Welcome to Seafood 101

A Journey from Sea to Market to Table

Sponsored by: The New England Fishery Management Council, NOAA Fisheries, and the Massachusetts Division of Marine Fisheries

Ever wonder about the seafood you eat? Who caught it, where it comes from, and how it gets to market? What you should know about buying seafood? What protections are in place to ensure the future of our seafood supply?

If so, take a journey with us from the boat to the fishing port to the dinner table. Learn more about fishermen and how our local communities are involved in bringing seafood to your plate and the wide range of choices the Northeast has to offer.

Get to know your seafood. Visit FishWatch.gov to find easy-to-understand, science-based facts that can help you make smart sustainable seafood choices.

Seafood is Good for You

The current U.S. Department of Agriculture (USDA) dietary guidelines recommend eating seafood at least twice a week. They emphasize the importance of eating seafood to fight obesity and promote overall good health.

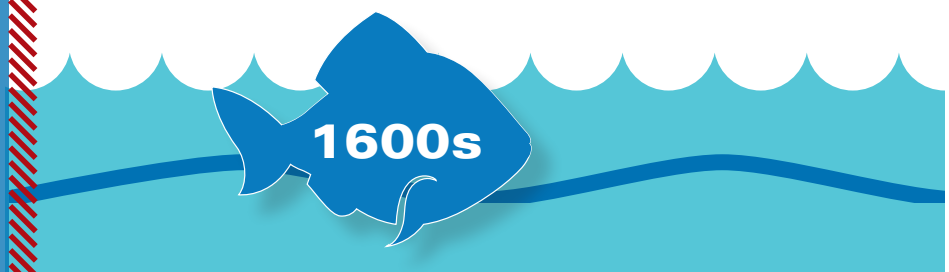
Besides containing high-quality protein that includes all of the essential amino acids for human health, the USDA says that seafood is considered the best dietary source of omega-3 fatty acids. While all fish and shellfish contain some omega-3s, and the amount can vary, scientific evidence suggests they may play a role in reducing the risk of heart disease.

Why Buy U.S. Caught Seafood?

The fish we harvest are valuable and renewable natural resources. Recognizing their importance to our food supply and economy, Congress passed the Magnuson-Stevens Fishery Conservation and Management Act in 1976. Many years and several amendments later, U.S. managed fisheries have gained a global reputation for providing sustainable seafood.

Under this law, overfishing must be prevented and overfished stocks rebuilt. And, based on the best available science, annual limits are placed on the amount of fish that can be caught along with other management measures to ensure stewardship of our ocean resources. The upshot is that U.S. fishermen operate under some of the strictest standards in the world to bring their catch to market.

Popular Seafood History



- Cod fished with hook and line by Native Americans
- Bartholomew Gosnold names the easternmost tip of MA Cape Cod after taking “a great store of codfish” there

The challenge in managing wild fish stocks is to maintain a balance — to protect jobs and fish populations, we need to limit how much we take from the ocean, so enough are left to enable fish populations to grow. We also need to protect the places they live, feed and breed, and minimize the catch of species that were not meant to be harvested. Successful efforts promote stable and profitable fishing businesses, shore-side support industries, and coastal communities.

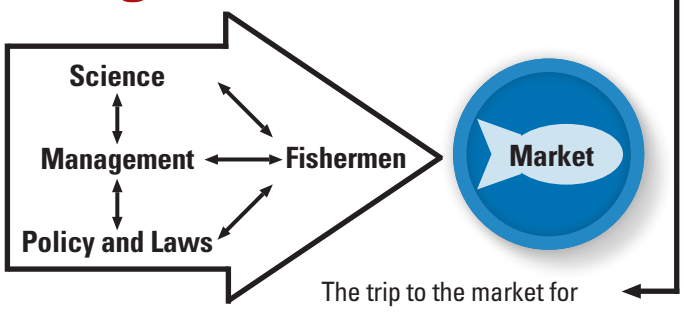
How Do I Know My Seafood is Safe to Eat?

Many agencies (the USDA, U.S. Food and Drug Administration (FDA), the U.S. Department of Commerce and the coastal states) work together to make sure the seafood you eat is of the highest quality and safe to eat. The FDA has the primary federal responsibility for inspecting seafood to ensure it is safe to eat.

The USDA has the primary federal responsibility for the safety of seafood products in the U.S. Rules in place since 1997 require that all seafood processors — companies that buy fish from the boats and package it for sale — use a science-based system of procedures to produce seafood that is safe for people to eat.

