17-26 (Sublette et al. 1990).”

“Body shape: Head rounded (Hubbs et al. 1991); dorsal view of snout rounded; eye closer to dorsum of head than to venter (Sublette et al. 1990). In New Mexico, fish are broader than their counterparts in Texas (Kelsch 1995).”

“Mouth position: Subterminal, upper jaw projecting (Sublette et al. 1990).”

“External morphology: Pectoral spine length much less than caudle peduncle depth; pectoral fin spine contained more than five times in standard length; caudal fin deeply forked; adipose fin free at tip, not joined to caudal fin (Hubbs et al 1991). Lateral line complete, terminating at the base of the caudal rays; thin, short barbels located immediately in front of the posterior nostrils; maxillary barbels exceed length of the head; chin with a transverse row of four barbels, median two barbels shorter than the outer ones (Sublette et al. 1990).”

“Internal morphology: Premaxillary band of teeth on upper jaw without a lateral backward extension on each side (Hubbs et al. 1991).”

## **Biology**

From Hendrickson and Cohen (2015):

“Particulate herbivore and benthic invertivore (following trophic guild classification of Goldstein and Simon 1999), and based on large amounts (96% by weight) of algae and aquatic invertebrates found in the gut contents; however presence of fish and terrestrial arthropods suggested carnivorous and opportunistic feeding behavior (Littrell et al. 2003). Gut contents of *Ictalurus lupus* from Independence Creek (Pecos River drainage) and Dolan Creek (Devils River drainage) of west Texas were examined and found to consist of algae and detritus (85%), aquatic insects (9%), crustaceans (3%) and other aquatic and terrestrial organisms (3%); aquatic insects and crustaceans were more prevalent in younger fish than older fish (Littrell et al. 2003)”

From Clausen and Hammerson (2012):

“This species is represented by a fairly large number of occurrences (subpopulations). Miller (2005) mapped about 23 collection sites in Mexico; these represent probably at least a dozen distinct subpopulations.”

“Total adult population size is unknown, but this species is regarded as locally or moderately common (Kelsch and Hendricks 1990, Page and Burr 2011). However, the species appears to be relatively uncommon in New Mexico and Texas (Harrell 1978, Platania 1990, Edwards et al. 2002, Bonner et al. 2005).”

## **Human Uses**

From Froese and Pauly (2017):

“Fisheries: of no interest; aquarium: commercial”

## **Diseases**

From Aguilar-Aguilar et al. (2014):

“*Leptorhynchoides thecatus* (Adult, A[canthocephala])  
*Procamallanus* sp. (Adult, N[ematoda])  
*Rhabdochona* sp. (Larvae, N[ematoda])”

From Littrell et al. (2003):

“Intestinal parasites were in 45% of the fish, 65% in catfish from Independence Creek and 18% in catfish from Dolan Creek. Trematoda was the most common and abundant parasite, occurring in 45% of the catfish (mean = 3.6 per fish, range = 1 – 29), followed by Acanthocephala (21% mean = 0.95 per fish, range = 1 – 12) and Cestoda (2%, found in one fish). Although parasites were common in the intestines of *I. lupus*, their frequency and intensity were not unusual for fishes (Ryon 1986; Nie et al. 1999). [...] In addition, no evidence was found that fish were negatively affected (e.g., emaciated) by the infestation levels observed here.”

No OIE-reportable diseases have been documented for this species.

