Fish 101:
A Crash Course in Alaska Fisheries

Last revised: December 2018

Created by: Meredith Redick, Jonathan Kreiss-Tomkins, Kelsey Schober, Berett Wilber, Eli White, Ella Lubin, Molly Dischner, Blaire Hunter, and Carly Dennis; with generous support from the State of Alaskan Salmon and People (SASAP) and other organizations.

Greetings!

Welcome to Fish 101.

It's not perfect, but it is, we hope, informative. We hope it functions as your 0-to-60 crash course in Alaska fisheries.

The fishing industry is the lifeblood of many Alaskan families and communities. In 2016 alone, Alaska's seafood industry produced 56,800 full-time jobs, 5.6 billion pounds of seafood, and $5.2 billion. Fishing permeates Alaskan economies, cultures, and dance recitals.

But understanding how Alaska fisheries work — what they are, how they're managed, and the political systems that govern them — can be like trying to join a fast-paced conversation of Finnish as a native English speaker.

People involved in fish politics can speak in a byzantine language of acronyms and jargon. It's not all jargon's fault, of course. The underlying concepts, political and biological, are complex in their own right.

The right to access Alaska's fish and fisheries is literally written into our Alaska Constitution. But fish politics are convoluted, and there's no real entry point for learning. How can we use, sustain, and protect our rights if we don't understand them?

Out of this need, Fish 101 was born. We wanted to solve that problem by providing a clear, accessible, dare we say fun, guide to Alaska fisheries. Our hope is that anyone reading this document will be ready to walk into a federal or state fishery management meeting, have a sense of what's going on, and be able to advocate for themselves.

Since its inception, the Fish 101 project has blossomed largely as the result of volunteer efforts from a core team. College interns have helped. Team members have observed the regulatory processes for federal fisheries. We've spent hours on the phone with state fishery managers unraveling the relationships and regulations that govern Alaska fisheries. We've edited for hours to cut through the jargon and distill concepts into accessible, engaging material.

We've also connected with organizations around Alaska, from the State of Alaska Salmon and People (SASAP), to SalmonState, to the Bering Sea Fishermen's Association, with the goal of soliciting feedback from a broad range of stakeholder groups. Along the way, we received generous grant funding from SASAP and Salmon Connect to support the project.

After nearly four years of work, almost all on a volunteer basis (not that we're doing the math, but somewhere around 1,880 hours) we have a mature document that a hard-hitting lineup of

fisheries experts and professionals have peer reviewed. Our contributors range from Southeast hand trollers to members of the North Pacific Council. We're building a corresponding website to provide 24/7 access to the content.

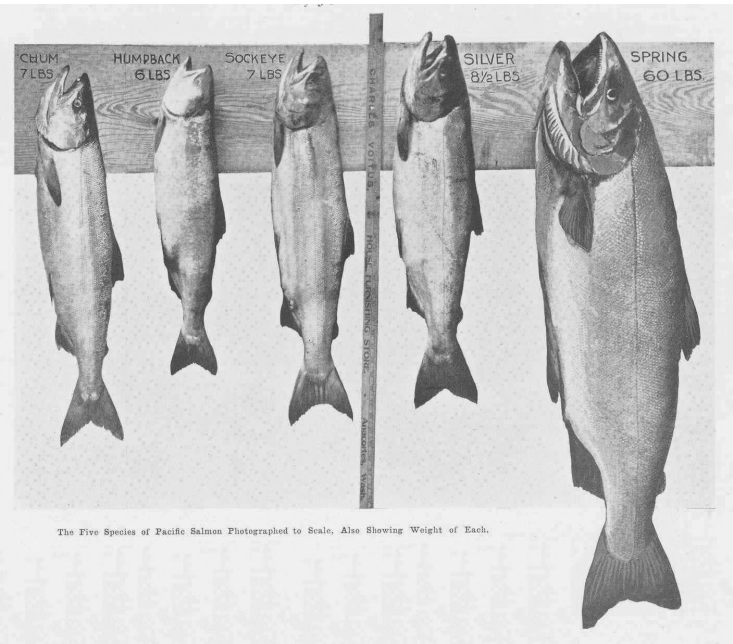
While we've poured time and energy into this labor of love, we also don't mean to hold up Fish 101 with Encyclopedia Brittanica-esque authority. We're in a state of constant improvement and looking to fix inadvertent accuracies — so please share your thoughts and ideas with us.

One last note: we focus on commercial fisheries in this document. Subsistence, personal use, and sport fishing are all critically important areas of the Alaska fishing landscape that this document doesn't cover; we just couldn't tackle them and finish this document within the average rockfish lifespan.

Thanks for reading. Stay dry.

— The Fish 101 Team

Table of Contents



The Five Species of Pacific Salmon Photographed to Scale, Also Showing Weight of Each.

I. FISH

Okay, you probably know what these are, but these are the fish we'll be focusing on: species targeted by commercial fisheries in Alaska.

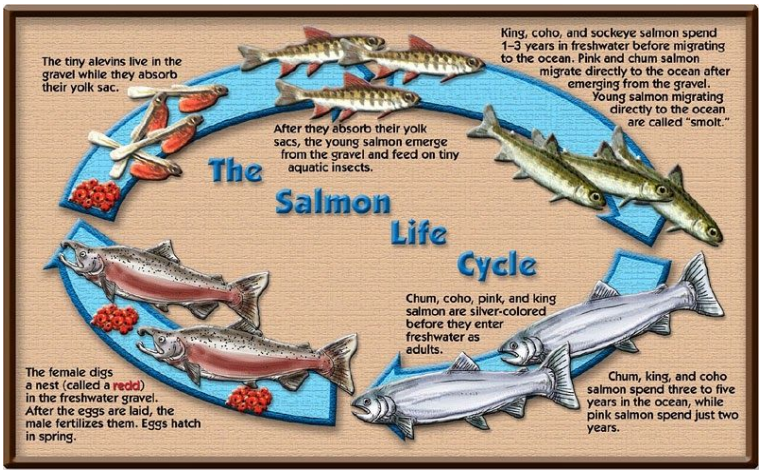
Salmon

There are five species of Pacific salmon in Alaska. They're all fished commercially as well as for sport, subsistence, and personal use.

Understanding the salmon life cycle is key to understanding how salmon are fished and managed. Salmon are anadromous: born in freshwater, they swim downstream to spend their adulthood in the ocean. To spawn, they return to the rivers where they were born.

Fishermen catch salmon as they "run" back to the streams where they were born. To keep

salmon stocks healthy, sustainable, and ensure strong future runs; managers have to make sure enough salmon make it up river to spawn.[1]



***King* (or Chinook, with a capital "C," *named for the indigenous group*) *salmon*:** Per their regal name, kings are legendarily large, and they're generally the most expensive of the salmon species. They're the official fish of the State of Alaska, too. Kings regularly grow beyond 30 pounds, and they spend 1-2 years in freshwater and 1-6 more in the ocean. They spawn in rivers from Southeast to the Yukon and beyond.[2]

***Sockeye* (or red) salmon:** According to the Alaska Department of Fish & Game (ADF&G), sockeye are the most economically important salmon species in Alaska, thanks to high volume and wide consumer recognition. They get their name not from semi-professional boxing careers, but from their rosy appearance: the word is a derivation of *Suk-kegh*, "red fish" in an indigenous Salish Sea language. Juvenile sockeye spend 1-3 years in freshwater, relying on lake habitat,[3] and another 1-3 in the ocean. They're fished along most of the Alaska coastline. Their weight varies by region, but they typically weigh between 4 and 15 pounds.

***Coho* (or silver) salmon:** Coho spend 1-3 winters in streams and lakes before they smolt[4] and head for salt water. Their time at sea is short, often between 6 and 18 months. Coho range as far north as the Chukchi Sea but are most abundant in Southeast, where they emerge from the ocean with distinctive hooked jaws and an average weight of 8 pounds. They're the bread-and-butter fish of the Southeast troll industry.

[1] That just-right number of salmon is the "escapement goal," as it's known in fisheries management jargon (that is, the number of salmon that manage to "escape" the litany of mortal threats and return to their natal streams to spawn). Most major salmon populations are managed with escapement data.
[2] The opposite of pink salmon, which can spawn even in intertidal zones and other creeks and trickles of water.
[3] The sockeye salmon's reliance on lake habitat (which differs from the other four species of salmon), is why the Bristol Bay watershed produces 51 percent of the world's sockeye salmon. Just look at a map of the huge, wild lakes everywhere.
[4] Smoltification is the very cool process by which salmon prepare their bodies for saltwater to avoid winding up like this.

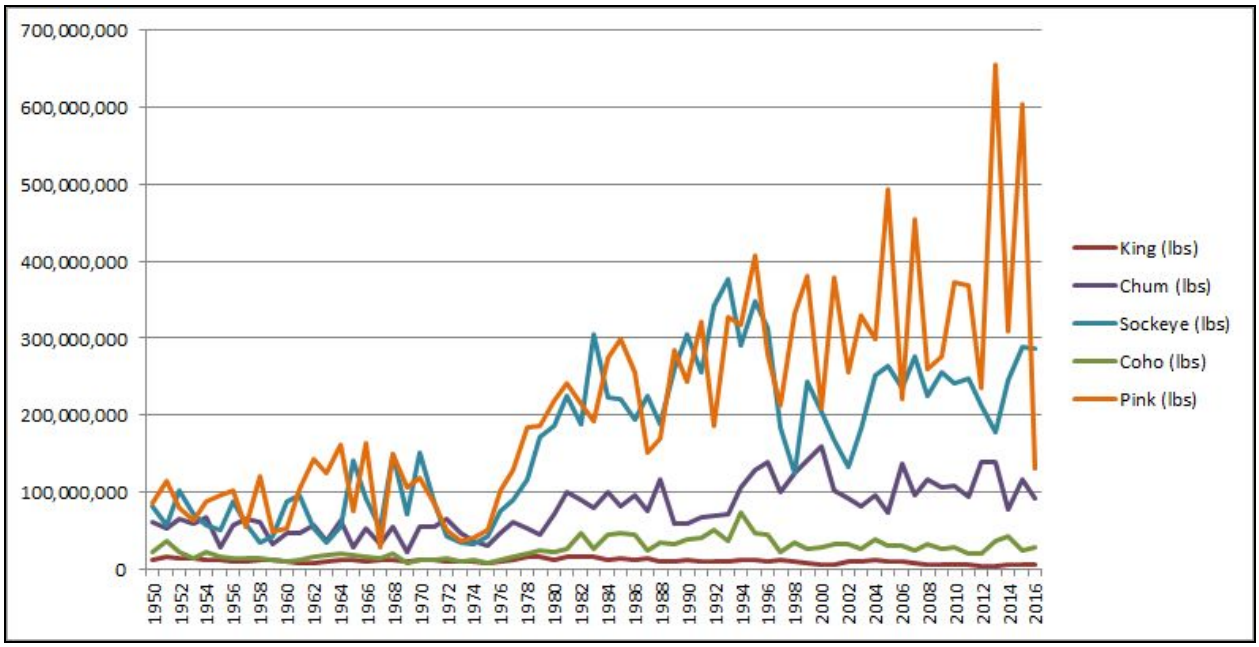
***Pink* (or humpy, short for for humpback) salmon:** Pinks are the smallest and shortest-lived of the salmon species, with adults barely topping five pounds. They live two-year cycles, swimming to the ocean immediately after hatching. As a consequence, their odd-year and even-year populations are genetically distinct, and the size of the even/odd year populations can vary dramatically. Males develop a characteristic humpback during the run, hence the nickname.

***Chum* (or dog or keta) salmon:** A far-roaming species, chum salmon manage to spawn in significant numbers even in Arctic rivers north of Kotzebue. Upon hatching, chum fry quickly migrate to the ocean, where they grow for 3-4 years, and typically are the second-largest salmon in Alaska (after kings), weighing between 8 and 15 pounds. Chums are nicknamed dog salmon because they are used as dog team food in Western and Interior Alaska. Marketers such as the Alaska Seafood Marketing Institute (ASMI) increasingly brand chum salmon as "keta salmon," a nod to the scientific name, because "chum salmon" and "dog salmon" aren't necessarily the most appetizing names. In recent years, chum's economic fortunes have been boosted by foreign exports (especially of ikura, or salmon caviar).

These five species of salmon, as you might have gathered, fit into distinct niches in the world of Alaska fisheries. A king and a chum differ in *lots* of ways — in value, in cultural importance, and in how their harvest is managed.

One example: in terms of pounds landed ("landing" is fish-speak for fish caught and brought to a processor), the puny pink salmon tends to be the heavyweight champ.

