

Pirapitinga (*Piaractus brachypomus*)

Ecological Risk Screening Summary

Web Version – 8/21/2012



Photo: L. Lovshin

1 Native Range and Nonindigenous Occurrences

Native Range

From Nico and Fuller 2012:

“Tropical America. Orinoco and Amazon river basins, South America (Machado-Allison 1982).”

Nonindigenous Occurrences

From Nico and Fuller 2012:

“A single fish (241 mm long) was taken in **Alabama** by an angler from Elk River in Limestone County on 29 August 1988 (museum specimen); the original newspaper account (Middleton 1988) incorrectly reported the fish as being a red piranha. A specimen was also collected in Lay Lake in Lower Coosa Basin in 2005 (Rider 2005) and in Magnolia River in 2002 (Hartman, pers. comm.). Two fish were collected in North Sauty area of Gunter Lake (Bonner 2005). One fish was taken by an angler from a cemetery pond in **Arkansas** in Fayetteville, Washington

County, in June 1995 (Wright 1995a, 1995b). Species were also collected from the Hot Springs vicinity (Loe 2005). One pacu was captured in **California** at Stevens Creek Reservoir, Santa Clara County, on 4 July 1996 (R. N. Lea, personal communication). Four specimens were collected from Adobe Creek in Petaluma, California, in July 2000 (D. Logan, personal communication). A single fish was collected from private pond in a housing development just east of town of Delta, **Colorado**, in October 2004 (P. Walker, pers. comm.). Specimen was collected in the Denver area (Anonymous 2004). There are several records of single fish taken from various sites in **Florida** including a pond near Port Charlotte in DeSoto County in September 1983 (Courtenay, personal communication); Bivens Arm Lake in Gainesville, Alachua County, 5 December 1984 (museum specimen); a lake at St. Lucie West Development, just east of I-95/St. Lucie West interchange in St. Lucie County, 11 June 1991 (museum specimen); a retention pond at the Stoneridge Apartments in Gainesville, Alachua County, 5 September 1993 (museum specimen); Lake Alice, Gainesville, Alachua County, 22 January 1998; Turkey Creek in Palm Bay, Brevard County, 16 November 2000 (Ruiz-Carus and Davis 2003), artificial lake in Coral Springs in 2005 (Kelley, pers. comm.). There are several records of single fish (identified as *Colossoma bidens*) taken from various sites in **Georgia**, including a private pond in Banks County in 1982, a private pond in Coweta County in 1987, and Big Cotton Indian Creek, east of Stockbridge in Henry County on 6 June 1990 (R. M. Gennings, personal communication). A specimen was collected from Savannah National Wildlife Refuge (USFWS 2005). A single fish was taken an by angler from Lake Tara in the Flint River drainage in September 1994 (museum specimen). A fish was collected from Wahiawa Reservoir (=Lake Wilson), Oahu, **Hawaii** (Wright 2004). A single fish taken with a trotline from the Mississippi River in **Illinois**, south of Chester, in or near Randolph County in September 1988; in an erroneous newspaper account (Anonymous 1988), it was identified as a piranha, but the accompanying photograph shows it to be *Piaractus*. Additional state records include a fish taken from Little Grassy Lake, Williamson County on 15 June 1992 (museum specimen); a single fish was taken from a campus lake at Southern Illinois University at Carbondale, Jackson County, on 22 June 1992 (Burr et al. 1996). Two fish were collected from Bangs Lake (Chinwah 2005). A fish was collected in Fox River in Carpentersville in 2005 (TePas, pers. comm.). One specimen was taken by a fisherman in the Brush Creek Reservoir, **Indiana** in August 2004 (L. Lehman, personal communication). Another was taken in Oxbow Park, Hammond, Indiana, in June 2005 (Keller, personal communication). A specimen was also caught in the Little Culumet River/Lake Michigan in Fall of 2003 (Simon and Breidert 2003). Fish were collected from Cayuga Power Plant discharge in 2002 and 2005 (Keller, pers. comm.) A single fish was taken from Lake Barkley, Cumberland-Ohio River drainage, **Kentucky**, about river mile 56, in Trigg County, on 16 June 1993 (museum specimen). Another Kentucky pacu (based on a newspaper photograph probably this species) was taken from Lake Cumberland in 1991; it was incorrectly reported as a piranha in original newspaper account (see Lander 1991). Pacus were collected from Caney Lake and Shreveport, **Louisiana** (Richie 2004) and Red River near Acme in 2005. Collected from C S Mott and Glover's Lakes near Flint, **Michigan** (Bass Times Staff Reporter 2005). The species is reported in Lakes Huron, Erie, Michigan, and Ontario (Cudmore-Vokey and Crossman 2000). The fish were collected from Bynum Run Park near Bel Air, Susquehanna River at Conowingo Pool near Peach Bottom, golf course in Calvert County, Susquehanna River near Port Deposit, and Swan Creek, Potomac drainage, **Maryland** (Maryland Department of Natural Resources 2004, 2005). One specimen was taken in **Massachusetts** by an angler from Dug Pond

