

Giant Pangasius (*Pangasius sanitwongsei*)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, April 2012
Revised, September 2018
Web Version, 9/14/2020

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 (2018):

“[In Cambodia:] Occurs in the Mekong basin [Rainboth 1996]. Rare in Great Lake and Tonle Sap river [*sic*] [Cambodian National Mekong Committee 1998].”

“[In China:] Found in lower reaches of Lancangjiang river [*sic*] in Xishuangbanna of Yunnan Prov. Listed as class II protected species in 1989 by the province of Yunnan.”

“[In Laos:] Its numbers have declined in the Khone Falls [Hill and Hill 1994]. Found in Ban Hang Khone, a village on an island in the middle of the mainstream Mekong River just below the

Great Khone Waterfalls in Khong District, Champasak Province [Baird 1998]. Also collected from Tha Ngon in the Mekong basin [Taki 1974].”

“[In Thailand:] Known from Mekong and Chao Phraya basins [Vidthayanon et al. 1997]. Reported from Phra Nakhon Si Ayutthaya, Nong Khai, Nakhon Ratchasima, Chiang Mai, Ubon Ratchathani, and Lop Buri river [*sic*] [Monkolprasit et al. 1997]. Threatened due to habitat loss and overfishing; extirpated in the Chao Phraya [Vidthayanon 2005].”

“[In Vietnam:] Found in the Mekong River [Khoa and Huong 1993].”

Status in the United States

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

P. sanitwongsei was listed as Endangered on the *First List of Endangered Foreign Fish and Wildlife* in Appendix A by the U.S. Fish and Wildlife Service in June 1970 (U.S. Fish and Wildlife Service 1970).

Means of Introductions in the United States

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

Remarks

From Jenkins et al. (2009):

“Assessed as Critically Endangered due to an estimated population decline of more than 99% over three generations, even using the most optimistic values for generation time and population size (assuming a constant exponential rate). This rate has been inferred for the whole population given that the same threats exist throughout the range of *P. sanitwongsei*.”

“Local fishermen report declines in sightings/catch of *P. sanitwongsei*; one interviewee said that *P. sanitwongsei* had disappeared from his catch, while another (ex-chair of the Giant Catfish Fishermens Club) said that 'fifteen years ago 100 *P. sanitwongsei* were caught per year...five years ago about 5-20 fish were caught per year...recently the catch has declined further and the fish has disappeared' (Meynell 2003).”

“In 1989 *P. sanitwongsei* was listed as a Class II protected species by the provincial government of Yunnan, China.”

From Thompson (2010):

“In an attempt to save this disappearing species, *Pangasius sanitwongsei* are now artificially spawned for aquaculture purposes. This has also seen juveniles appearing in the aquarium trade in large numbers, where they are sold under the names “paroon shark”, “hi-fin tiger shark” and “hi-fin Pangasius”.”

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

According to Eschmeyer et al. (2018), *Pangasius sanitwongsei* Smith 1931 is the valid name for this species; it is also the original name.

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 sanitwongsei* Smith, 1931

Size, Weight, and Age Range

From Froese and Pauly (2018):

“Max length : 300 cm SL male/unsexed; [Davidson 1975]; common length : 50.0 cm SL male/unsexed; [Smith 1945]; max. published weight: 300.0 kg [Roberts and Vidthayanon 1991]”

From Thompson (2010):

“Average lifespan in the wild: Unknown, but can reach 20 years in captivity”

Environment

From Froese and Pauly (2018):

“Freshwater; benthopelagic; potamodromous [Riede 2004].”

Climate

From Froese and Pauly (2018):

“Tropical; 25°N - 9°N”

Distribution Outside the United States

Native

From Froese and Pauly (2018):

“[In Cambodia:] Occurs in the Mekong basin [Rainboth 1996]. Rare in Great Lake and Tonle Sap river [sic] [Cambodian National Mekong Committee 1998].”