## **Threat to Humans**

From Froese and Pauly (2017):

“Harmless”

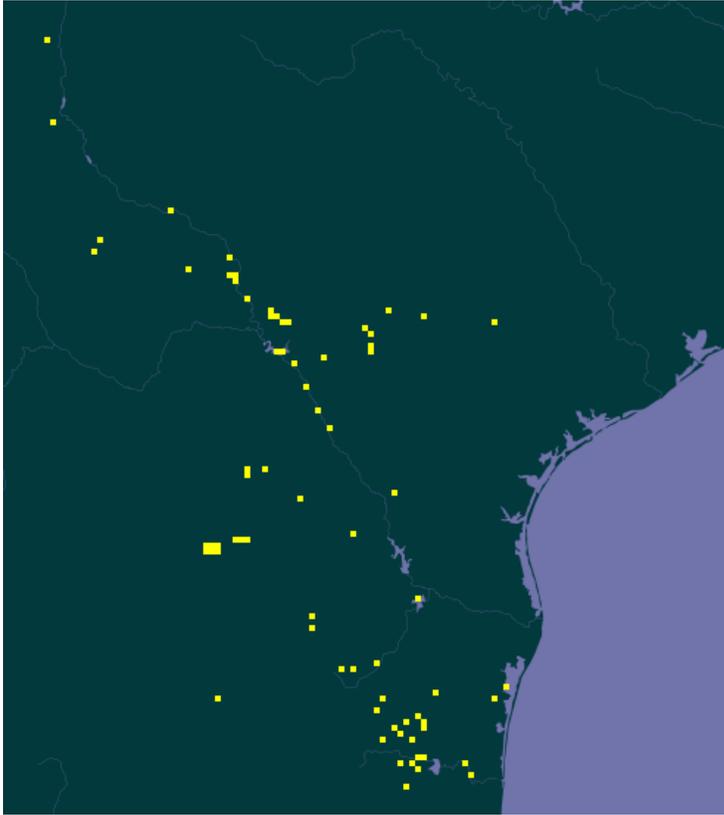
## **3 Impacts of Introductions**

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No information available.

## 4 Global Distribution

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**Figure 1.** Known global distribution of *Ictalurus lupus* (Texas and northeastern Mexico). Map from GBIF (2016). Points in northwestern Mexico and south of the Soto la Marina basin were excluded from this map and from climate matching because they lie outside the described range of the species (Clausen and Hammerson 2012; Distribution Outside the United States, above).

