NORTHERN PIPEFISH
Syngnathus fucus

Identification:

- Snout is tube-like and mouth is toothless.
- Body long and slender, similar to a pipe cleaner.
- Head occupies one eighth to one ninth of body length.
- Sides marked by brown bars and many white dots.
- Color is greenish, olive or brown on top.
- Bottom golden yellow.

Size:

Length to 12 in. (30 cm).

Range:

Atlantic Coast of North America from the Gulf of St. Lawrence to Florida; Gulf of Mexico.

Local Distribution:

Pipefish are believed to be a resident species in the Hudson-Raritan Estuary.

Habitat:

- Commonly found in seagrass beds in bays and estuaries.
- Rarely venture far from shore and occasionally enter freshwater.

Spawning:

- Breeding occurs from March to August.
- The female lays the eggs in the male’s pouch.
- Male pipefish maintain eggs in brood pouch.
- Incubation lasts ten days.
- The young remain in the pouch until they are about 5/16 in. (9 mm) long.
- Young are independent after leaving pouch.

**Feeding:**

- In order to capture prey they expel water from the trumpet-like mouth, the resulting vacuum returns water that contains food.
- Diet consists of minute copepods, amphipods, fish eggs and other small marine animals.
LINED SEAHORSE
Hippocampus erectus

Identification:

- Snout is tubular with small mouth at end.
- Horse-like head.
- The head is surmounted by a pentagonal star shaped coronet.
- Neck, body and tail are covered with bony plates.
- Long tail that curves inward.
- Male has a brood pouch.
- The dorsal fin is located about midway along the length of the fish.
- Color varies from light brown to gray.
- Various mottling and blotching with paler and darker colors.

Size:

Length to 4-6 in. (10-15 cm).

Range:

Atlantic coast of North America from Massachusetts to South Carolina.

Local Distribution:

The seahorse is believed to be a resident species in the Hudson-Raritan Estuary.

Habitat:

- Prefer to live among eelgrass and seaweed.
- Cling to objects with their prehensile tail.
**Spawning:**

- Breed in the summer.
- Eggs are deposited a few at a time in the pouch of the male.
- Up to 150 eggs may be deposited in the pouch.
- When the yolk sac is absorbed they are squeezed out of the pouch and resemble the parents.

**Feeding:**

- Feed by sucking in minute crustacea and anything else that fits in their mouth.
NORTHERN SEA ROBIN
Prionotus carolinus

Identification:

- Large mouth lacking teeth.
- Large head with tapering body.
- Head encased in bony plates.
- Fanlike pectoral fins.
  - The three lower rays of the pectoral fins are modified into feelers
- Body is reddish brown or gray in top.
- Black spot located in the center of the dorsal fin.
- Generally five blotches along side and white to pale yellow on the bottom.

Size:

Length to 15 in. (38 cm).

Range:

Atlantic coast of North America from Nova Scotia to Florida.

Local Distribution:

The northern sea robin undergoes an inshore offshore migration in the Hudson-Raritan Estuary. As water temperatures begin to warm sea robins begin to migrate inshore from depths of 300 feet (100 m) or more. They inhabit waters in the Hudson-Raritan Estuary as shallow as the tide line. When water temperatures begin to drop in the fall they migrate to deeper waters.
Habitat:

- Keep to the bottom but are active swimmers.
- Generally found on smooth, hard bottom, and often bury themselves in the sand.

Spawning:

- Spawning occurs from June to September
  - Eggs are buoyant, and hatching occurs in 60 hours or more.
  - Spawning and incubation varies with temperature. Warmer temperatures result in earlier spawning, as well as shorter incubation. The opposite applies for colder temperatures.

Feeding:

- A voracious feeder.
- Diet consists of squid, shrimp, bivalve mollusks, worms, crabs and small fish.
STRIPED SEA ROBIN
Prionotus evolans

Identification:

- Large mouth lacking teeth.
- Large head with tapering body.
- Head encased in bony plates.
- Fanlike pectoral fins.
- The three lower rays of the pectoral fins are modified into feelers
- Body is reddish brown or gray in top.
- Two black stripes along body.
- Dark blotch between dorsal spines 4-5.
- White to pale yellow on the bottom.

Size:

Length to 18 in. (45 cm).

Range:

Atlantic coast of North America from Nova Scotia to Florida.

Local Distribution:

The striped sea robin undergoes an inshore offshore migration in the Hudson-Raritan Estuary. As water temperatures begin to warm sea robins begin to migrate inshore from depths of 300 feet (100 m) or more. They inhabit waters in the Hudson-Raritan Estuary as shallow as the tide line. When water temperatures begin to drop in the fall they migrate to deeper waters.

Habitat:

- Keep to the bottom but are active swimmers.
- Generally found on smooth, hard bottom, and often bury themselves in the sand.
Feeding:

- A voracious feeder.
- Diet consists of squid, shrimp, bivalve mollusks, worms, crabs and small fish.
Identification:

- Large mouth.
- Large head with tapering body.
- Body unscaled.

Size:

Length to 7 in. (18 cm).