Given that up to 90 percent of U.S. seafood is now imported, half of which come from aquaculture, these rules also apply to other countries that export seafood products to the U.S.

Getting fish to market



The trip to the market for the nation's seafood is a complex process that involves thousands of individuals.

Fishermen Contribute to What We Know About Seafood

Commercial fishermen in the Northeast report to fishery officials each time they leave the dock to catch fish. They provide the who, what, where, when and how on each trip they take. Each boat documents what fish it caught and what is kept, where they caught it, what type of fishing gear they used, and who bought their catch. Similarly, dealers also report on the fish they buy. Along with scientists, fishermen also collaborate on research projects that help officials better manage the region's fish stocks.

Photo courtesy of www.capecodfishermen.org

1700s

- Salmon, lobster and Atlantic halibut plentiful on the east coast
- Lobsters seen as "fit only for the tables of the poor"
- Dried, salted cod contributes 35 percent of New England's total export revenue

1840-1870s

- Market demand for fresh Atlantic halibut skyrockets
- Schooners depart from ME, MA, RI, and CT with several tons of ice to preserve their catches
- Vessels deploy dories with more efficient gear called tub trawls to catch halibut

What Does Science Have to do With Seafood?

One of the goals of fisheries science is to determine the amount of seafood that may be harvested with little or no damage to the environment. Another is to help ensure that enough of our fish populations remain in the ocean so that harvested species are able replace themselves.

In leaving enough fish in the water for a population to renew itself, scientists must first estimate how many fish there are in that population. Different types of scientists conduct research and analyze the information they collect to accomplish this.

As part of this work, a mathematician might design a way to sample fish in the ocean in order to estimate their populations. A fishery biologist can find out what a fish eats, or how many eggs survive to adulthood.

Others can estimate how old a fish is by looking at tiny bones near a fish's ear, its scales, or sometimes backbones. Similar to trees, many fish create rings in these hard parts as they grow that reflect the fish's age. Importantly, still other experts track both the natural and man-made processes that affect our fish supply.

For Those Who Would Like to Dig Deeper

The ABCs of Stock Assessments: nmfs.noaa.gov/stories/2013/06/science_stock_assessments.html

For Kids of all Ages

Fish Fetch Activity: afsc.noaa.gov/education/Activities/fish_fetch.htm

Some Tips for Buying Seafood

Smell: Fish should smell fresh with no sour, ammonia-like smell.

Appearance: If you are lucky enough to see the whole fish, look at its eyes; they should be clear and not cloudy (a little bulge is OK); and make sure the edges of fillets or steaks are not brown or dry.

Feel: The flesh should be firm and spring back when pressed.

Fresh vs. Frozen: Buying from a local seafood dealer who offers seafood caught daily is a good way to get fresh seafood. Frozen fish is another alternative. Products labeled "fresh frozen" indicate the seafood was frozen while it was fresh, in many instances within hours of harvest. If fishery products have been frozen and thawed for retail sale, they should be labeled "previously frozen."

For more information on purchasing the highest quality seafood, view NOAA Fisheries' Seafood Inspection Consumer Guide: seafood.nmfs.noaa.gov/consumertips/07_consumertips.html

Fish in Garlic Sauce

Angela Sanfilippo, *President, Gloucester Fishermen's Wives Association*

"This is a true Mediterranean recipe for any fish or seafood. It can be used for any white meat fish such as redfish, whiting, hake, pollock, monkfish, or flounder, and can be baked or cooked in a skillet."

2 pounds fish fillets
1/3 cup of olive oil
1 lemon, squeezed
2 TBSP minced garlic
2 TBSP chopped parsley
1 TBSP oregano
Salt and pepper to taste

Put oil, lemon juice and one tsp of minced garlic in a skillet. Place fish in single layer (on top of the mixture, sprinkle with salt and pepper and let sit for a few minutes. Turn fish over and place rest of parsley, garlic, oregano and salt and pepper in the skillet. Cover, cook over medium heat for 15 minutes. For more juice, add a little water. Serve over rice using the broth for the rice.

For fish like mackerel, blue fish, scup, and black sea bass, mix the ingredients together and pour it over grilled or plain baked fish.