“[In China:] Found in lower reaches of Lancangjiang river [sic] in Xishuangbanna of Yunnan Prov. Listed as class II protected species in 1989 by the province of Yunnan.”

“[In Laos:] Its numbers have declined in the Khone Falls [Hill and Hill 1994]. Found in Ban Hang Khone, a village on an island in the middle of the mainstream Mekong River just below the Great Khone Waterfalls in Khong District, Champasak Province [Baird 1998]. Also collected from Tha Ngon in the Mekong basin [Taki 1974].”

“[In Thailand:] Known from Mekong and Chao Phraya basins [Vidthayanon et al. 1997]. Reported from Phra Nakhon Si Ayutthaya, Nong Khai, Nakhon Ratchasima, Chiang Mai, Ubon Ratchathani, and Lop Buri river [sic] [Monkolprasit et al. 1997]. Threatened due to habitat loss and overfishing; extirpated in the Chao Phraya [Vidthayanon 2005].”

“[In Vietnam:] Found in the Mekong River [Khoa and Huong 1993].”

Introduced

From Mäkinen et al. (2013):

“A catfish captured in the Breede River [...] in South Africa was identified using morphological and genetic techniques as the giant pangasius, *Pangasius sanitwongsei* Smith 1931, a new record for South Africa.”

“The fish appeared to be in a healthy state, demonstrating that the fish can survive in the wild. This species was not encountered during an intensive ichthyological survey of the river in 2008 and 2009 (Chakona & Swartz 2012). This indicates that the *P. sanitwongsei* specimen most likely represents a new introduction, and a post-introduction survey of the river is necessary to evaluate whether this species is establishing.”

Means of Introduction Outside the United States

From Mäkinen et al. (2013):

“The results indicate that *P. sanitwongsei* crossed the geographical barrier between Asia and Africa using the pet trade as a pathway, and its presence in the Breede River system shows escape from captivity.”

“As *P. sanitwongsei* is not on the list of fishes permitted into South Africa (Anon. 19[94]), its presence in the pet trade and escape into the wild illustrates the difficulty associated with preventing illegal introductions. This is especially pertinent for large species such as

P. sanitwongsei, which are imported by the pet trade as juveniles but quickly outgrow aquaria, which may result in their release into the wild.”

Short Description

From Froese and Pauly (2018):

“Fins are pigmented with dusky melanophores. First soft ray in dorsal, pectoral and pelvic fins prolonged into a filament [Taki 1974]. Broad head; black tips on first few anal-fin rays in individuals of all sizes, particularly in juveniles; palatine and vomerine teeth united into a single long crescentic patch [Rainboth 1996]. Mouth wide, its width 5.5-5.9 times in SL [Kottelat 2001].”

Biology

From Froese and Pauly (2018):

“Inhabits large rivers. Juveniles are found in larger tributaries [Vidthayanon 2005]. Both young and adults feeds on fishes and crustaceans [Rainboth 1996]. Larger individuals have been known to feed on carcasses of fowl or dog (which are commonly used for bait) [Roberts and Vidthayanon 1991]. A migratory species [Hill and Hill 1994]. Spawns just before the rainy season and the young of the year reach a length of about 10 cm by mid-June [Rainboth 1996].”

“At Kompong Cham [Cambodia] to the Khone Falls, this species migrates upstream between October and February when water level recedes and then downstream from June to August when water level rises [Sokheng et al. 1999].”

From Jenkins et al. (2009):

“Two sub-populations may be separated by the Khone Falls, over which *P. sanitwongsei* does not appear to migrate (Poulsen 2001).”

“*P. sanitwongsei* uses deep pools as refuges in the dry season.”

“This species is likely to have been affected by the destruction of rapids and reefs as part of the Upper Mekong Navigation Improvement Project, and by the construction of dams.”

