



NAS - Nonindigenous Aquatic Species

***Channa argus***

(northern snakehead)

Fishes

Exotic to United States



Artist: Susan Trammel

***Channa argus* (Cantor, 1842)**

Common name: northern snakehead

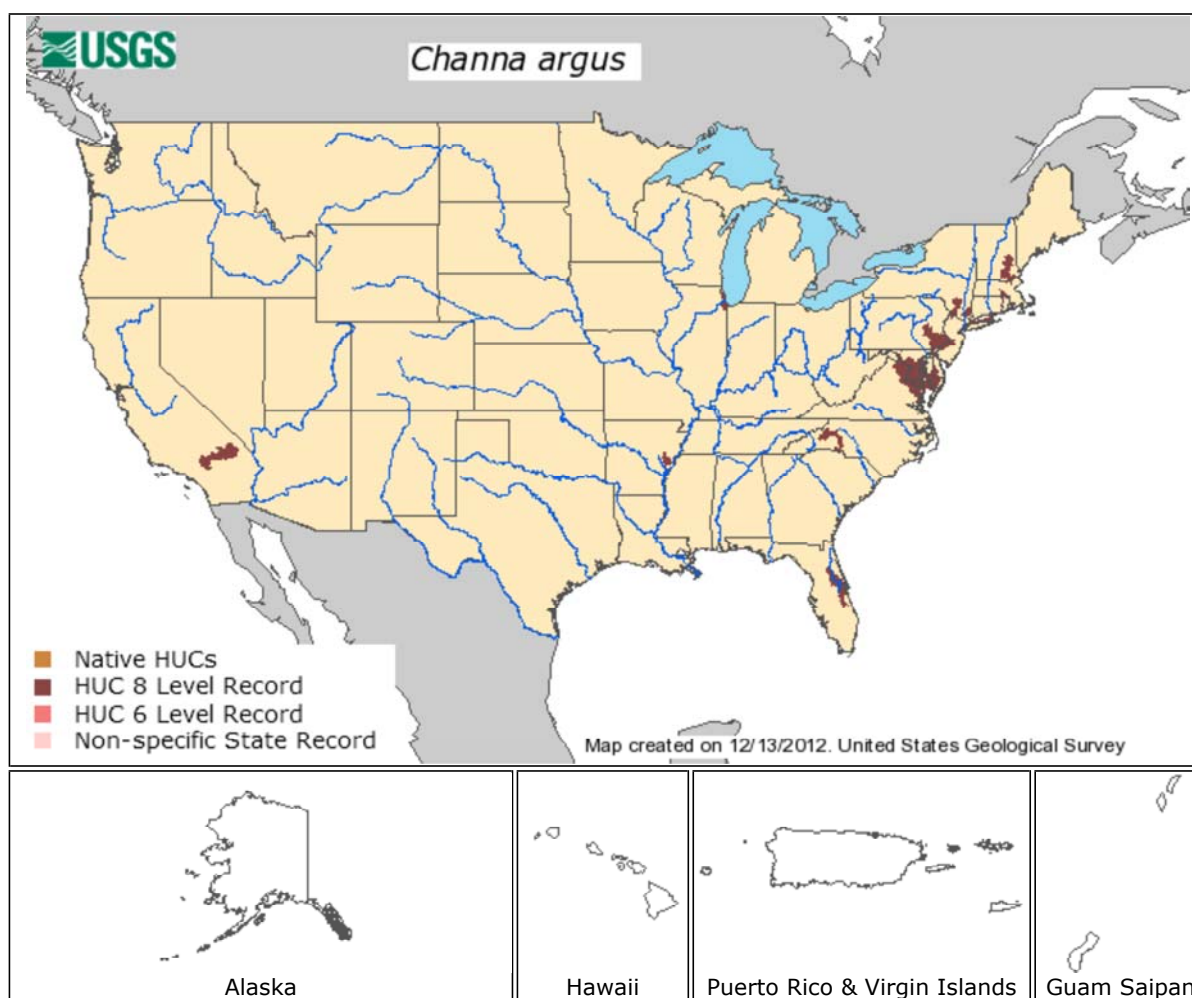
Synonyms and Other Names: Amur snakehead, eastern snakehead. Courtenay and Williams (2004) provide a larger list, including names used in other languages.

