Punagas (*Pangasius pangasius*)
Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, May 2011
Revised, August 2018
Web Version, 2/10/2021

Organism Type: Fish
Overall Risk Assessment Category: Uncertain

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1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2018a):

"Asia: large rivers of Indian subcontinent [including Pakistan] and Myanmar (Ganges, Krishna?, Godavari, Irrawaddy). […] Reports from Thailand, Malaysia and Indonesia are based on misidentifications."

"[In Bangladesh:] Found in Choto Jamuna river [sic] [Galib et al. 2013]. Occurs in the Ganges River."

"[In India:] Known throughout India [Shaji et al. 2000]. Found in Bihar, Darjeeling, Assam, Orissa, Madhya Pradesh, Chennai, West Bengal, Rohini and Rapti river [sic] in Uttar Pradesh and Gangetic estuary [Kapoor et al. 2002]. Recorded from Chilka Lake [Rao 1995]."

"[In Myanmar:] Occurs in Irrawaddy basin [Vidthayanon et al. 2005]."

"[In Nepal:] Occurs in Koshi, Narayani and Bagmati rivers [Shrestha 2008]."

Status in the United States

No records of *Pangasius pangasius* in the wild or in trade in the United States were found.

Pangasius pangasius falls within Group I of New Mexico's Department of Game and Fish Director's Species Importation List (New Mexico Department of Game and Fish 2010). Group I species "are designated semi-domesticated animals and do not require an importation permit." With the added restriction of "Not to be used as bait fish."

Means of Introductions in the United States

No records of *Pangasius pangasius* in the wild in the United States were found.

Remarks

From Froese and Pauly (2018a):

"Status of threat: Critically endangered in Western Ghats [India] [Dahanukar et al 2004]."

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

According to Eschmeyer et al. (2018), *Pangasius pangasius* (Hamilton 1822) is the valid name for this species. It was originally described as *Pimelodus pangasius*.

From ITIS (2018):

Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Actinopterygii
Class Teleostei
Superorder Ostariophysi
Order Siluriformes
Family Pangasiidae
Genus *Pangasius*
Species *Pangasius pangasius* (Hamilton 1822)

Size, Weight, and Age Range

From Froese and Pauly (2018a):

"Maturity: L_m ?, range 63 - ? cm
Max length : 300 cm SL male/unsexed; [Davidson 1975]"

Environment

From Froese and Pauly (2018a):

"Freshwater; brackish; benthopelagic; pH range: 6.0 - 7.5; dH range: ? - 25; potamodromous [Riede 2004]; depth range 50 - ? m [Talwar and Jhingran 1991]. […]; 23°C - 28°C [assumed to be recommended aquarium temperature] [Baensch and Riehl 1991]; […]"

Climate

From Froese and Pauly (2018a):

"Tropical; […]; 35°N - 8°N"

Distribution Outside the United States

Native

From Froese and Pauly (2018a):

"Asia: large rivers of Indian subcontinent [including Pakistan] and Myanmar (Ganges, Krishna?, Godavari, Irrawaddy). […] Reports from Thailand, Malaysia and Indonesia are based on misidentifications."

"[In Bangladesh:] Found in Choto Jamuna river [sic] [Galib et al. 2013]. Occurs in the Ganges River."

"[In India:] Known throughout India [Shaji et al. 2000]. Found in Bihar, Darjeeling, Assam, Orissa, Madhya Pradesh, Chennai, West Bengal, Rohini and Rapti river [sic] in Uttar Pradesh and Gangetic estuary [Kapoor et al. 2002]. Recorded from Chilka Lake [Rao 1995]."

"[In Myanmar:] Occurs in Irrawaddy basin [Vidthayanon et al. 2005]."

"[In Nepal:] Occurs in Koshi, Narayani and Bagmati rivers [Shrestha 2008]."

Introduced

Froese and Pauly (2018a) list *Pangasius pangasius* as introduced in Cambodia where it is part of commercial aquaculture.

From Froese and Pauly (2018a):

"[In Laos:] Status uncertain and needs confirmation. This species was probably introduced in the Mekong basin. Collected from Hatdokkeo, Tha Bo, Sai Fong and Sithan Tay in the Mekong basin."

"[Introduced in Vietnam:] Found in Mekong delta [Khoa and Huong 1993]."

