

# Climbing Perch (*Anabas testudineus*)

## Ecological Risk Screening Summary

Web Version—08/15/2014



Photo: Chinese Academy of Fishery Sciences, Information Center from Talwar and Jhingran (1991).

## 1 Native Range, and Status in the United States

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### Native Range

From Talwar and Jhingran (1991):

“Asia: India to Wallace line including China. May have been distributed in more areas than were commonly reported.”

## Status in the United States

From Nico and Fuller (2014):

“A small population was formerly established near a fish farm on Piney Point Road in northwestern Manatee County, Florida, in late 1960s/early 1970s; however, it was not found in 1970-1972 surveys and the population is thought to have died out, probably due to cold winter temperatures (Courtenay and Hensley 1979, Courtenay and Stauffer 1990).”

“Shafland et al. (2008) list it as a formerly reproducing species.”

## Means of Introductions in the United States

From Nico and Fuller (2014):

“Probable escape from local aquarium fish farms (Courtenay and Stauffer 1990).”

## Remarks

From Nico and Fuller (2014):

“Roberts (1989) considered *Anabas* to be among the hardiest of fishes. There are no known voucher specimens.”

## 2 Biology and Ecology

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### Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2011):

“Kingdom Animalia  
Subkingdom Bilateria  
Infrakingdom Deuterostomia  
Phylum Chordata  
Subphylum Vertebrata  
Infraphylum Gnathostomata  
Superclass Osteichthyes  
Class Actinopterygii  
Subclass Neopterygii  
Infraclass Teleostei  
Superorder Acanthopterygii  
Order Perciformes  
Suborder Anabantoidei  
Family Anabantidae  
Genus *Anabas*  
Species *Anabas testudineus* (Bloch,  
1792)

Taxonomic Status: Valid.”

## **Size, Weight, and Age Range**

From Talwar and Jhingran (1991):

“Maturity: Lm ? range ? - ? cm; Max length : 25.0 cm TL male/unsexed; common length : 12.5 cm TL male/unsexed (Davidson 1975).”

## **Environment**

From Talwar and Jhingran (1991):

“Freshwater; brackish; demersal; potamodromous (Riede 2004); depth range 0 - ? m.”

## **Climate/Range**

From Talwar and Jhingran (1991):

“Tropical; 22°C - 30°C (Riehl and Baensch 1991); 28°N - 10°S.”

## **Distribution Outside the United States**

### **Native**

From Talwar and Jhingran (1991):

“Asia: India to Wallace line including China. May have been distributed in more areas than were commonly reported.”

### **Introduced**

From Talwar and Jhingran (1991):

This species is reported as introduced in Saibai Island (Hitchcock 2008), Indonesia (Irian Jaya, Bartley 2006), Philippines (Herre 1935), Papua New Guinea (Eldredge 1994), and Bangladesh (Bartley 2006).

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

From Talwar and Jhingran (1991):

Reasons for introductions of the species include removal of natural barrier (Hitchcock 2008), accidental with ships (Hitchcock 2008), aquaculture (Herre 1935), diffused from other countries (Eldredge 1994), and unknown (Bartley 2006). The species is listed as established in most locations where introduced however effects of those introductions are unknown.

## Short description

From Talwar and Jhingran (1991):

“Dorsal spines (total): 16 - 20; Dorsal soft rays (total): 7-10; Anal spines: 9-11; Anal soft rays: 8 - 11. Color in life dark to pale greenish, very pale below, back dusky to olive; head with longitudinal stripes ventrally; posterior margin of opercle with a dark spot; iris golden reddish. Body form variable, affected by age and amount of food consumed. Scaled head with 4-5 rows between eye and rear margin of preoperculum. Scales large and regularly arranged, ciliate.”