1880s

- American lobster is one of the most popular canned products in America
- Prices for fresh lobster begin to surge
- The commercial halibut fishery collapses

Apple-Wood Bacon Wrapped Scallop Tournedos with Summer Succotash and Orange Pecan Butter

Aaron De Rego, *Executive Chef at The Back Eddy, Westport, MA*

Recipe and photo provided by authors Elaine Tammi and Karin Tammi from *Scallops: A New England Coastal Cookbook*

Serves 4
16 pieces of bacon, good quality, parcooked, 2 to a skewer
2 lbs. U10 sea scallops, trimmed, rinsed, pat dry & leave whole
8 skewers, soak if wooden
Oil for cooking
Kosher salt and fresh cracked pepper to taste

Orange Pecan Butter:
Zest and juice of 1 orange
4 TBSP softened butter
1/2 cup toasted pecans
1 TBSP brown sugar
Kosher salt and cracked black pepper to taste

Succotash:
2 TBSP butter
4 cups fresh corn
1 cup fresh lima beans (blanched)
Kosher salt and fresh cracked pepper to taste
Small bowl
2 skillets
Shallow oven proof pan

For the Orange Pecan Butter, add all ingredients and mix till combined in a small bowl and set aside. Wrap bacon around scallops and place 2 scallops to a skewer. Preheat oven to 400 degrees.

In a medium skillet on medium high heat, add 1 tbsp. of oil until hot but not smoking. Sprinkle bacon-wrapped scallops with salt and pepper on both sides. Place them flat side down in skillet, only doing 2 skewers at a time. Let them brown well on that side about 3 to 4 minutes. When they turn golden brown, turn them over and cook one additional minute.

Remove skewers from skillet and place into the shallow ovenproof pan. Repeat this process until all scallop skewers are seared. Once they are seared, the skewers will take an additional 5 to 10 minutes in the 400 degree oven. In another medium skillet on medium heat, melt 2 tsp. of butter. Add the corn and limas and continue to cook until tender 10 to 15 minutes, season with salt and pepper to taste.

To serve, place a spoonful of succotash on the plate; place the tournedos on top and dollop with Orange Pecan Butter.

1920-1930s

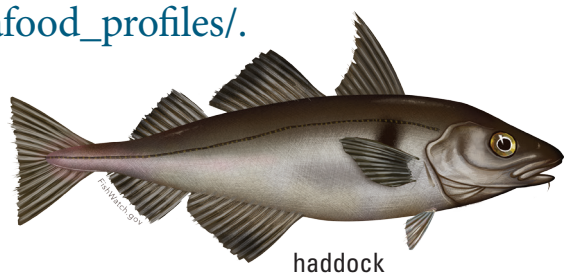
- A commercial fishery for sea scallops on Georges Bank takes off
- Cookbooks begin to publish fried scallop recipes
- Acadian redfish caught commercially with the advent of freezing fish; feeds the troops during WWII

1970s

- Congress approves new environmental laws, including the Magnuson-Stevens Fishery Conservation and Management Act in 1976

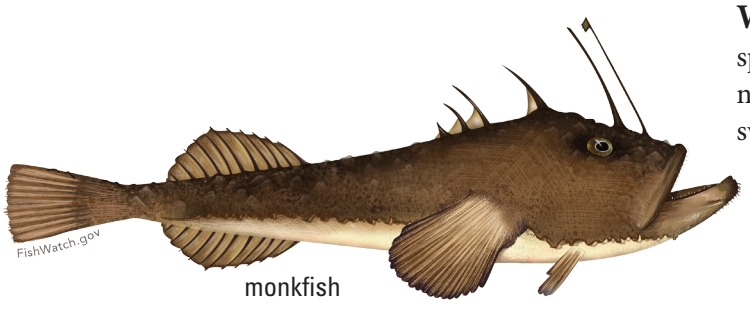
Smart and Healthy Choices

Let's discuss some already popular fish and those that may be harder to find but are worth the time and effort to track down. Each type of fish listed below comes from a healthy population that is fished in a sustainable manner. All are caught by fishermen who operate off the New England and mid-Atlantic coasts and may be found fresh in local markets. To learn more about these fish, take a look at the NOAA Fisheries website www.fishwatch.gov/seafood_profiles/.



haddock

silver hake



monkfish

Atlantic Sea Scallops – Sea scallops have a sweet, rich taste that can be mild or briny; when cooked they are opaque white with a firm, lean texture. Managed under a "crop rotational-like" management system, Atlantic sea scallops support the most valuable wild-caught scallop fishery in the world.

