
The Commodities

The following section gives interesting facts about each of the major commodities or groups of commodities produced in British Columbia. This is only a partial list of all the commodities grown in BC. It was grouped in this way simply for space considerations. For more details on each, contact the agencies noted.



Fish

Fish Farming

Shellfish

Commercial Fishing



Aquaculture—Fish Farming

Interesting Facts

Commercial finfish culture in British Columbia can be traced back to at least the mid 1950s when the province licensed the first rainbow trout farms. The first salmon farm began operation in 1971. 65% of all Canadian farmed salmon is produced in BC. Aquaculture is the main reason for the increase in seafood consumption in Canada during the past 10 years.

What is fish farming?

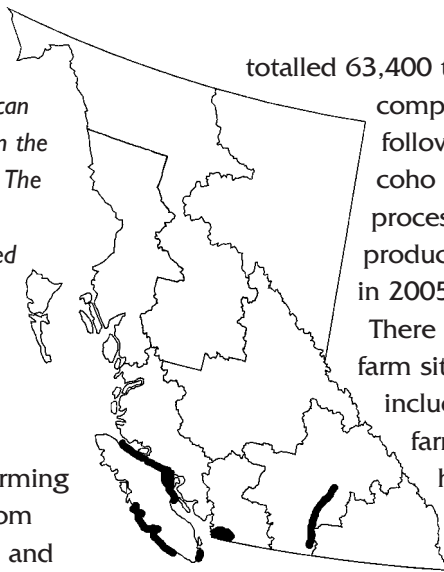
Aquaculture is the industry name for farming fish, shellfish and aquatic plants. It is from the Latin word “aqua”, meaning water, and “cultura”, meaning to cultivate, produce or grow. Another term, mariculture, is culturing in saltwater. Freshwater trout farms have been around since the 1950s and saltwater salmon farms were first developed in the early 1970s. A licence is required to farm fish in BC.

Where are the fish farms in BC?

Aquaculture requires water. The coastal areas in BC are ideal for the cultivation of saltwater fish, the most common being salmon. Almost all marine fish farms are currently located around Vancouver Island, predominately between Campbell River and Port Hardy on the northeast side, and in Clayoquot Sound on the west side. Some marine farms are located on the Sunshine Coast. Freshwater fish, such as rainbow trout, are raised on farms throughout BC, but mostly in the Fraser Valley, on Vancouver Island and in the Thompson-Okanagan region.

How much fish do we produce?

BC is the world’s 4th largest farmed salmon producer and in 2005, the farmed salmon harvest



totalled 63,400 tonnes. Atlantic salmon comprised 76% of production, followed by chinook at 22% and coho and steelhead at 2%. After processing, BC’s farmed salmon production was worth \$319 million in 2005.

There are more than 250 aquaculture farm sites in BC growing finfish, including 121 marine salmon farms and 129 freshwater finfish hatcheries and grow-out sites.

The 2005 finfish harvest from aquaculture was 63,600 tonnes worth \$319.3 million at the farm gate. The breakdown of production for 2003 is: 56,000 tonnes of Atlantic salmon valued at \$212.9 million, 15,700 tonnes of chinook salmon valued at \$36.8 million, and 1,400 tonnes of coho and steelhead valued at \$6.1 million as well as 110 tonnes of trout from freshwater sites valued at \$673 thousand. Eighty-five per cent of total production is exported primarily to the United States and Japan.

Of BC’s coastal nearshore area, which totals 816,000 hectares, salmon farms occupy less than 0.15% (1,200 ha). Recent industry growth is due primarily to more intensive cultivation of sites as access to new land has been limited. There are now a variety of finfish species (other than salmon) currently under culture in British Columbia including sablefish (also called blackcod) and wild-caught halibut.

How are fish produced?

Salmon are anadromous, meaning they spend most of their adult lives in saltwater, but must return to freshwater to spawn. Fish farmers have mimicked

this natural life cycle when developing techniques for culture. Freshwater hatcheries collect eggs and milt (sperm) from their broodstock (mature fish) and fertilize the eggs. For Pacific salmon, which will die as soon as they spawn (lay their eggs), the salmon are killed and then the eggs and milt are extracted. Atlantic salmon, which are also grown on BC farms, spawn 2 or 3 times in their life in the wild, but are generally used only once for commercial production.