## Biology

From Talwar and Jhingran (1991):

“Found mostly in canals, lakes, ponds, swamps and estuaries (Menon 1999, Vidthayanon 2002). Adults occur in medium to large rivers, brooks, flooded fields and stagnant water bodies including sluggish flowing canals (Taki 1978). Often found in areas with dense vegetation (Rainboth 1996). Can tolerate extremely unfavorable water conditions and is associated mainly with turbid, stagnant waters (Pethiyagoda 1991). They remain buried under the mud during dry season (Rahman 1989). Feed on macrophytic vegetation, shrimps and fish fry (Pethiyagoda 1991). Reported to undertake lateral migration from the Mekong mainstream, or other permanent water bodies, to flooded areas during the flood season and return to the permanent water bodies at the onset of the dry season (Sokheng et al. 1999). During the dry season, they stay in pools associated with submerged woods and shrubs (Sokheng et al. 1999). [Possesses] an accessory air-breathing organ (Allen 1991). Able to survive for several days or weeks out of water if the air breathing organs can be kept moist (Rahman 1989). Quite famous for its ability to walk.”

## Human uses

From Talwar and Jhingran (1991):

“Fisheries: commercial; aquaculture: commercial; aquarium: commercial.”

“Important food fish in SE Asia, considered as a tasty food fish (Herre 1935) but not of the finest quality since it is bony (Davidson 1975). Usually sold live in markets where it is kept alive for several days by keeping it moist (Rainboth 1996). Economic foodfish in the Southeast Asia (Vidthayanon 2002).”

## Diseases

From Talwar and Jhingran (1991):

Anchor worm Disease, Parasitic infestations; Procerovum Infestation 1, Parasitic infestations; Gnathostoma Infestation, Parasitic infestations; Procerovum Infestation 2, Parasitic infestations; Centrocestus Infestation 2, Parasitic infestations; Camallanus Infection 1, Parasitic infestations; Stellantchasmus Infestation, Parasitic infestations; Lernaea Infestation, Parasitic infestations; Dactylogyrus Gill Flukes Disease, Parasitic infestations; Contraecum Disease, Parasitic infestations; Tripartiella Disease, Parasitic infestations; Gnathostoma Infestation, Parasitic infestations; Camallanus Infection 1, Parasitic infestations; Allocreadium Infestation 6, Parasitic

infestations; Neopecoelina Infestation, Parasitic infestations; Camallanus Infection 8, Parasitic infestations; Paragendria Infestation 2, Parasitic infestations and Lernaea Infestation, Parasitic infestations. There are no known OIE-reportable diseases listed for this species.

## Threat to humans

Harmless.

## 3 Impacts of Introductions

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From East and Micke (2008):

“The freshwater climbing perch *Anabas testudineus* (listed as ‘noxious’ under Schedule 5A of Queensland’s Fisheries Regulation 1995) was introduced to West Papua via Indonesia in the 1980s. It has since spread to almost all freshwater bodies within the Indonesian province and neighbouring Papua New Guinea. In 2005, climbing perch were discovered within Queensland’s territorial waters, specifically Saibai Island (Torres Strait).”

“The effects of the climbing perch on native fish and other fauna can be devastating. Climbing perch are expected to out-compete native freshwater and estuarine species. In addition, the fish has sharp dorsal and opercular spines which are extended when the fish is ingested by predatory species (Hitchcock 2007). Villagers in Papua New Guinea have noticed substantial mortalities in piscivorous birds such as the cormorant (*Phalacrocorax spp.*) and darters (*Anbinga melanogaster*), as well as Arafura file snakes (*Acrochordus arafurae*) after ingesting climbing perch (Miller et al. 1995, Storey et al. 2002, Hitchcock 2006, Hitchcock 2007). Similar outcomes are expected to occur in Queensland birds, reptiles, animals and predatory fish.”

From: Hitchcock (2008):

“Climbing Perch is known to kill some fish, waterfowl and reptile species that predate on it – its sharp spines becoming locked in the predator’s throat or stomach (Lawrence 1995, Miller et al. 1995, Storey et al. 2002). Like many other exotic introductions in Australia and New Guinea, it probably also competes with native fishes for space and food (Allen 1991, Department of Primary Industries 2001, Storey et al. 2002). Its potential impacts on the Saibai Island environment are unclear, as little is known about the island’s fauna, however, the following native fish were collected from two freshwater locations close to where Climbing Perch were reported on the island (Queensland Museum catalogue numbers provided): *Megalops cyprinoides* QM I.38040, *Melanotaenia splendida rubrostriata* QM I.38037, *Ambassis agrammus* QM I.38038, *Amniataba caudavittata* QM I.38039, QM I.38043, *Selenotoca multifasciata* QM I.38042 and *Bostrychus zonatus* QM I.38041. Fortunately, Torres Strait effectively serves as a natural barrier to the spread of Climbing Perch to islands to the south of Saibai Island, and to the Australian mainland.”