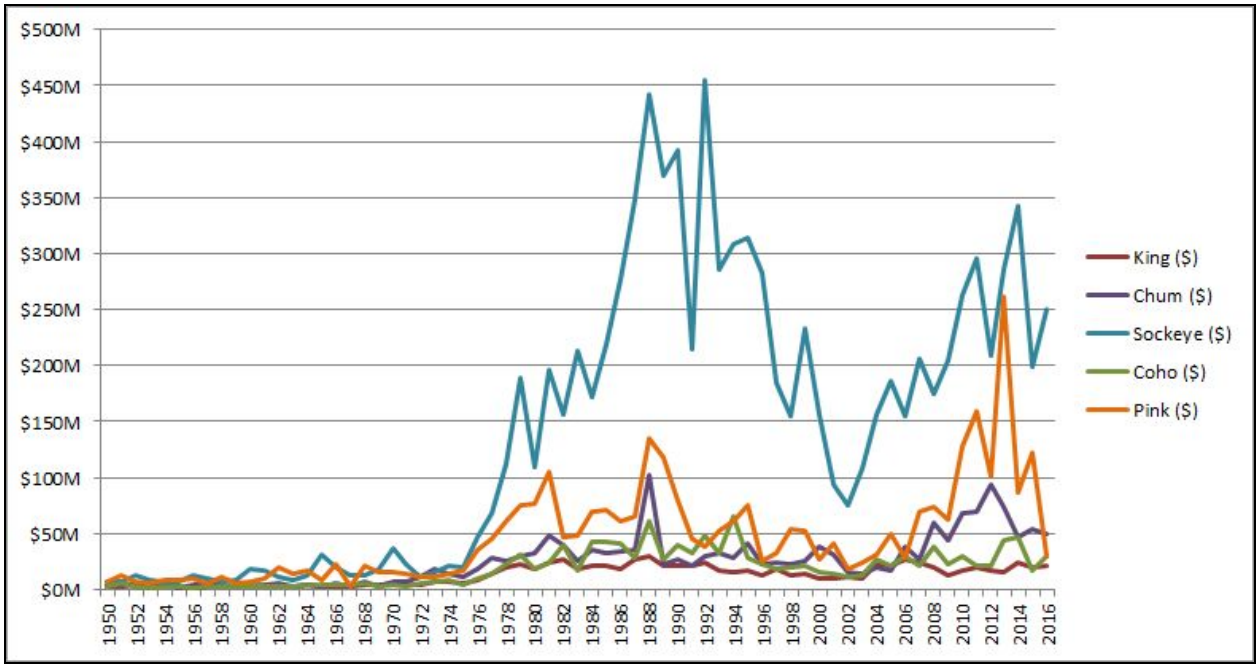
Landings (lb.) per year by salmon species in Alaska[5]



[5] Graphed using data from NOAA, which records this information each year for species and area.

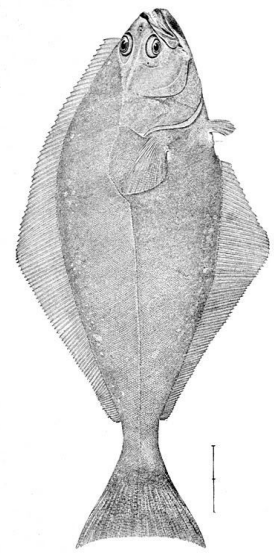
But when we look at the ex-vessel value, or the cash that a fisherman gets when offloading their fish, of all those salmon, species such as sockeye move up in the rankings.

Landing value (lb.) per year by salmon species in Alaska[6]



In other words, each species of Pacific salmon is unique, and they're fished and managed as such.

Halibut



Pacific halibut is a giant flatfish.[7] There is also Atlantic halibut, but as is so often true, the Western version is bigger and better (we're joking, mostly). The heaviest halibut caught in Alaska was reported at 533 pounds. Halibut transmogrify, as if by cardboard box designed by Calvin and Hobbes: they start life oriented vertically, like "normal" (stereotypical) fish, but in what might count as the most awkward adolescence in the animal kingdom, they flatten out to swim horizontally along the bottom, and one of their eyeballs migrates around their face. Halibut reach maturity between 8 years (males) and 12 years (females) but can live to be over 50. In Alaska, they range from Southeast through the Chukchi Sea.

[6] Also graphed using data from a NOAA database.

[7] Flatfish live life on the horizontal plane. Mature flatfish look like pancakes with both eyes on one side of their head. This configuration is useful since they swim along the ocean floor, moving their tails up and down instead of side-to-side. This term applies to a whole order of fish (Pleuronectiformes, if you're curious) including species like halibut, sole, flounder, turbot, plaice, and more.

Herring

Herring are small schooling fish that are as foundational to the food web as the bottom block of a Jenga game. Herring are so energy-rich that they've been referred to as "the Kobe beef of the forage-fish world." Everything eats herring: birds, sea lions, whales, salmon, and most other fish — not to mention humans. They're abundant along the West Coast, but infamous for their collapses.[8] Commercial herring fishing focuses on on harvesting eggs ("sac roe") and whole herring to use as bait.

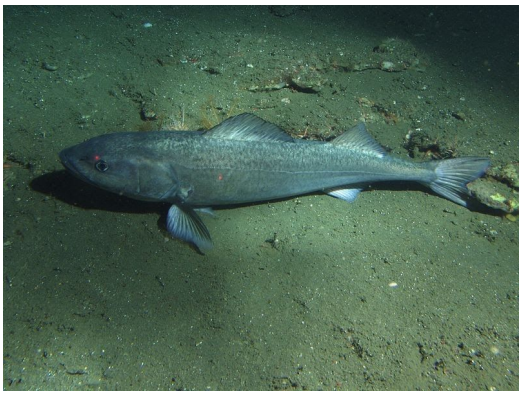
A Particularly Confusing Category: Groundfish

In the world of Alaska fishery management, "groundfish" is a catch-all term for commercially important fish and invertebrates that aren't covered under other management plans.

Outside of the regulatory world (i.e., to almost everyone), the term "groundfish" refers to a fish caught on or near the seafloor.

So, to the North Pacific Fishery Management Council (more on them later, and hereafter referred to as the "North Pacific Council"), a halibut, which is custom-built to spend its life on the seafloor, does not count as a groundfish; but an octopus, which is not a fish at all, *is* classified as a groundfish. To everyone else, a halibut is a groundfish and an octopus is not. (Confused yet?)

The fish below are groundfish according to the North Pacific Council's regulatory definition.



Sablefish (also known as black cod) are not actually cod, but rather the lone species in the *Anopolopoma* genus. (They also have a delicious buttery taste that distinguishes them from cod.) ADF&G and the federal government prefer the term "sablefish," whereas "black cod" is more colloquially popular in Alaska.[9] These fish are lucrative for small-boat fishermen, especially in Southeast, as well as for large vessels in the Gulf of Alaska and Bering Sea. Sablefish mature at five to

[8] The Prince William Sound herring population collapsed in 1993, dropping to a quarter of the 1989 population, and has never recovered. Herring stocks in Southeast Alaska were dramatically overfished in the early 1900s and have not recovered to historic levels.
[9] A completely different species is also referred to as "black cod" in Australia and New Zealand.

seven years, but can live to be over 90 years old and are typically caught at about 10 lbs.

Lingcod, despite its name, is also (cf. sablefish/black cod) not a true cod.[10] Lingcod are the largest member of the greenling family — a group of fish characterized by their small scales, long dorsal fins, and sharp teeth. They can live up to 25 years and grow up to 80 lbs. Lingcod are homebodies that stick relatively close to where they're born, so overfished areas are slow to recolonize.[11] Lingcod are found deep in nearshore waters around Southeast, the outer Kenai Peninsula, Kodiak, and Prince William Sound and are known for their aggressive, predatory behavior.

Alaska pollock ***(Alaskan walleye, walleye pollock)*** has the long-standing title of largest fishery by volume in the United States: more than 3 billion pounds a year since 2011.[12] (That's a lot of Filet-O-Fish.) Because the fishery is so valuable, pollock have an outsized presence in management: much of the time, focus, and money in federal fishery management go towards the pollock fishery. Pollock mature at four years, and can live to be 22 years old, growing up to 13 lbs. They're harvested in the Gulf of Alaska, the Bering Sea, and Aleutian Islands.

Pacific cod ***(Alaska cod, gray cod, or P-cod)*** is harvested at around 700 million pounds a year — a distant second to pollock, but still a major groundfish fishery. Pacific cod range in size from 5-15 lbs. (maxing out at 45 lbs). Pacific cod mature at five years and are found in the Gulf of Alaska through the eastern Bering Sea and Aleutian Islands.

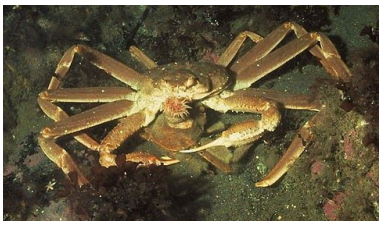
Rockfish is an umbrella term for lots of species of spiny fish divided into two groups in Alaska: pelagic (midwater) and non-pelagic (live on the bottom) rockfish. There are at least six species of commercially targeted rockfish — most notably black, yellow-eye, and Pacific ocean perch — as well as more than 30 types that aren't commercially targeted. Rockfish can be caught using a

[10] The naming insanity of fish and fisheries is one of the reasons fisheries can be difficult to understand. Technically, cod are several species within the genus *Gadus* — but many other fish, such as sablefish (a.k.a. black cod) and lingcod get named cod even though they're not cod.
[11] Male lingcod guard the "nest" of eggs so if caught, the whole nest is vulnerable to predators.
[12] See NOAA's Commercial Fisheries statistics for more information.

variety of gear types: trawling (mostly out of Kodiak), long-lining (Southeast), and jigging (Kodiak and other places). Rockfish are born live, rather than hatched from eggs. They mature slowly and don't reproduce right away, making populations particularly sensitive to overfishing. Rockfish that manage to survive can live more than 200 years.

Crab

Though not a fish, crab is still called and managed like a fishery. Bering Sea and Aleutian Island ("BSAI," in fisheries shorthand)[13] crab fisheries are managed jointly by the state and federal government, and the state alone manages all other crab fisheries across Alaska.



Tanner crab (also called by its species name, *bairdi*) typically weigh 2-4 pounds and are caught with pots from Southeast Alaska through the Bering Sea.

Snow crab (or opilio, also based on the species name) weigh 1-2 pounds and are caught out of the Bering Sea. They're closely related to Tanner crab — so close, in fact, that the crabs can mate and produce hybrids, which has caused havoc for those trying to regulate according to species. They're also often marketed with little regard for species, so finding a crab labeled as "Tanner" at the store is no guarantee that you're getting a bairdi crab.

Dungeness crab (or *Dungies* as shorthand) are the smallest of Alaska's commercial crab and are found in the shallowest water, or even crawling around on the beach at a low tide. Though named for the town of Dungeness, Washington (and this is why "Dungeness" is capitalized), Dungeness are fished in Kodiak and Southeast and near the Alaska Peninsula, as well as by a sizeable population of Alaskans who set Dungie pots for dinner.[14]

King crab are the largest type of crab in Alaska. Though there are around 40 known species, only three species of king crab are harvested commercially. They're conveniently differentiated by their color:

- *Red king crab* is a historically important commercial fishery in Alaska, and perhaps the most iconic: red king crab grows up to

[13] In Alaska, federal waters are the Gulf of Alaska (GOA) and the Bering Sea and Aleutian Islands (BSAI) as divided by the Aleutian Chain. (Okay, there's the Arctic, too, but there's less fishing — presently no fishing — up there.) GOA and BSAI are good acronyms to know; for better or worse, they're standard jargon.

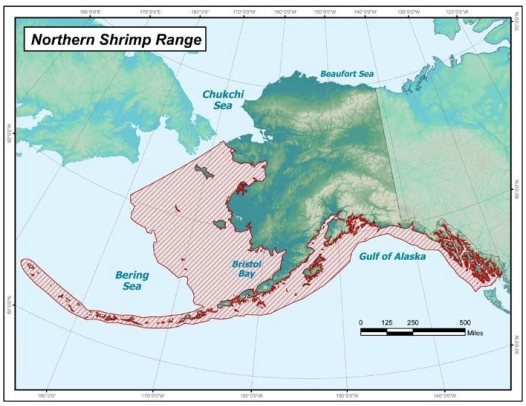
[14] Including this just because it's fascinating: in California, people catch Dungeness with snares.

24 pounds and are fished mostly out of Bristol Bay (perhaps inspiring this truly incredible film) (also, this one) (okay, pop culture loves a giant crab).

- *Blue king crab* are concentrated primarily in the eastern Bering Sea, near the island of St. Matthew and the Pribilof Islands, and can weigh up to 18 pounds.
- *Golden king crab* (also called *brown crab*) are the smallest (5-8 pounds) king crab, found in deep water from Southeast across the Gulf to the Aleutian Islands.

Shrimp

Southeast is the seat of commercial shrimping in Alaska, but there are both pot and trawl fisheries for shrimp throughout Prince William Sound, Kodiak, and the Gulf of Alaska.



Spot shrimp / spot prawns are the current king[15] of Alaska shrimp — the biggest, the most valuable per pound, and the most heavily fished. They can grow up to 9 inches and are pot fished commercially in Southeast and Prince William Sound.

Spot shrimp took their crown as Alaska's industry standard from pink, or northern, shrimp. Pinks are smaller and less valuable, but used to be targeted in larger number by bottom trawlers. Their population crashed in the seventies, possibly because of warming and acidifying oceans, and many of Western Alaska's historically valuable fisheries remain closed.

Sidestriped shrimp are medium-sized with stripes along their abdomen, and they're trawled up from the bottom. Harvests peaked in the 1970s and are now much lower, but little is known about the population status. They're found from Southeast Alaska, throughout the Gulf of Alaska and westward along the Aleutian Chain.

Coonstripe shrimp are the second-largest shrimp in Alaska, averaging 4-6 inches with large heads and a dark stripe pattern. They are both trawled and pot-fished and are the primary target of a Cook Inlet pot fishery.