Eggs and milt are extracted from the fish by anaesthetizing the fish and running a hand down the belly of the fish to squeeze out the eggs and sperm. The eggs are then fertilized and incubated. The eggs hatch and the juvenile fish, or “fry”, are raised in fresh water until they have reached the stage at which they smolt, or adapt to a saltwater environment. This varies from species to species and ranges from 6 months in Chinook to a full year in Atlantic salmon.

The smolts are then transferred to saltwater floating cages or pens. The fish are fed a diet rich in protein. After 14 to 20 months in saltwater the fish are ready for market.

For freshwater fish, like trout and arctic char, the process is similar to Atlantic salmon, except the fish remain in freshwater for their entire life. Instead of floating pens, the fish are raised in earthen ponds, concrete raceways and fiberglass or plastic tanks.



How are fish used?

Salmon is eaten as whole baked fish, grilled as steaks or served as fillets. It can also be smoked whole or in fillets. Recent innovations include salmon patties for burgers and ground and seasoned salmon in paté. Adding value to salmon is becoming increasingly popular as consumers demand more variety in product forms. Niche markets catering to cultural groups, such as Asian communities, are developing. Sushi (raw fish) has become very popular in the last few years. The demand for fish (high in omega fatty acids), along with other low fat foods, has increased rapidly. Studies have shown that a regular helping of fish instead of meat reduces heart disease. Fish is also an excellent source of protein.

What happens to a fish after it leaves the farm?

Fish from farms is available to the consumer in less than 24 hours. A fish is gutted, cleaned, and sold as fresh whole fish, or it can be sold as fillets, which requires removing the spine and skin. Fish must be refrigerated immediately after harvest. Much of the farmed coho salmon is sold to Japan where it is used in a variety of traditional dishes.

What challenges do fish farmers face?

Salmon are raised in the same environment as their wild cousins, with only a net keeping them “inside”. Farmers must safeguard farmed fish against accidents, pollution, vandalism, storms and predators, as well as toxic algae blooms, and also keep them from escaping. Good husbandry practices must be constantly maintained to reduce the incidence of disease on the farm.

Who’s involved in producing fish?

- Fish farmers and fish processors
- Wholesalers, brokers, retailers
- Government licensing agencies

Contacts and other resources:

BC Ministry of Agriculture and Lands
BC Salmon Farmers’ Association
BC Farmed Salmon Institute



Aquaculture—Shellfish

Interesting Facts

The commercial culture of the Pacific oyster can be traced back to 1912, when it was first introduced from the Far East. Since then, the European oyster, the Manila and littleneck clam, the Japanese scallop, the blue and Gallo mussel, and, most recently, the geoduck clam have also been added to the inventory of shellfish species found on farms in British Columbia.

What are shellfish?

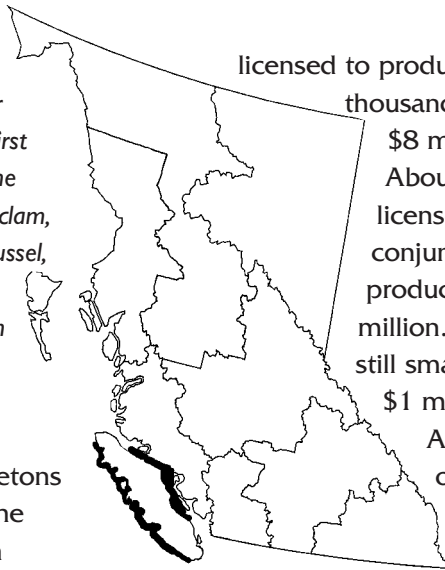
Shellfish are sea animals whose skeletons are on the outside of their bodies. The only shellfish grown commercially in British Columbia are bivalves such as oysters, clams, scallops and mussels. These shellfish have two halves to their shells, connected by a hinge (muscle). A shellfish can open its shell to filter water for its food or close the shell up tight for protection.

Where are shellfish produced in BC?

Shellfish in BC are grown in saltwater in the coastal regions off the mainland and in the waters surrounding Vancouver Island and the many smaller islands of the coast. The majority of shellfish production comes from the waters of the Georgia Basin and the West Coast of Vancouver Island. The gravel beaches around Baynes Sound on the eastern shore of Vancouver Island are well suited to beach culture. Deep-water tenures, where shellfish are grown suspended in the ocean, currently account for half of the number of tenures under production.

How much shellfish do we produce?

