



Grand Manan & White Head

MARINE FAUNA (Finfish, sharks & rays and invertebrates): The Grand Manan archipelago has a diverse marine fauna including marine mammals and seabirds, its productivity and abundance driven by large Fundy tides. Commercial species include a variety of finfish, invertebrates such as lobsters, clams, scallops and periwinkles, and sharks and rays. The table below includes only common species as defined in W.B. Scott and M.G. Scott (1988) "Atlantic Fishes of Canada". Other less common species of sharks and rays can be found on the Sharks page.

Commercial Fish Species	Commercial Invertebrate Species	Common Sharks & Rays
Cod (<i>Gadus morhua</i> Linnaeus)	American Lobster (<i>Homarus americanus</i>)	Spiny Dogfish (<i>Squalus acanthias</i> Linnaeus)
Haddock (<i>Melanogrammus aeglefinus</i> (Linnaeus))	Jonah Crab (<i>Cancer borealis</i>)	Porbeagle (<i>Lamna nasus</i> (Bonnaterre))
Pollock (<i>Pollachius virens</i> (Linnaeus))	Pink (Red) Shrimp (<i>Pandalus borealis</i>)	Basking Shark (<i>Cetorhinus maximus</i> (Gunnerus))
Halibut: Atlantic Halibut (<i>Hippoglossus hippoglossus</i> (Linnaeus)), Turbot or Greenland Halibut(<i>Reinhardtius hippoglossoides</i>)	Deep-sea Scallop (<i>Placopecten magellanicus</i>)	Thresher Shark (<i>Alopias vulpinus</i> (Bonnaterre))
Hake: Silver Hake (<i>Merluccius bilinearis</i>) White Hake(<i>Urophycis tenuis</i>)	Soft-shelled Clams (<i>Mya arenaria</i>)	Great White Shark (<i>Carcharodon carcharias</i> (Linnaeus))
Cusk (<i>Brosme brosme</i> (Mueller))	Quahogs (<i>Mercenaria mercenaria</i>)	Little Skate (<i>Raja erianea</i> Mitchell)
Redfish or Ocean Perch (<i>Sebastesmarinus</i>)	Common Periwinkles (<i>Littorina littorea</i>)	Barndoor Skate (<i>Raja laevis</i> Mitchell)
Monkfish (<i>Lophius americanus</i> Valenciennes)	Squid (Short-finned: <i>Illex illecebrosus</i> , Long-finned: <i>Loligo pealei</i>)	Winter Skate (<i>Raja ocellata</i> Mitchell)
Atlantic Salmon (<i>Salmo salar</i> Linnaeus)	Green Sea Urchins (<i>Strongylocentrotus droebachiensis</i>)	Thorny Skate (<i>Raja radiata</i> Donovan)
Atlantic Herring (<i>Clupea harengus harengus</i> Linnaeus)		Smooth Skate (<i>Raja senta</i> Garman)
Blue Fin Tuna (<i>Thunnus thynnus</i> (Linnaeus))		
Atlantic Mackerel (<i>Scomber</i>)		



<i>scombrus Linnaeus)</i>		
Atlantic Hagfish (<i>Myxine glutinosa</i> Linnaeus)		
Small Flounder/sole: American Plaice (<i>Hippoglossoides platessoides</i>), Yellowtail Flounder (Yellowtail) (<i>Limanda ferruginea</i>), Winter Flounder (Sole) (<i>Pseudopleuronectes americanus</i>), Witch Flounder or Gray Sole (<i>Glyptocephalus cynoglossus</i>)		

Fishing Industry

There are over 500 species of fish found in Atlantic Canada not including 37 species of cartilaginous fish ([sharks, skates, rays & chimaeras](#)); most are recorded from the Bay of Fundy. However, the number of commercially harvested fish is much less. These fish can be roughly grouped into groundfish (cod, haddock, pollock, etc.) those occurring on or close to the bottom, and pelagic - those occurring in the water column usually away from the bottom (tuna, herring, mackerel, etc.). They are caught in a number of ways involving nets, hooks or harpoons. Invertebrates are also fished in a number of ways and include squid, lobsters, shrimp, scallops, quahogs, sea urchins and crabs. Some species are collected from rocks (periwinkles) or dug (soft-shelled clams) in the intertidal zone - the area between high and low water. A number of [local companies](#) market the commercial species, shipping them around the world.

