

Scud (*Apocorophium lacustre*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, Web Version – 9/13/2017



Photo: U.S. Army Corps of Engineers. Public Domain.

1 Native Range and Status in the United States

Native Range

From Benson (2014):

“Native Range: Atlantic Ocean, coast of North America”

From U.S. Army Corps of Engineers (No Date):

“*Apocorophium lacustre* is native to the Atlantic coast of North America from the Bay of Fundy to central Florida but is considered introduced to the Gulf of Mexico.”

Status in the United States

From Benson (2014):

“Nonindigenous Occurrences: Illinois River”

From Grigorovich et al. (2008):

“The corophiid amphipod *Apocorophium lacustre* was first found in the Ohio River in 1996, and first detected in the Upper Mississippi River in 2005. None of these invaders was collected in the

Missouri River. The presence of breeding adults of all three species suggests they are permanently established in the Ohio and Upper Mississippi. The range and occurrence of all three species increased in the basin from 2004 through 2006.”

From U.S. Army Corps of Engineers (No Date):

“This scud has been reported from the lower and upper Mississippi River, the Ohio River, and the Illinois River as non-native. Within this non-native range, habitat preference was associated with hard substrate such as snags and cobble or sand.”

“*A. lacustre* was detected in the lower Mississippi River in 1987 and by 2003 it had been reported from the Illinois River. In 2005 it was reported from the Upper Mississippi River below the confluence with the Illinois River and has yet to be discovered within the Missouri River. In the Illinois River, specimens captured in 2005 were upstream of those caught in 2003, indicating an upstream dispersal pattern toward the Lake Michigan connection.”

Means of Introductions in the United States

Information on means of introduction in the United States was not found.

Remarks

No additional remarks.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2014):

“Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Protostomia
Superphylum Ecdysozoa
Phylum Arthropoda
Subphylum Crustacea
Class Malacostraca
Subclass Eumalacostraca
Superorder Peracarida
Order Amphipoda
Suborder Gammaridea
Family Corophiidae
Genus *Apocorophium*
Species *Apocorophium lacustre*”

“Taxonomic Status: Current Standing: valid”

Size, Weight, and Age Range

From Wilson (2002):

“A small amphipod that grows up to 6 mm.”

Environment

From GBIF (2013):

“Not terrestrial, Marine”

From U.S. Army Corps of Engineers (No Date):

“It can survive in a range of salinities from freshwater up to 16ppm and has generally been captured in tidal pools and river estuaries.”

Climate/Range

Information on the climate requirements of *Apocorophium lacustre* was not found.

Distribution Outside the United States

Native

Species is native to the United States, see Native Range in Section 1.

Introduced

From Jazdzewski et al. (2005):

“As in previous surveys, four corophiid species, *Apocorophium lacustre*, *Chelicorophium curvispinum*, *Corophium volutator* and *C. multisetosum*, occur patchily along the length of the Polish coast [of the Baltic Sea].”

Means of Introduction Outside the United States

A means of introduction outside of the United States for *Apocorophium lacustre* was not found.

Short Description

From U.S. Army Corps of Engineers (No Date):

“Identification to species of this scud requires knowledge of crustacean anatomy and a microscope as specimens may only reach several millimeters in length. The thoracopods are segmented, uniramous, and never lamellar. The carapace is reduced and not bivalved and the naupliar eye is always absent in adults. The telson is present and is usually smaller, narrower than the body, and projecting from the abdomen. The abdomen is not especially narrower than the thorax. The body shape is subcylindrical and the urosome segments are always fused.”

From Wilson (2002):

“It has small eyes that are situated on extensions of the head.”

“Head with triangular rostrum, especially pronounced in male.

Urosome segments fused; lateral ridge distinct, uropods 1 and 2 inserted ventrally.

Gnathopod 1 palm transverse, evenly convex.

Uropod 1 peduncle outer margin with 7-8 spines, inner margin with 1 distal spine; uropod 2 peduncle inner margin with 1 distal spine, outer margin with 3-5 setae.”