A licence is required to farm shellfish in BC. There are 455 shellfish tenures covering 2,700 hectares of the coast. Most of these tenures or farms, are



licensed to produce the Pacific oyster. Seven thousand six hundred tonnes valued at \$8 million were produced in 2005.

About one-half of the shellfish farms are licensed to farm Manila clams, often in conjunction with oysters. Current annual production is 1,800 tonnes valued at \$8.4 million. Scallop and mussel harvests are still small at 220 tonnes valued at \$1 million.

Almost 80% of all clams and all oysters produced in BC are from aquaculture. Recent industry growth is due primarily to more intensive cultivation of sites as access to new land has been limited. New shellfish aquaculture species are being explored and many provide high-value products. The spot prawn and giant rock scallop have been cultivated on an experimental basis as have abalone, sea cucumber and sea urchins.

How are shellfish produced?

All bivalves spawn at specific water temperatures and the eggs take 5 to 6 hours to hatch into larvae. The larvae are mobile for about two weeks. During this time they will find a place to settle and grow. Once the free-floating larvae of bivalves settle they don't generally move. Oysters and mussels firmly attach themselves to some sort of substrate. Clams live in the sand of beaches and can move up and down, while scallops are free to move along the bottom of the ocean in the wild.

All bivalves feed by filtering water through siphons and collecting plankton in gills. An oyster can filter 20 to 30L of water a day.

In the early days of the oyster industry, harvesters



Little Neck Clam



Oyster



Scallop

collected, from the wild, small “seed” oysters, which are the product of natural spawning. This supply was inconsistent from year to year. While this practice still occurs, it is no longer the predominant source of oysters for the industry.

Today, shellfish for aquaculture are spawned in hatcheries and the larvae and seed are sold to growers. On the farm, oyster larvae are placed in tanks filled with material to which the settling larvae can attach, often old oyster shells. After the oysters have attached themselves to this material, called cultch, they can be transferred to floating rafts where they are grown to market size.

Clams are also typically set in tanks similar to oysters, but they do not require cultch. They are kept in the tanks after setting and fed planktonic algae until they reach a size of 2 to 8mm in shell length. They are then gathered and seeded onto farm beaches.

Scallops are set in tanks on a filamentous material, also called cultch. Once they reach about 5mm in shell length, the cultch is bagged. When the scallops are bigger, they are removed from the cultch and placed in trays or lantern nets that are suspended from rafts for grow-out in the ocean.

How are shellfish used?

Shellfish are eaten fresh, in sauces and soups, breaded and deep-fried, canned or smoked. Oysters can also be eaten raw, right out of the shell. These are called “half-shell oysters” in the restaurant trade. A new innovation is “flash-freezing” which freezes the oysters in the shell individually at the peak of freshness and quality. This extends the shelf life of the shellfish and makes it attractive to food service chefs who use it when fresh oysters are unavailable. Value added shellfish products are being introduced to respond to changing consumer tastes such as prepared and packaged “Oysters Rockefeller”.

What happens after shellfish leave the farm?

About one half of the oysters harvested in BC are shucked. That means that the shell is pried open and the meat is removed and sold fresh in small containers. This is a labour intensive process. The remaining oysters are sold in the shell and served as “half-shell” product.

Clams are sold whole or are shucked and canned. Scallops are primarily shucked and the adductor muscle (the muscle that moved the shell open and closed) removed. A small amount of scallops are sold whole. Shellfish are marketed to restaurants and through seafood outlets.

What challenges do shellfish producers face?

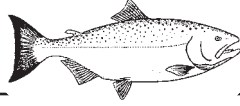
Major challenges to the development of shellfish aquaculture include securing suitable beach and deepwater tenures, the development and adaptation of technologies, the development of new markets, and making sure that growing areas do not become unusable because of pollution.

Who’s involved in producing shellfish?