Range:

Atlantic coast of North America from Strait of Belle Isle and Gulf of St. Lawrence to New Jersey.

Local Distribution:

Gruby’s are believed to be a resident of the Hudson-Raritan Estuary.

Habitat:

- Estuaries to 420 feet (130 m).
LONGHORN SCULPIN
Myoxocephalus octodecemspininosus,

Identification:

- Large mouth lacking teeth.
- Large head with tapering body.
- Head encased in bony plates.
- Long preopercular spine.
- Body is reddish brown or gray in top.

Size:

Length to 18 in. (46 cm).

Range:

Atlantic coast of North America from East New Foundland and north Gulf of St. Lawrence to Virginia.

Local Distribution:

The longhorn sculpin undergoes an inshore offshore migration in the Hudson-Raritan Estuary. As water temperatures begin to cool longhorn sculpins begin to migrate inshore from deeper offshore waters. When water temperatures begin to rise in the spring they migrate to deeper waters.

Habitat:

- Estuaries and continental shelf waters.

Spawning:

- Spawning occurs from November to January.
- Eggs are demersal and adhesive.
- Hatching occurs in three months or less.
Feeding:

- A bottom feeder.
- Diet consists of mainly of crustacea, particularly *Cancer* crabs, fish and fish eggs.
**SHEEPSHEAD MINNOW**  
*Cyprinodon variegatus*

**Identification:**
- Large, wedge shaped teeth.
- Upper profile slightly concave, deep-bodied.
- Thick caudal peduncle.
- Ocellus on rear of dorsal fin in females.
- Irregular bands and dark spot at base of dorsal fin.
- Males have dark-edged caudal fin. Breeding males display brilliant blue nape and orange cheeks.
- Commonly known as a killifish.

**Size:**
Length to 3 in. (7 cm).

**Range:**
Atlantic coast of North America from Cape Cod to Florida; Bahamas and Gulf of Mexico.

**Local Distribution and Movement:**
A year-round resident in the Hudson-Raritan Estuary.

**Habitat:**
- Common in weedy areas.
- Found in fresh to full seawater.
Spawning:

- Spawning occurs from April to September.
- Males fight for females, clasping them with dorsal and anal fin, while eggs and milt are released.
- Eggs sink, sticking together in clumps, hatching in 5 or 6 days.

Feeding:

- Diet consists of both plants and animals.
WINDOWPANE

Scophthalmus aquosos

Identification:

- Large mouth with small teeth.
- Thin, roundish body.
- Left handed flatfish.
- Pale and translucent greenish olive or light slaty brown on top often dotted with small brown spots.
- White bottom.
- Commonly known as a sundial.

Size:

Length to 18 in. (45 cm).

Range:

Atlantic coast of North America from the Gulf of St. Lawrence to Florida.

Local Distribution:

The windowpane is found year round in the Hudson-Raritan Estuary. They move inshore into the Hudson-Raritan Estuary as water temperatures rise in the spring and migrate offshore as temperatures cool in the fall.

Habitat:

- Prefer sandy coastal bottoms.
- Found in depths up to 148 ft. (45 m).
Spawning:

- Spawn in the bight from April to December.
- Eggs are transparent and buoyant.
- Incubation lasts about eight days.
- Larvae swim upright and have eyes on both sides of their head.
- Eyes migrate to left side and they take up a bottom existence.
- Measure approximately 7/16 of an inch (10 mm) by this stage.

Feeding:

- Diet consists of a variety of annelid worms, crabs, squid, mollusks and crustacea.
Identification:

- Deep body.
- Saw edge on belly; called razor belly.
- Forked tail.
- Dark spot on shoulder just behind operculum followed by 3 to 27 small spots.
- Silver color.

Size:

Length to 30 in. (75 cm) and weigh up to 12 lbs. (5 kg).

Range:

Atlantic coast of North America from Newfoundland to Florida.

Local Distribution:

Shad are anadromous. They enter the waters of the Hudson-Raritan Estuary in early spring, depending on water temperature. They reach peak abundance in the rivers by middle to late spring. Once spawning occurs they descend the rivers and return to their offshore grounds.

Habitat:

- Found in freshwater in the spring where oxygen levels are high.
- In the ocean they are found on continental shelf waters.
- Populations of different rivers mix on the wintering grounds.
Spawning:

- An anadromous species spawning in freshwater and maturing in the sea.
- In the spring adult shad migrate to the upper reaches of their natal rivers.
- Prefer to spawn over sand, gravel, or mud.
- Spawning begins in the late afternoon and continues into the night.
- Females release from 100,000 to 600,000 eggs, depending on the size of the female.
- Eggs are nonadhesive and heavier than water. They are dependent on currents to carry them and keep them afloat.
- Eggs generally hatch in 4 to 6 days.
- Small teeth develop in the jaws of the larvae.
- Growth is rapid and within 4 to 6 weeks they become juveniles.
- Juveniles lose their teeth.
- These young form schools migrating downstream to tidal portions.
- In the fall they migrate into the sea to their wintering grounds.
- After spawning adults return to the sea, although many die on their return to sea as a result of exhaustion from the spawning process.