Biology

From U.S. Army Corps of Engineers (No Date):

“Species in the family Corophiidae are mainly benthic filter-feeding amphipods, which pump water through a tube or burrow and use sieve setae to trap food particles. During reproduction, females brood embryos on their underside, which hatch out as crawling juveniles. A female biased sex ratio appears to be the most prevalent situation among the family of Corophiidae.”

From Wilson (2002):

“Constructs mud tubes on hydroids, submerged vegetation and other surfaces in fresh or slightly brackish waters.”

Human Uses

Human uses of *Apocorophium lacustre* were not found.

Diseases

Records on diseases of *Apocorophium lacustre* were not found.

Threat to Humans

Information on any threats to humans from *Apocorophium lacustre* was not found.

3 Impacts of Introductions

No information on demonstrated impacts was found. The information below discusses potential impacts of the known introductions.

From U.S. Army Corps of Engineers (No Date):

“This scud will compete with native mussels for food and habitat space and have been known to overwhelm populations. This species has been found to alter food webs and decrease faunal diversity in areas of non-native establishment.”

From Seibert et al. (2011):

“In fall an exotic amphipod (*Apocorophium lacustre*; Corophiidae) dominated the percent number and also percent mass of diets [of Shovelnose Sturgeon in the middle Mississippi River] (Fig. 1[in source material]).”

4 Global Distribution



Figure 1. Known global distribution of *Apocorophium lacustre* as reported by GBIF (2013).

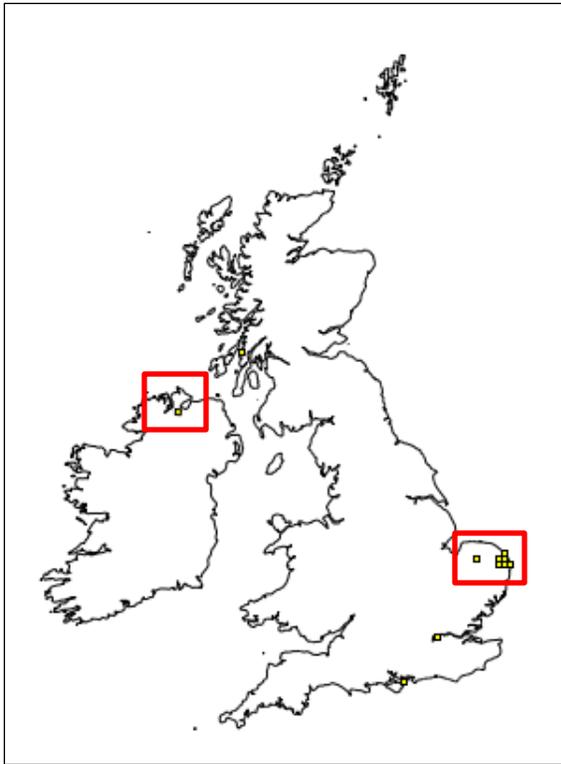


Figure 2. Known distribution of *Apocorophium lacustre* in the United Kingdom (National Biodiversity Network 2016). Squares highlighted with red boxes represent known occurrences.