- Shellfish farmers
- Processors
- Wholesalers, brokers, retailers
- Equipment manufacturers and suppliers
- Government licensing agencies

Contacts and other resources:

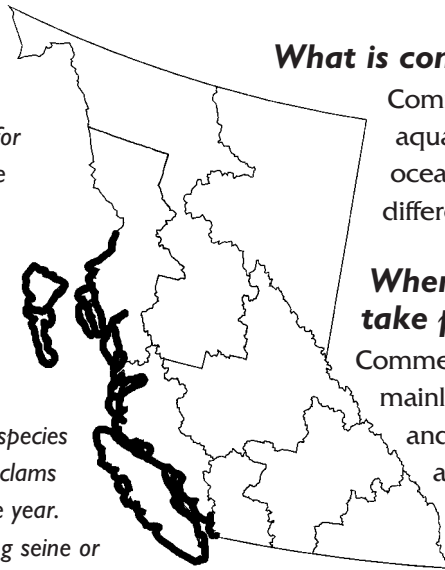
BC Ministry of Agriculture and Lands - (Fisheries and Aquaculture Branch)
BC Shellfish Growers



Commercial Fishing

Interesting Facts

The commercial fishing industry has been an integral part of BC's economy for over a century. Commercial fishing is the fourth largest primary industry in British Columbia after forestry, mining and agriculture. More than 80 different species of finfish, shellfish and plants are harvested commercially. While commercial fisheries for salmon and roe herring are seasonal, fisheries for other species such as sablefish, groundfish, geoducks, clams and other shellfish, occur throughout the year. Harvesting is undertaken by vessels using seine or gillnets, and by trawling, trolling or trapping. Other harvest methods include diving and hand picking. Wild shellfish is the most important commercial fishery in terms of value to the harvester. High landed prices are realized primarily in the geoduck clam, crab and prawn fisheries. Groundfish species account for 68% of the commercial fishery harvest by volume.



What is commercial fishing?

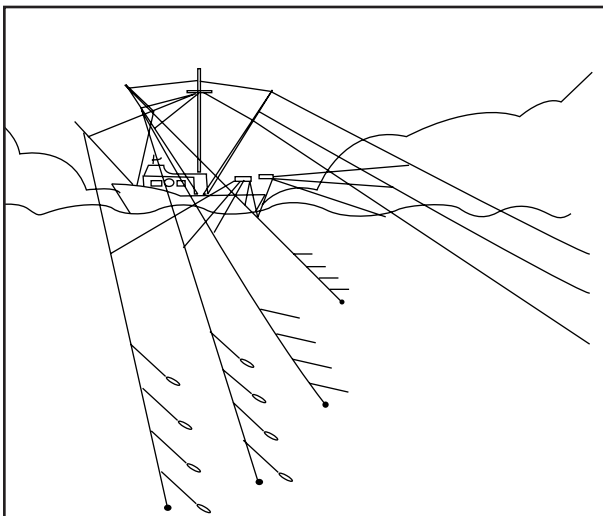
Commercial fishing is the harvesting of aquatic plants and animals from the oceans and rivers. There are more than 40 different species harvested.

Where does commercial fishing take place in BC?

Commercial fishing takes place off the mainland coast, all around Vancouver Island and the Queen Charlotte Islands and along the rivers of BC.

How much fish do we harvest?

In 2005, 70% of all fish and shellfish harvested in British Columbia came from the commercial fishing fleet participating in near and off-shore fisheries. The wild commercial harvest was 250 thousand tonnes with a landed value of \$330 million.



Trolling

A method of fishing in which several fishing lines with numerous lures are dragged slowly through the water.

Groundfish species including hake, halibut, sablefish, rockfish, sole and turbot accounted 170 thousand tonnes and 68% of the total wild harvest by volume. The rest of the catch was split between shellfish at 17 thousand tonnes, herring and salmon at 62 thousand tonnes each with minor species accounting for the remainder.

How is seafood used?

Seafood can be purchased fresh, frozen, canned, pickled, smoked or dried. It can be whole, filleted, flaked or in steaks.

How is seafood produced?

The primary types of fish that are caught in BC are salmon, herring, halibut and a variety of groundfish species including sablefish and rockfish.

Salmon are caught by trolling, purse seining and gill netting. A troller has several fishing lines each with numerous baited lures which are dragged slowly through the water. Purse seining uses a long, deep net. A person in a skiff takes one end of the net around a school of fish and attaches the ends. The net is then drawn together around the bottom, forming a purse. Herring are also caught this way. Gill nets have a mesh size just large enough to allow the head of the fish through, but not the body. When the salmon tries to back out of the net, the gills get trapped by the net and the fish is caught. Halibut are caught in a process called longlining. One main line has a number of shorter lines each