Feeding:

- Adults do not feed on their upstream migration.
- Juveniles diet consists of a variety of invertebrates, including crustaceans and insects while in freshwater.
- In saltwater their diet consists of zooplankton including copepods, mysids and euphausids.
STRIPED BASS
Morone saxatilis

Identification:

- Large mouth lacking teeth.
- Spinous dorsal fin.
- 7-8 stripes.
- Dark green to black on top.
- White bottom.

Size:

Length to 5 ft. (1.5 m) and weighs up to 125 lbs. Adults average approximately 18-30. in. (45-75 cm) and weigh between 1-15 lbs. (.5-7 kg).

Range:

Atlantic coast of North America from St. Lawrence to North Florida. They have been established in several landlocked lakes and on the west coast of North America.

Local Distribution:

The striped bass is a year-round resident in the Hudson-Raritan Estuary. Peak abundance is reached in the spring and fall, when they undergo extensive migrations to and from winter and summer grounds.

Habitat:

- Anadromous.
- Schools in rivers, bays, estuaries, and the ocean.
- Do not have a preference for particular bottom types, prefer to congregate around structure.
Spawning:

- Adult striped bass return to their natal rivers to spawn.
- Spawning begins in March and continues until June.
- Females carry between 62,000-112,000 eggs per pound of fish.
- Eggs are nonadhesive and heavier than freshwater.
- Current is required to keep the eggs from settling and being smothered by silt.
- Hatching occurs from 30-74 hours.
- Juveniles remain in fresh or slightly saline, water and seek shelter along protected shorelines until fall.
- In late fall they move into the deep holes of the river and remain there until spring.
- In their second summer they migrate into bays and sounds.
- Three year old fish will begin to migrate into the ocean and join the adult population along the coast.

Feeding:

- Voracious predators, high on the food chain.
- Prey upon invertebrates and small fishes.
- Diet consists of clams, calico crabs, herring, menhaden, and mullet.
- When feeding, bass will gorge themselves.
ATLANTIC STURGEON
Acipenser oxyrhynchus

Identification:

- Mouth sub-terminal, with four barbels on snout.
- Snout long and pointed.
- Covered by five rows of bony plates.

Size:

Length to 10 ft. (3 m) and weigh up to 250 lbs. (1.13 kg).

Range:

Atlantic coast of North America from Labrador and Newfoundland to St. Johns river, Florida.

Local Distribution:

The Atlantic sturgeon is a year-round resident in portions of the Hudson-Raritan Estuary.

Habitat:

- Inhabit fresh, brackish and saltwater.
- Prefer large rivers where they can swim upstream to spawn.
- Examples are the Delaware, Raritan and Hudson Rivers.

Spawning:

- Anadromous, spawning in freshwater and spending the rest of its life in saltwater.
- Spawn during May and June in the upper reaches.
- Eggs are broadcast in flowing water over rubble or gravel and become widespread.
- Hatching occurs from 4 to 7 days, and is temperature dependent.
Feeding:

- Bottom feeders.
- Use snout to stir up bottom and barbels to find food.
- Diet consists of mollusks, polychaete worms, gastropods, shrimps and small benthic fishes.
ATLANTIC TOMCOD
Microgadus tomcod

Identification:
- Three dorsal and two anal fins.
- Large subterminal mouth with single barbel on lower jaw.
- Olive or muddy-green on top.
- Spots or blotches forming a mottled pattern on its sides.
- Whitish on bottom.

Size:
Length to 16 in. (40 cm) and weigh up to 1 1/4 lbs. (0.5 kg).

Range:
Atlantic coast of North America from Labrador and the Gulf of St. Lawrence to Virginia.

Local Distribution:
Tomcod occur throughout the year in portions of the Hudson-Raritan Estuary.

Habitat:
- Inhabit brackish water and fresh water in winter months.
- Prefer depths of 6-8 ft. (2-3 m) or less.
- Congregate near some type of cover, preferably rocky bottom or patches of grass.

Spawning:
- Spawning occurs in November to February in brackish or saltwater.
- Eggs sink to bottom and attach to rocks or algae.
- Large females produce 40-45,000 eggs.
- Eggs hatch in one month.
- Growth is slow, juveniles are approximately 3 in. (75 mm) after one year.
Feeding:

- Bottom dwellers that use their barbell to detect food.
- Diet consists of shrimp, worms, clams, squid and small fishes.
Feeding:

- Bottom dwellers that use their barbell to detect food.
- Diet consists of shrimp, worms, clams, squid and small fishes.
WEAKFISH
*Cynoscion regalis*

**Identification:**
- Large mouth and protruding lower jaw.
- Called weakfish because of weak mouth.
- Dark olive or green on top.
- Dark green, sometimes bronze spots on top of body.
- Bottom white or silvery.