Human Uses

From Froese and Pauly (2018):

“Fishery used to be accompanied by rites and ceremonies of a religious nature [Davidson 1975]. Important food fish and is often referred to in textbooks and popular press or news media [Robins et al. 1991]. Marketed fresh [Rainboth 1996]. Threatened due to over harvesting, habitat loss and pollution [Stone 2007].”

“There is a recent decline in abundance; caught with "bet ken" (large hooks) set in isolated "gohk goom" (*Crateva nurvala*, Capparidaceae trees) [Roberts 1993]. In Southern Laos, this fish used to

be relatively abundant; big fish are now rare. [...] Also previously caught with hooks in Hoo Sadam, but they are now seldom seen or caught there [Roberts and Baird 1995].”

From Hogan et al. (2009):

“Captive breeding is practiced in Thai government's fishery stations (Juntasutra et al. 1989) but without a proper genetic management.”

Papavlasopoulou et al. (2014) report that *Pangasius sanitwongsei* was in trade in >50% of the aquarium stores surveyed in Greece.

Diseases

No information on diseases of *Pangasius sanitwongsei* was found. **No records of OIE-reportable diseases (OIE 2020) were found.**

Threat to Humans

From Froese and Pauly (2018):

“Harmless”

From Thompson (2010):

“Early fishing stories include a fatal encounter with the fin of a two metre giant pangasius, after one unfortunate local netted the fish near Raheng, Thailand.”

3 Impacts of Introductions

A single record of introduction was found in South Africa (Mäkinen et al. 2013). No information on impacts of introductions was found.

4 History of Invasiveness

A single record of introduction was found in South Africa (Mäkinen et al. 2013) indicating survival of a captive release, but further survey is suggested to verify establishment. Therefore, the history of invasiveness is no known nonnative population.

5 Global Distribution



Figure 1. Known global distribution of *Pangasius sanitwongsei*. Locations are in Thailand, Laos, Cambodia, and South Africa. Map from GBIF Secretariat (2018).

The location in South Africa (Figure 1) was not used as a source point for the climate match. A single specimen was captured at that location (Mäkinen et al. 2013) and no further information supports the existence of an established population at that location.

6 Distribution Within the United States

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

7 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Pangasius sanitwongsei* was low for most of the contiguous United States. Southern Florida and Texas had areas of medium match. 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.