COMMERCIAL SPECIES	GEAR USED
<p>Cod</p> <p>Pollock</p> <p>Winter Flounder</p>	<ul style="list-style-type: none"> • Gill Net • Bottom Trawl/Drag • Longline (baited hooks on bottom) • Bugging (lures on hooks) • Handlining (baited hooks)

There are many species of groundfish or bottom fish caught commercially. The most common are cod, haddock and pollock (or Boston bluefish). Flatfish including halibut (the largest in this group), flounders, sole, plaice, and turbot also fall into this category, along with less known fish such as silver and white hake,



cusk, redfish and monkfish. Various arrangements of hooks and nets are used to catch groundfish, some more efficient than others.

The catch may be sold fresh or salted and air dried into "**slack salted**" fish. This can be cut into chips and sold in bulk.

The hook and line fishery can be divided into:

- **Handlining** involves a series of baited hooks, weighted on the bottom which are lowered to within reach of the bottom and "jigged" or moved up and down. The vessel is anchored in one spot and the fish are attracted to the baited hooks. The line is brought to the surface periodically to remove the fish and add bait. The size of the fish can be regulated by the size of the hook and type of bait to some degree.
- **Bugging** is similar to handlining but instead of bait, fluorescent orange tubing (bugs) on the hooks acts as visual lures and the vessel drifts with the tide through a school of fish, moving back when out of range.
- **Drailing** involves a heavy, shiny "**Norwegian jig**" or a specific arrangement of hooks often called a "**Christmas tree**". The tree is a curved metal frame with a number of brightly coloured pieces of plastic arranged in rows between the frame, a lead weight and a trailing hook on each end. The vessel steams against the tide, chasing the fish and the fisher throws the jig or tree into the water ahead of the vessel, hauling back before the jig or tree can touch the bottom. The shininess and bright colours attract the fish. This method of fishing is not commonly used today.
- **Longlining** involves a line of hooks which are set on the bottom and left. Typically in this area, longlining is used to catch halibut and is called a halibut trawl. The longline is marked with a buoy and radar reflector (or **high flyer**) at the surface and anchored to the bottom.

The net fishery can be divided into:

- **Gill netting** which involves a series of monofilament nets with a cork line on top (for floatation) and a lead line on the bottom, an anchor on each end and a high flyer and buoy at the surface for each end. Fishers typically set 5 to 7 sets (or **strings**) of gill nets. The nets are left on the bottom over night before hauling to the surface to remove the fish.
- **Fish dragging** which involves a vessel towing a conical net across the bottom. The mouth of the net is kept open by a float line and by doors or otter boards on the cables



extending back to the vessel. Rollers on the bottom of the net mouth facilitate the movement of the net over the bottom. The net tapers to a closed end (the **cod end**) where the fish accumulate. After a varying amount of time, the net is winched back on board and the fish are removed.

Typically the vessel then steams back to where the tow was started, lowers the net and begins towing anew. Usually the vessel tows against the tidal current to prevent tangling the net and to tire the fish which swim in front of the mouth "stemming the tide" before eventually ending up in the cod end.

Regulation of the groundfish industry involves licensing, species quotas, seasonal closures, designated fishing areas, mesh size of nets, dockside monitoring and observer programs.



Atlantic salmon (*Salmo salar*) is an anadromous fish species, migrating to the oceans as smolts and returning as adults to spawn

in fresh water streams. A prized sport fish salmon in fresh water are caught in gill nets or fly fishing, however, the rivers in the Bay of Fundy are closed because of low returns of spawning salmon. Since the late 1970's, Atlantic salmon smolts, purchased from fresh water hatcheries, have been kept in sea cages in the Bay of Fundy and grown to a marketable size (3.6 to 5.5kg or 8 to 12lb). Typically this takes approximately 18 months. The salmon are fed a specially formulated diet for optimum growth. Atlantic salmon is marketed as fresh fish but some is now being canned. Because of the salmon's life history, smolts can be transferred from fresh water to salt water only at specific times of the year. Most are introduced in the spring when smolts would naturally be migrating to the sea, however, some are now added in the fall.

A number of cage sites can be seen around the Grand Manan archipelago, including Dark Harbour, from Long Island to White Head and in Seal Cove Sound. The sites are composed of a number of sea cages in a buoyed grid system. A simple construction, sea cages have an outer ring of PVC pipe which floats at the surface from which an inner net (to contain the salmon) and an outer net (to protect salmon from predators) are suspended. Another net is stretched over the top of the cage, above water to keep birds away from the salmon. The cages move up and down with the tide, unlike herring weirs which are fixed in one place and are constructed of

- **Aquaculture in sea cages**



wooden poles or stakes. In the winter an ice shield surrounds each cage and underwater noise makers are active to keep seals away. With any farming situation, the sites must be kept clean and the fish little stressed to prevent disease and its rapid spread. The cage sites are granted by the New Brunswick Department of Fisheries and Aquaculture and they also specify the maximum number of fish per farm.