Scallops

Weathervane (giant Pacific) scallops are the only commercially fished scallop in Alaska. They're the largest scallops in the world and can live up to 28 years. They arrange themselves in beds on the seafloor parallel to the

[15] And also, the queen — shrimp are born male, but become female later in life.

current and are harvested by dredge, meaning they are scraped up from the bottom with large metal combs. Alaska's scallop fishery is small and exists primarily in the Gulf of Alaska. Despite their humble appearance, scallops have both enviable swimming abilities and pretty insane vision. Scallops are delicious and cost you a pretty penny to eat.

Miscellaneous Sea-Things

This highly scientific category (also called "miscellaneous shellfish" in state regulations) is reserved for the menagerie of marine invertebrates harvested by divers who collect individual critters from the ocean floor (a fishery which may or may not have roots in medieval torture). The products of these fisheries are mostly exported to Asia, since American appetites have historically been squeamish when it comes to spines, guts, and raw shellfish.

Sea cucumbers ("cukes" for short) are squishy cucumber-shaped invertebrates with soft, brightly colored spines. They bear an odd resemblance to old Japanese weaponry, and their only defense mechanism is to throw up their own guts. Giant red sea cucumbers are the only type commercially harvested in Alaska. The fishery has been around since 1983 and around 230 divers participate annually. Sea cukes grow to a whopping 1 lb., and are mostly harvested out of Southeast, though they can be found around Kodiak and west to the Aleutians. Cukes are "fished" and processed by hand.

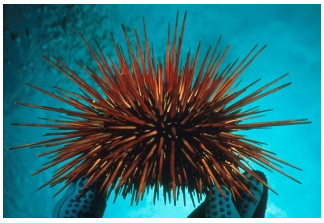
Geoduck clams (pronounced "gooey-duck") are found in Southeast and Southcentral. They're huge and ugly, with long wrinkled "necks." Despite their appearance, geoducks are considered a song-inspiring delicacy, heralded as an aphrodisiac in China (where they're called xiàngbábàng, or elephant trunk clam) and support a small but lucrative fishery. Geoducks also provide inspiration for Evergreen State College. The largest burrowing clams in the world, geoducks can weigh up to 14 lbs. and can live to more than 150 years, buried in the sand, happy as... well, clams.

Pinto abalone are marine snails. Once the target of a thriving commercial fishery, they're no longer commercially harvested, as the fishery crashed in the late '80s and was closed in 1996 due to overharvesting as well as the resurgence of sea otters.[16] While the commercial fishery has yet to

[16] Sea otters are notorious abalone aficionados, and strangely enough, can't seem to follow management guidelines.

reopen, you can still dive for abalone for personal use and subsistence purposes. Abalone can grow up to six inches and live for approximately 15 years.

Urchins (known archaically as “sea hedgehogs”) are harvested for their roe, or “uni.” Divers collect urchins by hand, often with rakes to avoid the spines. There’s a small but viable fishery for red urchins in Southeast. There used to be a green urchin harvest out of Kodiak, but it’s gone un-fished since 2002, perhaps because of lower demand and competition with sea otters.



II. FISHING

You're now familiar with Alaska's best-tasting marine denizens. Getting them out of the water, though, opens a whole other can of worms (or live squid, or whatever your preferred bait is).

In theory, fishing is deeply basic: you put gear in the water, you pull fish out.

But in practice, it's a little more complicated.

To start, not all fishermen are classified in the same way. They're separated into groups based on how and why they're fishing.

User Groups: Fishing with a Purpose

User groups are divided based on *why* a fisherman is fishing. You can fish for traditional use, for personal use, or for business. Regulatory bodies use these distinctions to determine when, where, and how much you can fish.

Subsistence fishing: Subsistence fishing is a millenia-old tradition of harvesting fish for customary use — a term encompassing everything from eating your fish for dinner to selling salmon-skin crafts. Subsistence fisheries exist so that people who have historical, cultural, and geographic ties to fishing in certain ways and places have continued access to those resources.[17]

People have been fishing in Alaska for thousands of years — long before anything resembling commercial or charter fishing arrived in Alaska. Subsistence fisheries are and have been part of "a way of life" — a cultural, economic, and even religious backbone for many rural and Alaska Native communities.[18] Subsistence fishing (along with hunting and foraging)

[17] That's the goal, anyway. Subsistence management has often constituted dramatic (and often undesired) changes in how subsistence fishing is practiced. Management decisions have historically been made without regularly including subsistence users or tribal representatives in the process until recently.
[18] Described as such in Rosita Worl's 2002 testimony.

provides an essential food source for many of Alaska's communities, as well as a backbone of cultural, social, spiritual, and economic well-being.[19]

Today, subsistence rules vary by area, and different areas have specific "traditional" target species and fishing methods — subsistence fishing might mean driftnetting for sockeye in one place and dropping hemlock boughs into the ocean to collect herring roe in another place. Both state and federal agencies have a hand in governing subsistence use, depending on species, jurisdiction, and management legislation.[20]

Subsistence fisheries are widespread across the Alaskan landscape, essentially everywhere outside of a few densely populated areas.[21] Subsistence users are, importantly, first in line when it comes to allocations within a fishery. If managers have to restrict the harvest, they pull fish from commercial and sport users before reducing subsistence catch.[22] As you can imagine, this hierarchy can cause tension, especially when overall harvest levels or catch limits are low — and it doesn't necessarily mean that subsistence users are satisfied.

Commercial fishing (often shortened to ***comm fish****,* as in the "Comm Fish" Division of the ADF&G, or the famous Comm Fish Expo): Commercial fishing is the business of fishing — although for many, it's also a lifestyle passed down over generations. Commercial fishermen catch and sell fish to markets around the world. Whether it's hand-picking sea cucumbers off the ocean floor or pulling a trawl net carrying 100+ tons of pollock in the Bering Sea, commercial fishing is highly regulated to determine who can catch what, where and when they can harvest it, and how much of it they can take (more on this later). Commercial fishermen pay taxes on their catch to local, state, and federal governments.

Sport and/or charter fishing: Sport fishing is recreational fishing, in which people catch fish because it's fun. Charter fishing is the business of taking people (often tourists) out sport fishing, often for impressive-looking trophy fish. Like commercial fishermen, charter operators use fish as a business resource, but ultimately the experience, not the fish, is the service they provide.

---

[19] In Kotzebue Sound, the subsistence harvest has averaged 500 pounds of wild food (much of which is fish) per person annually.

[20] State and federal subsistence are also governed in different ways. Under state regulations, any Alaska resident can fish in a state subsistence area — so if you're an Anchorage resident, you can fly out to the Yukon and subsistence fish just like a Yukon resident. Under federal regulations, there's a rural priority that prevents Alaska's urban residents from competing with people who live remotely.

[21] Subsistence is technically limited to rural areas in Alaska. The arbitration of where is "rural" and "non-rural" is contentious, orienting around (but not limited to) a 7,000-person population threshold, at least for federal rural designation.

[22] Federal subsistence priority is defined by ANILCA, and the definition has shifted over the years.

(To that end, charter operators are not taxed on the amount of fish they catch.) To sport fish, you must buy a license — the cost and number of which may vary depending on whether you're a resident — and follow bag limits. Selling sport fish on the open market is a big no-no and will land you in The Brig.

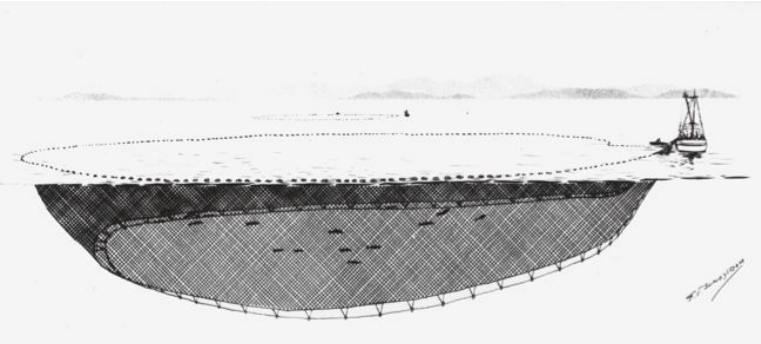
Personal use fishing: Personal use fishing, like subsistence, involves catching fish for personal use: usually, to eat — although there's nothing saying you can't get creative. Unlike subsistence fisheries, personal use fisheries don't have to check boxes of customary or traditional use; for example, there's no subsistence tradition of fishing for king crab in Southeast Alaska. But because there *are* king crab in Southeast, and Southeasterners want to eat them, there's a personal use fishery for those crab. Personal use fishing is allowed in Alaska's urban centers, whereas subsistence is limited to rural areas. Only Alaska residents can participate in personal use fisheries. Confused yet? This handy chart helps to unravel the differences.

Fishing Methods

Commercial and subsistence fishermen typically distinguish themselves by the gear they use, or their "gear groups" (cf. seiners, trollers, trawlers, driftnetters, etc.).

Gear groups operate like a collection of countries constantly in a border dispute: since there's a finite amount of fish, and it gets divided up (or "allocated") between different gear groups, each group has a shared interest in protecting their slice of the fish pie. Gear groups will often organize, present a united front to other groups (and managers), even make alliances — but, like countries, they often maintain plenty of internal tensions, too.

Purse seining (pronounced SANE-ing*)* is a boat-and-net fishing method in which a net encircles a school of fish, typically salmon or herring. "Seine" refers to the type of net, whereas "purse" refers to the technique used to capture the fish. One end of a net is attached to the back of the large boat, while the small seine skiff drags the other end away through the water. The skiff circles the net around to contain a large cylinder of water. The bottom of the net is then "pursed," meaning the lower edges of the net are cinched tight, capturing the fish between the bottom of the net and surface.



Seining is common in Southeast and Kodiak, and typically requires a crew of four to five on

vessels up to 58 feet (but not an inch longer, as per State of Alaska regulation), targeting salmon and sometimes herring.[23] Seiners in Prince William Sound and Southeast Alaska are really big, often at the legal 58-foot limit, and increasingly wide and deep, resembling floating bathtubs. You can still find smaller seiners in Kodiak and Cook Inlet.

Beach seining is mostly used for subsistence fishing of salmon and herring, with very small commercial fisheries in the Yukon River Delta and Kodiak.[24] The set up requires a large net with two long ropes at either end; one long rope is attached to the shore, and a skiff is used to pull the net out away from the beach before bringing the second line back to shore. The net is then pulled in parallel to shore, where fish are picked out of the net on land. At least two people are required to haul the net, though operations on the Yukon River often involve using an ATV to help pull the net to shore and multiple families working together to pick the net.

Driftnetting[25] entails hanging a net in a vertical curtain in the water and snagging fish by the gills when they try to swim through it.[26] The net (fittingly called a gillnet) is strung with weights on the bottom and corks on the top to keep it straight in the water. Once the net is reeled in, fish are "picked" by hand from the net. Driftnetting is used to catch all species of salmon — especially sockeye, chum, and coho — as well as herring, and is particularly famous in Bristol Bay, which has over 1,800 drift netters.[27] The easiest way to spot a drift netter is by the cylindrical drum[28] on a boat's deck, which reels in the net. If the drum sits on the back of the vessel, in the stern, the boat is known as a "sternpicker" because fish are being "picked" from the stern. If the drum is in front of the wheelhouse, on the

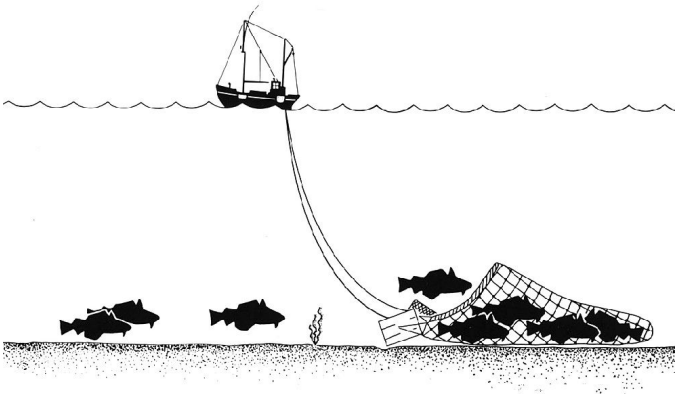
[23] Outside Alaska, purse seining is used to catch squid (notably in California) and tuna, among other species.
[24] Only 5% of commercially caught salmon around Kodiak are caught using a beach seine.
[25] Sometimes referred to as "gillnetting," a broader term that encompasses both setnetting and driftnetting. In areas where both methods are common, it's necessary to differentiate.
[26] Different mesh sizes on the net target different species of fish. Larger-mesh nets target larger salmon such as coho and kings, whereas smaller-mesh nets target pinks and chums.
[27] See this amazing spreadsheet for how many permits exist for which fisheries in Alaska, as well as market value for permits and residency data (resident/nonresident) for permit holders, all as of January 2017.
[28] There's also driftnetting on the Yukon and Kuskokwim, but people fish from skiffs, so you wouldn't see a drum on those vessels.

bow, the vessel is known as a “bowpicker.” Driftnetters require one to two deckhands in addition to the skipper. In Bristol Bay, vessels are famously limited to 32 feet. Outside of Bristol Bay, driftnetters range from 30 to 40 feet.

Setnetting is a net-and-shore based fishery in which a gillnet is anchored on one end near the shore, and the net is stretched out perpendicular to the shoreline. Fish are caught trying to swim through the net. Most often, a skiff pulls one end of a gillnet through the water to set it in place, although it can also be set on the beach at low tide. Nets are often left to fill with fish, not fished constantly.