From Nico and Fuller (2014):

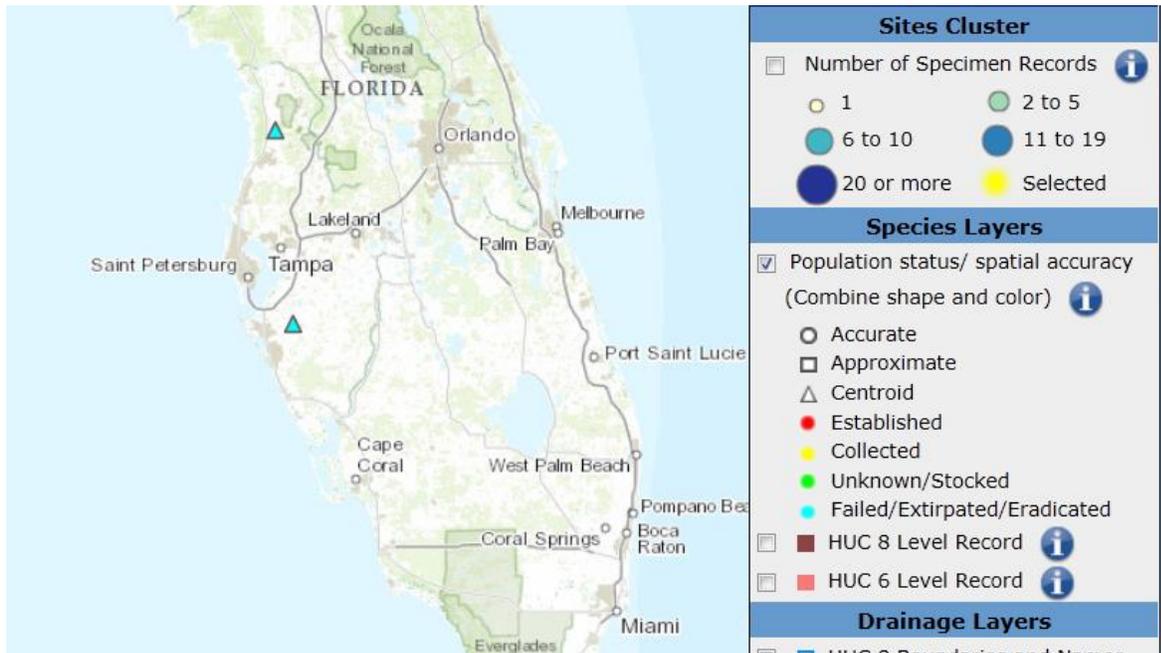
“Unknown.”

## 4 Global Distribution



**Figure 1.** Map of known global distribution of *Anabas testudineus*. Points in Florida were not included because those populations are believed to have been extirpated (Nico and Fuller 2014). Map from GBIF (2014).