Means of Introduction Outside the United States

From Froese and Pauly (2018a):

"Widely introduced in its geographical range for aquaculture."

Short Description

From Froese and Pauly (2018a):

"Dorsal spines (total): 2; Dorsal soft rays (total): 7; Anal spines: 0; Anal soft rays: 29 - 32. […]; 23-28 gill rakers on first arch [Rainboth 1996]."

From Mercy et al. (2007):

"Body elongate and compressed. Head slightly granulated above; occipital process reaches to basal bone of dorsal fin; snout fairly prominent. Eyes large, about 3.5 times in length of head, visible from ventral surface of head. Mouth fairly wide. Teeth villiform on jaws and palate; vomero-palatine teeth in a crescentic band, composed of four patches which may be variously joined together. Barbels two pairs, fairly well developed. Dorsal spine moderately strong, strongly serrated on its inner edge but finely serrated on its outer edge. Caudal fin deeply forked."

"Dusky yellowish-green on back, glossed with silvery-purple on flanks; sides of head golden tinge. Fins light reddish-yellow."

Biology

From Froese and Pauly (2018a):

"Found in large rivers and estuaries [Talwar and Jhingran 1991]. Occurs in high estuary (freshwater tidal zone) as juveniles, moving to brackish water as sub-adults, and finally as adults to river mouths and inshore areas [Rainboth 1996]. Longevity given as 10 years [Davidson 1975] but appears too low. Feeds on snails, other mollusks [Rahman 1989] and plants [Talwar and Jhingran 1991]."

"Young and adult fishes consume any matter they find [Shrestha 2008]."

"Feeds on crustaceans, mollusks, insects, plant material, and worms [Hardjamulia et al. 1988]."

Human Uses

From Froese and Pauly (2018a):

"Reared for consumption in Thailand, Cambodia and Vietnam; excellent food fish with very white fine grained sweet flesh [Davidson 1975]. Marketed fresh [Rainboth 1996]."

"Fisheries: commercial; aquaculture: commercial; gamefish: yes"

"A good fishery exists in the Gangetic estuaries in July-August [Talwar and Jhingran 1991]."

"Used to be cultured commercially in Malaysia [FAO Fishery Information, Data and Statistics Service 1993]."

"Common in the Yangon markets [Myanmar], important food fish [Vidthayanon et al. 2005]."

From Pal (2010):

"It is a food-fish but its flesh is not graded among that of good varieties of fishes. A good fishery exists in the Gangetic estuaries during July-August. […] Because of its dirty feeding habits, this fish is not much liked. Since it attains a good size, it affords a good sport to anglers. It has been successfully bred in Bangladesh (Khan and Mollah 2004)"

From Mercy et al. (2007):

"Juveniles are ornamental."

According to Algers et al. (2007), *Pangasius pangasius* is in live trade in the European Union.

Diseases

No records of OIE-reportable diseases (OIE 2021) were found for *Pangasius pangasius*.

From Froese and Pauly (2018a):

"Contracaecum Disease, Parasitic infestations (protozoa, worms, etc.)
Gymnorhynchus Disease, Parasitic infestations (protozoa, worms, etc.)
Allocreadium Disease, Parasitic infestations (protozoa, worms, etc.)
Cucullanus Infestation 2, Parasitic infestations (protozoa, worms, etc.)"

Froese and Pauly (2018b) list *P. pangasius* as a host of *Cucullanus chabaudi*, *Thaparocleidus chandpuri*, and *T. pangasi*.

Rastogi et al. (2008) list *P. pangasius* as a host of *Silurodescoides pangasi*.

Threat to Humans

From Froese and Pauly (2018a):

"Harmless"

3 Impacts of Introductions

Records of introduction were found for *Pangasius pangasius*. The records were unclear if the species was introduction to the wild or just into captive aquaculture programs. No information was found regarding impacts of introductions.

4 History of Invasiveness

Records of introduction were found for *Pangasius pangasius* but were unclear if the species was introduction to the wild or just into captive aquaculture programs. Therefore, the history of invasion is no known nonnative population.

