

## Species Status Assessment

**Class:** Osteichthyes (bony fishes)  
**Family:** Percidae (perch)  
**Scientific Name:** *Ammocrypta pellucida*  
**Common Name:** Eastern sand darter

### Species synopsis:

Eastern sand darter occurs east of the Mississippi River in the rivers and streams of western Illinois, Indiana, Ohio, northern Kentucky, western West Virginia, western Pennsylvania, and in the shallow shores of Lake St. Clair, the southern end of Lake Huron, and the southern shore of Lake Erie from Ohio to New York. There is a disjunct population in northern New York and southern Quebec in the Lake Champlain drainage and along the New York and Vermont border in the St. Lawrence River drainage. It inhabits medium-sized streams and larger rivers with clean sand and low gradient. Early reports placed this species in the Erie watershed and in the Salmon River of the Saint Lawrence watershed. The Salmon River population is secure but the population in the Erie watershed has apparently declined. Its presence in the Oswegatchie, Champlain, Allegheny and St. Lawrence tributaries dates back to 1979, which suggests an increase in abundance or possibly a range expansion. A new record from the Bouquet River in 2013 extends the range of this species northward significantly (D. Carlson, personal communication).

### I. Status

#### a. Current and Legal Protected Status

- i. **Federal** Not Listed **Candidate:** No  
ii. **New York** Threatened, SGCN

#### b. Natural Heritage Program Rank

- i. **Global** G4  
ii. **New York** S2 **Tracked by NYNHP** Yes

### Other Rank:

Species of Northeast Regional Conservation Concern (Therres 1999)  
Canadian Species at Risk Act (SARA): Schedule 1 Threatened (5 Jun 2003)  
(COSEWIC): Threatened (Ontario and Quebec populations)  
IUCN Red List Category: Vulnerable

American Fisheries Society Status: Threatened

**Status Discussion:**

The eastern sand darter is globally ranked Apparently Secure by NatureServe but has a discontinuous range in the northeastern United States and adjacent Canada. Many populations have been reduced or extirpated as a result of siltation, impoundments, and pollution, but currently populations are believed to be relatively stable in most of the range (NatureServe 2012).

Beyond those below, classifications in additional states include SGCN and threatened in Michigan (S1S2), and SGCN in West Virginia (S2S3) and Ohio (S3).

Habitat loss and poor water quality have resulted in a reduced distribution. In Canada, eastern sand darter has declined or become extirpated from 11 of 21 locations. Over the past 50 years, 45% of population occurrences in Ontario have been lost (Committee on the Status of Endangered Wildlife in Canada [COSEWIC] 2009). Several new sites have been found since the 1970s; however, the net result is a reduction in distribution (Holm and Mandrak 1996) ---excerpted from the Department of Fisheries and Oceans Canada Recovery Plan for Eastern Sand Darter (Ontario Ministry of Natural Resources 2013).

**II. Abundance and Distribution Trends**

**a. North America**

**i. Abundance**

declining     increasing     stable     unknown

**ii. Distribution:**

declining     increasing     stable     unknown

**Time frame considered:** Since 1989

**b. Regional**

**i. Abundance**

  X   declining      increasing      stable      unknown

**ii. Distribution:**

  X   declining      increasing      stable      unknown

**Regional Unit Considered:**   Region 5 – Northeast (Species of Concern)  

**Time Frame Considered:** \_\_\_\_\_

**c. Adjacent States and Provinces**

CONNECTICUT                      Not Present   X                        No data \_\_\_\_\_

MASSACHUSETTS                      Not Present   X                        No data \_\_\_\_\_

NEW JERSEY                      Not Present   X                        No data \_\_\_\_\_

ONTARIO                      Not Present \_\_\_\_\_                      No data \_\_\_\_\_

**i. Abundance**

  X   declining      increasing      stable      unknown

**ii. Distribution:**

  X   declining      increasing      stable      unknown

Time frame considered:   80 years  

Listing Status:     Threatened (S1)

**PENNSYLVANIA**                      **Not Present** \_\_\_\_\_                      **No data** \_\_\_\_\_

**i. Abundance**

\_\_\_\_ declining    \_\_\_\_ increasing                      \_\_\_\_ stable                      **X** unknown