**Size:**
Length to 39 in. (1 m) and weigh up to 20 lbs. (9 kg); adults average 10-20 in. (25-50 cm) and weigh between 2-7 lbs. (1-3 kg)

**Range:**
Atlantic coast of North America from Massachusetts to Florida.

**Local Distribution:**
Weakfish migrate in a general north south direction, with older fish migrating more offshore than south. Peak abundance is reached in lower portions of the Hudson-Raritan Estuary by late summer and then, as water temperatures begin to fall, they leave the area.

**Habitat:**
- A pelagic species.
- Cruise open water in search of food.
- Prefer shallow water, rarely found far from the coast.
- Commonly found in the surf, sounds, inlets, bays and saltwater creeks.
Spawning:

- Spawning occurs from May to October, peaking in May and June in estuaries and nearshore zones.
- Females produce about 286,000 eggs.
- Eggs are buoyant and hatch in approximately 48 hours.
- Growth is rapid and fish measure 8 in. (20 cm) by the end of their first year.
- Young spend summer in protected nursery areas until fall, then migrate southward.
- Young migrate in a north-south direction, while adults migrate in an inshore-offshore direction.
- Females mature at ages 1 and 2.

Feeding:

- Feed throughout the water column.
- When feeding they open their mouth quickly causing a drop in pressure this draws food into their mouth.
- Diet consists of grass shrimp, crabs, worms, and small fishes such as silversides, anchovies, and killifish.
WHITE PERCH
*Morone americana*

Identification:

- Similar in appearance to striped bass only body is more compressed and lacks stripes.
- Anal fin has three spines.
- Caudal fin with a shallow fork.
- Olive or dark green on top.
- Silver green on sides.
- Silver on the bottom.

Size:

- Length to 19 in. (48 cm) and weigh up to 4 lbs. (1.8 kg).

Range:

Atlantic coast of North America from Nova Scotia to North Carolina.

Local Distribution:

White perch are year-round residents in the Hudson-Raritan Estuary.

Habitat:

- Prefer shallow water, usually not deeper than 10 feet (3 m).
- Inhabit fresh, brackish and coastal waters, usually near mouths of rivers.
- Roam in search of food.
Spawning:

- Spawning occurs in April, May and June.
- Adults swim into fresh or slightly brackish water to spawn.
- Eggs sink, and stick together in masses or to benthic.
- Hatching occurs in about six days.
- Larvae at time of hatching measure approximately 2.3 mm long.
- As juveniles grow they migrate to the lower reaches of their natal rivers and bays.
- Growth is rapid during the summer and early fall months.
- In the winter they gather in large schools and move into deep holes in the river.
- Migrate upstream to spawn in the spring.

Feeding:

- Gregarious and constantly in search of food.
- Diet consists of young squid, worms, shrimps, crabs, killifishes, and fish fry.
- Eat spawn as fish deposit it.
MENHADEN
Brevoortia tyrannus

Identification:

- Dark shoulder spot often followed by many smaller spots.
- Saw-like edges on the belly, near anus.
- Dark bluish-green on top, silvery, with brassy sides,
- Fins pale yellowish.
- Commonly known as a mossbunker.

Size:

Length to 14 in. (35 cm).

Range:

Atlantic coast of North America from Nova Scotia to Florida.

Local Distribution:

Menhaden are common in the waters of the Hudson-Raritan Estuary from May to October. They arrive in the spring as temperatures warm, then migrate south as temperatures cool in the fall. It is not known where they spend the winter. They are last seen around Cape Fear in North Carolina.

Habitat:

- Roaming fish.
- Inhabit bays, estuaries and the open ocean
- Rarely stray more than a couple miles from the coast.
- Travel in schools that number in the thousands.
**Spawning:**

- Spawning begins in June, and continues into August in the northern part of its range, and late autumn into early winter in the southern portion of its range.
- Eggs are buoyant and are carried by the currents.
- Hatching occurs in less than 48 hours.
- Growth is rapid, and fish spawned in the summer will measure 2-3 in. (6-8 cm) by winter.

**Feeding:**

- Swim with mouth open and gills spread apart.
- Mouth and straining apparatus act in a way similar to that of a plankton net.
- Adult menhaden will filter between 6-7 gallons of water per minute.
- Diet consists of microscopic plants, diatoms in particular, and small crustaceans.
- Feed by filtering the water with a strain-like apparatus consisting of layers of gill rakers.
HOGCHOKER
Trinectes maculatus

Identification:
- Small mouth.
- Right handed flatfish.
- Lack pectoral fin.
- Dark brown with dark bars.
- Blind side frequently blotched or spotted.

Size:
Length to 8 in. (20 cm).

Range:
Atlantic coast of North America from Massachusetts to Florida; Gulf of Mexico to Argentina.

Local Distribution:
The hogchoker is a year-round resident in the entire Hudson-Raritan Estuary.

Habitat:
- Found in coastal waters out to depths of 240 ft. (73 m).
- Enter freshwater hundreds of miles upstream.

Spawning:
- Spawn in late spring and summer.
- A female contain about 54,000 eggs.
- Growth is rapid. They measure 2-3 inches (5-8 cm) at one year.
- Hogchokers become mature at approximately 4 inches (10 cm).
Feeding:

- Diet consists of worms and small crustaceans.
BLUEBACK HERRING
Alosa aestivalis

Identification:

- Large mouth lacking teeth.
- Usually one small shoulder spot.
- Lining of the body cavity is sooty or blackish.
- Forked tail.
- Similar to alewife.
- Silvery appearance.
- Bluish on top.

