Species Status Assessment

Common Name: Atlantic marsh fiddler crab **Date Updated:** 12/4/2023

Scientific Name: *Minuca pugnax* **Updated by:** Kyle Martin, MISC

Class: Malacostraca

Family: Ocypodidae

Species Synopsis *(a short paragraph which describes species taxonomy, distribution, recent trends, and habitat in New York):*

Previously known as *Uca pugnax,* the Atlantic marsh fiddler crab, *Minuca pugnax* has historically been found throughout intertidal wetlands along the Atlantic Coast from Massachusetts to Florida (Shih 2016, Grimes et al. 1989). In 2014, it was recognized that this species has undergone a range expansion as adult Atlantic marsh fiddler crabs were found 80 km north of its previously known limit in New Hampshire, with gravid females indicating establishment of this species in North Hampshire. Recently, adult Atlantic marsh fiddler crabs have been reported as far north as Maine (Roberts 2017). This is a burrowing crab that has a large impact on ecosystem functions in salt marshes and tidal waters by altering nutrient/oxygen availability and possibly encouraging root growth of *Spartina alterniflora* (Grimes et al. 1989, Shields 1999). In New York, this species can be found in the Lower Hudson River and Long Island estuaries and bays (NYSDEC 2005). There is little information describing the abundance and occurrence of this species making it difficult to determine population trends; however, this species seems common where it occurs. This species is anticipated to expand its range and increase in abundance due to increased temperatures and sea level rise driven by climate change (Zajac 2022).

I. Status

a. Current legal protected Status

i. **Federal:** Not Listed **Candidate:** No

ii. **New York:** Not Listed

b. Natural Heritage Program

i. **Global:** G5 secure

ii. **New York:** Not Ranked **Tracked by NYNHP?:** No

Other Ranks:

-New York 2025 SGCN status: Species of Greatest Conservation Need

-IUCN Red List: Not listed

-Northeast Regional SGCN: Not listed

Status Discussion:

There is little information on the abundance of *M. pugnax* throughout its range, including New York. This species has not received any federal or state protection. Additionally, it has not received any global or state Natural Heritage Program ranks. This species is fairly common in its habitat and is expected to respond positively to climate change as warming temperatures and sea level rise lead to increased habitat availability (Zajac 2022).

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Unknown	Unknown			-
Northeastern US	Yes	Unknown	Unknown			No
New York	Yes	Unknown	Unknown			Yes
Connecticut	No data	Unknown	Unknown		Not Listed	No
Massachusetts	No data	Unknown	Unknown		Not Listed	No
New Jersey	No data	Unknown	Unknown		Not Listed	No
Pennsylvania	No	-	-			-
Vermont	No	-	-			-
Ontario	No	-	-			-
Quebec	No	-	-			-

Column options
Present?: Yes; No; Unknown; No data; (blank) or Choose an Item
Abundance and Distribution: Declining; Increasing; Stable; Unknown; Extirpated; N/A; (blank) or Choose an item
SGCN?: Yes; No; Unknown; (blank) or Choose an item

Monitoring in New York *(specify any monitoring activities or regular surveys that are conducted in New York):*
There are no surveys or monitoring activities specific to *M. pugnax* in New York.

Trends Discussion *(insert map of North American/regional distribution and status):*

There is little information available describing the abundance of this species, making it difficult to determine population trends. This species is expected to benefit from warming temperatures, as milder winters may reduce mortality and increase suitable habitat (Roberts 2017, Zajac 2022).

