

Species Status Assessment

Common Name: Buffalo pebblesnail **Date Updated:** February 2025

Scientific Name: *Gillia altilis* **Minor Edits by:** DEC Wildlife Diversity Section

Class: Gastropoda

Family: Lithoglyphidae; Subfamily Lithoglyphinae

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

The buffalo pebblesnail is native to the Atlantic coastal drainage of North America, occurring from New York and Vermont southward to South Carolina. Hydrobiidae is one of the most common and diverse gastropod families, with 185 species in 14 genera typically found in springs, creeks and small to medium rivers in temperate, subtropical and tropical regions of the world. The first record of the buffalo pebblesnail in the Great Lakes drainage was from Oneida Lake, New York around 1915-1918, however, in subsequent years it was likely extirpated from this water body and later recorded from Niagara-on-the-Lake, Lake Ontario, Lake Erie, and multiple locations in the Erie Canal. The buffalo pebblesnail was able to colonize Lake Ontario through the Erie Canal, extending its range westward, and is now considered established in the Lake Ontario drainage (Thompson 1984). It is usually found in freshwater stream environments and has adapted to inhabiting both stagnant waters in lakes and streams as well as rapidly moving waters.

DEC is not aware of any additional data or new information on population trends or threats to this species since the last SWAP revision in 2015. This species was listed as SPCN in 2015, but with the removal of this status in the 2025 revision it has been changed to SGCN.

I. Status

a. Current legal protected Status

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

ii. **New York:** Special Concern; SGCN

b. Natural Heritage Program

i. **Global:** G5

ii. **New York:** S1 **Tracked by NYNHP?:** Yes

Other Ranks:

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

-IUCN Red List: not listed

-Northeast Regional SGCN: not listed

-American Fisheries Society: CS - Currently Stable

Status Discussion:

In some regions where this species is native, populations are declining or not very abundant (Kipp et al. 2013). In Vermont, this species is considered to be in greatest conservation need, and it is listed as a species of special concern in New York (unprotected but of special concern due to increasing evidence of vulnerability). Its state NatureServe rank is S1 (critically imperiled) because it is very vulnerable due

to low abundance of species or required habitat (Kipp et al. 2013). It has a wide distribution, presumed large population, occurrence in a number of protected areas, tolerance of a broad range of habitats, tolerance to habitat modification, lack of substantial immediate threats, and because it is not in decline or is unlikely to be declining fast enough to qualify for global listing in a more threatened category (NatureServe 2013).

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Stable	Stable			-
Northeastern US	Yes	Unknown	Unknown			No
New York	Yes	Unknown	Unknown		SC	Yes
Connecticut	No	-	-			-
Massachusetts	No	-	-			-
New Jersey	No data	Unknown	Unknown	Not specified	Not listed	No
Pennsylvania	No data	-	-	Not specified	Not listed	No
Vermont	Yes	Declining	Declining		Not listed	Yes
Ontario	Yes	Unknown	Unknown			-
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*):

None.

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

Short and long-term trends are unknown. In New York this species is vulnerable due to low abundance. Very few populations have been found in recent years throughout its range, but this could be due to either low abundances or lack of sampling (NatureServe 2013). The relative abundance of buffalo pebblesnail throughout its range is unknown and more information about this species habitat requirements and population trends is needed to determine specific challenges to its conservation.