Size:

Length to 15 in. (40 cm).

Range:

Atlantic coast of North America from Nova Scotia to Florida.

Local Distribution:

In the spring, blueback herring are abundant in the New York Bight region. They enter the Hudson-Raritan Estuary to spawn, then migrate to the Georges Bank, Gulf of Maine area.

Habitat:

- Use lower reaches of rivers to spawn, then return and remain in the ocean.
Spawning:

- The blueback herring is anadromous.
- Spawning begins in April, when they begin to ascend fresh and brackish water.
- Spawn in streams over rocky or gravel bottom.
- Approximately 350,000 eggs are laid.
- Eggs sink and will stick to any object.
- Hatching occurs in approximately 50 hours.
  - In one month they measure 1-2 inches (3-5 cm).
  - Spent fish return to the ocean.

Feeding:

- Filter feeders.
- Feeding is believed to take place mainly during daylight hours.
- Planktonic feeder.
- Diet consists of copepods and pelagic shrimp.
ALEWIFE
Alosa pseudoharengus

Identification:

- Large mouth lacking teeth.
- Usually one small dark shoulder spot.
- Forked tail.
- Similar to blueback herring.
- Lining of body cavity is silver.
- Silvery appearance.
- Greenish on top.

Size:

Length to 15 in. (40 cm).

Range:

Atlantic coast of North America from New Foundland and Gulf of St. Lawrence to South Carolina.

Local Distribution:

In the spring, alewives are abundant in the New York Bight region. They enter the Hudson-Raritan Estuary to spawn, and then migrate to the Gulf of Maine.

Habitat:

- Use lower reaches of rivers to spawn, and return to the ocean.
Spawning:

- Alewives are anadromous.
- Become mature between three and five years old.
- Spawning begins in late March and early April.
- Spawning takes place in shallow, quiet areas of streams, ponds of large rivers and small coastal streams.
- Eggs are randomly broadcast and adhesive but lose this property within a few hours of spawning.
- Females deposit 100,000 to 300,000 eggs.
- Hatching occurs in three to five days, depending on water temperature.
- Juveniles remain in the estuary until the summer, when they migrate into the ocean.
- After spawning, mature adult fish return to the sea.

Feeding:

- Alewives are plankton feeders.
- Diet consists of copepods in freshwater and euphausids, mysids, mollusks and arrow worms in marine waters.
RED HAKE
Urophycis chusss

Identification:
- Small pointed teeth.
- Third ray of dorsal fin is three to five times as long as the rest of the fin.
- Round tail.
- Top of fish is usually reddish, bottom varies from white to yellow.

Size:
Length to 20 in. (52 cm) and weigh up to 6 lbs. (3 kg).

Range:
Atlantic coast of North America from Labrador to North Carolina.

Local Distribution:
Red hake are abundant in the lower portions of the Hudson-Raritan Estuary in late fall to early winter and again in the spring. They spend the rest of the time in deeper waters of the New York Bight.

Habitat:
- A bottom fish.
- Found from inshore to offshore depths of 3000 feet (914 m).
Spawning:

- Spawning occurs from April to May in the New York Bight. The New York Bight is an important spawning and nursery area.
- Eggs are buoyant.
- Young fish are pelagic until 2 to 4 inches (5-10 cm), then settle to the bottom.
- Young fish during their first year enter and live within sea scallops for protection. They live here until they are too large for their hosts, or water temperatures become too low.
- Red hake mature when approximately two years old.

Feeding:

- Red hake feed predominantly at night on or near the bottom.
- Diet consists of squid, shrimp, amphipods, other crustaceans, and small fish.
COMMON BIRDS OF THE HUDSON RARITAN ESTUARY AND ADJACENT NEW YORK BIGHT

INTRODUCTION

The New York Bight is home to a diverse population of resident bird species but is equally important to the migrating, wintering and breeding birds that use the area. The bight is able to support this diversity because of the many types of habitats it has to offer. The habitat can range from open water to marsh and woodlands along the shores. The birds that use these varied habitats can range from large birds of prey, to waterfowl, to passerines.

Birds have evolved in such a way as to make them specialists, each bird occupies a separate niche. Body parts have evolved to perform specific functions. Waterfowl, for example have short legs and webbed feet, this is important because they spend most of their time in the water and need to be strong swimmers. Wading birds have long necks, legs and beaks that enable them to stalk prey in the shallow water habitats they frequent. Meanwhile birds of prey use sharp beaks and powerful legs to grasp prey once it is sighted with their keen eyesight. By inferring from these examples it is easy to see why birds need to specialize. Birds of prey would have no use for webbed feet and waterfowl would find long legs useless. There are countless specializations of body parts among birds, these are just a few example that are common to the birds of the bight area.

