Species Status Assessment

Common Name: Cownose ray **Date Updated:** 12/1/2023

Scientific Name: *Rhinoptera bonasus* **Updated by:** Tajrian Sarwar (MISC)

Class: Chondrichthyes

Family: Rhinopteridae

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

Cownose rays are one of the most readily identifiable ray species due to their indented snout and specialized bi-lobed fin beneath the head, appearing bovine-like. The cownose ray is a large batoid of the family Rhinopteridae, characterized by its flat body and venomous spine present on the whip-like tail. Cownose rays occur from New England (southern Massachusetts) to Brazil, including the Gulf of Mexico and Cuba. A study utilizing acoustic telemetry to track locations of individual cownose rays revealed that this species migrates repeatedly between the same summer nurseries and overwintering sites each year (Ogburn 2018).This is a benthic to epipelagic species, occurring along the continental and insular shelves in shallow marine and brackish waters (Barker 2006). Cownose rays were targeted as it was believed that a population increase of this species, driven by a reduction of coastal sharks which predate upon rays, would lead to a collapse in shellfisheries in a trophic cascade effect (Grubbs 2016). Perceived competition between rays and humans for shellfish consumption led to the culling of cownose rays, which were blamed for bivalve stock collapses – although these collapses were more likely driven by overharvesting and disease, not increased abundance of rays (Grubbs 2016).The schooling nature and inshore habitat of this species coupled with their low productivity and late maturity make cownose rays susceptible to overexploitation and recovery from population declines would be limited (Kyne et al. 2012). Steep population declines are suspected in the Southern Caribbean and Southwest Atlantic, with the Northwest Atlantic and Gulf of Mexico populations increasing – resulting in this species being listed as globally Vulnerable by the IUCN (Carlson 2020).

I. Status

a. Current legal protected Status

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

ii. **New York:** Not listed

b. Natural Heritage Program

i. **Global:** Not Ranked

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

Other Ranks:

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

-IUCN Red List: Vulnerable A2bd

-Northeast Regional SGCN: Not listed

Status Discussion:

Cownose rays are susceptible to overexploitation and may have limited ability to recover from population declines due to their schooling behavior in inshore habitats and inherently slow reproductive rate due to late maturity, long gestation periods, and small litters(Barker 2006). Heavy

fishing pressure in the inshore environment, especially throughout Central and South America, have contributed to a substantial decline of Cownose rays in that region. In the Northwest Atlantic population, targeted fisheries and culling of rays potentially threatens this species – it is estimated that this species has experienced an overall population reduction of 30-49% in the past 43 years, and it is listed as Vulnerable by the IUCN (Carlson 2020).

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Unknown	Unknown			-
Northeastern US	Yes	Unknown	Unknown	(NW Atlantic Ocean)		-
New York	Yes	Unknown	Unknown		Not Listed	No
Connecticut	No data	-	-		Not Listed	No
Massachusetts	No data	-	-		Not Listed	No
New Jersey	No data	-	-		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 currently no monitoring activities specifically for this species in New York waters, though it has been caught on independent surveys such as the SoMAS Nearshore trawl.

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

There are no existing population size estimates for the cownose ray, but they are common in parts of their range at certain times of the year (Barker 2006). During suspected migration periods, they often occur in groups of thousands of individuals. The IUCN acknowledges that there is an urgent need for research to determine population status and catch levels. The IUCN designated the Cownose ray as Near Threatened in 2006 and assessed the species as Vulnerable in 2019. Significant genetic differences between the Gulf of Mexico and Northwest Atlantic populations have been revealed in a study analyzing mitochondrial markers of Cownose rays (Carney 2017). In the Gulf of Mexico population, a fishery-independent demersal trawl survey running from 1987 to

2018 indicates that overall abundance has increased at an annual rate of 2.5%. The IUCN suggests that while the probability of Least Concern in this population is 83%, there is a 14% probability of this population being threatened (Carlson 2020). Data in the Caribbean and Southwest Atlantic is sparse, but this species has been targeted intensely by unmanaged gillnet fisheries which exist in Colombia, Venezuela, and Brazil which are likely causing population declines in those regions (Tagliafico 2012). Population abundance in the Northwest Atlantic population are suspected to be increasing, but this species' very low reproductive rate makes them susceptible to overfishing – the development of fisheries targeting this species in the United States represents a potential threat to their population (Carlson 2020).

Distribution Map

Rhinoptera bonasus

Legend

EXTANT (RESIDENT)

Compiled by:

IUCN SSC Shark Specialist Group 2018

Figure 1. IUCN Red List distribution of Cownose Ray (Carlson 2020)

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

They are common in parts of their range at certain times of the year, especially in the Chesapeake Bay during summer (Barker 2006).

Details of historic and current occurrence:

Historical: This species uses coastal and estuarine waters south of Long Island as nursery habitat (Ogburn 2018).

Current: Cownose rays have been captured on the SoMAS Near Shore trawl along the south shore of Long Island.