**ii. Distribution:**

\_\_\_\_ declining    \_\_\_\_ increasing                      \_\_\_\_ stable                      **X** unknown

Time frame considered: \_\_\_\_\_

Listing Status: \_\_\_\_\_ Endangered \_\_\_\_\_                      SGCN? Yes \_\_\_\_\_

**QUEBEC**                                      **Not Present** \_\_\_\_\_                      **No data** \_\_\_\_\_

**i. Abundance**

**X** declining    \_\_\_\_ increasing                      \_\_\_\_ stable                      \_\_\_\_ unknown

**ii. Distribution:**

**X** declining    \_\_\_\_ increasing                      \_\_\_\_ stable                      \_\_\_\_ unknown

Time frame considered: \_\_\_\_\_

Listing Status: \_\_\_\_\_ Threatened \_\_\_\_\_

**VERMONT**                                      **Not Present** \_\_\_\_\_                      **No data** \_\_\_\_\_

**i. Abundance**

\_\_\_\_ declining    \_\_\_\_ increasing                      \_\_\_\_ stable                      **X** unknown

**ii. Distribution:**

\_\_\_\_ declining    \_\_\_\_ increasing                      \_\_\_\_ stable                      **X** unknown

Time frame considered: \_\_\_\_\_

Listing Status: \_\_\_\_\_ Threatened \_\_\_\_\_                      SGCN? Yes \_\_\_\_\_

**d. NEW YORK**

No data \_\_\_\_\_

**i. Abundance**

\_\_\_ declining \_\_\_ increasing X (North NY) stable \_\_\_ X (West NY) unknown

**ii. Distribution:**

\_\_\_ declining X increasing \_\_\_ stable \_\_\_ unknown

Time frame considered: \_\_\_\_\_

**Monitoring in New York.**

Monitoring programs are carried out by the NYSDEC Rare Fish Unit, 1998-2012.

**Trends Discussion:**

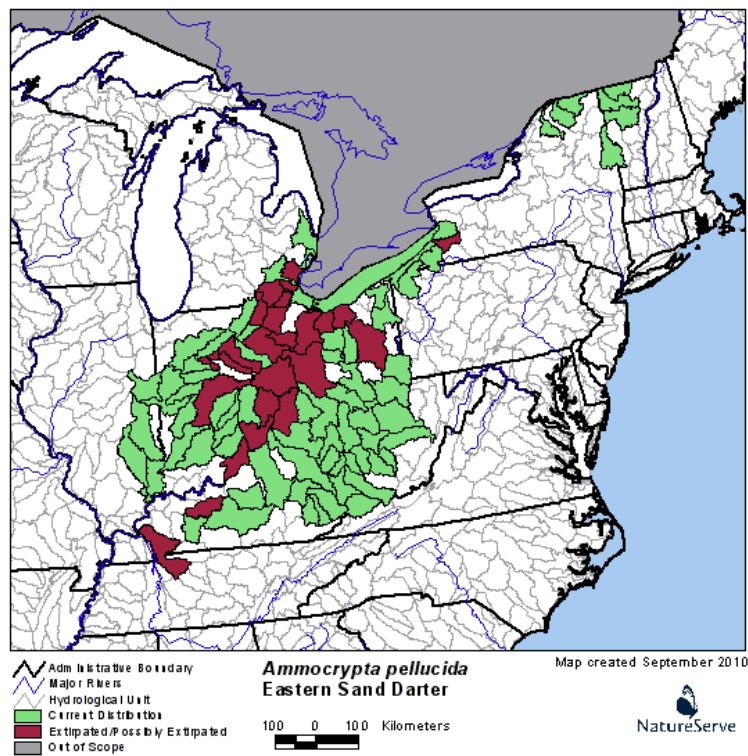
Eastern sand darter has a discontinuous range in the northeastern United States and adjacent Canada and New York's position within this range is at the edge.

Many populations have been reduced or extirpated as a result of siltation, impoundments, and pollution, but short-term trends indicate that since 1989 populations have been relatively stable in most of the range. Long-term trends show that area of occupancy and abundance have declined significantly (30-70%) in several areas (NatureServe 2012).