Birds will use areas for different purposes depending on the time of year and species involved. The New York Bight is especially important to birds on their annual spring and fall migrations. It is during the spring and fall when there is abundance of food. This abundance makes the bight area an ideal rest stop. The birds can feed heavily and rest before heading onto their wintering and breeding grounds. Fall migrations are generally the heaviest because they contain progeny from the summer breeding season.

Wintering grounds are very important to all birds. Birds have specific requirements for an area to qualify as wintering grounds. They will often move about quite a bit to satisfy these needs. Plenty of food is a major requirement of all birds. With colder temperatures birds need more energy to survive. In order to produce more energy they must digest faster therefore they need to eat more. Open water is important to waterfowl because this is where they feed. Should an area become iced over they will have to move, in search of open water. Waterfowl prefer the bight because the constant currents ensure there will always be some open water available to them.

The bight area is used as breeding grounds for many species of birds. Breeding areas must also fulfill specific requirements needed by the bird in order for it to qualify as a breeding site. The saltmarsh, beach-littoral zone and uplands with woody vegetation are the most important areas used in the bight. Breeding areas must be able to support a growing population of birds by providing plenty of food and safety. The health of the bight is also very important to a successful brood. Because birds use the same breeding grounds year after year, the health of the bight can be measured on how successful breeding is.
Various types of birds live in and visit the bight area throughout the year. Some of the more common types are waterfowl, wading birds, gulls, terns, raptors and passerines.

Wading birds are water birds that do not swim but wade through the water. In the bight area they consist of herons, egrets and ibises. They wade along the shallow edges of marshes, mud flats and creek stalking their prey. Wading birds have short tails and long legs. They also have long necks and specialized bills. The bills of egrets and herons are used to seize prey in quick motions such as small fishes, frogs and aquatic insects. Ibises on the other hand use their bills to probe into the mud in search of fiddler crabs and mollusks.

Gulls and terns are long winged birds that have hooked bills and are good swimmers. They are probably the most common and visible of all birds in the bight area. The herring gull and the common tern are the most frequently observed in the bight area. Gulls are generally large in size and have a grey and white appearance. Gulls are opportunistic feeders and will feed on almost any food it can find. Terns are smaller and more graceful birds and unlike the gull they sharp have pointed bills. Terns are similar in color to gulls but instead of grey they generally have black caps. Terns are more selective in their preferring small live minnows, squids and shrimps.

Shorebirds inhabit the beach-littoral and marsh zones they include the plovers, sandpipers and oyster catchers. Most shorebirds have long legs and live near areas that are only exposed during low tides. Shorebirds makeup a considerable portion of the birds that migrate through the bight area with only a few remaining to nest. They feed mainly on sand and mud dwelling invertebrates.

Raptors are birds of prey and feed at the top of the food chain. They consist of ospreys, hawks and owls. They feed mainly on fish and small rodents. They are large birds with strongly hooked bills and powerful feet with hooked claws. Raptors are often good biological indicators of the health of the bight area.

Waterfowl spend most of their time on the water as their name would imply. They consist of ducks, geese and swans. Waterfowl have webbed feet and are very good swimmers. They are also strong and swift fliers that enable them to undertake extensive migrations each spring and fall. Migrations begin in the early afternoon and continue through the night. Waterfowl follow specific paths in their migrations and these paths have become known as flyways. Most waterfowl are gregarious, which is advantageous for feeding and safety when migrating.

Passerines are the largest order of birds containing some 59 families. They are made up of sparrows, warblers, ravens and other similar perching type birds. They can range in size from 4-26 inches. Passerines are the most adaptive and intelligent of all birds. They all have three toes pointed forward and one backward: This enables them to perch easily on anything from a branch to a grass stem.
The arrangement of class, families, genus and species follows the taxonomic order of the Peterson Field Guide to Eastern Birds. Within the family, genus are placed in alphabetical order and within each genus, species are listed alphabetically.

**Common and Scientific Names:** The common and scientific names used in this guide, are Latin names which are used worldwide by scientists. Both scientific names are italicized, genus is capitalized and species is not.

**Identification:** Identification includes a brief description of the species, focusing on characteristics that are obvious and easy to recognize. Descriptions generally begin with the head and progress to the tail, also included are color and anything special they do.

**Size:** Lengths are maximum total lengths recorded and weights are maximums.

**Range:** The range is given in a north to south direction and is very general. Range is often useful in the identification of a species.

**Local Distribution:** Local distribution provides species specific information on a species occurrence in the Hudson-Raritan Estuary.

**Habitat:** Lists the types of habitat they prefer including substrate, water composition and depth. This information can be useful in identification as many species are habitat specific.

**Spawning:** Information on spawning is provided to help understand the life cycles of a particular species. Detailed information is not currently available on all species, therefore some species may have more detail than others.