in Natick, Middlesex County, in 1988 (Hartel 1992; Hartel et al. 1996); another was taken from Webster Lake, Webster in 1992 (Hartel 1992). A specimen identified as this species was taken in **Minnesota** from Taft Lake, Hennepin County (K. Schmidt, personal communication). Also collected from Tanner Lake in 2002 (Minnesota Department of Natural Resources 2005). There have been five records from **Mississippi**, all from the Pascagoula River drainage. Two specimens were originally identified as *Colossoma* species, the first collected at Lake Serene, Lamar County, in September 1990, and the second taken from a tributary in the Leaf River system, Forrest County, in July 1991 (Ross and Brenneman 1991; S.T. Ross, personal communication). There are two records of single specimens taken from West Lake in the Leaf River system, Lamar County, during the summer of 1992; another specimen was taken from a pond in the Leaf River system in Hattiesburg, in September 1982 (museum specimens; Ross, personal communication). Specimens have been collected in Sardis Lake (Tallahatchie River) northwest of Oxford in northern Mississippi, Enid Lake, and Lake Patsy (Oxford) (Mississippi Department of Wildlife and Fisheries 2003). Collected from Tchoutacabouffa River near Lil Joe's Cedar Lake Fishing Camp and Gautier (Jones 2003; Lukens, pers comm. 2003). A single specimen was taken by an angler in southwest **Missouri** from Stockton Lake, Dade County, in August 1995 (T. J. Banek, personal communication). Also collected from Longview Lake just southeast of Kansas City (Missouri Department of Conservation 2003). A single specimen was taken by angler in Montana from Lake Elmo, Billings, in July 1994 (preserved specimen). This species has been taken from one or more sites in **Nebraska**; Welsch (1996) reported that piranhas were commonly taken in the state but the accompanying photograph of a local 'piranha' is that of a *Piaractus brachypomus*. Collected from Tate Pond near Hudson, **New Hampshire** (AP 2005). This species was reported in Lake Ontario, **New York** (Cudmore-Vokey and Crossman 2000) and in Esopus Creek, NY (Arnold 2005). In **North Carolina** a single fish was taken with a hook and line from Elizabeth Lake, Insole County, in October 1991 (Lee 1991). Pacus were collected from Wauseon Reservoir and Ohio River near the mouth of Paddy Creek, in Rome Township, **Ohio** (Dick 2005; Stephens 2005). A specimen was caught in Lake Texoma, **Oklahoma** on September 25, 2003 (Hysmith, pers. comm. 2003); two were caught near Catoosa in 2007 (K. Holcomb, pers. comm.). A single specimen was taken in **Oregon** from the Willamette River near Portland in Multnomah County, on 4 July 1988; one or more other collections of pacu from other sites in the state also may represent this species (Logan et al. 1996). One fish was collected from Fairfield Fish Culture Station at the edge of West County Pond in Erie County, Pennsylvania in 2000 (Browser and Leighton 2000). Specimens have been collected in the Ohio River near the towns of Industry and Glasgow (Dyer 2001). Several single fish (identified as *Colossoma brachypomum*) were taken from various sites in **Texas** including Town Lake in Austin, Travis County, in 1980; Lake Bastrop, Bastrop County, during the summer of 1987; the Colorado River near Bastrop, Bastrop County, on 16 July 1987; a private pond near Cleburne, on 12 June 1989; a freshwater canal near Nederland, Jefferson County, on 4 June 1990; Gray's Hisle Camp, Tri Cities Beach Road, near Baytown, Harris County, on 31 July 1990; a creek adjacent to All American Rice Growers Canal, 9.7 km south of Dayton, Liberty County, on 17 October 1990 (an angler reported catching three additional specimens, which he released); the Colorado River 1.6 km upstream from Bastrop, on 26 August 1991 (Howells et al. 1991). A single fish was also collected in Nasworthy Reservoir, Concho River, Tom Green County; Fort Phantom Hill Reservoir, Jones County; Lake Tyler, Smith County; Lake Granbury, Hood County; Gibbons Creek Reservoir, Grimes County; the Livingston Reservoir; Cypress