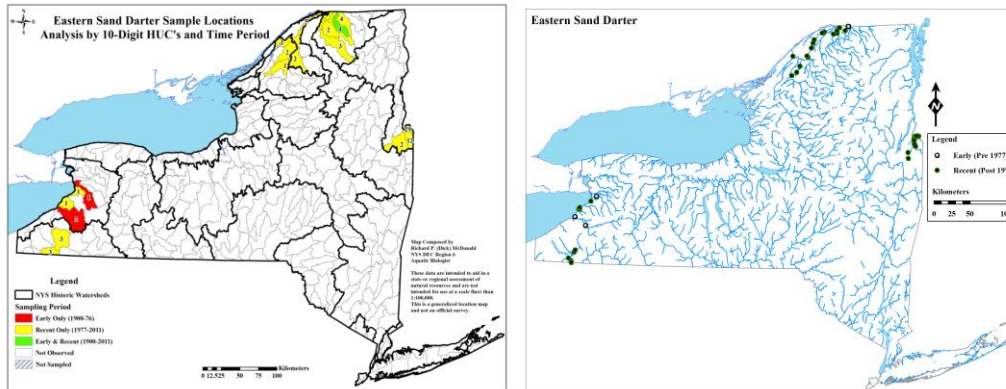
In New York State, eastern sand darter has historically been found in 13 waters (still in 11) and their range has increased in five of the six watersheds. In the sixth watershed, Erie, sand darters remain in Lake Erie but have never recovered from declines in two subbasins. Abundance appears to be stable in northern New York and its trend is unknown in western New York. The early records show losses of this species from Cattaraugus and Cazenovia creeks, and this reduced the number of waters from four to two. However, there was a gain of seven new waters in the last 20 years, and this puts the present number at nine separate waters. Abundance was estimated (as catch per unit effort) over four years in four northern streams, and the numbers showed modest fluctuations (Bouton 1991). The population in Lake Erie may be affected by the recent invasion of round goby.

The differences in frequency occurrence in comprehensive stream surveys from these watersheds show relatively low levels throughout, and the increase in the number of watersheds they inhabit shows improvements. The percent frequency occurrence of records was 2-4% of the St. Lawrence/St. Lawrence Canada watersheds in 2007 compared to 0.4% in 1930-31. They occurred in 2% of the samples in Oswegatchie in 2007 (for the first time), 4% in the Champlain watershed

(1999-2004), 5% in the Allegheny (1998-2007, for the first time) and were not caught in stream samples of Erie watershed (1993-2006). Other sampling efforts in Lake Erie encountered them during the same period. The distribution of this species among sub-basins within each watershed has also changed substantially, with records from seven of the hydrologic units prior to 1977 and from 20 units since 1976 (Table 1). Statewide, the number of records of this species in the last 30 years exceeds 86, compared to only four reports prior to 1977. (There were a couple hundred more collections from the 1970-80s from studies specifically directed at this species). The number of extant occurrences is now somewhere between 6 and 13 depending upon whether some rivers are combined and whether the Lake Erie sites are combined. The newly discovered populations of the eastern sand darter indicate that the species is recovering. The goal of established five disjunct populations as stated in the state recovery plan has been met.



**Figure 1.** U.S. distribution of eastern sand darter by watershed (NatureServe 2012).



**Figure 2.** Eastern sand darter distribution in New York, as collected before 1977 and from 1977 to present time, shown with HUC-10 units where they were found.

Watershed name	Total # HUC10	Early only	Recent only	both	Watershed status
Allegheny	6	0	2	4	gain?
Champlain	3	0	3	0	gain
Erie-Niagara	4	2	2	0	
Oswegatchie	3	0	3	0	gain
St. Law&SLC	6	0	5	1	
sum	22	2	15	5	

**Table 1.** Records of rare fish species in hydrological units (HUC-10) are shown according to their watersheds in early and recent time periods (before and after 1977) to consider loss and gains. Further explanations of details are found in Carlson (2012).

**III. New York Rarity, if known:**

Historic	<u># of Animals</u>	<u># of Locations</u>	<u>% of State</u>
prior to 1977	_____	<u>4 records</u>	<u>2/18 watersheds</u>
prior to 1980	_____	_____	_____
prior to 1990	_____	_____	_____

**Details of historic occurrence:**

Eastern sand darters were found in western New York in Cataraugus Creek, Cazenovia Creek and Lake Erie, and in northern New York in the St. Lawrence and Little Salmon River.