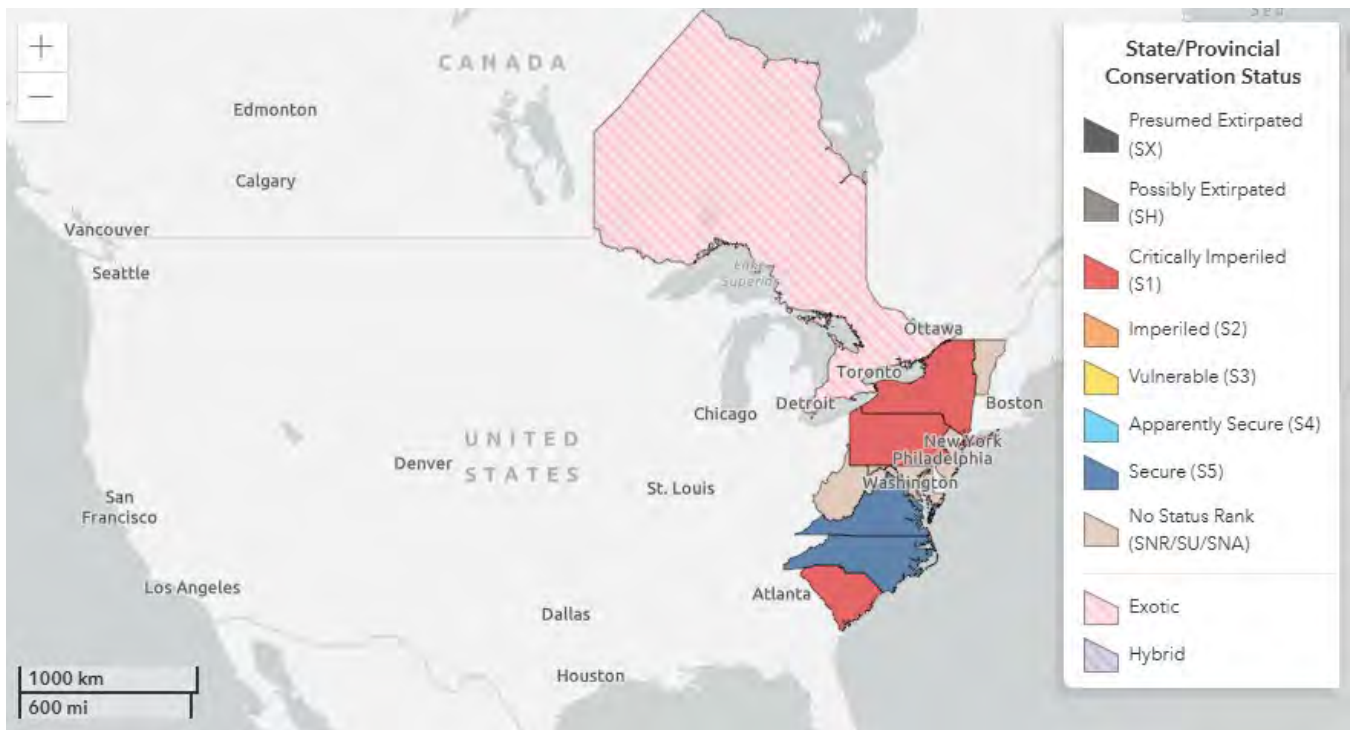


Figure 1. Conservation status of the buffalo pebblesnail in North America (NatureServe 2025).

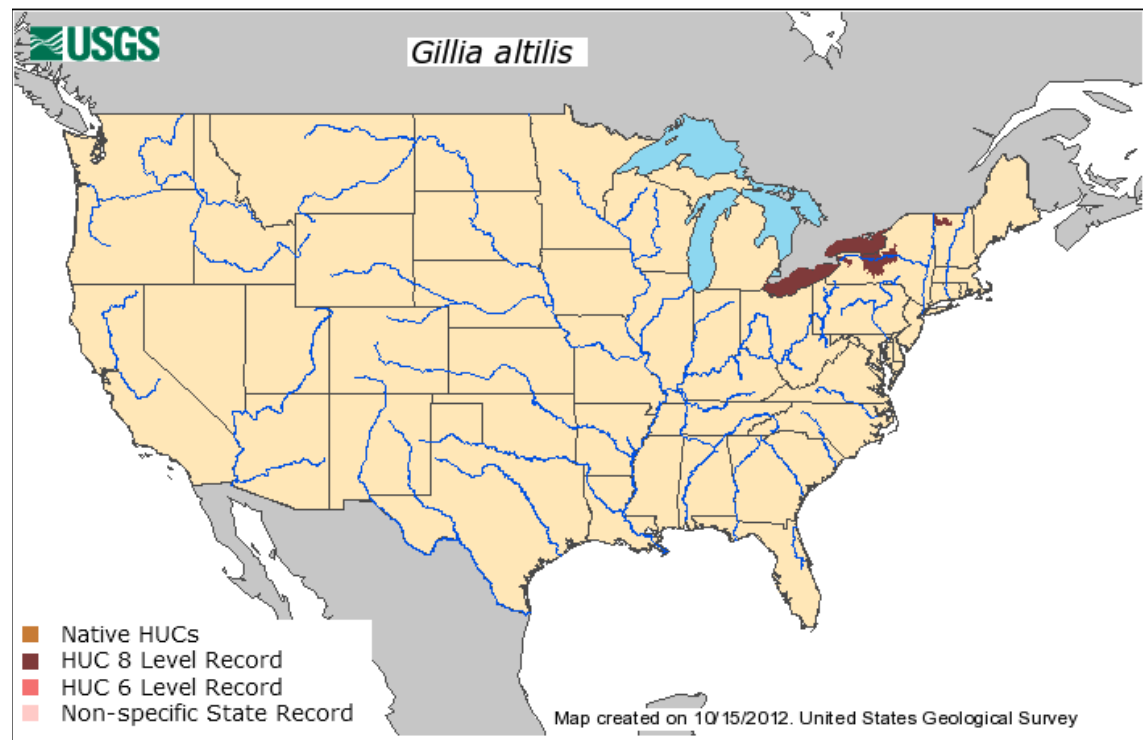


Figure 2. Distribution of buffalo pebblesnail by watershed in North America (Kipp et al. 2013).