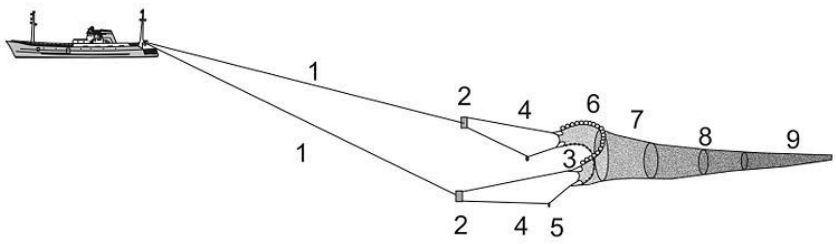
The fish can be picked from a skiff, or the whole net can be reeled in and picked from the shore. This type of fishing typically requires one to two people, a skiff (or in limited cases a truck to pull the net onshore), and beachside infrastructure to support the whole operation. Setnetting is used to catch salmon (commercially and for subsistence), as well as some freshwater whitefish species in Interior and Western Alaska (typically subsistence only). Commercial setnet fisheries exist in Yakutat, Bristol Bay, Kodiak, Cook Inlet, Prince William Sound, and the Aleutian Islands.

Bottom trawling involves dragging a large net bag along the bottom of the ocean and pulling up the fish caught in its path (as such, bottom trawlers are sometimes known as *draggers*). Bottom trawling targets groundfish, notably Pacific cod and Pacific ocean perch, as well as sole and other species of flatfish in the Gulf of Alaska, Bering Sea, and Aleutian Islands. It’s a historically contentious gear group because of high rates of bycatch (fish caught incidentally while fishing for another species) and the damage trawls can cause to the ocean floor. The advent of technologies such as excluder devices have helped to reduce bycatch.[29] Small trawlers can be less than 100 feet with three to five crew members, while factory trawlers can be huge (the *Alaska Ocean* is 376 feet!) and require dozens to hundreds of crew members.



[29] Still, bycatch is a particular flash point between halibut longliners and groundfish trawlers, since juvenile halibut are commonly caught as trawl bycatch in the Bering Sea.

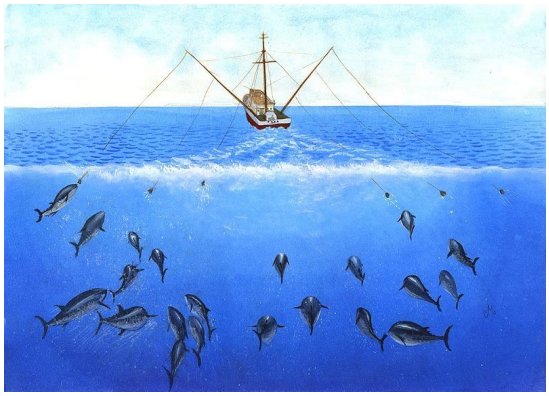
Midwater (or pelagic) trawling, like bottom trawling, requires dragging a large net through water to scoop up and haul in fish. In midwater trawling, however, the nets are situated so that they don't drag along the ocean floor.



Midwater trawling in Alaska is limited to the massive pollock fisheries in the Bering Sea and Gulf of Alaska, which are fished by a mix of small and large trawlers, or "catcher vessels" and "catcher-processors," respectively. Catcher vessels only catch pollock and deliver their catch to shore-based processors or catcher-processors. The latter catch *and* process the pollock as a single integrated floating operation.

Midwater catcher-processor trawl vessels can be well over 300 feet (not much smaller than the 418-foot M/V *Columbia*, flagship of the Alaska ferry system) and are typically based outside Alaska, often in Washington. Small midwater trawlers deliver to shore in Alaska (and sometimes, controversially, to floating catcher-processors), and have smaller crews of five to six.

Trolling (not to be confused with trawling) is a hook-and-line fishery in which lines of troll wire (usually four) are pulled down by lead weights and hang deep into the water from trolling poles overhead. The poles form a distinctive "V," as iconized by Alaskan Amber labels. The long wires hold "branches" of shorter lines tied with hooks that stream out behind the boat through the water, parallel to the surface. Fish are caught when they bite onto the hooks and reeled aboard with hydraulics ("power troll"), or by hand ("hand troll"). Hand trolling is REALLY hard; it gets you ripped and is often done out of small open skiffs.

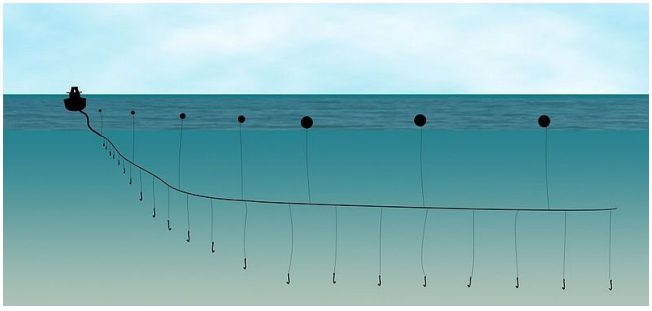


Trollers typically catch lower numbers of fish, but the fish they do catch are high-value. A fish is almost always still alive when brought onboard and is immediately killed, bled, cleaned, and iced.

Trolling and trawling are *very* different. They're pronounced differently (think droll vs. drawl) and are at opposite ends of the fishing spectrum. Don't make the awkward mistake of mixing them up.

Southeast has the only commercial troll fishery in Alaska, and it's a big one: 978 hand and 962 power troll permits, respectively. Hand trollers are almost always solo operations. Power trollers have a crew of two and occasionally three, and usually run between 30 and 50 feet long. Trollers sometimes flash-freeze their catch at sea, making them "freezer trollers,"[30] and traditionally target coho and king salmon. More recently, some fishermen have expanded to chum, too.

Longlining is a hook-and-line fishery in which fishermen lay out a mile or two (or many more) of line tied with hundreds of baited hooks on the ocean floor, with weights and anchors holding down each end. Extra line reaches up to the surface, where the line is tied to floating buoys. The longline "soaks" on the ocean floor, waiting for fish to come and bite the baited hooks. The longliner returns many hours later and reels in the line, along with all the fish on the hooks. Because sperm whales like to floss sablefish off of long lines for an easy snack, sablefish fishermen are trying to see if using pots instead will reduce conflict with the whales.



Longlining is used for sablefish, Pacific cod, halibut,[31] lingcod, and rockfish. There are also massive, over 100-foot freezer longline vessels that target Pacific cod in the Bering Sea; these vessels freeze and package the fish onboard the way freezer trollers do.

Jigging uses a main line with a dozen baited hooks, lowered to just above seafloor and bounced, or "jigged," up and down. Jigging targets Pacific cod and rockfish and is popular in the Gulf of Alaska (especially Kodiak) and Aleutians. It's also relatively common on the South Alaska Peninsula, Prince Williams Sound, and Lower Cook Inlet. Jigging is often seen as an entry-level fishery because it's open access: to jig, you don't need to buy a limited entry permit, which in other fisheries cost tens or hundreds of thousands of dollars (we'll get into that more later).

Pot fishing uses cage-like traps to catch crab, shrimp, Pacific cod, and, more recently, sablefish. Pots are designed to lure in target species through one-way

[30] Freezer trollers have custom-made, very expensive fish holds that double as -40°F blast freezers into which fish are flash frozen (also called "fresh frozen") and then individually "glazed" by being dipped in layers of ice water in the freezer hold of the boat. Frozen-at-sea products are the crème de la crème of the salmon world and fetch significantly higher prices than fish that is stored in ice or ice water until it can be delivered to be a processor to be frozen. How a fish is bled and stored really affects the quality of the product.

[31] Longlining is the only legal commercial fishing method for halibut.

openings with bait to trap them. Pots are used for commercial, subsistence, and personal use fishing and bear almost no resemblance to something you would find in a kitchen.

Fish wheels use the power of a river to push a circular configuration of baskets around, in and out of the water, scooping up salmon as they head upstream. Fish slide down the basket towards the axle, where they can be collected in a bin. Fish wheels were common in the early 20th century in the Pacific Northwest, but were so effective they were eventually banned from commercial use in most places. They remain a legal commercial gear type on the Upper Yukon River and are also used for subsistence fisheries on the Yukon, Copper, Kuskokwim, and Upper Yentna Rivers. Fish wheels are also used by fishery managers to monitor salmon returns.

Dipnetting is allowed for Alaska residents, for personal use and subsistence. Large nets, a few feet in diameter with long handles, are used to catch salmon as they run upriver. There are bag limits and location restrictions based on area. Dipnetting (really, *combat* dipnetting with a thousand of your closest friends) along the Kenai River is an iconic[32] Alaska experience — especially for those from Anchorage and Mat-Su. Dipnetting on the Chitina and Copper Rivers near Glennallen is also common, especially for those from Fairbanks, and to a lesser extent, Southcentral.

The first *commercial* dipnet fishery in the world was started on the Yukon River in 2014 for chum salmon. Previously, Yukon River commercial fishermen used gillnets to target chum, but the gillnets also caught king salmon, which were becomingly alarmingly scarce and needed to be conserved. With gillnets, there was no way to catch chum without injuring or killing kings. The commercial dipnet fishery was introduced as an experiment and has been a wild success, "saving" the commercial chum fishery — and an important local source of income — on the Yukon.

Fishing Ports

Okay, you did it. You caught a fish (or a couple thousand). But the journey is far from over. Once you pull those fish out of the sea, they have to be processed, sold, and purchased for someone's plates. The first step? Getting fish to port.

[32] Tricky management issues that Kenai communities contend with include cleaning up fish waste left on beaches, parking and congestion, restroom access, damage to riparian habitat from the crowds, etc.

Top Alaskan Ports (by pounds landed)[33]

Area	Millions of pounds of fish landed (2015)	Ex-vessel value in millions of $ (2015)	State Limited entry permits held by residents[34] (2015)[35]	Notes and context
Unalaska	787.4	218.2	15	Better known in the fishing world as "Dutch Harbor" for the name of its natural harbor, Unalaska (the name of the municipality) has been the highest volume fishing U.S. port for 19 years, thanks to pollock trawlers. Also known for crab.
Kodiak	513.9	137.5	682	Kodiak homeports a broadly diversified fishing fleet that includes seiners, jiggers, longliners, and driftnetters that fish Bristol Bay, as well as a large Alaska-based trawl fleet: about 15 vessels averaging 80 feet.
Aleutian Islands	467.4	111.3	8	This area includes Adak, Atka Island, False Pass, and Akutan, a tiny Aleutian community, which is off the charts in terms of total fish landed because it is home to Trident's Akutan mega-facility..
Alaska Peninsula	268.0	90.3	184	Includes Chignik, Port Moller, Sand Point, and King Cove; important year-round ports for salmon, groundfish, and crab fisheries.
Naknek	175.5	68.5	175	In Bristol Bay at the mouth of Naknek River, which boasts a sockeye run and one of largest sport king fisheries in the state. Includes King Salmon (the place, not the fish).

[33] All of these ports are in the top 100 ports in the U.S. Whoo-e, we got a fishin' state!
[34] Non-residents held about 23 percent of state limited-entry permits in 2015 (4242 non-resident permits, compared to 14534 resident permits). The resident/non-resident divide can be a hot-button issue.
[35] This data is from the Commercial Fisheries Entry Commission and only includes permanent (not interim-use) permits.

Cordova	162.0	64.5	525	Cordova is particularly well-known for its driftnet fleet, given its proximity to the world-famous Copper River Delta.
Seward	94.4	59.3	66	
Sitka	87.4	59.4	876	Home of the biggest proportion of Alaska's troll fleet.
Ketchikan	84.3	39.6	771	
Petersburg	69.6	39.3	928	Known for its seine fleet.
Bristol Bay	69.6	90.1	666	Includes Dillingham, Egegik, Ekuk, Togiak, Ugashik, and St. George and St. Paul Islands.
Kenai	49.6	32.5	638	Includes Kasilof, Nikiski, and Soldotna.
Juneau	16.7	22.5	665	
Anchorage	10.4	9.1	878	
Homer	6.7	18.1	824	Homer markets itself as the halibut fishing capital of Alaska and homeports a diversified fleet, similar to Kodiak, that includes driftnetters, longliners, seiners (Prince William Sound, Cook Inlet, Kodiak, and beyond), as well as larger vessels, including Bering Sea crabbers. Includes Ninilchik.
Wrangell	5.2	10.7	402	
Upper Southeast	5.2	4.8	281	Includes Elfin Cove, Gustavus, Hoonah, Pelican, Tenakee Springs. Also Excursion Inlet, where Ocean Beauty owns one of the largest fish canneries in the world, which has been operating since 1918.
Yakutat	4.4	12.2	284	

(Don't see your community? Because of the diminutive size of many of Alaska's fishing communities, the federal government often groups them together when determining pounds of

fish landed or ex-vessel value in order to protect confidentiality.The full list of how the ports are grouped is here. And, in map form!)

Many boats that fish in Alaska homeport in non-Alaska ports, the most prominent of which include the Washington ports of Seattle, Bellingham, Anacortes, and Port Townsend; and the Oregon ports of Astoria and Newport.