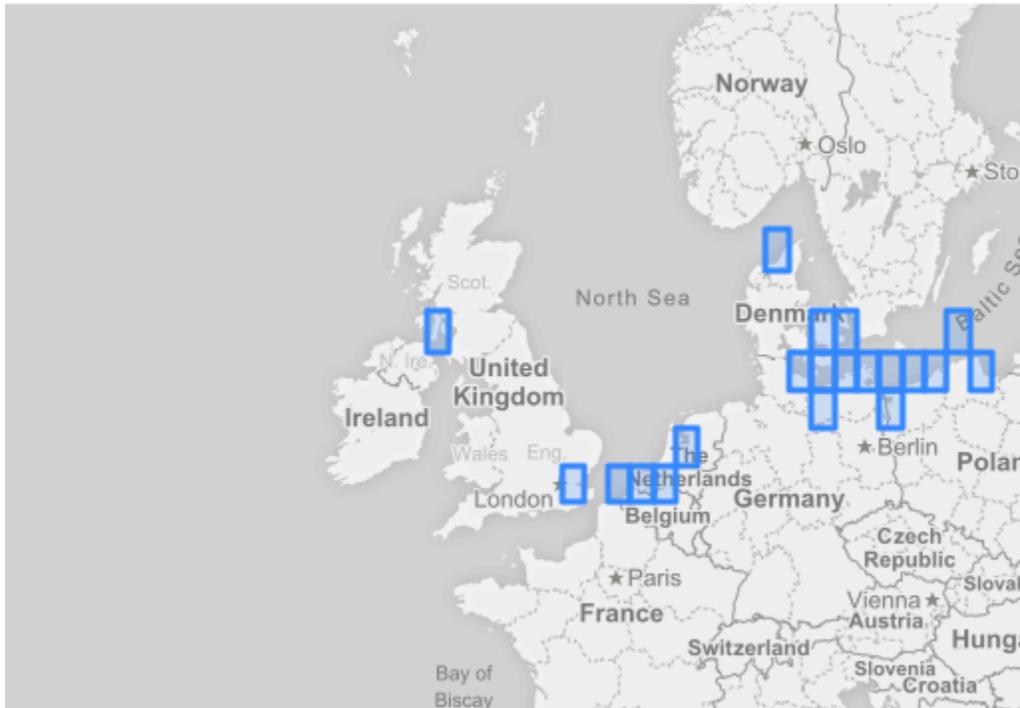


Figure 3. Known distribution of *Apocorophium lacustre* in Europe. Map from Wilson (2002).

5 Distribution Within the United States



Figure 4. Known distribution of *Apocorophium lacustre* in the continental United States as reported by USGS NAS Database (2016). Brown area is the native range of *A. lacustre*; dots of different shades of blue are observations of the species outside its native range.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Apocorophium lacustre* was high in the eastern United States. States west of Texas and Wisconsin have a medium to low match; the west coast has a very low match. The Climate 6 score (Sanders et al. 2014; 16 climate variables; Euclidean distance) for the Continental U.S. was 0.416, high, and individually high in Alabama, Arkansas, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Vermont, Virginia, Washington D. C., West Virginia, and Wisconsin.