**Feeding:** Explains how the species feed and includes a list of their preferred food items.

The glossary includes words that are found in the text as well as other words that can be useful when discussing fishes, birds and invertebrates.
<table>
<thead>
<tr>
<th>SCIENTIFIC NAME</th>
<th>COMMON NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Order Gaviiformes</strong></td>
<td></td>
</tr>
<tr>
<td>Family Gaviidae</td>
<td></td>
</tr>
<tr>
<td>Gavia immer</td>
<td>Common Loon</td>
</tr>
<tr>
<td><strong>Order Podicipediformes</strong></td>
<td></td>
</tr>
<tr>
<td>Family Podicipedidae</td>
<td></td>
</tr>
<tr>
<td>Podiceps auritus</td>
<td>Horned Grebe</td>
</tr>
<tr>
<td>Podilymbus podiceps</td>
<td>Pied-billed Grebe</td>
</tr>
<tr>
<td><strong>Order Pelecaniformes</strong></td>
<td></td>
</tr>
<tr>
<td>Family Phalacrocoracidae</td>
<td></td>
</tr>
<tr>
<td>Phalacrocorax olivaceus</td>
<td>Great Cormorant</td>
</tr>
<tr>
<td>Phalacrocorax auritus</td>
<td>* Double-Crested Cormorant</td>
</tr>
<tr>
<td><strong>Order Ciconiiformes</strong></td>
<td></td>
</tr>
<tr>
<td>Family Ardeidae</td>
<td></td>
</tr>
<tr>
<td>Ardea herodias</td>
<td>* Great Blue Heron</td>
</tr>
<tr>
<td>Butorides striatus</td>
<td>* Green Heron</td>
</tr>
<tr>
<td>Florida caerulea</td>
<td>Little Blue Heron</td>
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<tr>
<td>Bubulcus ibis</td>
<td>Cattle Egret</td>
</tr>
<tr>
<td>Casmerodius albus</td>
<td>* Great Egret</td>
</tr>
<tr>
<td>Egretta thula</td>
<td>* Snowy Egret</td>
</tr>
<tr>
<td>Nycticorax nymphilus</td>
<td>Black Crowned Night Heron</td>
</tr>
</tbody>
</table>
Family Threskiornithidae

* Plegadis falcinellus

Order Anseriformes

Family Anatidae

Subfamily Cyginae

* Cygnus olor

* Olor columbias

Subfamily Anserinae

* Branta canadensis

* Branta bernicla

* Chen caerulescens

Subfamily Anatinae

* Anas platyrhynchos

* Anas rubripes

* Anas strepera

* Anas acuta

* Anas crecca

* Anas discors

* Anas americana

* Anas clypeata

* Glossy Ibis

Mute Swan

Whistling Swan

* Canada Goose

Brant

Snow Goose

* Mallard

Black Duck

Gadwall

* Pintail

Green-winged Teal

Blue-Winged Teal

* American Widgeon

Northern Shoveler
Subfamily Aythyinae

Aythya americana
Aythya collaris
Aythya valisineria
Aythya merila
Aythya affinis
Bucephala clangula
Bucephala albeola
Clagula hyemalis

Subfamily Oxyurinae

Oxyura jamaicensis

Subfamily Merginae

Mergus serrator

Order Falconiformes

Family Accipitridae

Subfamily Buteoninae

Haliaeetus leucocephalus

Subfamily Circinae

Accipiter striatus

Circus cyaneus

Family Pandionidae

Pandion haliaetus

Redhead
Ring-necked Duck
* Canvasback
Greater Scaup
Lesser Scaup
Common Goldeneye
* Bufflehead
Oldsquaw
Ruddy Duck
Red-breasted Merganser
Bald Eagle
* Sharp-Shinned Hawk
* Marsh Hawk
* Osprey
**Order Gruiformes**

**Family** Rallidae

- *Rallus elegans*
- *Rallus longirostris*
- *Rallus limicola*
- *Laterallus jamaicensis*
- *Gallinula chloropus*
- *Fulica americana*

**Order Charadriiformes**

**Family** Haematopodidae

- *Haematopus palliatus*

**Family** Charadriiidae

- *Charadrius semipalmatus*
- *Charadrius vociferus*
- *Charadrius melodus*

**Family** Scolopacidae

- *Calidris pusilla*
- *Bartramia longicauda*
- *Tringa melanoleuca*
- *Tringa flavipes*
- *Tringa solitaria*
- *Catoptrophorus semipalmatus*