When the Fish Don't Come to Port: Catcher-Processors

Most fishermen take their fish to port to process, but there are a few vertically integrated companies that manage to do it all. These are huge, well-oiled fishing machines that take care of every step themselves, from pulling fish aboard to international seafood sales to product development (from fish oil to goldfish food). These companies are based mainly in Seattle and use "factory trawlers" (also known as "at-sea processors" or "catcher-processors") which fish, process, and freeze the product all on one (often enormous) boat. They catch vast quantities of pollock and groundfish from the Bering Sea and Aleutian Islands to make processed fish products such as fish sticks, fish meal, and more. Their sales, operations, and final processing (and thus most of the economic benefits from their revenue), however, are usually based in the Lower 48.

The Amendment 80 Fleet: There are five major companies that use trawl catcher-processors to catch Bering Sea groundfish — *not* pollock, but lower-value fish such as Atka mackerel, Pacific cod, Pacific ocean perch, yellowfin sole, rock sole, and flathead sole.[36] All of these companies are based out of the Seattle area. These companies are represented by the trade group Groundfish Forum.

The American Fisheries Act (AFA) Fleet: There are six main companies that catch and process Alaskan pollock (*not* other groundfish) with pelagic trawl gear in the Bering Sea.[37] (There are also a number of individual, smaller trawl vessels that target pollock.) All but one of these companies are based in Seattle (the exception is Coastal Villages, which is a Community Development Quota, or CDQ, group). Their trade group is the *At-Sea Processors Association:* the name comes from the fact that they're so huge they can process their pollock onboard, or "at-sea."

[36] These companies are Fishermen's Finest, United States Seafoods, O'Hara Corporation, Ocean Peace Inc., and Iquique US.
[37] These companies are American Seafoods Company, Arctic Storm Management Group, Coastal Villages, Glacier Fish Company, Starbound, and Trident Seafoods. The vertical integration of fishing industry holdings is what makes Trident Seafoods the largest seafood company in America.

III. FISHING INDUSTRY

While fishermen are the only ones who pull fish out of the ocean, many other companies and organizations process, sell, and market fish.

Alaska harvests a larger volume of seafood than all of the other states combined.[38] That means that Alaska's fishing industry provides a lot of jobs — 99,000 full time jobs nationwide in 2016 that led to $12.8 billion in economic output.

Processing, Marketing, and Selling Fish

***Tenders**:* These are big "fish taxis" that shuttle fish from often remote fishing grounds to shore, thus saving fishermen the time and money it takes to run back to town. Tenders have a long tradition of providing a certain "hospitality-at-sea," whether it's fresh water, showers, extra fuel, even freshly baked cookies or ice cream.

Processors: After a fish is brought to port by a tender or fishing boat, processors are the next in line to handle it. Processing is to fish as butchering is to cows: you take something that looks like a critter and turn it into the filleted/smoked/canned/frozen product that a consumer would buy in the grocery store. Processors do everything from gutting fish (on the "slime line") to slapping the logo on a can of sockeye.

Processors and fishermen tend to build long-term relationships, sometimes verging on absolute loyalty, the way Alaska Airlines has remained loyal to Boeing. These connections provide security for both sides: the processors receive fish to process, and fishermen know they'll have a place to sell their fish as well as a suite of perks depending on the processor. Generally, those perks can include financing and loans, tender access, use of processor facilities — such as using a processor's truck while in port, laundry facilities, and showers.

***Major processors**:* For our purposes, "major processors" are scientifically distinguished as being… big. Okay, not so scientific. But while the data isn't public, the 11 "major" processors we identified are, as of early 2018[39], likely the largest seafood processing companies in Alaska by volume and value. All have extensive distribution systems to the Lower 48 and global markets,

[38] From "The Economic Value of Alaska's Seafood Industry" by McDowell, 2017.
[39] It's worth noting that, in five years, this list may no longer be accurate — but we include it because it provides a helpful snapshot of processor profiles and ownership.

and they employ a lot of people. Exceptionally large processor companies, such as Trident, also own their own fishing vessels (trawlers, not small mom-and-pop vessels).

Name	Headquarters	Ownership	Processor locations	Member of United Fishermen of Alaska (UFA)[40]	Member of Pacific Seafood Processors Association (PSPA)
Trident Seafoods	Seattle	Private (owned by Bundrant family), Seattle based	Akutan, Chignik, Cordova, Ketchikan, Kodiak, North Naknek, Petersburg, Sand Point, St. Paul, Wrangell	Yes	Yes
Icicle Seafoods, Inc.	Seattle	Cooke Seafood, a Canadian aquaculture company	Petersburg, Egegik, Seward, Kodiak, Dillingham	Yes	No
Ocean Beauty Seafoods	Seattle	50% Bristol Bay Economic Development Corporation,[41] 50% individuals	Naknek, Alitak, Cordova, Excursion Inlet, Kodiak, Petersburg	Yes	No
Peter Pan Seafoods Inc.	Seattle	Subsidiary of Maruha Nichiro Holdings of Japan	King Cove, Dillingham, Port Moller, Valdez	Yes	Yes
Silver Bay Seafoods	Seattle	Fishermen-owned processor	Sitka, Craig, Valdez, Naknek, Metlakatla	Yes	No
North Pacific Seafoods	Seattle	Marubeni America	Sitka (dba Sitka Sound Seafoods),	Yes	Yes

[40] United Fishermen of Alaska is the fishing industry's version of the AFL-CIO — an organization of all fishing (or with AFL-CIO, labor) organizations. UFA is really Alaska's only statewide, pan-commercial fishing trade organization to advocate the interests of commercial fishermen.
[41] Notable as Bristol Bay Economic Development Corporation (BBEDC) is a CDQ group. Read on in the CDQ section!

		Corporation	Kodiak (dba Pacific Seafoods), Naknek (dba Pederson Point, Red Salmon),Togiak (Togiak Fisheries), Kenai		
	Kenmore, Washington	Canadian fishing company, Jim Pattison Group	Ketchikan, Naknek, Egegik	Yes	Yes
	Clackamas, Oregon	Family owned (Dulcich family)	Wrangell, Seward, Nikiski, Kodiak	No	No
	Seattle	Maruha Nichiro (Japanese company)	Unalaska	No	Yes
	Redmond, Washington	Nippon Suisan (Japanese company)	Unalaska	No	Yes
	Anchorage	Private	Cordova, Kotzebue, Naknek, Kenai, Togiak, Unalaska	No	No
	Seattle	Maruha-Nichiro (Japanese company)	Unalaska	No	Yes

Small processors: The sampling of small processors below are mostly single-site processors. Smaller processors often work with the smaller fishing industries and communities, and often focus on niche markets or products.

Name	**Headquarters**	**Ownership**	**Locations**
Adak Fresh	Victoria, BC, Canada	Hart Sales Corp.	Adak
Alaska Glacier Seafoods	Juneau	Family owned (Erickson family)	Juneau
Alyeska Seafoods	Seattle	Maruha-Nichiro (Japanese company)	Unalaska
Atka Pride Seafood and Bering Pacific Seafoods	Atka	Atka Fishermen's Association and Aleutian Pribilof Island Community Development Association	Atka and False Pass
The Auction Block Company	Homer	Private	Homer
Big Creek	Everett	Deep Sea Fisheries	Egegik
Coffee Point Seafoods	Seattle	Double E Foods	Egegik
EC Phillips & Son	Ketchikan	Private	Ketchikan

Ekuk Fisheries	Ekuk (16 miles south of Dillingham)	Private (Joe Kelso and John Lowrance)	Ekuk
Haines Packing Company	Haines	Private	Haines
Hoonah Cold Storage	Hoonah	Alaska Seafood Holdings Inc.	Hoonah
Inlet Fish Producers	Kenai	Private (Vincent Goddard)	Kenai, Kasilof
Kwik'Pak Fisheries	Anchorage	Yukon Delta Fisheries Development Association	Emmonak
Northern Fish Alaska	Cordova	Northern Fish Co. (Tacoma, Washington)	Cordova
Norton Sound Seafood Products	Nome	Norton Sound Economic Development Corporation	Nome
Pacific Star Seafoods	Seattle	Double E Foods	Kenai
Seafood Producers Cooperative	Bellingham	Cooperative (owned by 500+ fishermen)	Sitka
Sea Aleutian Seafoods	Seattle	Private (Tran and Dinh families)	Unalaska
Snug Harbor Seafoods	Kenai	Private (Paul Dale)	Kenai
Taku Smokeries and Fisheries	Juneau	Private (Gallizio family)	Juneau
Tonka Seafoods	Petersburg	Private (Petersburg fishermen)	Petersburg
Yakutat Seafoods	Yakutat	Double E Foods, E&E Foods, Greg Indreland	Yakutat

***Direct marketing**:* Some fishermen, like those who make up Kenai Wild Salmon Co., and Small Scales Seafood sell fish directly to the customer and bypass a processor. Similar to farmers

selling produce at a farmers market, fishermen can receive a higher price by cutting out the intermediary (in this case, the processor). But processing, marketing, and establishing relationships is time-intensive, and requires very different skills than traditional catch-and-offload fishing. It is generally seen as a boutique industry, typically requiring some combination of internet savvy, marketing charisma, and a good story that resonates with consumers.

There is also a nascent trend of community-supported fisheries (CSFs) that function like CSAs (community-supported agriculture) but for fish. Sitka Salmon Shares, which targets the upper Midwest of the U.S., and Alaskans Own, are both based in Sitka. Alaska Marine Conservation Council runs Catch 49 out of Anchorage.

Fishing and Industry Trade Groups

Just as workers have labor unions to lobby for their interests, fishermen's industry groups advocate their interests. Different industry groups advocate on behalf of different gear groups, regions, and fisheries. They do everything from host end-of-season barbecues to lobby on the state and federal levels.

And where the many different labor unions are united by the AFL-CIO, the fishing industry is united by United Fishermen of Alaska (UFA). UFA is the Alaska fishing industry's umbrella advocacy group: commercial fishing groups across the state send representatives and pay dues. UFA is highly political, and because the individual member groups sometimes have opposing interests, internecine squabbles are not uncommon.

UFA lobbies and advocates issues that unite UFA's many and diverse member groups and Alaska fishermen as a whole. "Safe" topics that all Alaska fishermen can agree on include: continuing to ban fish farming in Alaska, increasing Alaska Seafood Marketing Institute (ASMI) funding, creating Alaska Wild Salmon Day (heavy political lift), supporting the State of Alaska's Commercial Fishing Revolving Loan Fund.

UFA member groups:

Name	Fishery	Headquarters	Notes
Alaska Bering Sea Crabbers	BSAI king, bairdi, and snow crab	Seattle	Industry group for the crab fleet that fishes "out west" (Bering Sea", but homeports in Washington.
Alaska Independent Tenderman's Association	Herring, salmon, and more	Petersburg	Statewide group of tendering (and fish processing such as Icicle, Trident, Ocean Beauty, etc.) organizations to lobby for laws and regulations that help business.

Alaska Longline Fishermen's Association	Halibut, sablefish, rockfish, and salmon	Sitka	Predominantly advocates on federal fishery issues, but active in state fisheries too.
Alaska Scallop Association	Scallops	Kodiak	Small — representing three scallop vessels (the entire industry though, likely worth over $1 million revenue per vessel).
Alaska Trollers Association	Salmon	Juneau	Formed 1925. Very active on state level, emphasis on salmon: fish farming, transboundary issues, habitat.
Alaska Whitefish Trawlers Association	Gulf of Alaska (GOA) groundfish and pollock	Kodiak	Active in federal fisheries, especially in rationalization of Gulf of Alaska trawl fishery.
At-Sea Processors Association	Bering Sea pollock (and some non-Alaska fisheries)	Juneau and Seattle	Representing six companies who run catcher-processors in the largest U.S. fishery — pollock. Well-funded and active in federal fisheries.
Bristol Bay Fishermen's Association	Bristol Bay salmon	Seattle	BBFA is highly regional, but made up of mostly non-Alaska resident fishermen. Focused on good prices for Bristol Bay fish, anti-oil and gas development.
Cape Barnabas, Inc. CQE	Halibut, sablefish	Old Harbor	The first (and one of the few) CQEs to capitalize and offer quota to its residents.
Concerned Area "M" Fishermen	Alaska Peninsula salmon drift net	Homer	Represents the Area M (False Pass area) salmon driftnet fleet.
Cordova District Fishermen United	Driftnet and seine, herring, and groundfish	Cordova	Prince William Sound and Copper River both fall under the membership area.
Freezer Longline Coalition	BSAI and GOA Pacific cod (and a little bit of) groundfish)	Seattle	Represents mostly industrial longliners fishing in the West, many homeported in Washington, a few in Alaska.
Golden King Crab Coalition	Aleutians golden (or "brown") king crab	Aleutian Islands	Shares a board of directors with Alaska King Crab Research Foundation, which studies Aleutian king crab stocks.
Groundfish Forum	BSAI groundfish	Seattle	Nicknamed for the amendment to the Magnuson-Stevens Act which regulates

“Amendment 80”			them. This is a politically powerful non-pollock groundfish fleet group.
North Pacific Fisheries Association	Salmon, crab, halibut and groundfish in Cook Inlet	Homer	Homer’s local fishing advocacy organization.
Petersburg Vessel Owners’ Association	Multi-gear, multi-species vessel owners	Petersburg	Petersburg’s local fishing advocacy organization: engaged on statewide level, heavy emphasis on seining and salmon as well as longlining.
Purse Seine Vessel Owners’ Association	Salmon (mostly) in Alaska, other fisheries along the West coast	Seattle	Washington-based, very active lobbying for business-friendly laws, regulations, interests of member seiners who may not live in Alaska.
Seafood Producers Cooperative	Salmon and halibut processing (mostly)	Bellingham	The oldest fish processing co-op on the West Coast. Jointly owned by 575 small hook-and-line fishermen: plant in Sitka, HQ in Bellingham.
Southeast Alaska Fishermen’s Alliance	Multi-gear, multi-species	Juneau	Mixed-bag group of Southeast Alaska and Washington Seafood processors.
Southeast Alaska Regional Dive Fisheries Association	Sea cucumbers and geoducks	Ketchikan	Cucumber, urchin, and geoduck divers in Southeast Alaska.
Southeast Herring Conservation Alliance	Herring, specifically sac roe herring seine	Sitka	The alliance lobbies exclusively for sac roe permit holders, and not for subsistence spawn harvest.
United Cook Inlet Drift Association	Salmon	Soldotna	Very active group. Focused on lobbying hard and often for 570 driftnetters’ access to sockeye salmon in a region notorious for arguably the most cutthroat fish politics: see “Cook Inlet Fish Wars.”
United Southeast Alaska Gillnetters Association	Salmon	Petersburg	The primary gillnet lobbying group out of Southeast. Made up of small boat fishermen, heavily engaged in statewide politics, focused on salmon.