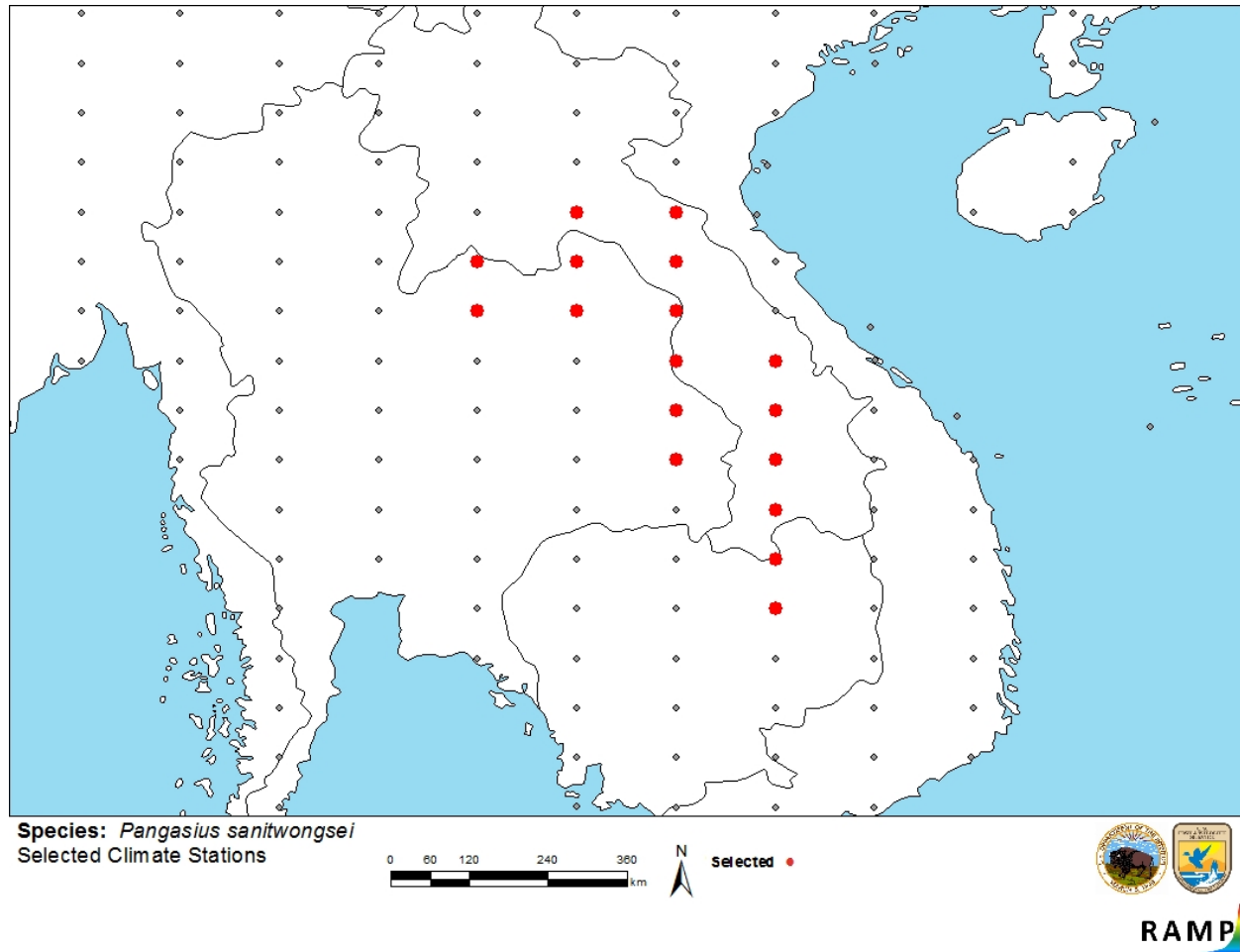


Figure 2. RAMP (Sanders et al. 2018) source map showing weather stations in Southeast Asia selected as source locations (red; Thailand, Cambodia, Laos, Vietnam) and non-source locations (gray) for *Pangasius sanitwongsei* climate matching. Source locations from GBIF Secretariat (2018). Selected source locations are within 100 km of one or more species occurrences and do not necessarily represent the locations of occurrences themselves.