## 5 Distribution within the United States

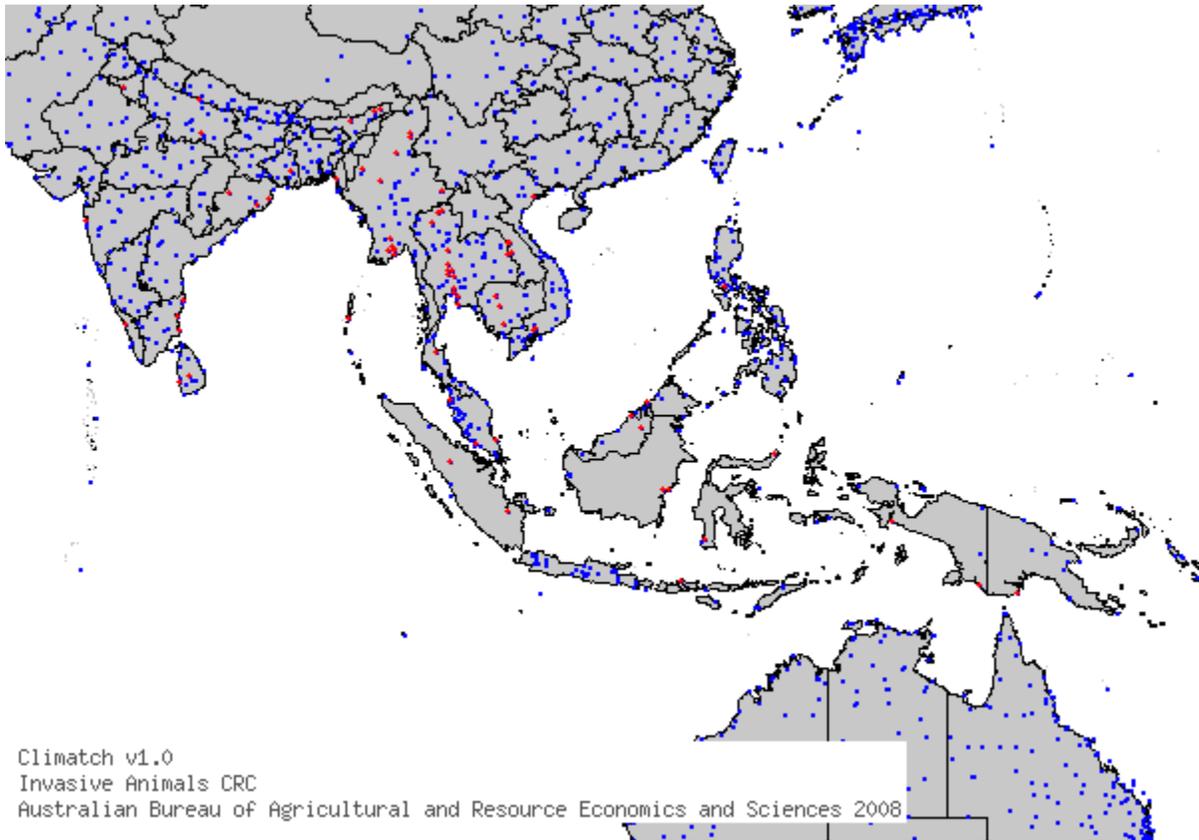


**Figure 2.** Distribution of *Anabas testudineus* in the United States. Map from Nico and Fuller (2014).

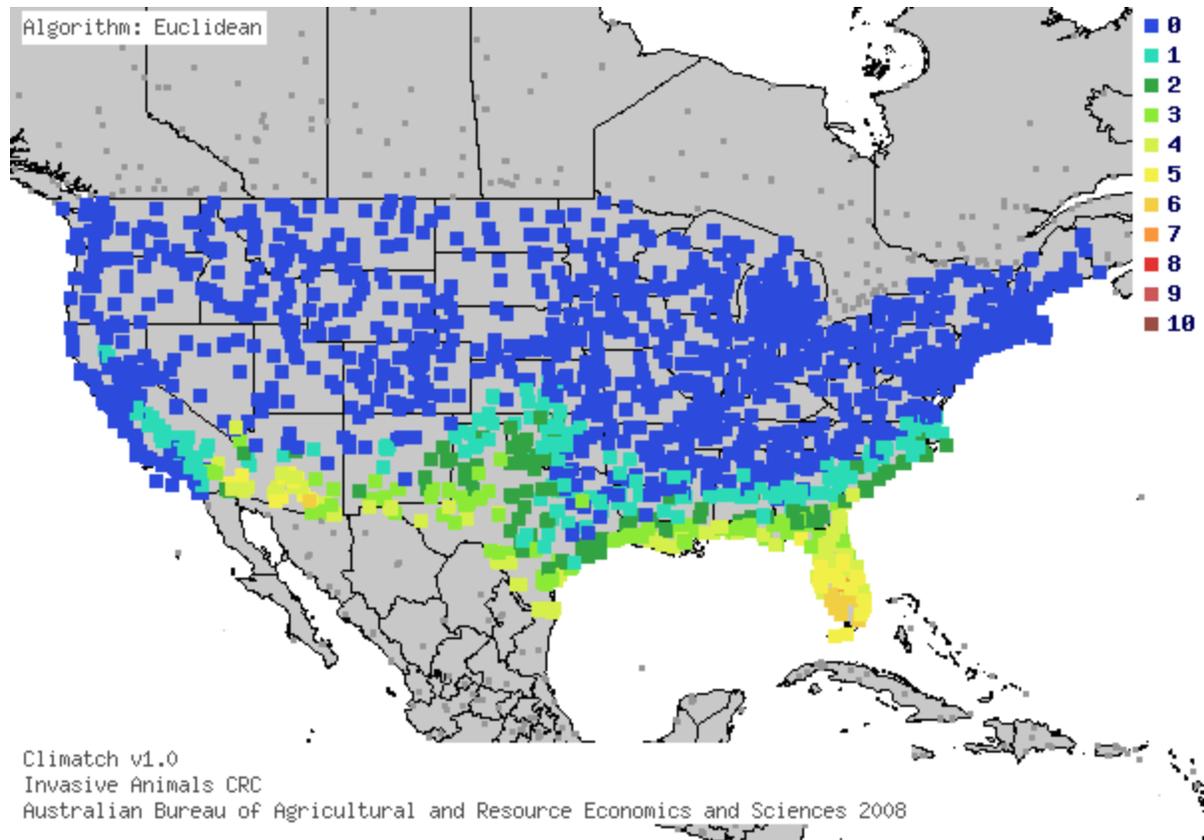
## 6 CLIMATCH

### Summary of Climate Matching Analysis

The climate match (Australian Bureau of Rural Sciences 2008; 16 climate variables; Euclidean Distance) was medium in Florida, isolated locations in the Gulf of Mexico, and the desert southwest. Low match covered the rest of the contiguous U.S. Highest match was in southern Florida. Climate 6 proportion indicated that the contiguous U.S. has a medium climate match. The range for a medium climate match is 0.005 - 0.103; climate match of *Anabas testudineus* is 0.010.



**Figure 3.** CLIMATCH (Australian Bureau of Rural Sciences 2008) source map showing weather stations selected as source locations (red) and non-source locations (blue) for *Anabas testudineus* climate matching. Source locations from GBIF (2014).



**Figure 4.** Map of CLIMATCH (Australian Bureau of Rural Sciences 2008) climate matches for *Anabas testudineus* in the contiguous United States based on source locations reported by GBIF (2014). 0= Lowest match, 10=Highest match.

**Table 1.** CLIMATCH (Australian Bureau of Rural Sciences 2008) climate match scores.

CLIMATCH Score	0	1	2	3	4	5	6	7	8	9	10
Count	1380	194	116	112	103	50	16	2	1	0	0
Climate 6 Proportion =		0.010									

## 7 Certainty of Assessment

There is adequate information about the biology and distribution of *Anabas testudineus*; however, scientific knowledge of impacts from introductions of the species is inconclusive. More information is needed to evaluate the potential and actual impacts the species may be having in introduced areas before the certainty of assessment can be anything but low.

## 8 Risk Assessment

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### Summary of Risk to the Contiguous United States

*Anabas testudineus* is a freshwater fish native to parts of Asia including India and China. It has established in other Asian countries including Indonesia, the Philippines, and Papua New Guinea as well as an Australian island. This species was formerly reported to have an established population outside of a Florida fish farm. This population is now extirpated. Climate match with the contiguous U.S. is medium, with Florida as most likely habitat. Hitchcock (2008) speculates on potential threats from this species including competition for space and food. This species can kill its predators by using its dorsal and opercular spines to lodge itself in the predator's throat. Predator mortality has been observed in Papua New Guinea, but the larger impact of those mortalities is unknown. Currently, no adverse impacts have been reported from the former U.S. population or the Australian population. Overall risk for this species is uncertain.

### Assessment Elements

- **History of Invasiveness (Sec. 3):** Uncertain
- **Climate Match (Sec.6):** Medium
- **Certainty of Assessment (Sec. 7):** Low
- **Remarks/Important additional information** Host of 18 parasites/diseases, able to “walk” across land and survive out of water for substantial period of time
- **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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