IV. FISHERY MANAGEMENT

The fishing industry is a cornerstone of Alaska's economy and identity; there's a lot at stake.

That makes fishery management — using the best science to make laws and regulations that maximize catch while prioritizing sustainability — a Sisyphean task. As with managing water in California, managing fish in Alaska is vitally important and often hyper-politicized.

But Alaska's thriving fishing industry is not a coincidence: there are governing bodies, laws, and organizations to make sure that the rock(fish) keeps getting rolled uphill.

Legal Framework: What are the laws?

The Magnuson-Stevens Fishery Conservation and Management Act is the Bible of federal fishery law, setting national policy and guiding states. The American Fisheries Act was another important one, limiting foreign investment in U.S. fisheries, promoting American companies, and rationalizing, or privatizing, the pollock industry. (We'll get to that later.) On the state level, fishery management rules were baked into the Alaska Constitution. Additional amendments and laws have supplemented these since 1959.[42]

Magnuson-Stevens Act (Federal)

The Fishery Conservation & Management Act was passed in 1976 and renamed the Magnuson-Stevens Fishery Conservation and Management Act during its reauthorization in 1996. The act (Public Law 94-265) manages fisheries in federal waters — we'll explain more on that later.

The Magnuson-Stevens Act (MSA) governs federal fisheries in Alaska and across the United States. The MSA's original goal was to curb overfishing, restore overfished stocks, and support the long-term economic and social benefits that fisheries provide for people. (The "Stevens" in the title is in reference to Alaska's Senator "Uncle" Ted Stevens, who helped author the law along with Washington Democratic Senator Warren Magnuson.)

How does the MSA work? The law:

- Increased U.S. control from just 12 miles offshore to 200 miles offshore. Suddenly, domestic fishermen had exclusive access to 188 more miles of fishery resources. (For

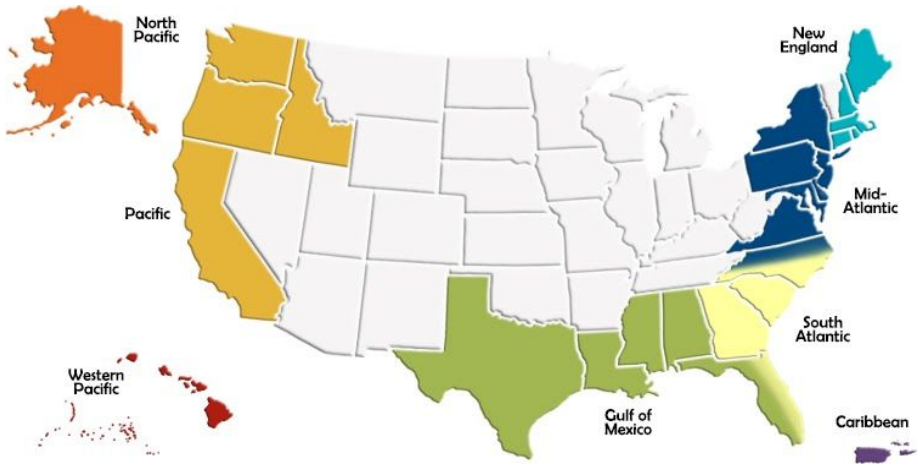
[42] Subsistence fishing has been managed through a separate patchwork of regulations since the U.S. purchased Alaska from Russia— notably, the Alaska National Interest Lands Conservation Act (ANILCA) in 1980. This timeline outlines the history well.

the record, this was a feature of the UN Law of the Sea Treaty: the U.S. didn't just wake up and decide we had ownership of resources out to 200 miles.)

- Established eight regional management councils around the United States to set regional fish policy, including Alaska's North Pacific Council. The North Pacific Council manages federal fisheries only in Alaska. But because of Washington and Oregon's economic interest in Alaska's fisheries, both Washington and Oregon have voting representation on the North Pacific Council.

- Required that each fishery be guided by a specific fishery management plan.

- Set ten standards that all fishery management plans had to abide by — essentially the 10 commandments for fisheries, though the last three weren't added until 1996. The ten standards include prioritizing sustainability, relying on scientific data, not discriminating against user groups, and keeping fishermen safe.



The eight regional fishery management councils established by the Magnuson-Stevens Act

Magnuson-Stevens emphasized use of science in fisheries management. For its first twenty years, however, the Magnuson-Stevens Act had a loophole that meant fishery managers could bypass scientific recommendations in order to maximize catches in the short term, even at the direct cost of long-term sustainability of the fishery.[43] During this period, fisheries in some parts of the country, such as the Atlantic cod fishery in the Northeast, declined.

It wasn't until 1996 that the MSA reauthorization closed the loophole, requiring each fishery management plan to give clear, objective standards for what "overfished" meant and to come up with steps for rebuilding stocks.

[43] This site has the most up-to-date info on ongoing reauthorization activities. This one lists all the bills introduced to reauthorize the MSA.

The 1996 reauthorization appears to have had a positive impact. Since 2000, over 40 overfished stocks have rebounded.[44]

American Fisheries Act (Federal)

Much more narrow in scope than the Magnuson-Stevens act, the American Fisheries Act (AFA) took measures to limit foreign influence in the fishing industry. The AFA requires that every vessel be at least 75% U.S. owned and controlled, referring largely to the number of U.S. citizens working on, operating, and managing each fishing vessel. The AFA also singlehandledly rationalized, or established quota for, pollock fisheries.

Alaska Constitution (State)

Alaska's Constitution includes an exceptional provision: Article 8, Section 4 requires that fish, wildlife, and waters are reserved for the common use of all Alaskans, and must be "developed, utilized, and maintained on the sustained yield principle..."

In other words, all the natural resources of Alaska belong equally to each Alaskan. If you were born in Utqiaġvik, you have as much right to a salmon in Cordova as a born-and-raised Cordovan. Further, Alaska is constitutionally obligated to manage its fisheries based off the "sustained yield principle," meaning policy-makers must constantly think about the long-term health of the fisheries so future users (be they from Cordova or Utqiaġvik) will benefit, too.

A particularly hefty Constitutional amendment in 1972 (Article 8, Section 15, if you're curious) paved the way for Alaska's Limited Entry Act, which allowed Alaska to limit the number of people who could participate in a given fishery.[45]

Management Structure: Who Has Power Over What?

Fishery management is basically split into two kinds of entities: one that creates policy (the "fish legislature," so to speak) and one that implements those policies (the "fish executive branch").[46]

---

[44] NOAA's 2016 Status of Stocks report gives more information about stock rebuilding.

[45] Section 15 reads that "no exclusive right or special privilege of fishery shall be created or authorized in the natural waters of the State. This section does not restrict the power of the State to limit entry into any fishery for purposes of resource conservation, to prevent economic distress among fishermen and those dependent upon them for a livelihood and to promote the efficient development of aquaculture in the State. [Amended 1972]."

[46] Much in the way that we chose to focus most of our efforts on commercial fishing as opposed to covering the details of all fishing across Alaska, we focus primarily on the "fish legislature" without diving into the details of the "fish executive branch." ADF&G and NFMS are critical fisheries management entities in Alaska, and they handle everything from collecting and analyzing trawl survey data to monitoring escapement and collecting information from fishermen. For another time!

These relationships exist between organizations on both state and federal levels.

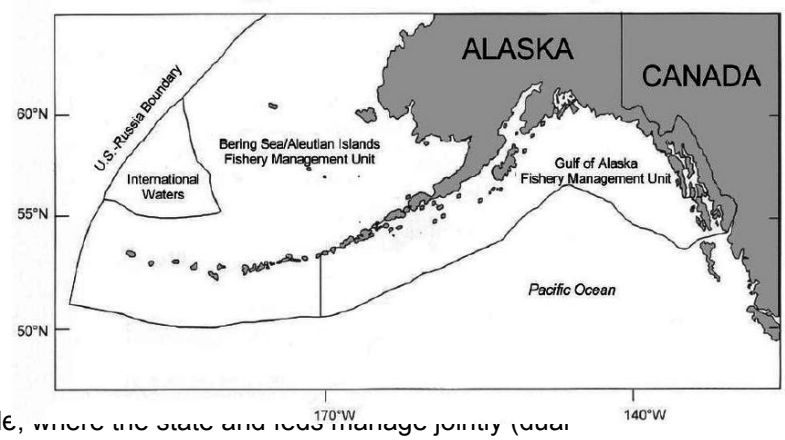
	STATE	FEDERAL
Policy (Legislative)	Board of Fisheries ↓	North Pacific Fishery Management Council ↓
Management (Executive Branch)	Alaska Department of Fish & Game	National Marine Fisheries Service

On the state level:

The State of Alaska manages fish in rivers and ocean fisheries within a three-mile range of Alaska's coast, as well as *some* fisheries in federal waters.[47] The state also manages pretty much all salmon fisheries, regardless of where the salmon are fished.[48] This system has been in place since statehood, when the feds delegated Alaska the responsibility to manage salmon.

The Board of Fisheries (BOF) develops nearly all fisheries regulations in Alaska. Their job is analogous to a parent trying to split a single cookie between many siblings — the BOF says how many fish can be caught in a given fishery in a given year, and then decides how to divide those fish between all the areas and types of fishermen participating in the fishery.

ADF&G provides the BOF the best scientific information available (cf., reports on salmon escapement goals) to help them make those decisions: they're counting fish, monitoring stocks, and recommending harvest guidelines. But it's ultimately up to the BOF to set policy and allocations, providing some separation between fish scientists and fish lobbyists.[49]



On the federal level:

The U.S. federal government manages fisheries between 3-200 nautical miles offshore, referred to as "federal waters" or the Exclusive Economic Zone (EEZ, exclusive economic domain of the United

[47] There are some exceptions to the three-mile rule, where the state and feds manage jointly (dual management) or when the feds delegate management to the state. For rivers that run across both federal and state areas of management, managers try to work together to get regulations to align.

[48] The state's blanket management of salmon is being challenged by a big-deal lawsuit in Cook Inlet right now, which is all a part of the Cook Inlet fish wars.

[49] You'll also hear about the Commercial Fisheries Entry Commission. CFEC is the public board that was created to do the administrative work of limiting fisheries and setting up systems to decide who would get permits to those fisheries.

States, and therefore, of U.S. fishermen) and comprised of two major areas (GOA and BSAI) as divided by the Aleutian Chain.

The North Pacific Council develops federal fisheries regulations in Alaska.[50] The federal operations entity that carries out their decisions is the National Marine Fisheries Service (NMFS, pronounced “nymphs”).

Exceptions to These Rules (Because There Are Always Exceptions):

- *Dual Management:* Giving both state and federal governments jurisdiction to manage a fishery — called dual or joint management — tends to make things more complicated, but it does happen. BSAI crab, for example, has been managed by the State of Alaska with federal oversight since the late ‘70s, partly because the crab fleet wanders into state waters and also because the fishery has historically been fragile.

- *International:* Most notable international management examples are the Pacific Salmon Commission and the International Pacific Halibut Commission (IPHC), joint ventures between the U.S. and Canada. After salmon stocks crashed along the West Coast of both nations in the ‘70s, the U.S. and Canada negotiated the Pacific Salmon Treaty to rebuild stocks and make sure neither nation was catching too many salmon destined for rivers of the other nation. We’ll discuss the IPHC in more detail later.

The Policy Side: How is Fish Policy Born?