<b>Current</b>	<b><u># of Animals</u></b>	<b><u># of Locations</u></b>	<b><u>% of State</u></b>
<b>(since 1977)</b>	_____	<b><u>6-13 occurrences</u></b>	<b><u>5/18 watersheds</u></b>

**Details of current occurrence:**

Since 1977, additional sampling has shown eastern sand darter to also inhabit an extension of the Little Salmon River into the Salmon River, as well as seven new rivers, the Mettawee River (1979), Poultney River (1983), St. Regis (1997), Deer River (1997), Grasse River (1998), Conewango Creek (2004), Stillwater Creek (2004), Oswegatchie River (2007-09), Halfway Creek (2008 and 2011), Lake Champlain Canal (2008 and 2011), and Bouquet River (2013). The records from the Bouquet River in 2013 document a significant range expansion, 60 miles farther north along the Lake Champlain corridor (D. Carlson, personal communication).

The Poultney River population was thought to be the most wide-spread, as shown by intensive seining efforts for five years by Bouton (1991) and by additional studies (Daniels, as described by Facey 2002). Sand darters were thought to be possibly expanding their range in the Mettawee River (Daniels 1993) from the 4 miles reach, but sampling in 1995 showed them to be in the same areas (Facey 1998). The Lake Champlain Canal population is 14 mi upstream of the mouth of Mettawee River and located just downstream of Lock 9. The St. Regis River-Deer River population extends over 10 mi. The most downriver site with this species was within one mile of the St. Lawrence and on lands/waters of the Mohawk St. Regis Tribe. In 1985, the Little Salmon River population was found to extend up the Little Salmon River 8 mi and extend downstream into the Salmon River to amount to an additional two mi (upstream from the Fort Covington, US Customs Office).

Catches in Lake Erie with trawl and seine have been near Athol Springs in 1991, Sturgeon Point in 1994, Evangola State Park in 1995 and 2001 (at depths generally of 17m but one at 21 m) and off the mouth of Big Sister Creek in 2005. These areas extend along 18 miles of shore frontage. Cattaraugus Creek contained this species in 1893, but surveys in neither 1928, 1985 (McKeown 1986) nor 2004 were able to capture this species. Severely polluted conditions before 1928 are expected to have eliminated this population. In the Allegheny River system, this species was caught in the lower 1 mile of Conewango and Stillwater Creeks in 2004 when it was previously known over 60 mi. away and in a different tributary in Pennsylvania, French Creek. The Oswegatchie River population is now known (since 2007-08) in the 18 mi segment upstream of DeKalb and near Eel Weir State Park.

**New York's Contribution to Species North American Range:**

**% of NA Range in New York**

\_\_\_\_ **100 (endemic)**

**Classification of New York Range**

\_\_\_\_ **Core**



\_\_\_ 76-99

X Peripheral

\_\_\_ 51-75

X Disjunct

\_\_\_ 26-50

Distance to core population:

\_\_\_ 1-25

450 miles

**IV. Primary Habitat or Community Type:**

1. Medium River, Low-Moderate Gradient, Assume Moderately Buffered, Warm
2. Summer-stratified Monomictic Lake
3. Unconfined River

**Habitat or Community Type Trend in New York:**

\_\_\_ Declining X Stable      \_\_\_ Increasing      \_\_\_ Unknown

Time frame of decline/increase: \_\_\_\_\_

Habitat Specialist?      X Yes      \_\_\_ No

Indicator Species?      X Yes      \_\_\_ No

**Habitat Discussion:**

This species inhabits Lake Erie and low gradient streams, usually occurring over sand substrate where currents are sufficient to prevent siltation but retain sand. In streams, these darters are typically found on the depositional side of the channel immediately downstream of a bend. Habitat preferences were described by Daniels (1993). The agricultural land-uses of the Poultney River riparian areas may be causing erosion and habitat degradation. These conditions are not currently present in the far northern corridor where three of the other streams are found, but may be present in lower Conewango Creek. The recent discovery of their presence there may be a sign of habitat improvement rather than the often assumed degradation. The Lake Erie population uses much different habitats than those in streams of the St. Lawrence and Lake Champlain watersheds, but details are not available. Degradation of habitats in Lake Erie was substantial in previous decades, and improvements in water quality may account for their recent resurgence. Sand bars of the Upper Niagara River might be expected to attract or sustain sand darters but none have been caught.