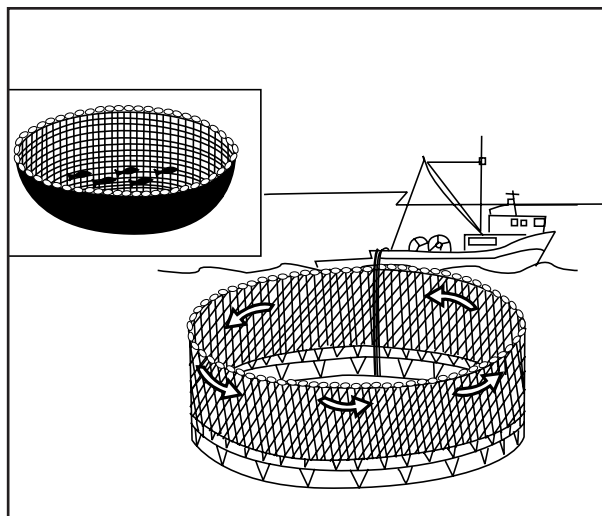
with baited hooks attached. This type of line can be used at a variety of depths.

The main shellfish species caught in BC are clams, scallops, crabs, shrimp, prawns and sea urchins. Clams are dug by hand from the beaches using shovels and pitch forks. Scallops are scooped up from the bottom of the ocean with a large net. After using an electronic finder to locate large concentrations, shrimp and prawns are also collected in nets dragged through the water. They can also be caught in baited traps such as those used to collect crabs. Sea urchins on the other hand are picked by hand.

What happens after the seafood is caught or harvested?

Once the seafood is caught, it is generally stored on ice and transported fresh to the processing plant for processing and packaging. Sometimes fishing vessels will be at sea for days and, therefore, to preserve the fish, it may be gutted before being stored on ice. At the plant the seafood is processed as per the species or market demands. Fish may be gutted and sold fresh, dressed head on, or it may be filleted or cut into steaks. Filleted fish can be further processed by smoking or drying. Fish such as salmon or tuna may also be canned.

Bivalve shellfish such as Manila clams, mussels and scallops are either left in the shell and sold fresh to be cooked and served from the shell or removed from the shell and canned. Larger bivalves such as



Purse Seining

A method of fishing involving a long, deep net that stands like a fence in the water, supported at the surface by floats and held down by lead lines at the bottom. A person in a skiff (small boat) takes one end of the net around the school of fish and joins the seiner (large boat) at the other end. The seiner then hauls in the wire or rope purse line strung through the bottom of the net, forming a "purse" under the fish.

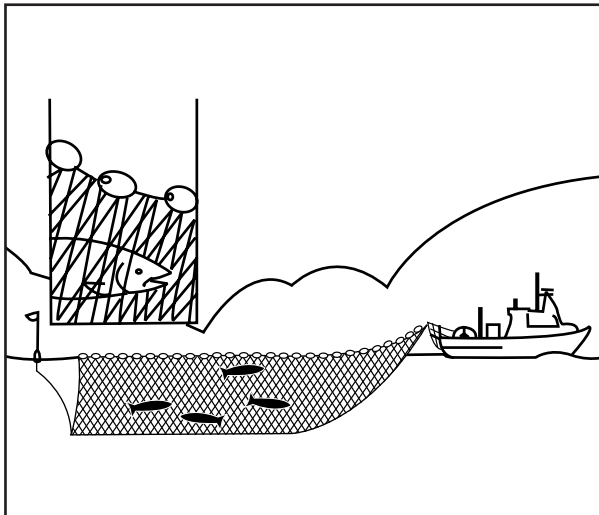
horse clams and geoducks are removed from the shell and sold fresh or processed in a variety of forms, such as canned or dried. Shrimps and prawns are shelled or not and sold fresh or frozen.

What challenges does the commercial fishing industry face?