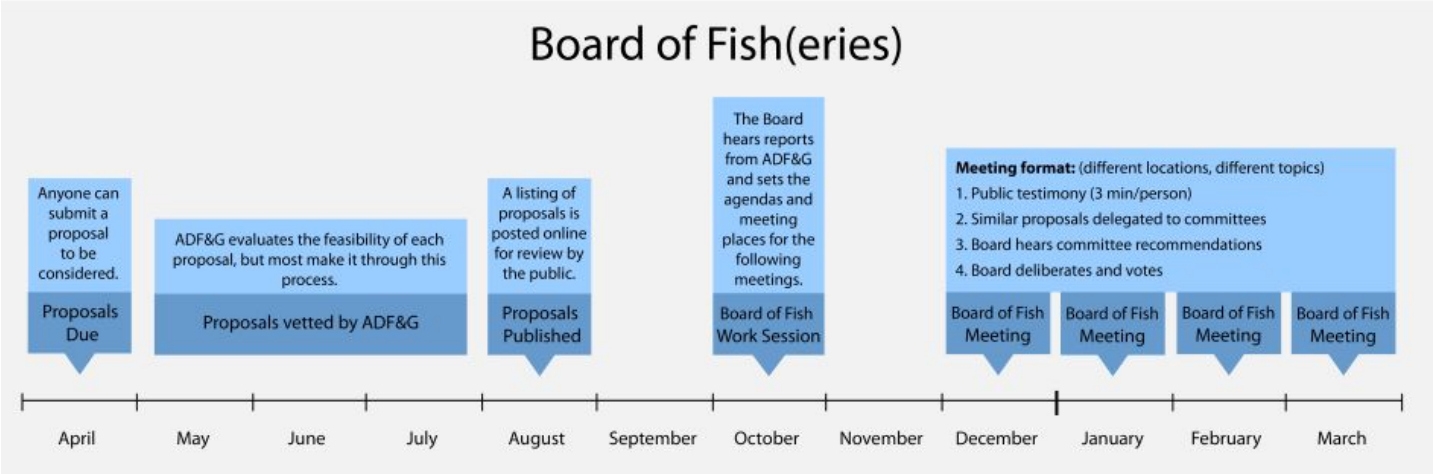
State-Managed: Alaska’s Board of Fisheries, a.k.a. the Board of Fish (BOF)

The BOF makes decisions about how state-managed fisheries are regulated, with plenty of input from fishermen. The Alaska Legislature delegated power to the BOF to establish new fisheries, change fishing seasons, and balance access to fisheries among different user groups, and more. Allocation decisions like who gets to catch how much fish are up to BOF, which means that the BOF rarely makes everyone happy.[51]

There are seven members on the BOF, appointed by the governor and confirmed by the legislature. For a long while, different user groups enjoyed traditional representation: some board members represented the sport fishing community, some commercial fishing, and some subsistence fishing. However, in past years, BOF membership has become a bit more muddied, and the more traditional if informal divisions that existed in past years no longer exist.

[50] While the BOF manages both subsistence and commercial fishing in state waters, subsistence in federal public areas is managed by the Federal Subsistence Board.
[51] Here’s one such case.

The BOF meets five times annually — one prep session and four meetings — to vote on proposals and addresses specific regions and fisheries each year.[52] Within the year, each of the four meetings focuses on the fisheries of a specific region, such as Kodiak or Southeast or Bristol Bay.



The BOF makes policies in an unusually democratic fashion. Anyone — literally anyone (that includes you — can submit a proposal: individuals, businesses, corporations, nonprofits, advisory committees, ADF&G, and the board itself. Deliberation includes public comment on each proposal.[53] There are few rules that limit or regulate lobbying. “Working the board” is an integral part of submitting a proposal: you grab a board member during break and highlight why the proposal is important to you.

The BOF also gets input from advisory committees (ACs) across Alaska. The 84 ACs provide forums for community members to develop recommendations to bring to the board. AC members are often elected by whomever shows up to the local meetings.

Since ACs are self-selecting, they can be a mixed bag. Some are really effective; others less so. ACs tend to be most influential when they have motivated representatives, regular meetings, and membership across user groups.

Federally Managed: North Pacific Fishery Management Council[54]

---

[52]The usual meetings are: October work session, December, January, late February/early March, and late March. Each year the board focuses on specific fisheries and regions, following a three-year cycle. Occasionally, the BOF will meet four times a year, with one prep session and three voting sessions.
[53] They are so devoted to public commentary that when a 2016 proposal asked the board to consider streamlining the public commentary process to save money, the board declined.
[54] Frequently mistakenly called the North Pacific “Fisheries” (plural) Management Council by some. Get it right (“Fishery” > “Fisheries”) for a leg up.

The North Pacific Council's job is to develop and maintain fisheries management plans in federal waters (within the Exclusive Economic Zone) offshore from Alaska. The North Pacific Council has members from Alaska, Washington, and Oregon, with a board of 11 total voting members. Three seats are reserved for the top brass at each state's Department of Fish & Wildlife, or for Alaska, its Department of Fish & Game. Seven seats go to private citizens (two from Washington, five from Alaska), and the final voting seat is held by the Regional Administrator for NMFS in Alaska. There are also four non-voting members: representatives from the Pacific States Marine Fisheries Commission, the U.S. Fish and Wildlife Service, the U.S. Department of State, and the U.S. Coast Guard.

North Pacific Fishery Management Council Membership

The appointment of those seven private citizens gets very political. The governors of Alaska and Washington put forth a preferred nominee (usually, someone in the same ideological camp), and two alternates. The U.S. Secretary of Commerce makes the final choice, often although not always honoring the governors' preference. Federal congressional delegations, as well as the director of NMFS, can (and do) lobby for certain nominees.[55]

Since Alaskans constitute a majority of the North Pacific Council (6 of the 11 members), Alaska's interests win out when at odds with Washington and Oregon's — provided Alaska's delegation is united.

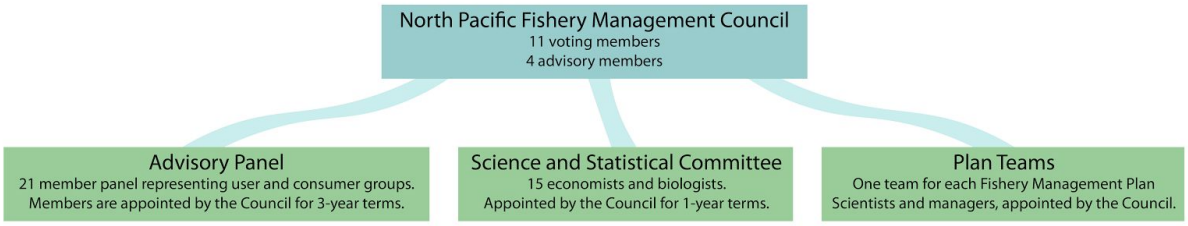
The North Pacific Council meets five times a year, rotating between Anchorage, Seattle or Portland, and a coastal Alaskan fishing community (which has ranged from Nome to Juneau to Kodiak).

The North Pacific Council discusses proposed amendments to fishery management plans,

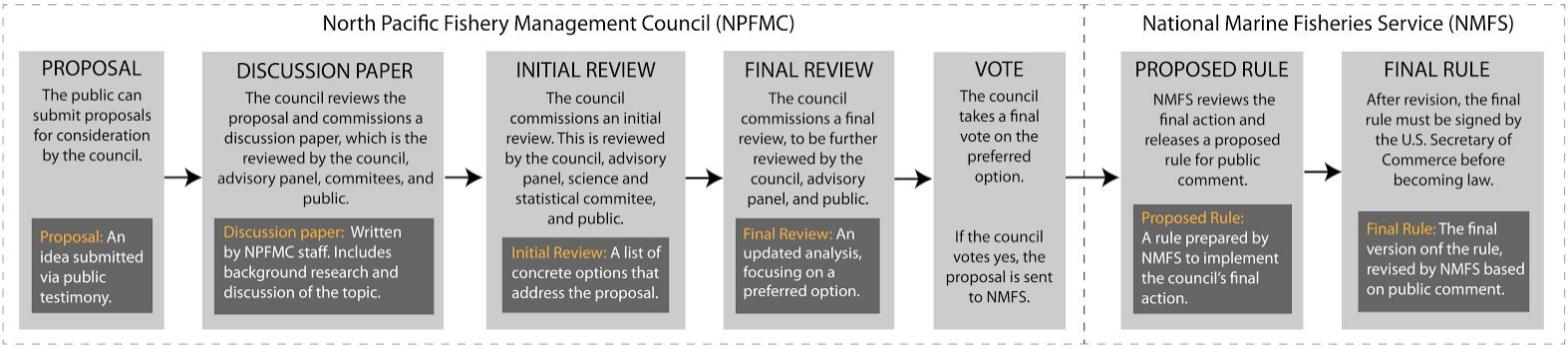
[55] In 2010, owing to political machinations, Sam Cotten was appointed to the North Pacific Council as an alternate over Gov. Parnell's preferred nominee, Jim Hubbard.

which is the council equivalent of a bill in the legislature (the fishery management plan is the North Pacific Council equivalent of the incumbent body of statutory law; the amendment to the fishery management plan is the equivalent of a house bill or senate bill).

The council gets advice from three official advisory committees: an Advisory Panel, a Science and Statistical Committee, and a fishery-specific Plan Team. It's worth noting that, by law, the North Pacific Council *must* follow the Science Committee's recommendations on harvest limits.[56]



For any proposal, those three committees and the public get to weigh in. Proposed amendments can take a long time (months or years) to get finalized.[57]



If approved, the final rule eventually becomes a NMFS regulation (the way a proposal that passes the Board of Fish becomes an ADF&G regulation) and incorporated into the existing fishery management plan. For example, the "Amendment 80 fleet" of trawlers gets its name from the 2006 amendment of the BSAI Groundfish Fishery Management Plan that allocated several groundfish species to the sector.

The Exception to These Systems: Halibut

Halibut is the fishery which does not conveniently fit under federal or state regulation.

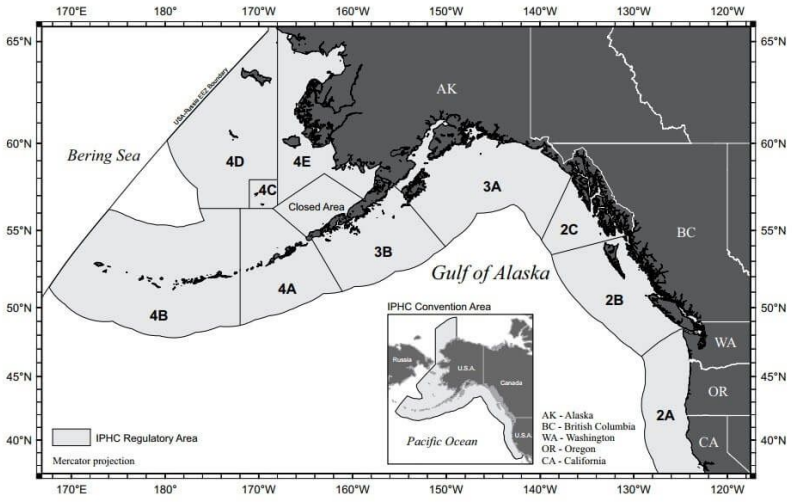
---

[56] While the council has increased tribal outreach in the last few years, there is no standardized tribal consultation process, as there is with NMFS. Tribal representatives can testify at meetings, or raise issues with representatives in D.C.

[57] Anyone can write a letter or publicly testify, but actually assigning staff to look into the issue is at the discretion of the North Pacific Council. Most successful proposals have the support of council members.

Halibut fishing all along the West Coast is managed by the International Pacific Halibut Commission (IPHC) with help from respective state, provincial and federal governments.[58]

The IPHC monitors halibut stocks and recommends how many fish should be caught. The IPHC also assigns catch to regulatory areas. How fish are shared from there (i.e., between sport, charter, subsistence and commercial harvesters) is decided by the North Pacific Council and, on the Canadian side, the Department of Fisheries and Oceans. While the "international" nature of the Commission is skewed (the U.S. has 11 management areas; Canada has just one — the delightful 2B), both the U.S. Secretary of State and Canada's Minister of Fisheries, Oceans, and the Canadian Coast Guard have to approve the IPHC's recommendation.



That's just the beginning. The IPHC was established in 1923 by the aptly-named Halibut Treaty to coordinate management between the U.S. and Canada. Each country gets three commissioners selected by the President of the United States and Governor General of Canada from a list of nominees.[59] It's like being made ambassador to a foreign nation, except the nation is halibut.

So, if Canada only has one management area and the U.S. has ten, why does Canada get equal representation? The short answer: when the treaty was written, the U.S. halibut fishery used to have fewer regions, but it has expanded since the treaty was signed, namely into the Aleutians and Bering Sea. When the Magnuson-Stevens Act extended U.S. jurisdiction to 200 miles offshore, Canadians were relegated to just area 2B. The Commission hasn't revamped itself in terms of representation.

Disproportionate Canadian representation means that Canada gets a lot of say in how Alaska halibut fisheries are managed. The U.S. has reason to grin and bear it, though, because the treaty has so far served the halibut stock well (meaning that under the treaty, we've reduced overharvest of halibut). That said, the Commission can not control bycatch of halibut, which is significant in Alaska's trawl fisheries, and has not been able to prevent Canada from setting catch limits in Area 2B about scientifically identified levels — which, because halibut don't observe international borders, directly affects Alaskan fishermen.

[58] Since halibut is regulated under an international treaty, the IPHC's jurisdiction includes both state and federal waters. The IPHC regulates halibut fishing right up to the beach!

[59] The Governor General of Canada is the Queen of England's personal proxy to Canada. The role is often ceremonial.

Management Decisions: What do these policies mean for fishermen?

Limiting Access

The 1973 Limited Entry Act marked a major change in how Alaska managed fisheries. The act allowed Alaska to start "limiting" its fisheries, meaning that only so many people could hold permits to catch fish. At first, those who could prove that they had a substantial history of participation in the industry were given permits. After that initial allocation, you could buy and sell permits, but the overall number of permits was fixed. The amendment continues to play an important part in contemporary challenges to Alaska's fishing laws, as people tease out what some see as a contradiction: limited fisheries in a state based on equal ownership of resources.