Creek, Hays County; Trinity River; and Eagle Mountain Lake, near Ft. Worth, Tarrant County, Texas (Texas Parks and Wildlife Department 2001; Anonymous 2004; L. Pearson personal communication). Specimens were collected in San Felipe Creek in Del Rio (Killin 2005), Palestine Reservoir, northeast Texas (Knight 2005), Cypress Creek, near Wimberly (Pearson 2000), and Belton Lake (Texas Parks and Wildlife Department 1993). A single fish was collected in Burke Lake in Burke Lake Park, Fairfax County, **Virginia**, in June 1988 (Bohn 1988). A fish was also collected in Smith Mountain Lake, Beford County (Conley 2005). A single fish was collected in Medical Lake near Clear Lake, Spokane, **Washington** (Roesler 2003).”

Means of Introductions

From Nico and Fuller 2012:

“Most records likely represent aquarium releases, although some Florida and Georgia records may have resulted from fish farm escapes.”

Remarks

From Nico and Fuller 2012:

“This species is a popular aquarium fish. It is a prized food fish in South America. To date, records maintained by the Georgia Department of Natural Resources on introduced foreign fishes show pacus identified as either *Colossoma bidens* (= *Piaractus brachypomus*) or as unidentified pacus.” ... “A fish taken from the Snake River in Oregon (OS 13217) was originally identified as *Colossoma macropomum* by Logan (1994), but one of us (LGN) examined this specimen and it more likely represents a hybrid between *C. macropomum* and *Piaractus* (also see Logan et al. 1996). All Texas specimens were taken by anglers and later identified by biologists of the Texas Parks and Wildlife Department. “

“Selected voucher specimens: Alabama: (UF 98946); Florida (UF 42782, 87879, 94136, 107100); Georgia (UF 98944); Illinois (SIUC 19835); Kentucky (SIUC 22241); Massachusetts (MCZ 96096); Mississippi (USM 14134, 14160, 14637); Montana (uncatalogued); Oregon (OS 11491); Texas (TNHC 11037).”

“Voucher photographs: Arkansas, Florida, Illinois, Minnesota, Missouri, Montana, Nebraska, Texas (video film), and Virginia.”

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2012):

Kingdom Animalia

Phylum Chordata

Subphylum Vertebrata

Superclass Osteichthyes

Class Actinopterygii

Subclass Neopterygii

Infraclass Teleostei

Superorder Ostariophysi

Order Characiformes

Family Characidae

Genus *Piaractus* Eigenmann, 1903

Species *Piaractus brachypomus* (Cuvier, 1817) – pirapatinga

Size, Weight, Age

From Froese and Pauly (2010):

“Max length: 88.0 cm TL male/unsexed (IGFA 2001); Max published weight 25.0 kg (Baensch and Riehl 1985); Max reported age: 28 years (Loubens and Panfili 2001); Length at first maturity: range 52 - ? cm”

Environment

From Froese and Pauly (2010):

“Pelagic; Freshwater; pH range: 4.8 – 6.8; dH range: ? – 15”

Climate/Range

From Froese and Pauly (2010):

“Tropical; 23°C - 28°C (Baensch and Riehl 1985); 23°N - 11°S”

Distribution

From Froese and Pauly (2010):

“South America: Amazon and Orinoco River basins (Jégu 2003). Reported from Argentina (Lopez et al. 1987).”

Biology

From Froese and Pauly (2010):

“Juveniles mimic *Serrasalmus nattereri*. Feeds on insects and decaying plants (Lovshin 1995). Possesses powerful dentition that can cause serious bites (Robins et al. 1991). An important foodfish (Ferreira et al. 1996).”