## 5 Distribution Within the United States

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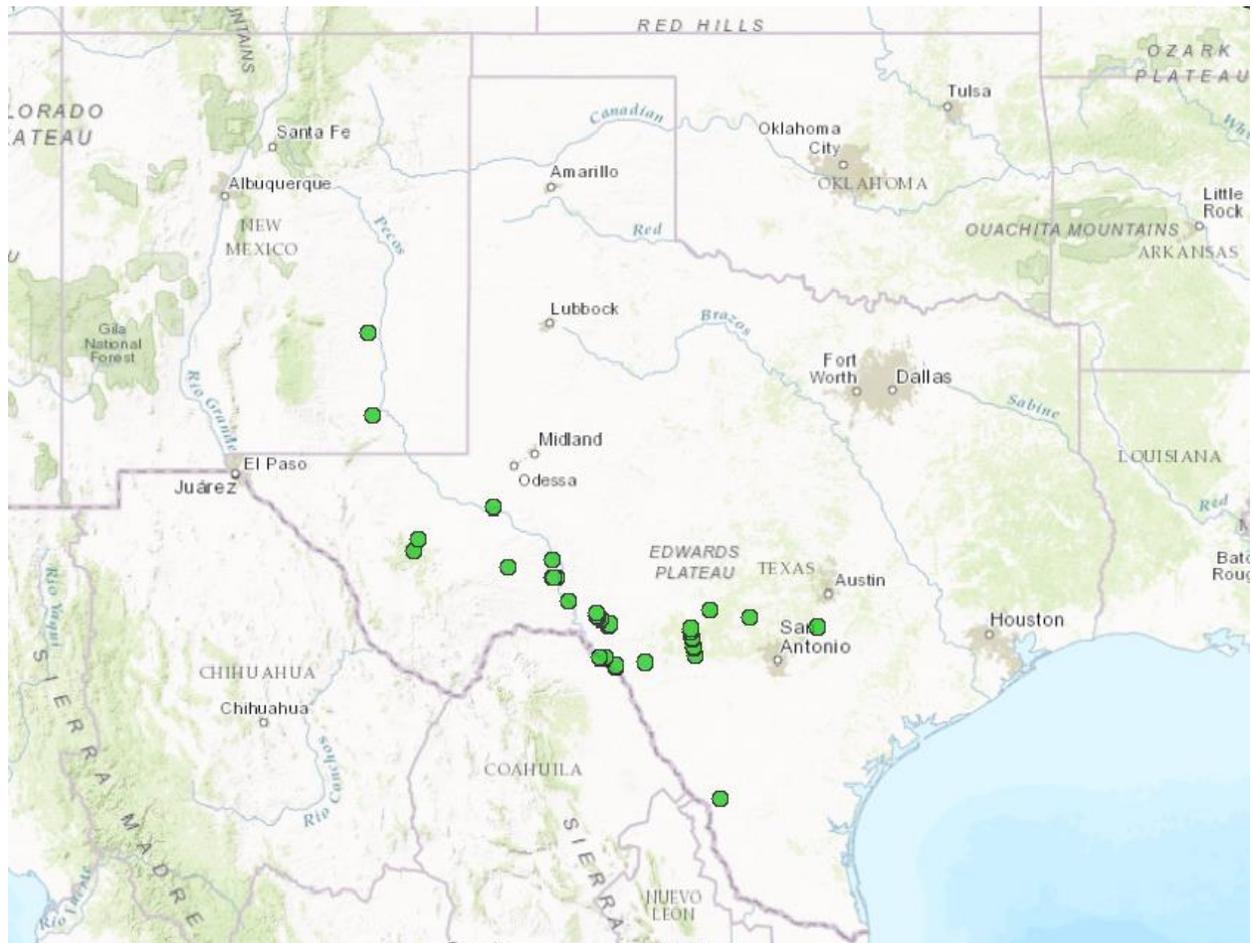