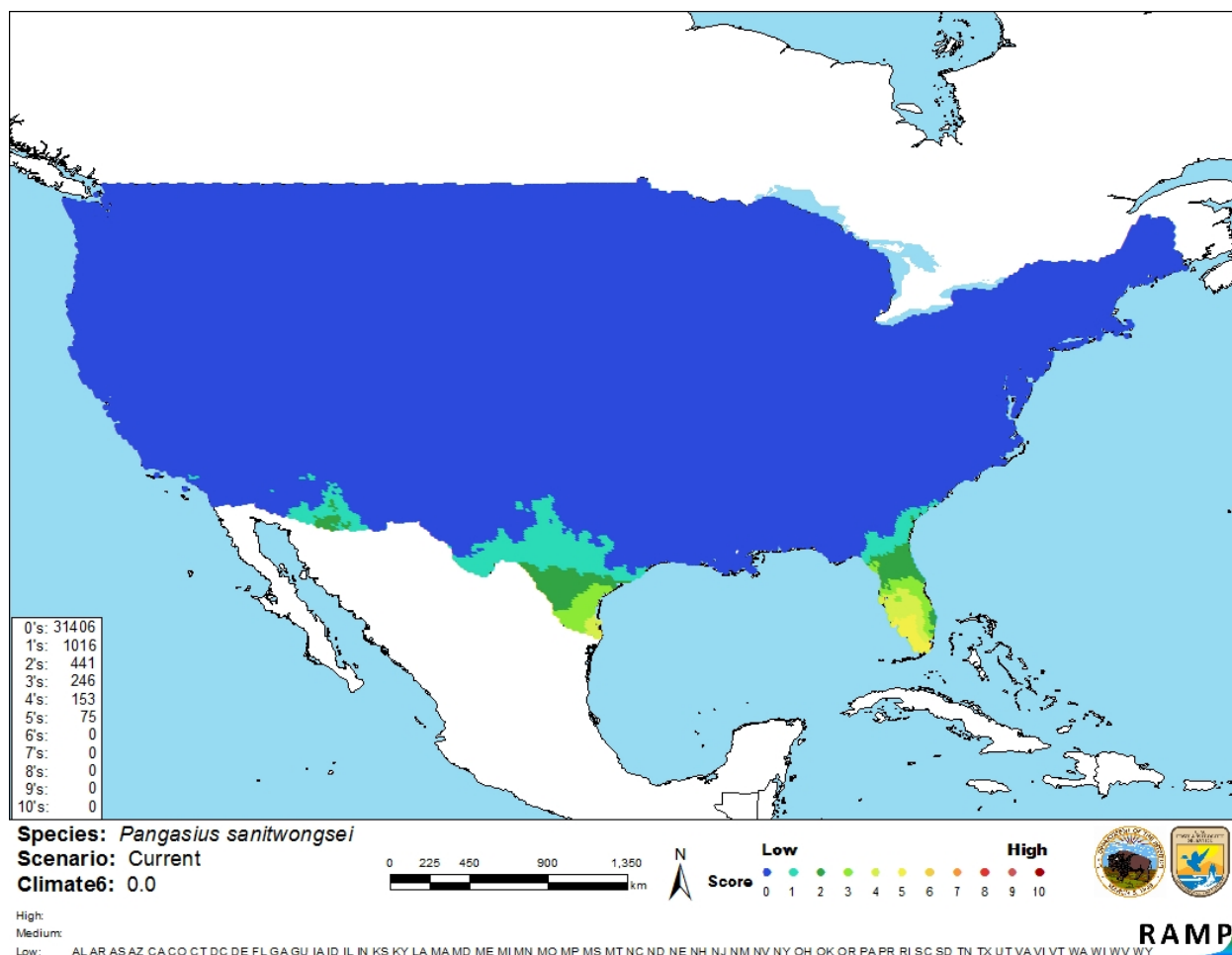


Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for *Pangasius sanitwongsei* in the contiguous United States based on source locations reported by GBIF Secretariat (2018). Counts of climate match scores are tabulated on the left. 0/Blue = Lowest match, 10/Red = Highest match.

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

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

8 Certainty of Assessment

The certainty of assessment is medium. There is a moderate amount of quality scientific information available for this species. A single record of introduction was found. No information on impacts was available. However, there is enough general evidence of trade in this species that

if information on the actual volume in trade could be obtained, the history of invasiveness could potentially be re-categorized to low.

9 Risk Assessment

Summary of Risk to the Contiguous United States

The Giant Pangasius (*Pangasius sanitwongsei*) is a species of large catfish native to the main river drainages in southeastern Asia. The species has been heavily fished for local consumption and the aquarium trade by local peoples. *P. sanitwongsei* is now considered rare and threatened in part due to the intense harvesting. It is cultured and stocked in the wild by the Thai government. The history of invasiveness for this species is no known nonnative population. A single record of introduction was found in South Africa. Only a single specimen was collected and no information indicating an established population at that location could be found. This species is in the aquarium trade, particularly as juveniles. The overall climate match was low. The southern areas of Florida and Texas had medium matches but all States had low individual Climate 6 scores. The certainty of assessment is medium. 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): Medium**
- **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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