Human uses

From Froese and Pauly (2010):

Fisheries: minor commercial; aquaculture: commercial; aquarium: commercial

Diseases

According to Moravec (1998), as cited by Froese and Pauly (2010), *P. brachypomus* have experienced outbreaks of parasitic infestations (protozoa, worms, etc.) of *Klossinemella* and *Rondonia* in Argentina and Brazil, as well as *Spectatus* infestations in Argentina, Brazil, and Paraguay.

Threat to humans

From Froese and Pauly (2010):

“Tramatogenic”

3 Impacts of Introductions

From Dau 2001, as cited in Froese and Pauly (2010):

“The fish originally entered Malaysia from Brazil, possibly via Taiwan. The genetic composition of the stock is dubious and is possibly already subject to in-breeding. A total of 14,511 individuals were released in 9 locations (remote lakes in the lower and middle Sepik, Bunapas, in the lower and middle Ramu and Brahman area (Coates 1997). Started attacking other fishes in the Sepik and Ramu rivers in 1999 when their main food, insects became scarce. There are also reports on human attacks. Causes ecological imbalance by killing local fish and wiping out eggs and fry.” [Note: Information in this newspaper article has not been scientifically verified.]

From Tan and Tong 1989, as cited in Froese and Pauly (2010):

“Being cultured experimentally in southern China. Since 1985, it has spread all over southern China's inland waters due to its rapid growth, high production and availability of feed (Welcomme 1988).”

From Froese and D. Pauly (2010):

“Possesses powerful dentition that can cause serious bites (Robins et al. 1991).”

4 Global Distribution

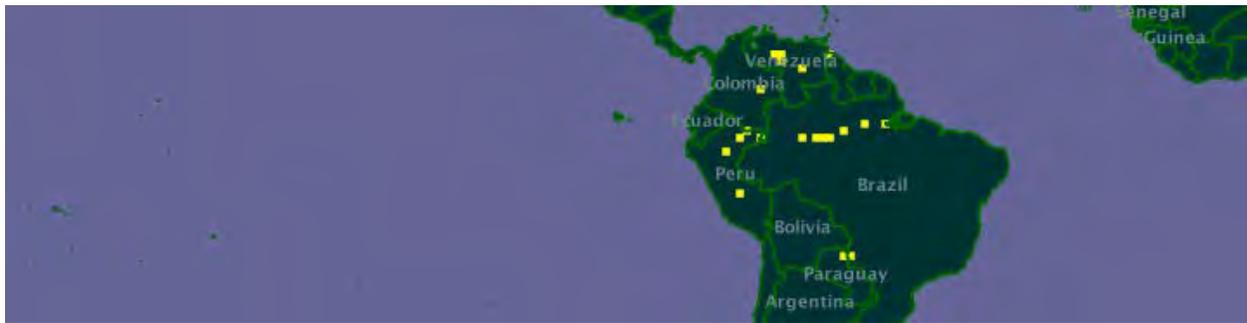


Figure 1. Global distribution of *P. brachypomus*. Map from GBIF (2012).

5 Distribution within the United States



Figure 2. Distribution of *P. brachypomus* in the US. Map from Nico and Fuller (2012).

6 CLIMATCH

Summary of Climate Matching Analysis

The climate match (Australian Bureau of Rural Sciences 2010, 16 climate variables; Euclidean Distance) was medium in Florida, southern Texas, and along the West Coast. Low matches covered the rest of the continental U.S. Climate 6 match indicated that the U.S. has a medium climate match. The range for a medium climate match is 0.005 - 0.103, climate match of *P. brachypomus* is 0.021.