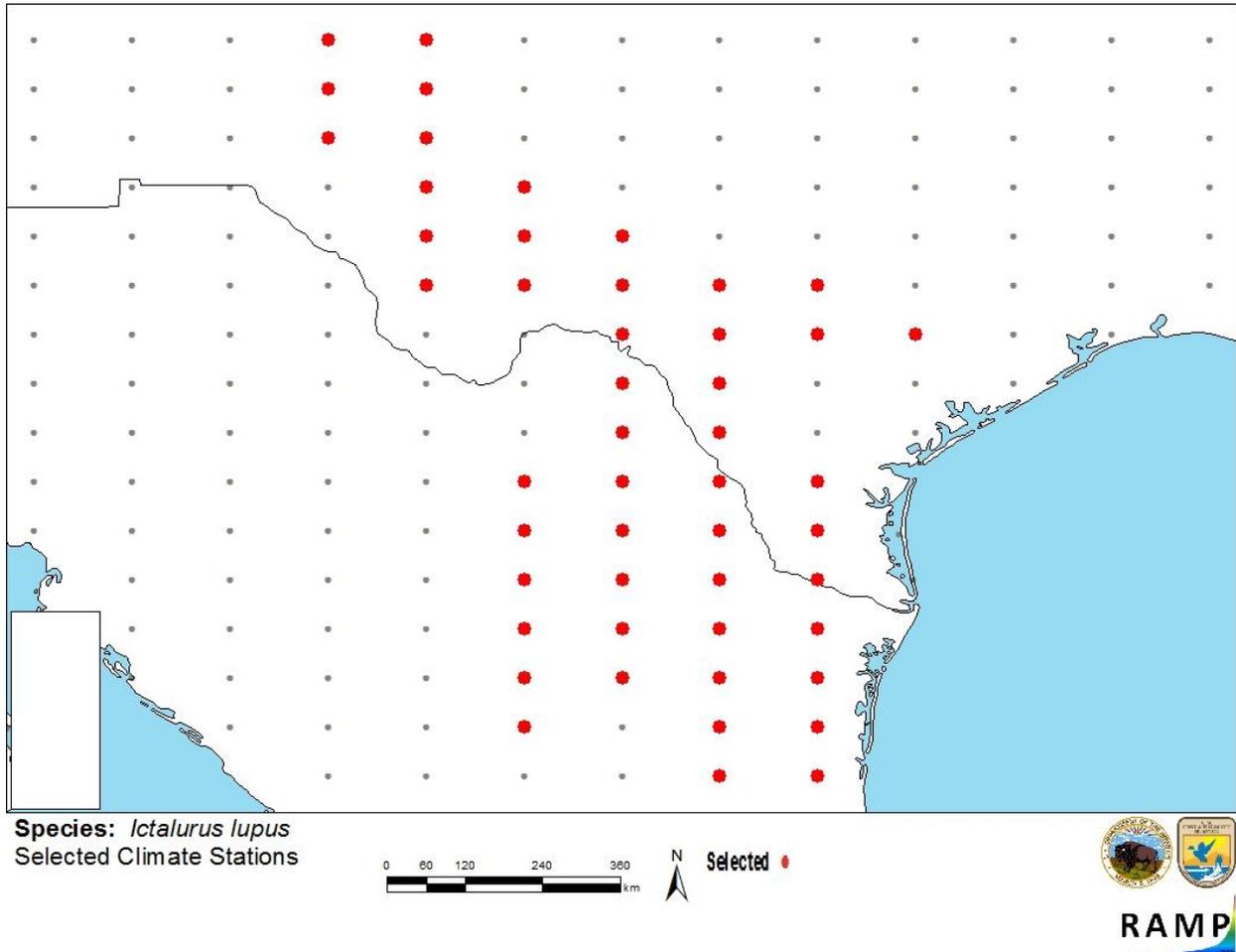
Figure 2. Known distribution of *Ictalurus lupus* in the United States. Map from BISON (2017).