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

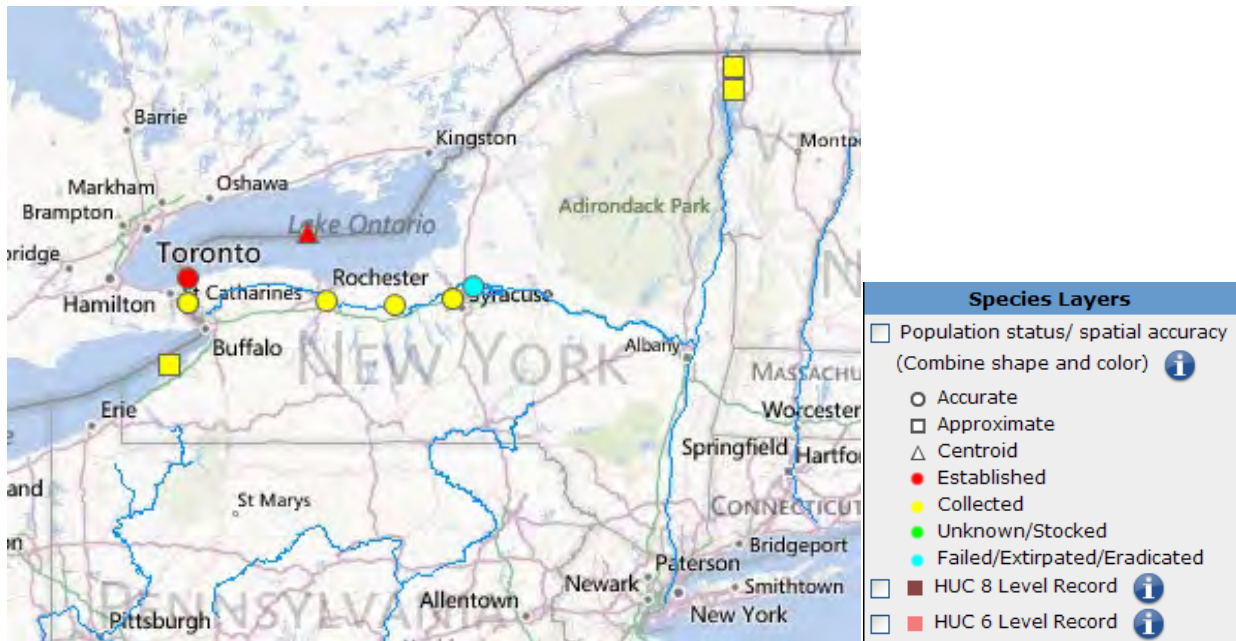


Figure 3. Distribution of buffalo pebblesnail depicting population status of collections (Kipp et al. 2013).