For a discussion, the latest information and lots of links on salmon aquaculture refer to [Fundy Net Aquaculture](#) files.



Bluefin tuna (*Thunnus thynnus*) is the largest and fastest of the tuna reaching lengths of over 270cm (or 9') and a maximum weight of 680kg (or 1500lb). Spawning in warm waters, the adult tuna migrate north to feed on schooling fish such as herring. Bluefins maintain a constant warm body by continuously swimming. Up to the 1960's bluefin tuna were regularly caught in the Bay of Fundy but apparently, responding to a drastic decline in herring in the 1970's, tuna were scarcely seen until the late 1980's. A prized sport fish because of its size, predictability and power, a sport fishery in the Bay does not exist. There are also no licenses in the Grand Manan archipelago but fishers from Nova Scotia cruise the Bay during the summer and early fall looking for bluefin tuna. Because the fish are so valuable to the Japanese sushi and sashimi market, some fishers use planes to spot tuna. The tuna are caught with a hand thrown harpoon equipped with an electric charge to stun the fish. Unlike the sport fishery, commercial tuna fishers do not want the fish to struggle and possibly bruise or injure itself. The tuna are dressed and flown to Japan within 72 hours of capture. The price of the fish is directly related to the quality and fat content. Bluefin tuna has sold in Japan for as much as \$165 US/kg or \$75 US/lb, although most is sold for much less. Tuna can also be caught on baited hooks on lines towed behind the vessel as it moves through likely areas. Sometimes swimming into herring weirs, all attempts must be made to release the fish alive since a quota for accidental entrapments has been difficult to negotiate. Much controversy has occurred in this area.

Regulation of the tuna industry involves licensing, quotas, seasonal closures, designated fishing areas, and dockside monitoring. An international commission (the International Commission for the Conservation of Atlantic Tunas - ICCAT) was established to curb overexploitation of bluefin tuna.

- **Harpoon or longline**



 <p>Mackerel</p> <p>Herring</p>	<ul style="list-style-type: none"> • Weir • Gill net • Torching
Hagfish	<ul style="list-style-type: none"> • Baited Traps
 <p>Lobster</p> <p>Lobsters (<i>Homarus americanus</i>) are a predatory clawed crustacean which can attain large sizes (64cm or 25" and over 13.5kg or 30lb). Lobsters are also scavengers. They have both a "pincer" and a "crusher" claw. Most lobsters are sold at a much smaller size. Lobsters were so common when the early Europeans explored the area that they reported picking them up along the shore at low water. Today lobsters are caught in baited traps or pots. The season in the Grand Manan archipelago begins the second Tuesday of November each year until the end of June. Traps are checked daily or when weather permits. Most traps are brought ashore in the coldest part of the winter when lobsters are less likely to wander into traps and when scallop druggers work close to the islands. Traps are set individually, in pairs or in trawls of 10 to 25 traps. Bait is usually salted or fresh herring depending on the time of year and preference of the fisher. Other fish may also be added to the bait mixture. The lobsters are banded when removed from the traps with rubber bands. At the end of the day they are then brought ashore and placed in wooden lobster crates which hold about 45kg or 100lb of table size lobsters. The crates are floated in structures called lobster cars for short periods until they are shipped elsewhere. Lobster fishing is regulated by licensing, designated fishing areas, seasonal closures, limits to the number of traps, minimum size allowable, returning to the water females carrying eggs (berried females), and recording activities in fishing logs. A recreational lobster fishery does not exist.</p> <p>Large structures for keeping lobsters for several months called pounds, can be found along the Thoroughfare (with access from Woodwards Cove or Grand Harbour) and White Head. The pounds</p>	<ul style="list-style-type: none"> • Baited Traps or Pots



are fenced areas in the intertidal area and the water level is controlled by flood gates. The lobsters are fed while captive although the claws are still banded to prevent fighting and injury. Because lobsters are not caught in the summer here, the pounds ensure a constant supply of fresh lobsters. In other areas such as Maine and Prince Edward Island, lobster fishing seasons are open during the summer, and these lobsters are sometimes trucked to the Grand Manan and White Head Island lobster pounds.