5 Global Distribution

Figure 1. Known global distribution of *Pangasius pangasius*. Locations are in India, Bangladesh, Myanmar, Thailand, Cambodia, and Vietnam. Map from GBIF Secretariat (2018). The location in the ocean east of Vietnam was not used to select source point for the climate match. The locality description does not match the coordinates given (GBIF Secretariat 2018). The locations in Thailand were not used to select source points for the climate match. They are based on misidentifications (Froese and Pauly 2018a) and do not pertain to *P. pangasius.* The locations in Cambodia and Vietnam were not used to select source points for the climate match. Froese and Pauly (2018a) list the species as introduction for aquaculture in those countries, but no information is available indicating that it has become established in the wild.

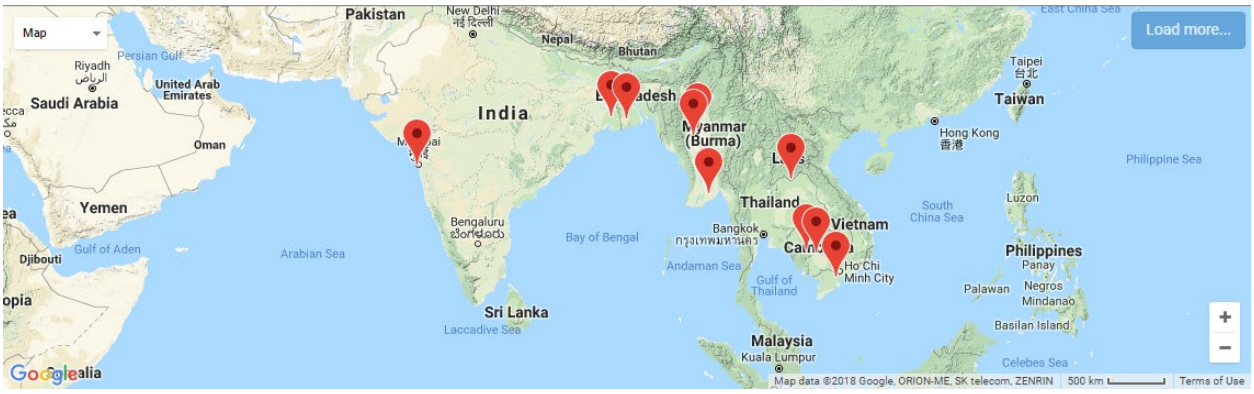

Figure 2. Additional known distribution of *Pangasius pangasius.* Locations are in India, Bangladesh, Myanmar, Laos, Cambodia, and Vietnam. Map from VertNet (2018). The locations in Thailand were not used to select source points for the climate match. They are based on misidentifications (Froese and Pauly 2018a) and do not pertain to *P. pangasius.* The locations in Cambodia and Vietnam were not used to select source points for the climate match. Froese and Pauly (2018a) list the species as introduction for aquaculture in those countries, but no information is available indicating that it has become established in the wild.