These areas are now infested with round goby.

Essential habitat trend appears stable, but specifics are unknown. Habitat degradation studies have been underway in the Poultney River (Facey and O'Brien 2003).

**V. New York Species Demographics and Life History**

- Breeder in New York**
  - Summer Resident**
  - Winter Resident**
  - Anadromous**
- Non-breeder in New York**
  - Summer Resident**
  - Winter Resident**
  - Catadromous**
- Migratory only**
- Unknown**

**Species Demographics and Life History Discussion:**

Maximum longevity is only a few years. Spawning takes place between June and July. Yearling females that had not attained a standard length of 36 mm may not spawn in that year (NatureServe 2012).

**VI. Threats:**

The American Fisheries Society listed the eastern sand darter as threatened in all the states where it occurs, and USFWS has begun a status assessment (Grandmaison and Mayasich 2004). The major cause of declines in their populations is loss of clean sandy substrate due to siltation. Heavy siltation is a problem in highly industrialized and agricultural areas. Siltation can vary with the type of crops and tillage practices. Disturbance of riparian areas, such as levees or wetlands that represent silt

traps can be a significant threat. On some streams, the construction of dams led to fragmentation of sand darter populations. In addition, the impoundments created with the construction of these dams also act as settling basins which aggravate siltation problems. Stream pollution and stream channelization have also caused loss of eastern sand darter habitat. Problems in New York's populations are not evident, even though habitat protection is needed to control stream bank alterations in important areas. Sea lamprey control practices in the Poultney River (tributary to Lake Champlain) were considered a threat to sand darter, and reduced levels of the lampricide, TFM, were used as a precaution (Plosila et al. 1986). Instream tests and laboratory bioassays (Neuderfer 2000) indicated that treatments at normal concentrations of TFM would be appropriate. Invasive species like goby are likely to have brought about localized decline in L. Erie, and eventually in the Grasse River.

Eastern sand darter was classified as “moderately vulnerable” to predicted climate change in an assessment of vulnerability conducted by the New York Natural Heritage Program (Schlesinger et al. 2011).

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

No       Unknown

Yes

The eastern sand darter is listed as an threatened species in New York and is protected by Environmental Conservation Law (ECL) section 11-0535 and the New York Code of Rules and Regulations (6 NYCRR Part 182). A permit is required for any proposed project that may result in a take of a species listed as Threatened or Endangered, including, but not limited to, actions that may kill or harm individual animals or result in the adverse modification, degradation or destruction of habitat occupied by the listed species.

The Protection of Waters Program provides protection for rivers, streams, lakes, and ponds under Article 15 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:**

**Management Requirements:** Identify (1) the locations of habitat, (2) how habitat and population size change over time, and (3) sources of pollution and siltation. Replant open stream banks and levees. Fence livestock from streams. Identify natural flow regime in rivers with dams and assess possible changes in water and sediment flow regimes from impoundments. Attempt to recreate natural regimes by working with managers of such impoundments. Identify adjacent lakes and wetlands in terms of their relative importance as sources or sinks for sediments. Maintain natural flow regimes and water level fluctuation within wetlands. Protect and maintain stretches of clear,

unpolluted streams and high quality riparian zones. Promote the following: good agricultural practices that reduce erosion, green belts along streams, improved treatment of municipal and industrial wastes, and care in construction of roads, bridges and buildings.

**Management Research Needs:** (1) What is the feasibility of captive breeding and culture to produce supplies for reintroductions? (2) What are feasibility of and best methods for reintroduction? (NatureServe 2012).

Conservation actions following IUCN taxonomy are categorized in the table below.

Conservation Actions	
Action Category	Action
Site/Area Protection	Resource/Habitat Protection
Land/Water Management	Invasive/Problematic Species Control
Land/Water Management	Habitat/Natural Process Restoration
Species Management	Species Reintroduction

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for the eastern sand darter.

**Habitat Restoration:**

\_\_\_ Habitat losses and recommendations for restoration in the Poultney River, as studied in Vermont, will be applied as appropriate.

**Relocation/Reintroduction:**

\_\_\_ Examine possibilities for reintroducing to Cattaraugus Creek and for introducing to other St. Lawrence tributaries.

**VII. References**

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