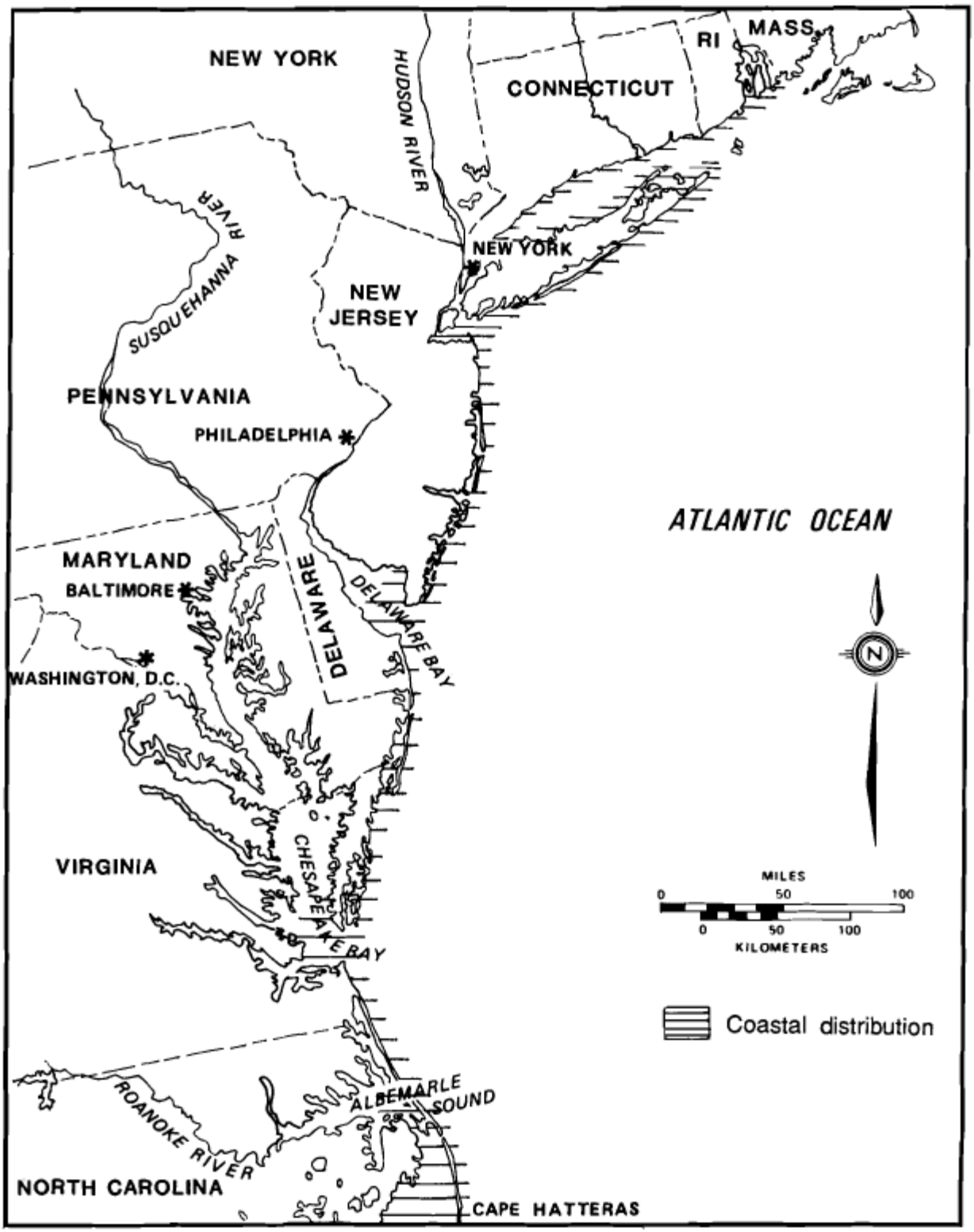

Figure 1: Historical distribution of the Atlantic marsh fiddler crab along the Mid-Atlantic Coast (Grimes et al. 1989).

Figure 2. Expanded distribution of *Minuca pugnax* (Martínez-Soto 2023)

Figure 3. Conservation status of Atlantic marsh fiddler crab in North America.

III. New York Rarity *(provide map, numbers, and percent of state occupied)*

This species is fairly common throughout its occurrence.

Details of historic and current occurrence:

Currently, this species still can be found in the Lower Hudson River and Long Island bays and estuaries (NYSDEC 2005).

New York's Contribution to Species North American Range:

Percent of North American Range in NY	Classification of NY Range	Distance to core population, if not in NY
1-25%	Peripheral	

Column options
Percent of North American Range in NY: 100% (endemic); 76-99%; 51-75%; 26-50%; 1-25%; 0%; Choose an item
Classification of NY Range: Core; Peripheral; Disjunct; (blank) or Choose an item

IV. Primary Habitat or Community Type *(from NY crosswalk of NE Aquatic, Marine, or Terrestrial Habitat Classification Systems):*

a. Size/Waterbody Type:

1. Estuarine, Brackish Intertidal, Tidal Wetland
2. Estuarine, Brackish Intertidal, Benthic Geomorphology
3. Marine, Intertidal, Benthic Geomorphology

Habitat or Community Type Trend in New York

Habitat Specialist?	Indicator Species?	Habitat/ Community Trend	Time frame of Decline/Increase
Yes	No	Stable	

Column options
Habitat Specialist and Indicator Species: Yes; No; Unknown; (blank) or Choose an item
Habitat/Community Trend: Declining; Stable; Increasing; Unknown; (blank) or Choose an item

Habitat Discussion:

This species is associated with both high and low salt marsh where short cordgrass, *Spartina alterniflora* is abundant (Grimes et al. 1989, Shields 1999). This crab creates burrows in the mud and burrows decrease in abundance as you move from low to high marsh. This is due to the accumulation of a heavy root mat in the high marsh (Grimes et al. 1989). *M. pugnax* is considered an ecosystem engineer and their loss could be detrimental to the health of salt marshes as they play a central role in decomposition, oxygenation, and nutrient cycling in saltmarsh ecosystems (NYSDEC 2005).