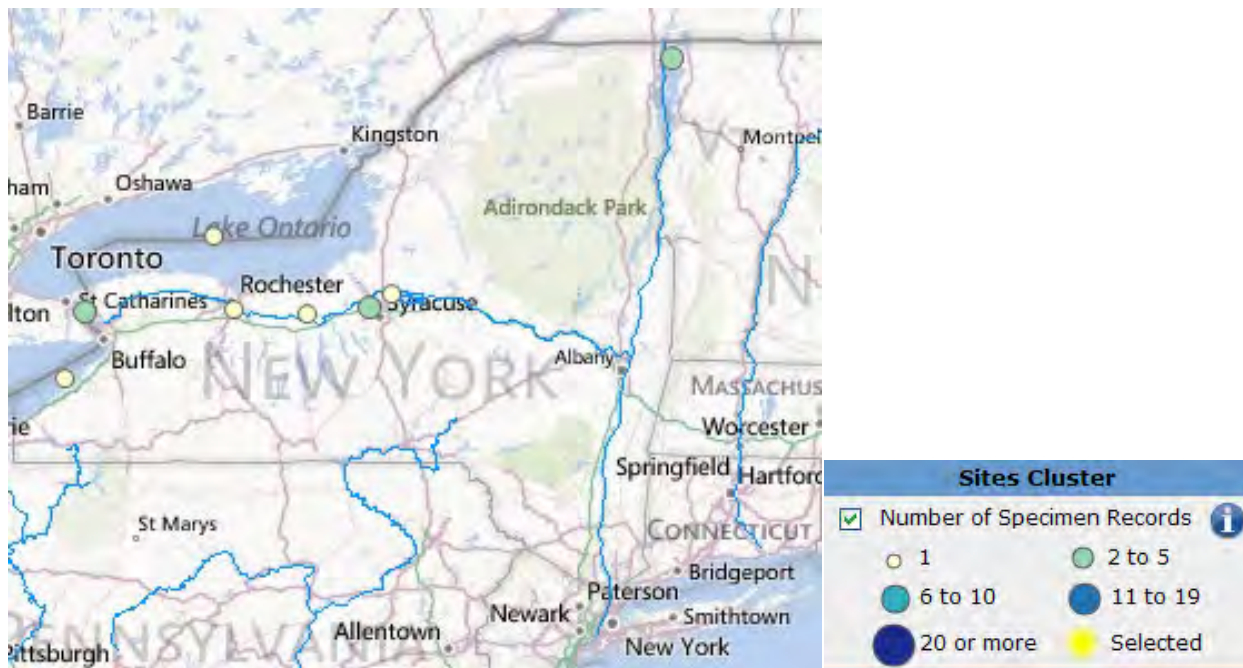


Figure 4. Distribution of buffalo pebblesnail depicting number of specimen records at each location (Kipp et al. 2013).

Details of historic and current occurrence:

The first record of this species was from Oneida Lake, Oswego County in 1915, but this population is now thought to be extirpated. This species has been recorded from the Erie Canal, Onondaga, and Herkimer counties; the Albany/Troy area and the Hudson River, Albany and Rensselaer counties, and the Hudson River from Barrytown south to Straatsburg, Dutchess County. Shells have been found in beach wash from Lake Ontario, Monroe County; Oneida Lake, Oswego and Onondaga Counties; and the Salmon River, Oswego County (Jokinen 1992).

No populations were located during Jokinen’s survey from 1978-1991 or Strayer’s 1987 survey, but the USGS reports records from multiple locations in the past 20 years: Erie Canal at Clyde, Syracuse, and Brighton in 1993, Niagara River in Niagara Falls 1993, Erie Canal at Syracuse in 1994, and Lake Erie and Lake Ontario in 2005 (Kipp et al. 2013). Thompson (1984) sites the following localities from museum lots: Hudson River, Albany, Dutchess, and Ulster counties; Erie Canal, Herkimer and Onondaga counties; Champlain Canal, Rensselaer County; Niagara Falls, Niagara County; Monroe County; and Wayne County. The New York State Museum has numerous specimens from the Hudson River, Albany County.

The buffalo pebblesnail is rare due to low abundance in New York and also appears to be quite rare in the southern end of its range. Very few populations have been found in recent years and it is not clear whether reduced sightings are due to a decline in global abundance or to lack of extensive surveys for snails. Only a single population exists in South Carolina and it is also uncommon in Virginia, likely due to erosion and sedimentation of habitat (Dillon et al. 2006).

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%	Core	

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. Large/Great River
- b. Summer-stratified Monomictic Lake
- c. Freshwater
- d. Canal
- e. Headwater/Creek

Habitat or Community Type Trend in New York

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

Presence of the buffalo pebblesnail in the great lakes indicates it can be found in cold, clear lakes; however, it is usually found in freshwater streams, canals and rivers. Its globose shell is adapted for inhabiting high-velocity lotic environments and it has a large muscular foot used to suction to rocks (Kipp et al. 2013). It is well also well adapted to living on silty substrates as the foot prevents it from sinking, and it has been found to inhabit both stagnant waters in lakes and streams as well as rapidly moving waters (Thompson 1984). In the Hudson River, this species occurred on mud and aquatic plants in shallow water (Townes 1936).

Aquatic gastropods are frequently used as bioindicators because they are sensitive to water quality and habitat alteration (Callil and Junk 2001, Salanki et al. 2003).