The commercial fishery faces a large challenge to ensure that over-fishing does not occur. If too many fish or shellfish are taken from the waters there will not be enough remaining to replenish the stocks. The federal government is responsible for conservation and protection of marine fish stocks in

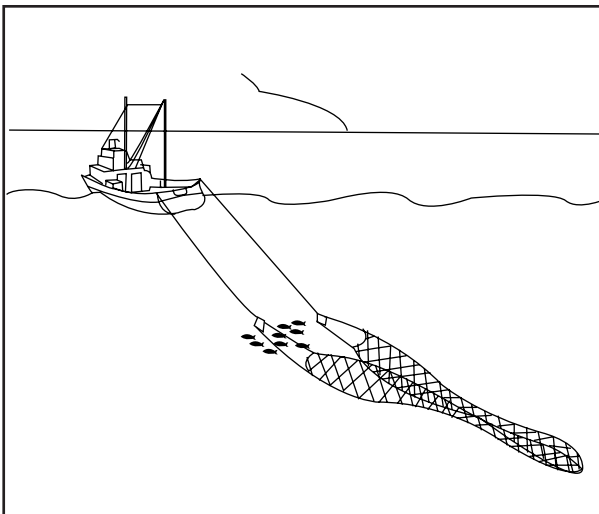
BC and the provincial government is responsible for shellfish and freshwater fish stocks.

Harvesting seasons vary for different species and for different parts of the coast. Open season and quotas are chosen so as to allow enough individuals to escape capture to allow the species to continue to harvest in the ensuing years. Salmon season can be open July through November, while herring season is in February and March. Some species' seasons are open all year and quotas are set on how much an individual fishing boat may harvest. These are called individual Vessel Quotas, or IVQs.



Gillnetting

A method of fishing in which fish swim into a suspended net and become entangled by their gills in the webbing. The net can be placed at various depths, depending on the fishery location.



Otter Trawling

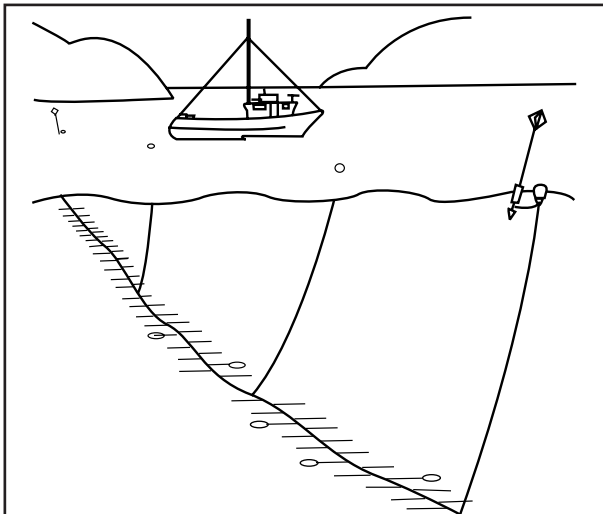
A method of fishing in which a large wedge-shaped net is dragged along the ocean bottom. An otter door is attached to each side of the net to hold the net open and keep it horizontal. Fish collect in the end (the back) of the net.

Who's involved in the commercial fishing industry?

- Fishing vessel owners and workers
- Seafood processors
- Wholesalers, brokers and retailers
- Suppliers of fishing equipment
- Government licensing agencies

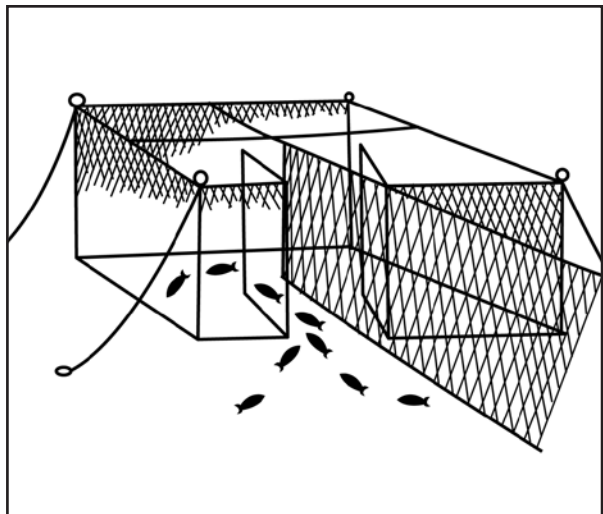
Contacts and other resources:

BC Ministry of Agriculture and Lands
Federal Department of Fisheries and Oceans
BC Salmon Marketing Council



Longlining

A method of fishing involving one main line to which a series of shorter lines (gangions) with baited hooks are attached. Used at various depths i.e. a surface longlining for pelagic species such as tuna and swordfish, bottom longlining for demersal species such as halibut and cod.



Blackcod Traps

Set on the ocean floor close to shore these open-topped box nets contain a door facing the shore. Seashore feeding cod are deterred by a net fence that directs them to the trap: once inside they tend to swim in circles and not leave the trap.