Taxonomy: available through www.itis.gov

Identification: A long, thin fish with a single dorsal fin running the length of the fish. Also has a single long anal fin similar to the North American native bowfin (*Amia calva*; see 'Do you know the difference (ID guide)' in the **Other Resources** section below). Overall color is brown with dark blotches. It has a somewhat flattened head with eyes located in a dorsolateral position on the anterior part of the head; anterior nostrils are present and tubular; dorsal and anal fins are elongated, and all fins are supported only by rays (Courtenay and Williams 2004).

Size: Maximum size exceeds 85 cm (33 inches).

Native Range: China, Russia and Korea (Courtenay and Williams 2004).



Nonindigenous Occurrences: The first report of this species in the United States came from Silverwood Lake, **California** in 1997 (Courtenay and Williams 2004). Two fish were captured from the St. Johns River below Lake Harney in **Florida** early in 2000. There were unconfirmed reports of another 3 fish nearby. A specimen was collected in Lake Michigan, Burnham Harbor in downtown Chicago, **Illinois** in 2004 (D. Chapman, pers. comm.). In June 2002, an established population of this species was discovered in a pond in Crofton, **Maryland**. This population was eradicated by state biologists using rotenone. Fish have been reported from two locations in **Massachusetts**; once in 2001 and again in 2004. In July 2005, they were reported in Meadow Lake in Queens, **New York** and persisted in 2006 (J. Pane, pers. comm.). In late May and early June 2008, three snakeheads were collected from stream in Wawayanda, New York (M. Flaherty, pers. comm.). An attempt was made to eradicate this population in 2008.

Two fish were reportedly caught by anglers in August 2002 from Lake Wylie, **North Carolina**. Five years later in 2007, a large adult was caught by a fisherman in South Fork Catawba River in North Carolina (J. Rash, pers. comm.). In July 2004, several individuals were captured from a pond in FDR Park in Philadelphia, **Pennsylvania**. The following year young snakeheads were captured in the park pond (R. Worthington-Kirsch, pers. comm.). In June 2008, a specimen was collected by the city water department from the Schuylkill River in Philadelphia (J. Perillo, pers. comm.).

Beginning in April 2004, several fish were captured from the Potomac River in **Maryland** and **Virginia**. Although it was originally thought that these fish may have originated from the Crofton pond population, genetic evidence showed that this was an unrelated introduction (Starnes et al. 2011). The Potomac River population now extends throughout the lower Potomac from Great Falls to the mouth, including some tidal portions with moderate salinity (up to 7.6 ppt; Starnes et al. 2011). Another specimen was collected in Dogue River in Fairfax County, Virginia. A fish was collected from Massey Creek and in 2005 a breeding female was found in Little Hunting Creek, a tributary of the Potomac, **Virginia**. Many others have been collected in 2006 and 2007 in the Potomac basin centering around Dogue and Little Hunting creeks in Virginia and from the Anacostia River in **Maryland** (J. Odenkirk, pers. comm.). In April 2008, the discovery of a single specimen in a ditch near Monroe, **Arkansas**, led to the determination that a population appears to be established (L. Holt, pers. comm.). Their first appearance in

New Jersey occurred in Delaware River tributaries as early as 2009; they have been caught by fisherman from nearly a dozen streams (C. Smith, pers. comm.).

Ecology: *Channa argus* prefers stagnant shallow ponds, swamps and slow streams with mud or vegetated substrate, with temperatures ranging from 0 to >30°C. This species is highly piscivorous, with fishes comprising >97% of its diet (Saylor et al. 2012).

Means of Introduction: This fish is popular in the Asian food market and most introductions were likely released for this purpose. This was the case in the founding individuals of the Crofton pond population in Maryland.