V. Species Demographic, and Life History:

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

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):*

As a prosobranch snail, the sexes of this species are dioecious, or separate, with internal fertilization (Dillon et al. 2006). Females lays single or clumps of eggs (up to six at a time) in hemispherical-shaped capsules on solid substrates, including leaves, stems of macrophytes, shells of other gastropods, stones or leaf litter in late spring or early summer (Dillon et al, 2006, Kipp et al. 2013). Few detailed life history studies have been completed, but the maximum age of species is thought to be 2 years (AFS 2013).

It is speculated that this species is a generalized grazer, like most Hydrobiidae. It has a specialized radula, adapted for grazing on coarser food particles than those of other related snails (Kipp et al. 2013).

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

Threat Level 1	Threat Level 2	Threat Level 3	Spatial Extent	Severity	Immediacy	Trend	Certainty
1. Residential and Commercial	1.1 Housing & Urban Areas	(habitat loss/degradation)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
7. Natural System Modifications	7.2 Dams & Water Management/Use	7.2.1 Water level management using dams (channelization).	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	8.1.3 Aquatic animals (New Zealand mud snail)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.1 Domestic & Urban Wastewater	9.1.1 Domestic wastewater	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.2 Industrial & Military Effluents	(metals)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.3 Agricultural & Forestry Effluents	(fertilizers)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.3 Agricultural & Forestry Effluents	9.3.3 Herbicides & pesticides	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
11. Climate Change	11.1 Habitat Shifting & Alteration	-	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.

Table 1. Threats to Buffalo pebblesnail.

High imperilment rates among freshwater gastropod groups have been linked to alteration, fragmentation and destruction of habitat from the creation of dams and impounded reaches, development of riparian areas, channelization, erosion, groundwater withdrawal and associated impacts on surface streams (flows, temperature, dissolved oxygen), multiple forms of pollution (salt, metals, untreated sewage, agricultural runoff, pesticides/fertilizers), changes in aquatic vegetation, and invasion of exotic species (AFS 2013).

Most gastropod species live in the shallows (depths less than 3 meters), where food abundance is greatest. As a result, drastic water fluctuations, such as draw-downs, may cause declines in snail populations (Hunt and Jones 1972). Strayer (1987) concluded that human activities had destroyed much of the original mollusk fauna in some parts of the Hudson basin, but not in others. Channelization of farmed mucklands and industrial pollution from Beacon were noted as causes for the notably reduced biodiversity of mollusks in the Wallkill River of Orange County and the Fishkill River of Dutchess County, respectively.

The New Zealand mud snail (*Potamopyrgus antipodarum*) is a highly invasive species that was introduced in Idaho in the 1980s. It can have devastating consequences to aquatic ecosystems, reducing or eliminating native snail species (Benson et al. 2013). This snail was found established in Lake Ontario in 1991 (Zaranko et al. 1997) and in Lake Erie in 2005 (Levri et al. 2007).

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

Yes: ü

No: _____

Unknown: _____

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

The Protection of Waters Program provides protection for rivers, streams, lakes, and ponds under Article 15 of the NYS Environmental Conservation Law.

The Freshwater Wetlands Act provides protection for regulated wetlands greater than 12.4 acres in size under Article 24 of the NYS Conservation Law. The Adirondack Park Agency has the authority to regulate smaller wetlands within the Adirondack Park. The Army Corps of Engineers has the authority to regulate smaller wetlands in New York State, and the DEC has the authority to regulate smaller wetlands that are of unusual local importance.

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

Basic biological information is lacking for most taxa of freshwater gastropods and there is a strong need for surveys and biological studies given the strong evidence of decline and extinction.

The following goals and recommended actions are provided in the NY Comprehensive Wildlife Conservation Strategy (NYSDEC 2005):

- Conduct surveys to determine distribution and population trends
- Identify habitat requirements for all life stages
- Develop specific plans for each listed species (or appropriate suite of species) that details status, threats, and actions necessary to reverse declines or maintain stable populations
- Develop fact sheets for each listed species for paper and online distribution

Action Category	Action	Description
B.3 Outreach	B.3.1.4.3 Fliers and Brochures	
C.6 Design and Plan Conservation	C.6.5.0.0 Conservation Planning	
C.8 Research and Monitoring	C.8.1.5.0 Literature Search and Analysis	
C.8 Research and Monitoring	C.8.1.5.1 Species Monitoring	
C.8 Research and Monitoring	C.8.1.5.3 Analyzing Threats or their impacts	

Table 2. Recommended conservation actions for buffalo pebblesnail.

VII. References

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Townes, Jr., H.K. 1936. Studies of the food organisms of fish. A biological survey of the Lower Hudson watershed. State Of New York Conservation Department Annual Report 26. 217-230.

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