Haddock – With a healthy population, haddock has been a mainstay for New England foodies for many years. It has a slightly sweet taste. Its lean white flesh is firm yet tender, and its delicate flake is finer than that of cod.

Monkfish – One of nature's truly unattractive creatures, east coast monkfish tails produce firm white meat that has a texture that is similar to lobster meat. It can be sautéed, roasted or served in stews.

Acadian Redfish - Unlike the fish associated with "blackened redfish" (the Atlantic red drum), Acadian redfish have rebuilt to sustainable levels after being overfished in the 1950s. Because this is a slow growing species, its population has taken longer to recover from overfishing than other groundfish species. Acadian redfish is a firm, white-fleshed fish, like haddock, but it requires careful handling to be fully enjoyed.

Pollock - Atlantic pollock abundance dropped in the early 1990s due to heavy fishing, but under strict catch limits, populations steadily increased. Today, this population is fished at a sustainable level. The meat is white and firm and has a sweet, delicate flavor.

Whiting - Whiting (aka silver hake) are considered an abundant species, although there is some uncertainty in the science. It is nonetheless available, produces white flesh, and tastes mild and slightly sweet.

1990s

- Once labeled a trash fish, monkfish surpasses cod and haddock in value in the 1990s; new restrictions are imposed after it becomes overfished
- A program similar to crop rotation is adopted for the sea scallop fishery
- Fishery regulations tighten for most groundfish stocks (cod, haddock, pollock, and flounders)

White Hake – Not to be confused with whiting, this close relative of cod and haddock has a similar flavor with mild, white, and flakey meat that lends itself to any number of preparations.

Atlantic Herring - Atlantic herring have recovered from the low levels of the 1970s and are now harvested sustainably. Most of the herring eaten in the United States is canned and either pickled or smoked.

Other species have piqued culinary interests: summer flounder, also called fluke in some parts of New England, with its light delicate flavor; spiny dogfish (aka cape shark), a ubiquitous but delicious resident of the eastern seaboard when prepared properly; bluefish, particularly when purchased very fresh and grilled; and a number of other species that are caught off Rhode Island and further south.

Among these are black sea bass, one of the best small fish to bake or grill whole; and scup, often referred to as a "pan fish," because its small size, is excellent for pan frying or sautéing whole. If flounder is your favorite, consider American plaice, also called a sand dab or dab, and cook it using any flounder recipe you have on hand.

Cooperative Research

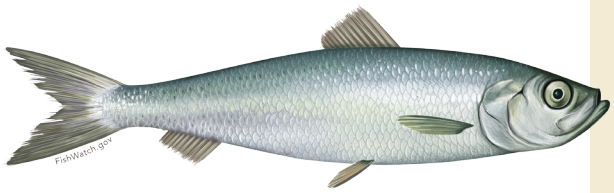
Through cooperative research programs in the Northeast, fishermen and scientists work together to collect information about commercial fishing operations, especially focusing on what they see on the water and how their gear works.

Teaming fishing, science and technology professionals to answer questions of mutual interest leads to better science and management of fisheries and stronger working relationships between these groups.

Hundreds of projects have contributed directly to decision -making by the region's state and federal fishery officials. Among them: surveys conducted aboard research vessels to help estimate fish populations, specialized fishing gear to avoid or minimize contact with endangered species such as sturgeon and sea turtles, as well as some overfished groundfish species, and the development of other programs to reduce the wasteful discards of less commercially valuable fish.

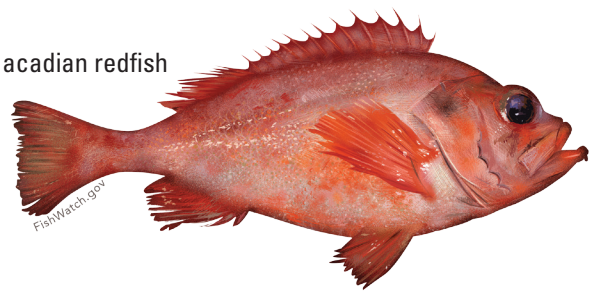
For more information on cooperative research in the northeast check out these websites:

- http://www.mass.gov/eea/agencies/dfg/dmf/programs-and-projects/conservation-engineering.html
- http://www.nefsc.noaa.gov/coopresearch/