V. Species Demographics and Life History

Breeder in NY?	Non-breeder in NY?	Migratory Only?	Summer Resident?	Winter Resident?	Anadromous/ Catadromous?
Yes	-	-	Yes	Yes	-

Column options
First 5 fields: Yes; No; Unknown; (blank) or Choose an item
Anadromous/Catadromous: Anadromous; Catadromous; (blank) or Choose an item

Species Demographics and Life History Discussion *(include information about species life span, reproductive longevity, reproductive capacity, age to maturity, and ability to disperse and colonize):*

Atlantic marsh fiddler crabs are found in burrows that can be up to two feet deep near the water's edge (Shields 1999). The average lifespan of a fiddler crab is one to 1.5 years (Grimes et al. 1989). Fiddler crabs are colonial, often living together in large clusters. Territorial fighting between males often occurs (Shields 1999). The large claw of the male fiddler crab is a sexual characteristic and is used to attract a mate during the breeding season and for territorial protection (Shields 1999).

Breeding in New York is believed to occur in July and August (Crane 1975 from Grimes et al. 1989). During courtship, the male crabs stand by the entrance to the burrow waving the larger claw to attract a female while also producing acoustical displays (Grimes et al. 1989, Shields 1999). Once a female is attracted, mating typically occurs inside the burrow. Unlike other crab species, the female fiddler's exoskeleton remains hard during mating. The fertilized eggs, in clutches ranging from 1,500 to 94,000 eggs, remain on the underside of the female until they are ready to hatch (Grimes et al. 1989).

Larvae go through three stages and sexual maturity is reach in about one year (Grimes et al. 1989). This species is a detritovore that feeds on meiofauna living in the mud (Shields 1999). Fiddler crabs are an important link in the food web as their burrowing activities can improve metabolic processes in the marsh by possibly increasing oxygenation, drainage, and sediment turnover (Shields 1999). Predators include several fish species and various birds (Grimes et al. 1989).

VI. **Threats** *(from NY 2015 SWAP or newly described)*

Threat Level 1	Threat Level 2	Threat Level 3	Spatial Extent	Severity	Immediacy	Trend	Certainty
7. Natural System Modifications	7.3 Other Ecosystem Modifications	-	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
8. Invasive & Other Problematic Species	8.1 Invasive Non-Native Plants & Animals	-	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
8. Invasive & Other Problematic Species	8.2 Problematic Native Plants & Animals	-	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.1 Domestic & Urban Wastewater	-	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.

Table 1: Threats to Atlantic marsh fiddler crab.

Threats specific to this species are not well described in the literature. General threats to fiddler crab species include: oil spills, substrate contamination, tidal wetlands loss, human activities, and invasive flora and fauna (NYSDEC 2005). It has been shown that the invasive Asian shore crab, *Hemigrapsus sanguineus* utilizes *U. pugnax*' burrows in areas around the Long Island Sound. Although it was determined that the invasive crab will not significantly alter the fiddler crabs' habitat usage (Brousseau 2003), monitoring the expansion and impact of this invasive species will be important in assessing the potential threats to fiddler crabs and other native crab species.
*Reasons for loss: eutrophication/climate change/shoreline hardening/development

Are there regulatory mechanisms that protect the species or its habitat in New York?

Yes: X **No: _____** **Unknown: _____**

If yes, describe mechanism and whether adequate to protect species/habitat:

The Tidal Wetlands Act provides protection for all tidal wetlands under Article 25 of the NYS Conservation Law.

Describe knowledge of management/conservation actions that are needed for recovery/conservation, or to eliminate, minimize, or compensate for the identified threats:

Protection and proper management of tidal wetlands will protect the Atlantic marsh fiddler crab and other species that utilize such areas for habitat. Abundance surveys should be conducted in order to better assess the status of fiddler crabs in the marsh habitat. How the marsh is affected by fiddler crab burrows, as well as the effects of marsh loss on fiddler crabs are two areas of research that should be studied in greater depth. It is also important to research the impacts on fiddler crabs from changes in marsh plant assemblages, such as the increased occurrence of *Phragmites australis*. Monitoring the spread and impacts from the Asian Shore Crab, *Hemigrapsus sanguineus* on native crab populations will aid in assessing potential threats that face the Atlantic marsh fiddler crab. Much of the life history information available for fiddler crabs is general, and does not distinctly address all three species within NY's marine district. In order to better assess the conservation needs of the Atlantic marsh fiddler crab, species specific research should be conducted.

Action Category	Action	Description
A.1 Direct Habitat Management	A.1.0.0.0 Direct Habitat Management	Manage tidal wetlands
C.6 Design and Plan Conservation	C.6.5.0.0 Conservation Planning	Protect tidal wetlands
C.8 Research and Monitoring	C.8.1.1.1 Characterization, demographic study, population, or inventory	Conduct abundance surveys
C.8 Research and Monitoring	C.8.1.5.3 Analyzing threats or their impacts	Investigate threats from Asian shore crab and marsh plant assemblages

Table 2: Recommended conservation actions for Atlantic marsh fiddler crab.

VII. References

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