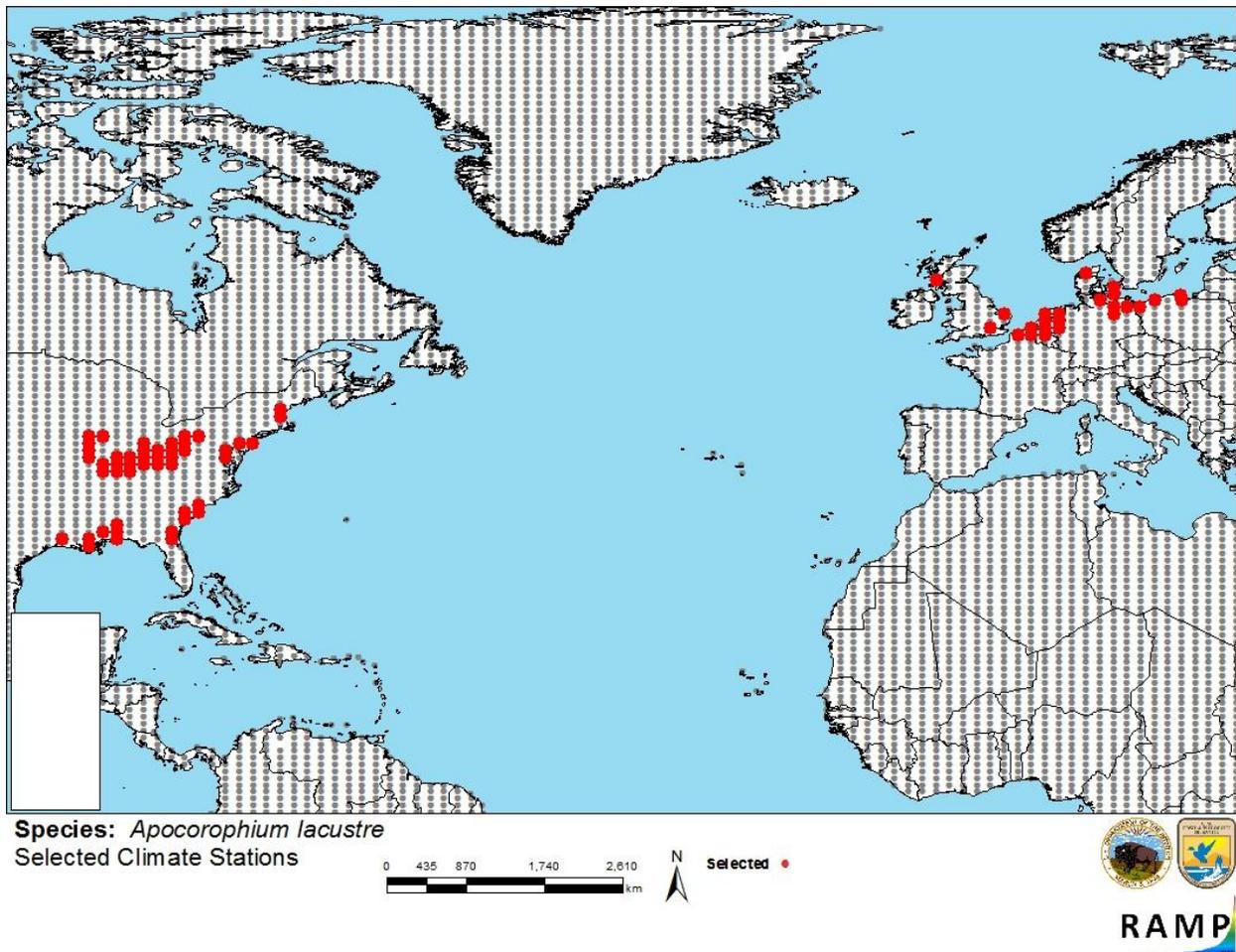


Figure 5. RAMP (Sanders et al. 2014) source map showing weather stations selected as source locations (red) and non-source locations (grey) for *Apocorophium lacustre* climate matching. Source locations from GBIF (2013), National Biodiversity Network (2016), and USGS (2016).