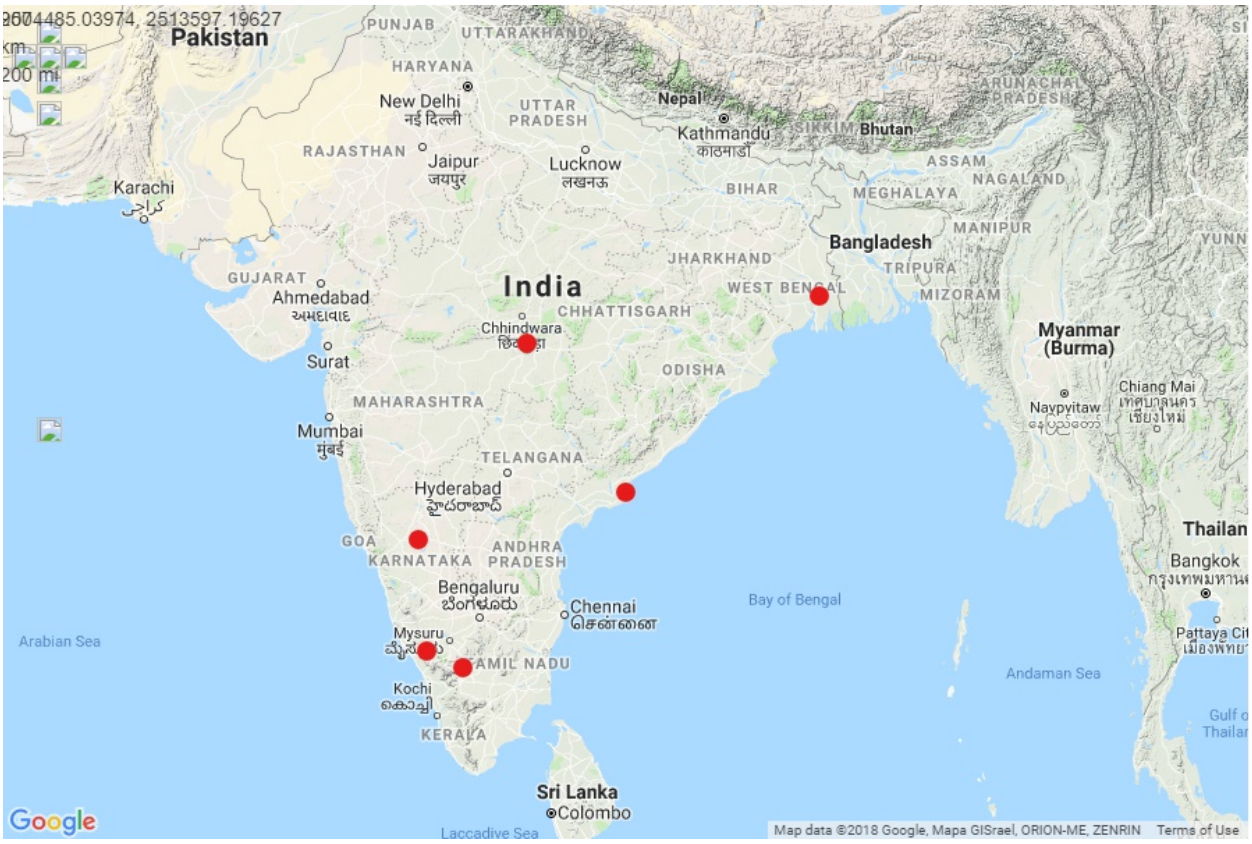

Figure 3. Additional distribution of *Pangasius pangasius* in India. Map adapted from India Biodiversity Portal (no date).

Pangasius pangasius has been reported as native and present in Pakistan but no georeferenced observations were found.

6 Distribution Within the United States

No records of *Pangasius pangasius* in the wild in the United States were found.

7 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Pangasius pangasius* was low for most of the contiguous United States. There were areas of medium match in southwestern Florida, southern Texas, New Mexico, and California. The Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for contiguous United States was 0.000, low (scores between 0.000 and 0.005, inclusive, are classified as low). All States had low individual climate scores.