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
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<tbody>
<tr>
<td>King Rail</td>
<td><em>Rallus elegans</em></td>
</tr>
<tr>
<td>Clapper Rail</td>
<td><em>Rallus longirostris</em></td>
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<tr>
<td>Virginia Rail</td>
<td><em>Rallus limicola</em></td>
</tr>
<tr>
<td>Black Rail</td>
<td><em>Laterallus jamaicensis</em></td>
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<tr>
<td>Common Gallinule</td>
<td><em>Gallinula chloropus</em></td>
</tr>
<tr>
<td>American Coot</td>
<td><em>Fulica americana</em></td>
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<td>American Oystercatcher</td>
<td><em>Haematopus palliatus</em></td>
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<tr>
<td>Semipalmated Plover</td>
<td><em>Charadrius semipalmatus</em></td>
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<tr>
<td>Killdeer</td>
<td><em>Charadrius vociferus</em></td>
</tr>
<tr>
<td>Piping Plover</td>
<td><em>Charadrius melodus</em></td>
</tr>
<tr>
<td>Semipalmated Sandpiper</td>
<td><em>Calidris pusilla</em></td>
</tr>
<tr>
<td>Upland Sandpiper</td>
<td><em>Bartramia longicauda</em></td>
</tr>
<tr>
<td>Greater Yellowlegs</td>
<td><em>Tringa melanoleuca</em></td>
</tr>
<tr>
<td>Lesser Yellowlegs</td>
<td><em>Tringa flavipes</em></td>
</tr>
<tr>
<td>Solitary Sandpiper</td>
<td><em>Tringa solitaria</em></td>
</tr>
<tr>
<td>Willet</td>
<td><em>Catoptrophorus semipalmatus</em></td>
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</tbody>
</table>
Actitis macularia
Arenaria interpres
Limnodromus griseus
Limnodromus scolopaceus
Calidris alba
Caladris minutilla
Calidris alpina

Family Laridae

Subfamily Larinae

Larus marinus
Larus argentatus
Larus delawarensis
Larus atricilla
Larus philadelphia

Subfamily Sterninae

Gelochelidon nilotica
Sterna forsteri
Sterna hirundo
Sterna dougalli
Sterna albifrons
Sterna maxima

Spotted Sandpiper
Ruddy Turnstone
Short-billed Dowitcher
Long-billed Dowitcher
*Sanderling
Least Sandpiper
Dunlin

* Great Black-backed Gull
*Herring Gull
Ring-billed Gull
* Laughing Gull
Bonaparte’s Gull

Gull-billed Tern
Forster’s Tern
*Common Tern
Roseate Tern
Little Tern
Royal Tern
Family Rynchopidae

*Rynchops niger*  
*Black Skimmer*

Order Strigiformes

**Family Strigidae**

*Asio flammeus*  
*Short-eared Owl*

Order Coraciiformes

**Family Alcedinidae**

*Megaceryle alcyon*  
*Belted Kingfisher*

Order Passeriformes

**Family Alaudidae**

*Eremophila alpestris*  
*Horned Lark*

**Family Corvidae**

*Cyanocitta cristata*  
*Blue Jay*

*Corvus ossifragus*  
*Fish Crow*

**Family Paridae**

*Parus atricapillus*  
*Black-capped Chickadee*

**Family Troglodytidae**

*Cistothorus palustris*  
*Long-billed Marsh Wren*

**Family Turdidae**

*Turdus migratorius*  
*Robin*

**Family Parulidae**

*Geothlypis trichas*  
*Yellow Throat*
Family Icteridae

Agelaius pheoniceus  
Red-winged Blackbird

Family Fringillidae

Ammospiza caudacuta  
Sharp-tailed Sparrow

Ammospiza maritima  
Seaside Sparrow

Melospiza melodia  
Song Sparrow
DOUBLE-CRESTED CORMORANT
Phalacrocorax auritus

Identification:

- Mostly black with a white breast and a darker belly.
- Bill slender with a hook tip
- Orange chin pouch

Size:

A mature adult will probably grow to approximately 33 in. (83 cm).

Range:

Most of North America

Local Distribution:

The Double-Crested Cormorant arrives in the New York Bight region in late winter and early spring and remains abundant throughout the summer and fall. Migrates south in the winter.

Habitat:

Salt and brackish waters, mostly bays and rivers.
Breeding:

- Nest in colonies built by both sexes on ground or trees.
- Nest built of sticks and weed stems, lined with leafy twigs and grass.
- Eggs, clutch of 2-7 are laid from April to July.
- Incubation performed by both sexes 24-25 days.
- First flight 35-42 days after hatching.

Feeding:

- Dives from the surface and swims about in pursuit of prey, generally depths of 25 ft. below the surface.
- Catches mainly fish such as, sculpins, eels, herring, tomcod, flounder, butterfish along with small invertebrates.
GREAT EGRET
Casmerodius albus

Identification:

- A large, stately, slender white bird within the heron family, with a yellow bill.
- Legs and feet black.
- Straight plumes on back extend beyond tail when breeding.

Size:

A mature adult will grow to approximately 38 in. (95 cm).

Range:

Continental United States to South America.

Local Distribution:

The Great Egret arrives in New York Bight region sometime in spring and remains abundant throughout the summer and fall. When temperatures drop in late fall they will fly south to find a more suitable temperature and are rarely seen in the New York Bight during the winter.

Habitat:

Marshes, ponds, shores and mud flats.
Breeding:

- Nest either singly or in colonies, Usually with other herons in woods of swamps, mangroves, cypresses and willows near water.
- Nest is usually 20-40 feet above ground in medium sized trees.
- 1-6 eggs are laid from January into June depending on location of nest.
- Incubation lasts 23-24 days.
- First flights of young occur about 42 days after hatching.

Feeding:

- Feeds commonly in salt-marshes and freshwater ponds and marshes.
- Feeds on fishes, frogs, salamanders, snakes, crayfishes, mice, cotton rats, aquatic insects, moths, grasshoppers, etc.