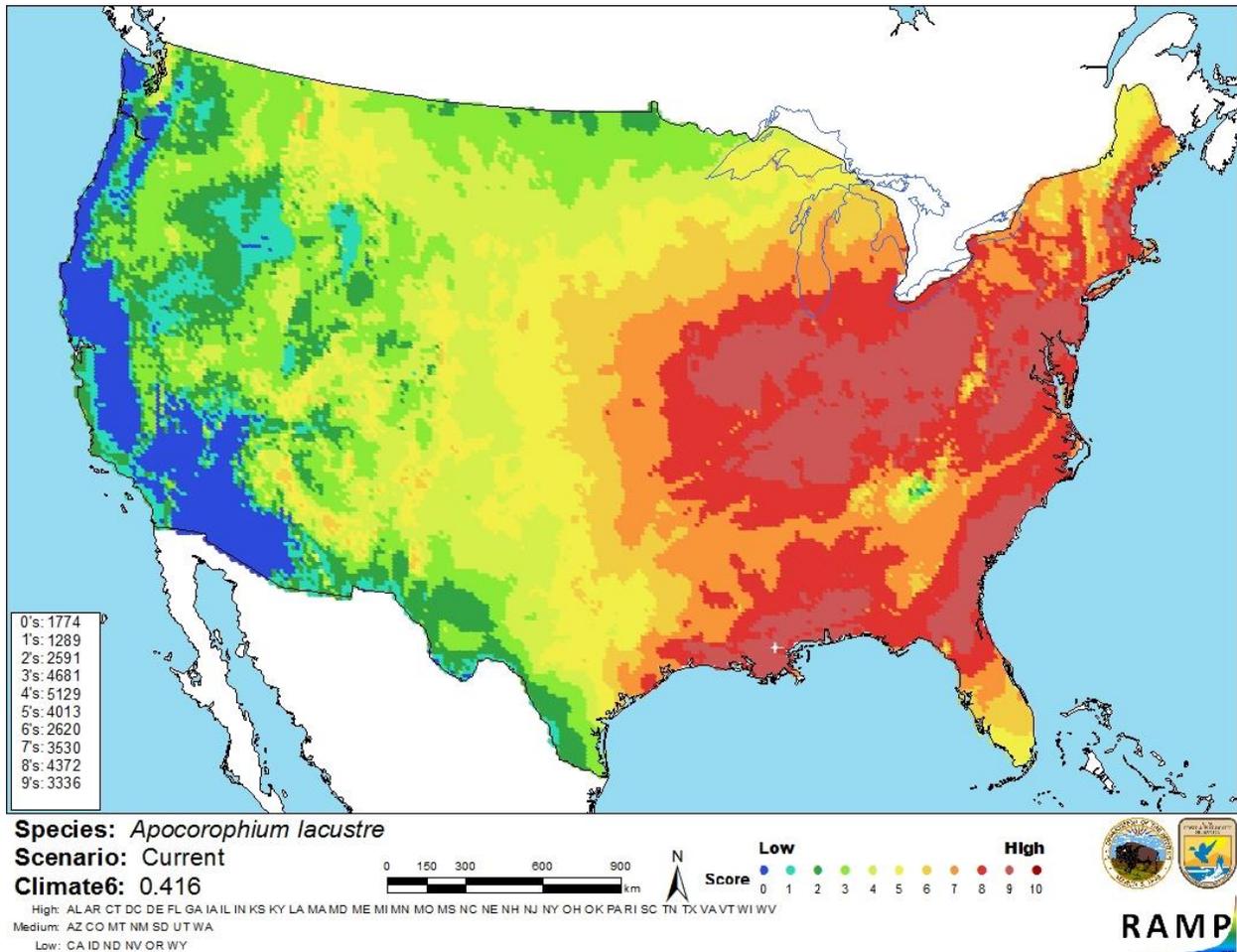


Figure 6. Map of RAMP (Sanders et al. 2014) climate matches for *Apocorophium lacustre* in the continental United States based on source locations reported by GBIF (2013), National Biodiversity Network (2016), and USGS (2016). 0 = Lowest match, 10 = Highest match.

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

Climate 6: Proportion of (Sum of Climate Scores 6-10) / (Sum of total Climate Scores)	Climate Match Category
$0.000 \leq X < 0.005$	Low
$0.005 < X < 0.103$	Medium
≥ 0.103	High

7 Certainty of Assessment

The certainty of assessment is medium. There was adequate information available about *Apocorophium lacustre* but gaps exist. Records of introductions in the United States and Poland were found. Information on impacts of those introductions was minimal and only included potential impacts and not demonstrated ones. Information on ranges, introductions, and impacts was more plentiful than basic biological information.

8 Risk Assessment

Summary of Risk to the Contiguous United States

The history of invasiveness for *Apocorophium lacustre* is not documented. It has already invaded parts of the Illinois, Missouri, upper Mississippi, and Ohio rivers but no information was found on realized impacts. Some information was available regarding potential impacts of those introductions. It has the potential to spread further in these rivers and to expand to neighboring watersheds and the Great Lakes. This species poses a high risk to native food webs and potential decreases in native fauna. The climate match is high. The certainty of assessment is medium. The overall risk assessment category is high.

Assessment Elements

- **History of Invasiveness (Sec. 3): None Documented**
- **Climate Match (Sec. 6): High**
- **Certainty of Assessment (Sec. 7): Medium**
- **Remarks/Important additional information** No additional remarks.
- **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.

No references in this section.