Status: *Channa argus* is established in Virginia, Maryland, Pennsylvania, New York, and Arkansas, but is **not** established in California, Florida, Illinois, Massachusetts, Delaware, and North Carolina where a few individual fish have been collected. However, the northern snakehead was eradicated from the Crofton pond in Maryland where it was established. The species is well established in the Potomac River and several of its tributaries in Virginia and Maryland (Starnes et al. 2011). Although young fish were found, the status of the Philadelphia population is uncertain. Officials believe fish may have gotten into the lower Schuylkill River and Delaware River in Pennsylvania and see no practical means to eradicate them. In March 2009, the population in Little Piney Creek drainage was eradicated with the application rotenone to more 700 km of creeks, ditches, and backwaters (L. Holt, pers.comm.). The population in Catlin Creek, New York was also treated with rotenone.

Impact of Introduction: Specific impacts are unknown surrounding the Potomac population. These predatory fishes may compete with native species for food and habitat. Juveniles eat zooplankton, insect larvae, small crustaceans, and the fry of other fish. Adult snakeheads feed almost exclusively on other fishes (>97% of diet), with the remainder of their diet composed of crustaceans, frogs, small reptiles, and sometimes small birds and mammals (Courtenay and Williams 2004; Saylor et al 2012). Adult snakeheads show significant diet overlap with largemouth bass (*Micropterus salmoides*), with both consuming a large proportion of fundulids and other centrarchids in the lower Potomac River (Saylor et al. 2012).

Management: The presence of juveniles in the Crofton pond demonstrates the significant potential that the northern snakehead would invade ponds, lakes and rivers in Maryland. Rotenone can be used to eradicate northern snakeheads from lakes and ponds, however this chemical treatment will kill non-target fish species. Rotenone should be applied to the pond or lake with both surface spray application and injected underwater over the entire pond sufficient to achieve a dosage of at least 3 parts per million.

Remarks: There is no evidence that juveniles or adult snakeheads escaped from the Crofton ponds. The northern snakehead has a wider latitudinal range and temperature tolerance than other snakehead species. It also seems to be adaptable to a wide range of aquatic environments, as evidenced by the spread of reproducing, introduced populations in Asia and Japan.

A specimen collected from Lake Wylie, North Carolina, in 2009 was originally identified as *Channa argus*, but later genetic work combined with a closer morphological analysis determined the specimen to be *Channa maculata* (NCSM 53258; W. Starnes, personal communication).

References:

Courtenay, W. R., Jr., and J. D. Williams. 2004. Snakeheads (Pisces: Channidae) -- A biological synopsis and risk assessment. U.S. Department of the Interior, U.S. Geological Survey Circular 1251, 143 p.

Flarherty, M. 2008. New York State Department of Environmental of Conservation. Personal communication.

Holt, L. 2009. Arkansas Game and Fish Commission. Personal communication.

Saylor, R.K., N.W.R. Lapointe, and P.L. Angermeier. 2012. Diet of non-native northern snakehead (*Channa argus*) compared to three co-occurring predators in the lower Potomac River, USA. *Ecology of Freshwater Fish* 21:443-452.

Starnes, W.C., J. Odenkirk, and M.J. Ashton. 2011. Update and analysis of fish occurrences in the lower Potomac River drainage in the vicinity of Plummers Island, Maryland—Contribution XXXI to the natural history of Plummers Island, Maryland. *Proceedings of the Biological Society of Washington* 124(4):280-309.

Other Resources:

USGS Snakehead photo gallery

USFWS Final Rule

Do you know the difference (ID guide)

Snakeheads (Pisces, Channidae) - A Biological Synopsis and Risk Assessment by Courtenay and Williams (March 2004) or download a 7.6 MB PDF version.

Channa argus (Global Invasive Species Database)

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<http://nas.er.usgs.gov/queries/FactSheet.aspx?speciesID=2265> Revision Date: 11/19/2012

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