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. Marine, Deep Subtidal

b. Marine, Shallow Subtidal

c. Estuarine, Brackish Shallow Subtidal

d. Estuarine, Brackish Shallow Subtidal, Benthic Geomorphology, Benthic Flat

Habitat or Community Type Trend in New York

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

Cownose rays occur in marine and brackish waters up to 60ppt, often swimming into estuaries and bays (Kittle 2013). They are pelagic swimmers and benthic feeders, found at depths of 0-22m (Barker 2006). Cownose rays are a gregarious species, forming large schools that can number in the thousands. They are presumed to make long migrations with their school, moving northward in late spring and southward in late fall (Barker 2006). The onset of migration may be influenced by

changes in water temperature for some populations and possibly due to other factors such as food availability or predator avoidance in the estuaries. Chesapeake Bay is an important location for pupping and mating, where large schools of cownose rays are abundant from late spring to late fall (Fisher 2010). A study monitoring the movements of tagged individuals along the Atlantic coast of the United States revealed that this species exhibits philopatry, migrating between the same nursery sites and overwintering sites annually (Ogburn 2018).

V. Species Demographics and Life History

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

Age to maturity is estimated at 5-6 years for males and 7-8 years for females, with an average lifespan of 13 years (Smith and Merriner 1987). Gestation appears to be 11-12 months long, resulting in only one pup per reproductive cycle. Cownose rays reproduce by aplacental viviparity in which eggs hatch and young develop inside the female without a placenta for nourishment. Females will ovulate immediately after parturition, so reproduction is likely annual or biannual depending on the exact gestation period (Barker 2006). A study monitoring the movements of tagged individuals along the Atlantic coast of the United States revealed that this species exhibits philopatry, migrating between the same nursery sites and overwintering sites annually. In the Northwest Atlantic, Cownose rays utilize coastal estuaries south of Long Island, NY as mating and pupping habitat, and will overwinter near Cape Canaveral, FL (Ogburn 2018).

Cownose rays feed on bottom-dwelling invertebrates, particularly mollusks and crustaceans, by crushing the shells with their dental plates, separating the meat from the indigestible parts, and spitting out the shells. They are common prey of large predatory sharks including sandbar and bull sharks (Kittle 2013). Cownose ray life history parameters suggest that intrinsic rates of increase are low and they may be susceptible to overexploitation.

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

Cownose rays are not directly targeted by fisheries but they are frequently caught in tropical waters where fishing is intense and generally unregulated (Barker 2006). Creation of a commercial fishery has been suggested due to their reputation as a pest species to the shellfish industry, which may have negative consequences if not regulated carefully due to their late maturity and low productivity. Commercial fisheries for other species pose a threat to cownose rays, which are caught as by-catch with pound nets, haul seines, and shrimp trawls (Barker 2006). Heavy fishing pressure on the inshore environment combined with their schooling behavior will have an effect on populations. There are no species-specific protections or management measures in place in the southern Caribbean or South America. Further research is needed on taxonomy, life history, population size and trend, and threats. All fisheries should be managed for bycatch at the species level.Direct effects of climate change on rays are unknown, but changes in behavior, distribution, prey availability and migratory patterns are likely to be affected (ZSL 2010).

Threat Level 1	Threat Level 2	Threat Level 3	Spatial Extent	Severity	Immediacy	Trend	Certainty
5. Biological Resource Use	5.4 Fishing & Harvesting Aquatic Resources	5.4.2 Commercial fishing (bycatch)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
11. Climate Change	11.3 Changes in Temperature Regimes	11.3.3 Gradual temperature change (warming ocean temperature)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.

Table 1. Threats to cownose ray.

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

Yes:_____ No:__X__ Unknown:_____

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

There is no existing legislation protecting this species.

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

Coordination with Central and South American regions would greatly improve conservation of the cownose ray since their fisheries are largely unregulated. Monitoring (include species-specific catch details) landings and by-catch are needed throughout the whole distribution of cownose ray habitat to provide valuable information on the biology and population status of the species. Fishery-independent surveys should be performed to provide estimates of abundance and biomass, especially in New York waters. Coordinated national and international efforts are needed to assess migratory movements, abundance, and fishery impacts due to the transient nature of the species. Further research, including tracking studies, would give managers a better understanding of movement patterns, improve life history data, and characterize habitat use and identify potential nursery areas (Barker 2006). If a commercial fishery is instated for the Chesapeake Bay, regulations and a management plan will be needed at a regional level.

Action Category	Action	Description
A.2 Direct Species Management	A.2.0.0.0 Direct species management	Harvest management
A.2 Direct Species Management	A.2.0.0.0 Direct species management	Trade management
B.4 Law Enforcement and Prosecution	B.4.0.0 Law Enforcement and Prosecution	Compliance and enforcement
C.6 Design and Plan Conservation	C.6.5.0.0 Conservation planning	Site/area protection

Table 2. Recommended conservation actions for cownose ray.

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