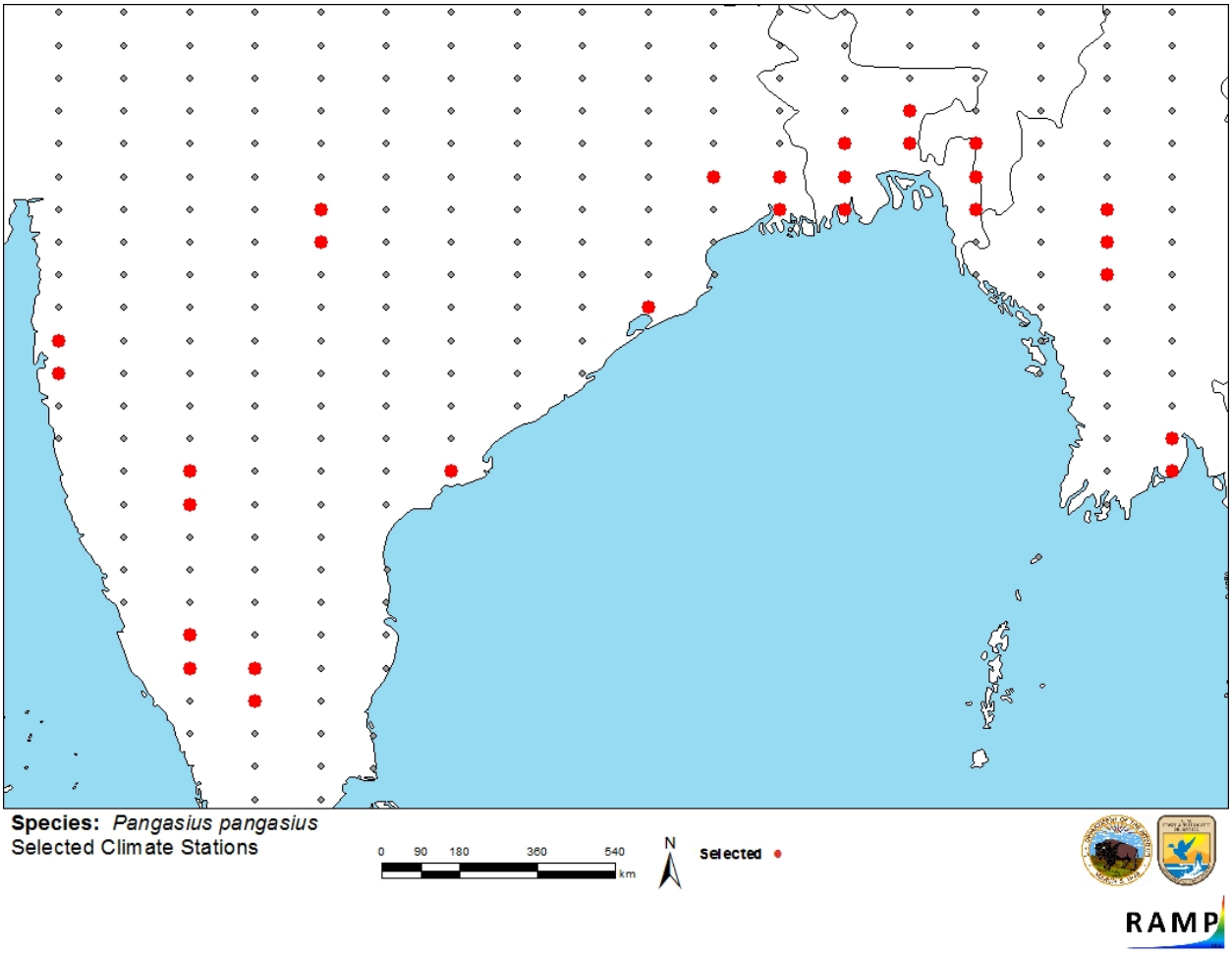

Figure 4. RAMP (Sanders et al. 2018) source map showing weather stations in southern Asia selected as source locations (red; India, Bangladesh, Myanmar) and non-source locations (gray) for *Pangasius pangasius* climate matching. Source locations from GBIF Secretariat (2018), VertNet (2018), and India Biodiversity Portal (no date). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