Sea Lanes [Lobster](#) Habitat Page

Crabs

Scallops (*Placopecten magellanicus*) are a filter feeding, bivalve mollusks that can reach 20cm (8"). The "meat" is actually two muscles used to regulate opening and closing of the shells. Scallops are usually caught commercially in specially designed drags which are towed along the bottom. Scallop fishing is regulated through licensing, designated fishing areas, seasonal closures, restricted working hours and days, minimum size of shell and minimum number of "meats" per a specific weight, dockside monitoring, recording activities in fishing logs, and for some areas satellite tracking of vessels. Recreational scallop diving permits can be purchased from the Department of Fisheries and Oceans. Because only the muscle is eaten, the scallop industry is not affected by toxic algal blooms or other toxins which can affect clams, mussels, oysters, etc.

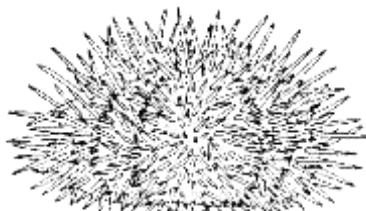


Deep Sea Scallop

- **Specialized Bottom Trawl/Drags for Each Species**

Sea Lanes [Scallop](#) Habitat Page

Sea urchins (*Strongylocentrotus droebachiensis*) are a spiny invertebrate with five-sided symmetry related to sea stars. Urchins attained a size of 75mm or 3" and are usually green with a purplish hue.



Sea Urchin

The spines are relatively short. Urchins graze algae and other material from rocks with a specialized mouth part, called an "Aristotle's lantern". They also scavenge and are attracted to baited lobster traps. When found in tide pools, gulls readily consume



urchins by breaking them open. Urchins sometimes camouflage themselves with bits of seaweed, shells and small pebbles. Urchins are dragged from the bottom using a specially designed gear which protects the urchins from being crushed by limiting the number of rocks picked up in the gear. Scuba is also used to collect urchins in Maine but no one still dives for urchins in the Grand Manan archipelago. The roe is extracted in processing plants and sold in the Japanese fish market. Regulation of the urchin fishery involves licensing, quotas, minimum shell size, seasonal closures, and designated fishing areas.

Sea Lanes [Sea Urchin](#) Habitat Page

Quahogs

Shrimp

- Mid-water Trawl/Drag

Squid

- Weirs
- Jigs

Common periwinkles (*Littorina littorea*) were brought to Nova Scotia from Europe in the 1800's and have colonized the Maritimes. This marine snail up to 31mm (or 1 1/4") is brownish with stripes around the shell. Periwinkles are grazers of seaweeds. By late summer many seaweeds show the effect of grazing - small holes through the fronds or ragged edges, but not all holes in seaweeds are caused by periwinkle; some algae like the colander kelp (*Agarum cibrosum*), are naturally "holey". Periwinkles are picked from rocky shores at low water, placed in mesh bags and left in salt water for a couple of days to let the periwinkles excrete sandy particles, etc. The periwinkles are steamed and then removed from the shell with a toothpick. Similar to escargot, they are tasty with garlic butter. Periwinkles are bought and sold by [Roland's Sea Vegetables](#).



- Hand Picked From Rocks

Sea Lanes [Periwinkle](#) Habitat Page

A bivalve mollusk, soft-shelled clams (*Mya arenaria*) are filter feeders reaching up to 150mm or 6". The clams remain buried in mud or gravel/mud mixture throughout the tide cycle and have a

- Dug With a Hack or Fork



retractable siphon or neck which can be extended surface when the tide is in or retracted when the is out. This is the clam which squirts water upwards when you walk over tideflats. Clams are by hand with a fork or "**clam hack**" (looks like a handled pitch fork, the fork bent at 90° to the handle). The clams are collected in a "**kibben**" (a wooden slated box with handle - today's version often made of plastic milk crates), washed and sold. Clam flats are regularly monitored for toxic algal blooms and faecal bacteria. Notices are posted when clams should not be dug. These clams have a variety of other names including steamers and are served deep fried, pan fried, in pies, baked or as is after steaming. A license must be purchased to commercially harvest clams.



to the tide
dug short

is

Sea Lanes [Soft-shelled Clams](#) Habitat Page

Shocking, Shucking and Shacking

Three indispensable words used:

- "shocking" - removing scallop meats from the shell
- "shucking" - removing clams and mussels from their shells
 - "shacking" - gutting fish

Have a Question? E-Mail us at: info@grandmanannb.com

Page revised April 30, 2004