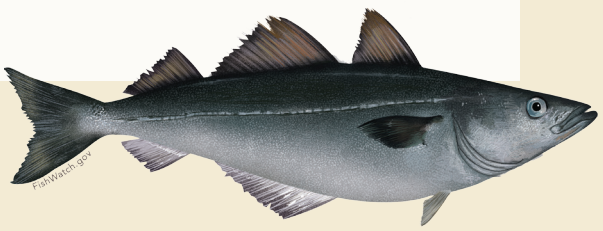


atlantic herring

acadian redfish



atlantic sea scallop



pollock

Today

- Cod off the Northeast continues to decline despite reduced fishing pressure
- The monkfish resource supports a healthy, profitable fishery
- Haddock is at the highest levels ever recorded
- The east coast sea scallop fishery is the most valuable fishery in the U.S.
- After a serious decline, today's healthy redfish population supports an active fishery

Where Your Seafood Comes From

Native Americans were fishing the rich waters of the Northeast for thousands of years before European settlers arrived, but it wasn't until the 1800s that a commercial industry developed to the point where it became a major economic driver of the regional economy.

Although not as economically dominant in the region's economy as it once was, commercial fishing remains vital to the local economies of many port cities and towns. Commercial fishermen in the New England region landed 664 million pounds of finfish and shellfish, earning $1.2 billion in revenues for those landings in 2012. Even states with relatively small fishing ports, like Hampton\Rye, NH, and Stonington, CT, generated more than $600 million in sales impacts in that year.

Fishing Ports in the Northeast

Along with contributing to the regional economy, fishing communities have intangible benefits. Residents and visitors alike are drawn to small coastal towns like Stonington and Port Clyde in Maine because of their rich fishing histories and the fact that they are still active ports. Similarly, in the picturesque Massachusetts towns of Scituate, Plymouth, Chatham, and Provincetown, while tourists enjoy the shops and beaches, they also appreciate the influence of the local fisheries. Traveling to southern New England, in the port of Pt. Judith and the village of Galilee in Rhode Island, it is obvious how commercial and recreational fishing impacts the local economy, culture and traditions.

Waterfront cities like Portland, ME and Boston, MA are home to relatively larger boats that offload their catches to be processed, packed and shipped worldwide. Similarly, Gloucester, MA, is home to an important fishing industry that demonstrates a dedication to its fishing culture through public memorials such as the famous Man at the Wheel bronze, and its companion sculpture, the Gloucester Fishermen's Wives Memorial, and summer events and festivals.

A former whaling port of world renown, New Bedford today holds the position of the top U.S. port in revenues from commercial fishing, with most coming from the sale of sea scallops. Each fall, the city celebrates its fishing heritage during the Working Waterfront Festival where commercial fishermen educate the public about their role in the community with cooking demonstrations, readings, storytelling, fishing vessel tours, music, and more.

Innovations

Following the farm to consumer model of community supported agriculture, or CSAs, and the growth of local farmers markets, resourceful fishermen from most of these port cities and towns also sell their products fresh from the boat.

Collectively known as community supported fisheries, the operations of each CSF vary, but their hallmark is the sale of local, sustainably caught, fresh seafood. Some even deliver orders to convenient locations for pick-up. Many, but not all are listed at namanet.org/csf. Find out if there is a CSF near you, or visit a port city or town and try something new in one of their many restaurants. Remember, if your fish is caught by a U.S. fisherman, you are enjoying a sustainably harvested product.

Photos courtesy of www.capecodfishermen.org

The New England Fishery Management Council – develops rules for both commercial and recreational fisheries that operate between three and 200 miles off the region's coastline. Its management authority extends to the Gulf of Maine, Georges Bank and southern New England and overlaps with the Mid-Atlantic Council for some species. Learn more at www.nefmc.org.

New England Fishery Management Council

NOAA Fisheries – promotes the stewardship of living marine resources through science-based management to ensure a steady supply of safe, sustainable seafood for the nation and world. For information about the Northeast visit www.greateratlantic.fisheries.noaa.gov/ and the agency's Northeast Fisheries Science Center at www.nefsc.noaa.gov/.

NOAA FISHERIES

The Massachusetts Division of Marine Fisheries – is responsible for the development and promulgation of the Commonwealth's laws governing commercial and recreational fishing activity conducted in the marine environment. Central to its vision is a commitment to balance living marine resources with our coastal culture through innovation, collaboration, and leadership. Visit www.mass.gov/marinefisheries.