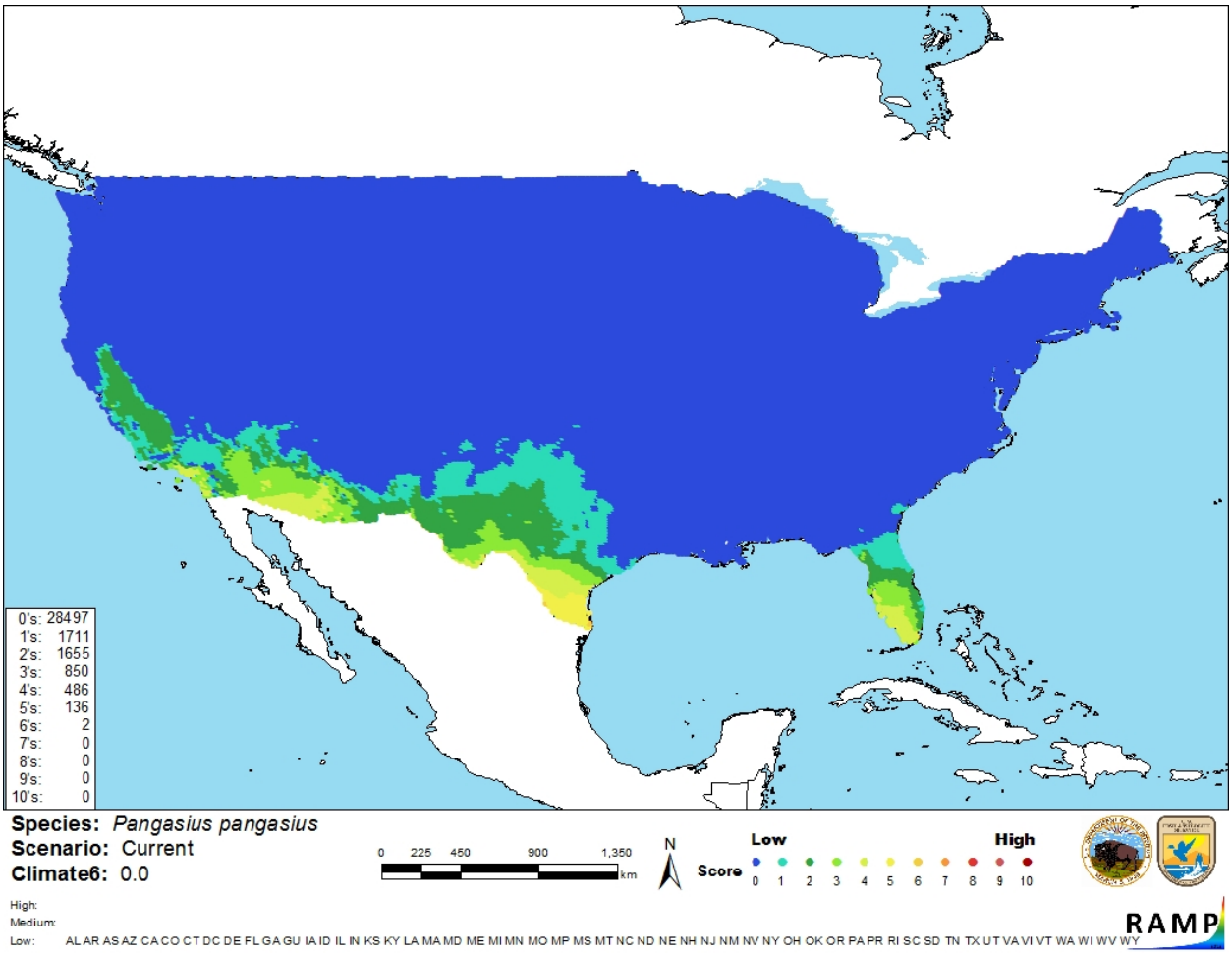

Figure 5. Map of RAMP (Sanders et al. 2018) climate matches for *Pangasius pangasius* in the contiguous United States based on source locations reported by GBIF Secretariat (2018), VertNet (2018), and India Biodiversity Portal (no date). Counts of climate match scores are tabulated on the left. 0/Blue = Lowest match, 10/Red = Highest match.

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

Climate 6: (Count of target points with climate scores 6-10)/ (Count of all target points)	Overall Climate Match Category
0.000≤X≤0.005	Low
0.005<X<0.103	Medium
≥0.103	High

8 Certainty of Assessment

The certainty of assessment for *Pangasius pangasius* is low. There is some quality information available regarding the ecology and biology of this species. The full range of this species in the wild is not well documented. The described range of the species includes Pakistan, but no

georeferenced observations were available from that country to use as source points in the climate match. Records of introduction were found; however, it was unclear if those introductions for aquacultural purposes resulted in established wild populations. There was no information on impacts of introductions to evaluate, and adding in climate source points from Pakistan and the potentially introduced range could alter the results of the climate match.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Punagas (*Pangasius pangasius*) is a species of catfish native to river drainages of India, Pakistan, Myanmar, Bangladesh, and Nepal in southern Asia. *P. pangasius* is used widely as a food fish both in its native range and in other areas of southeastern Asia. The history of invasiveness is no known nonnative population. Records of introduction to countries outside the native range for use in aquaculture were found. The sources were not clear if this also resulted in release of this species into the wild in these new countries. No information on impacts of introduction were found. The climate match is low. There were some areas of medium match in the far southern contiguous United States. However, all States had low individual climate scores. The certainty of assessment is low. There are gaps in information and uncertainty in the range of the species and introductions. The overall risk assessment category is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 4): No Known Nonnative Population**
- **Overall Climate Match Category (Sec. 7): Low**
- **Certainty of Assessment (Sec. 8): Low**
- **Remarks/Important additional information:** No additional information
- **Overall Risk Assessment Category: Uncertain**

10 Literature Cited

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

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11 Literature Cited in Quoted Material

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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