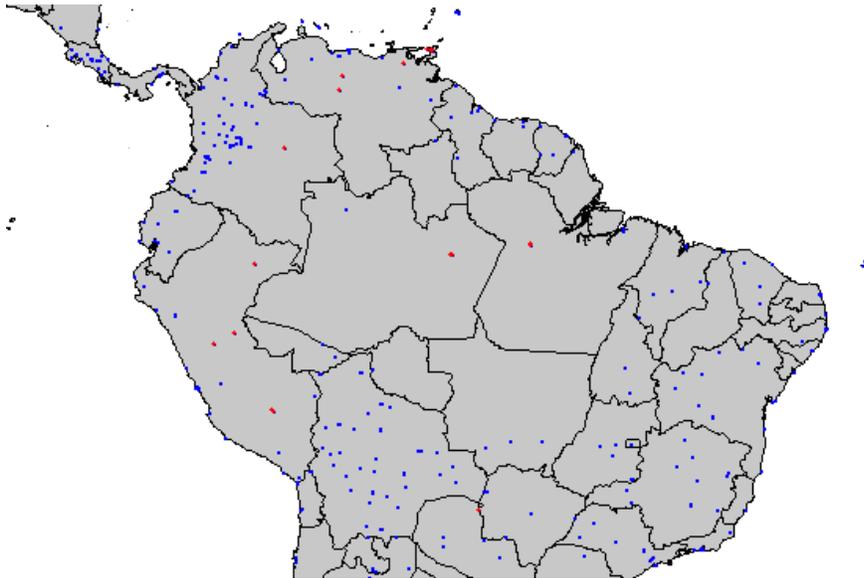


Figure 3. CLIMATCH (Australian Bureau of Rural Sciences 2010) source map showing weather stations selected as source locations (red) and non-source locations (blue) for *P. brachyomus* climate matching. Source locations from GBIF (2012). Only established locations were used.

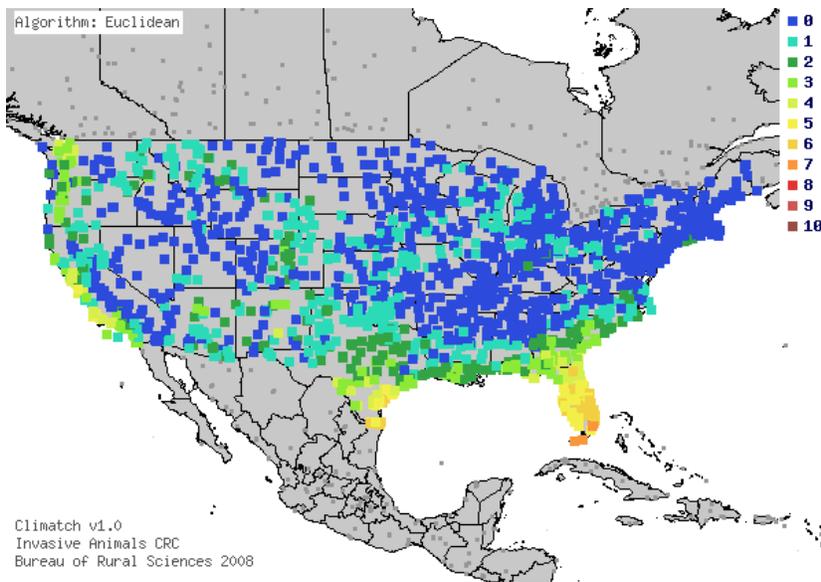


Figure 4. Map of CLIMATCH (Australian Bureau of Rural Sciences 2010) climate matches for *P. brachyomus* in the continental United States based on source locations reported by GBIF (2012). 0= Lowest match, 10=Highest match.

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	1018	438	205	134	86	51	33	9	0	0	0
Climate 6 Proportion =			0.021								

7 Certainty of Assessment

Although there have been many individual reports of *P. brachypomus* within the U.S., there are no known established populations within U.S. borders. While researchers have identified potential impacts from this species in newly established habitats, there has been little evidence of adverse impacts reported in peer-reviewed literature. In order for this ERSS to have a higher level of certainty, more research is needed. The risk level is therefore uncertain, and the certainty of this risk is low.

8 Risk Assessment

Summary of Risk to the Continental United States

P. brachypomus has been introduced to several parts of the continental US, but has thus far failed to establish any known reproducing populations. However, its potential impacts have been reported and it is causing enough concern to be listed as a potential threat in some states. Indications of ecological impacts from this species have been reported and its biological characteristics increase the risk associated with this species.

Assessment Elements

- **History of Invasiveness (Section 3):** Medium. Documented to bite humans.
- **Climate Match (Section 6):** Medium
- **Certainty of Assessment (Section 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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10 References Quoted But Not Accessed

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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