## 6 Climate Matching

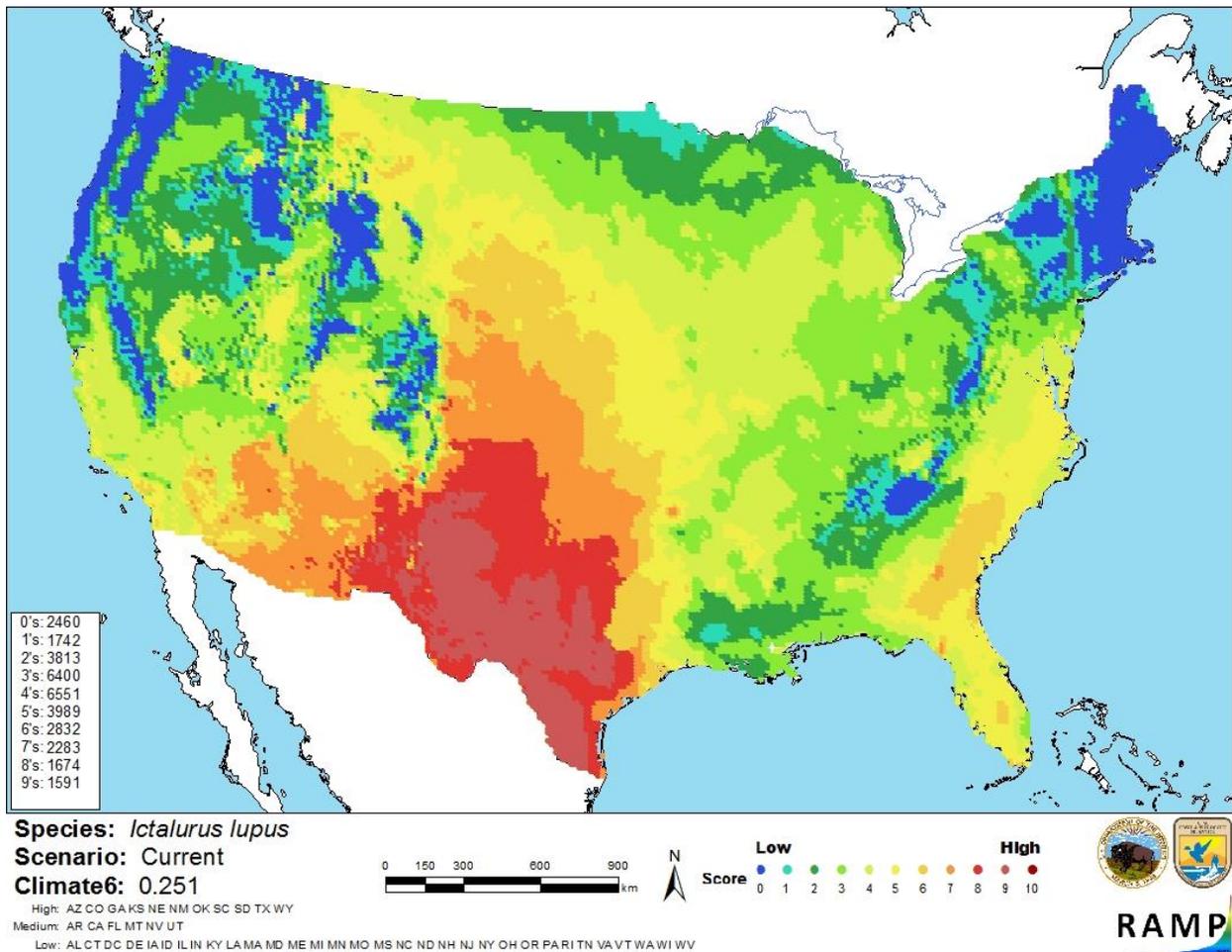
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### Summary of Climate Matching Analysis

The climate match (Sanders et al. 2014; 16 climate variables; Euclidean distance) was high in Texas and adjoining areas of New Mexico and Oklahoma. Medium climate matches extended northward through the Plains states, westward to central and southern California, and along the Atlantic Coast between Maryland and Florida. The Northeast, Upper Midwest, Pacific Northwest, and the Appalachian Mountains showed low climate matches. Climate 6 score indicated that the contiguous U.S. has a high climate match overall. Scores of 0.103 or greater are classified as high match; Climate 6 score for *I. lupus* was 0.251.



**Figure 3.** RAMP (Sanders et al. 2014) source map of southern Texas and northeastern Mexico showing weather stations selected as source locations (red) and non-source locations (gray) for *Ictalurus lupus* climate matching. Source locations from GBIF (2016).



**Figure 4.** Map of RAMP (Sanders et al. 2014) climate matches for *Ictalurus lupus* in the contiguous United States based on source locations reported by GBIF (2016). 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
$0.000 < X < 0.005$	Low
$0.005 < X < 0.103$	Medium
$> 0.103$	High

## 7 Certainty of Assessment

There is adequate information available on the biology and distribution of *Ictalurus lupus*. This species has a well-documented native range. *I. lupus* has been introduced into two locations, but it is unclear if these populations became established. Certainty of this assessment is low.

## 8 Risk Assessment

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### Summary of Risk to the Contiguous United States

*Ictalurus lupus* is a catfish native to New Mexico, Texas, and northern Mexico. Although intentional introductions of *I. lupus* have been documented, it is unclear if these populations became established. *I. lupus* has a high climate match with the United States, with the areas of highest match located in New Mexico and Texas, which is the native U.S. range of this species. Overall risk assessment category 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

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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 10.**

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## 10 References Quoted But Not Accessed

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