Permitting

There are three basic ways of regulating who can participate in commercial fisheries in Alaska.

- *Open access* — Before limited entry and before IFQs, this was how all of Alaska's fisheries operated. You didn't have to pay for the right to access the fishery, beyond a basic fishing license; basically, open access means (maybe with a little paperwork) any regular person can fish. There are limits on when the fishery is open, what gear can be used, and how many total fish should be caught, but anyone can register for the fishery, buy the right gear, and put it in the water. Open access is criticized as being more dangerous than limited fisheries, since it incentivizes people to fish as much as possible and as quickly as possible to outfish their competitor (even if the weather is terrible, the vessel is unsafe, etc.). However, open access systems are also seen as democratizing access, preserving wide-spread, public access to a public resource. Many fisheries are still open access.[60]

- *Limited entry* — Many fisheries in Alaska are managed by "limited entry" programs, a permitting system that relies on the same basic premise as a taxi medallion system or a liquor license quota system — by limiting the number of individuals who can participate, you limit overall activity. The limited entry system began in the '70s amidst panic about dwindling salmon runs as a way to control the number of vessels participating in the fishery, with the goal of making the fishery safer and more sustainable. In the context of Alaska fisheries, limited entry means there are a set number of permits available for a given region and gear type, and a permit allows you to fish for as much poundage as you want while the fishery is open. Permits are issued by a autonomous state agency

[60] For a complete list, check out SeaGrant's Fisheries Map: set "access" to "open" and leave everything else blank.

called the Commercial Fisheries Entry Commission (CFEC). Permits were initially allocated based on historical participation, which was controversial since it left many people out of the fishery. Now, permits are expensive, ranging from a few thousand (for a hand troll permit) to hundreds of thousands of dollars depending on the location and gear group. These permits are marketable, tradable commodities, and price fluctuates on the open market. To avoid "armchair fishermen" (the fishing version of sharecropping), the permit holder must be onboard the vessel when it fishes. There are a few exceptions, including medical transfers, or short-term leases when a permit holder can't fish.

    - *Examples on the state level:* all salmon fishing, Southeast Dungeness, king, and Tanner crab, Kodiak Tanner, Southeast shrimp, Southeast dive fisheries, Kodiak herring, sablefish in Clarence and Chatham straits.
    - *Examples on the federal level:* BSAI crab, BSAI and GOA groundfish.[61]

- *Catch shares (also known as quota, IFQs, or ITQs)* — Many federal fisheries in Alaska have undergone what's called (jargon alert!) rationalization, which means privatizing access rights into a catch-share system.[62] In a catch-share system, you buy the right to fish a certain percentage ("quota") of the total poundage allocated to that fishery. Just as buying stock allows you to own a fraction of a company, buying quota gives you the right to catch a specific percentage of a fishery. If you've bought quota that amounts to 5% the fishery's total allowable catch (TAC), and the TAC 100, you're entitled to catch five fish. If the biomass does well, and the next year's TAC doubles to 200 fish, your quota entitles you to catch 10 fish that next year.

  The value of your shares in the fishery might change year to year depending on the market or how much fish is available to be caught overall, but the proportion of your ownership in the fishery remains steady. Within the category of catch shares, there's the individual fishing quota (IFQ)[63] program, which governs the federal halibut and sablefish fisheries so common in coastal Alaska communities. There are also cooperative catch-shares, which include major federal fisheries such as BSAI pollock, GOA rockfish, and many non-pollock BSAI groundfish.[64]

  Many federal fisheries have been moving towards catch-share systems for a variety of reasons (although the process often sparks less-than-appealing controversy). First, catch-share programs limit participation, which streamlines management and (hopefully)

[61] Limited entry on the federal level is done through separate programs, such as the limited license program.
[62] One of the authoritative texts on catch-sharing systems is the National Research Council's *Sharing the Fish*, which is dense but full of nutritious information calories and also downloadable for free.
[63] IFQ is sometimes referred to as ITQ — "individual transferable quota" — and while this reference pretty much never surfaces in Alaska, it can be helpful to know. At least conceptually, IFQ and ITQ are interchangeable.
[64] Community Development Quotas (CDQs) also fall under the catch-share umbrella, but we'll talk about those later.

makes bigger paychecks for fishermen. They improve safety by eliminating the "race to fish." They also allow fishing companies to keep prices high — companies can avoid flooding the market with a ton of fish all at once, and fish is available all year round. Some of the cons? Privatizing a public resource makes entering fisheries more difficult for rural or young fishermen and makes consolidation more likely. And, when fisheries are rationalized, quota are assigned to fishermen based on their historical catch data. Later, quota shares can be bought and sold on the open market. Open-market sale of quota means people with money buy quota rather than people who have traditionally relied on fisheries.

Openers and closures

Openers and closures are the fishing equivalent of running a marathon — openers are the race, and closures are the finish line. An "opener" signifies the time when a particular fishery opens for harvest. Fishing ends when a closure is declared. These are typically used in open access or limited entry fisheries and enable managers to control harvest by controlling the time fished.

As a fishermen, you might not know the dates of openers and closures in advance. Depending on the fishery, ADF&G might set the dates beforehand or declare them in-season by "emergency order." King salmon season, for example, always opens July 1st for Southeast trollers but is never closed on a predetermined date. Instead, the fishery is closed when ADF&G decides the quota has been reached. Emergency orders (EOs) are rarely actual emergencies — they're just the name of the tool ADF&G has to open or close a fishery based on real-time data.

And, they're part of what makes Alaska's fisheries so well-managed: emergency orders give ADF&G the flexibility to open or close fisheries based on what's happening now, rather than relying on models or estimates from last year's fishery.

As a consequence, openers vary a lot. Some fisheries have openings that last for months, like summer salmon fisheries. In the Sitka sac roe herring fishery, openers can be as short as a few minutes, resulting in countdowns and traffic jams. Some fisheries open and close on a regular schedule, for a few days each week. Short, derby-style openers mean fishing hard whatever the weather, while longer ones, especially in fisheries with individual quota systems, give fishermen flexibility to fish whenever they want throughout the year.

Other Regional Entities: Who else participates?

Hatcheries: Hatcheries in Alaska are basically nurseries for salmon. They fertilize and incubate salmon eggs, protecting the young fish before releasing them into the ocean. Hatchery fish return to the hatchery to spawn and die, just as other salmon return to the rivers where they were born.

By rearing young salmon and sending them out to sea, hatcheries increase the number of salmon in the ocean available for fishermen to catch. There are private and federal hatcheries, but state-owned hatcheries, established with the 1974 Hatchery Act, play the most significant role in the commercial fishing industry.

From a salmon's perspective, a hatchery is just an industrial-sized natal stream. Hatchery salmon are incubated in trays full of freshwater, sent into the ocean, and return to the hatchery to reproduce and die. In the ocean, hatchery fish lead wild lives: they face the same predation and pressure by salmon born in the wild, including predation by bears, hooks, and sea lions.

The goal of a hatchery is to supplement, not supplant, wild fish stocks. Hatcheries can't start up in a stream with an existing wild salmon run. There is (controversial) evidence showing that hatchery fish may outcompete natural populations in the wild; the well-fed, disease-free fry that hatcheries release might have an edge over salmon that fend for themselves from the moment they're born.

Today, hatchery fish make up more than a quarter (!) of the commercial salmon harvest in Alaska.[65] In Prince William Sound, hatchery fish make up over 75%.

As nonprofits, hatcheries have several options to cover costs:

- "Cost recovery": catch and sell returning hatchery fish.
- Taxes: Within each region, commercial fishermen can self-impose an "aquaculture tax," which they pay to the state. The Prince William Sound Aquaculture Association gets a 2% tax from all salmon permit holders in the Sound. Southern Southeast Regional Aquaculture Association (SSRAA), Kodiak Regional Aquaculture Association (KRAA), Chignik Regional Aquaculture Association (CRAA), Cook Inlet Aquaculture Association (CIAA), and Northern Southeast Regional Aquaculture Association (NSRAA) are also funded this way.
- Some hatcheries generate a significant amount of money from grants, similar to other nonprofits.

[65] This 2018 chum salmon fishery in Crawfish Inlet was the result of strong hatchery returns of 3- and 5-year-old chum salmon. Each of those jumps is a salmon!

Regional Seafood Development Associations (RSDA)*:* RSDAs were authorized by the legislature in 2004 and are unique regional organizations allowing fishermen in a given region to self-impose a tax. Permit-holders within a given fishery vote whether or not to join the RSDA and initiate a fishery-wide tax. If approved, RSDAs can put that money towards pretty much whatever their members want (related to marketing): branding, marketing, educational programs, research, ice barges, and more. RSDAs can be somewhat thought of as regional analogues to the well-known statewide Alaska Seafood Marketing Institute.

Currently, there are two RSDAs: Bristol Bay Regional Seafood Development Association (BBRSDA) and Copper River/Prince William Sound Marketing Association (with the truly eye-popping shorthand, CR/PWS MA). Along with substantial private marketing efforts, the CR/PWS MA played a role in transforming Copper River sockeye into a globally recognized brand, boosting market prices and fattening the wallets of Prince William Sound fishermen. And BBRSDA has made huge inroads in promoting name recognition of Bristol Bay sockeye salmon.

But RSDAs remain controversial in other regions. A Southeast Alaska RSDA was proposed in 2007 and 2009 and voted down both times. Fishermen worried it would only benefit the region's biggest towns, and those in Southeast's smaller communities would have to pay the tax to keep the RSDA afloat without reaping the benefits.

Community Development Quota (CDQ):

CDQ groups represent coastal Bering Sea communities and hold 10% of most all Bering Sea fisheries quota. CDQ groups acquire this quota for free, and lease it out to resident fishermen, fishing companies, and vessels owned by the CDQs themselves. Their most notable holdings are in pollock, but also in species such as halibut, crab, cod, and sablefish.

CDQs are a big deal. Since those federal fisheries were rationalized, they've become more and more expensive to enter — it now costs six or seven times as much as halibut is worth per pound to buy a pound of halibut quota! Many rural folks without access to big loans can't afford to buy quota. When CDQs can lease quota to individuals, it's the difference between people either making a living fishing their community's traditional fisheries or not being able to fish at all.

Beyond leasing quota, CDQs invest in community

and fishing infrastructure, making them true development drivers in Western Alaska.

Six CDQ groups represent 65 communities within 50 nautical miles of the Bering Sea coast, totaling 27,000 Alaskans from Atka to Diomede. The 50 mile limit is important: Alaskans outside that line aren't allocated quota, even if they have ties to Bering Sea fisheries. The six groups, often referred to by their acronyms (as if there weren't enough acronyms to keep track of), are:

- Norton Sound Economic Development Corporation (NSEDC)
- Yukon Delta Fisheries Development Association (YDFDA)
- Coastal Villages Region Fund (CVRF)
- Bristol Bay Economic Development Corporation (BBEDC)
- Aleutian Pribilof Island Community Development Association (APICDA)
- Central Bering Sea Fishermen's Association (CBSFA)

Five of the CDQs work closely together, whereas Coastal Villages Region Fund (CVRF), which represents the largest group of people, has politically split off on its own. Highlighting that it represents more people than the other five CDQs, and that its region has less quota per capita (a fact argued as unfair), CVRF wants to own more quota — effectively, at the expense of the smaller CDQs.

The other five CDQs, even the CDQs that would benefit from a reallocation, don't want to open the Pandora's box of original quota allocation; they have opposed CVRF's push to rellocate quota among the six CDQs on a population proportionality basis. (It's like a 21st century Constitutional Convention!) Thus far, the other five CDQs have prevailed.

CDQs also deal with bycatch politics. Most of the CDQs lease quota to fish pollock, which scoop up salmon as bycatch. That creates tension between commercial salmon and pollock industries, as well as subsistence users — which includes the same Western Alaskans represented by CDQs — for whom salmon is a way of life.

Community Quota Entity **(CQEs)**: CQEs, like CDQs, are theoretically conceptually similar, their acronyms are a similar jumble of letters, but in reality CDQs are elephants and CQEs are elephant mice.

CQEs can own and lease federal fishing quota to locals. CDQs and CQEs share similar missions (and acronyms), but they're different in a few ways.

First, geography. CDQs only serve Bering Sea and Aleutian Island communities that reside along the Bering Sea. CQEs exist only with Gulf of Alaska and Southeast communities, and were created, in some sense, with the hope that they would serve a similar socioeconomic role in the Gulf of Alaska and Southeast as CDQs play in Bering Sea and Aleutian Island communities.

Second, scope. CDQs (with the exception of BCSFA) encompass entire regions, and sometimes many dozens of communities. CQEs exist on a community-specific basis. Hoonah has a CQE. Angoon has a CQE. Old Harbor has as a CQE. But they're isn't (and can't be) a Southeast-wide CQE and there isn't and can't be a Kodiak Archipelago-wide CQE.

And third — and this is the biggie — CQEs weren't given quota to get going. CDQs *were* given quota (a lot of quota), and the CDQs took that quota and turned themselves into economic juggernauts. Most CQEs have never gotten off the ground, and the few that have are of modest scale.

In order to lease quota to fishermen, CQEs first have to generate enough cash to buy that quota on the open market. For halibut and sablefish quota, that's prohibitively hard to do (think: hundreds of thousands of dollars for one trip worth of halibut). So, unsurprisingly, CQEs haven't been well-utilized. Though half of the 42 eligible communities have set up CQEs, only four[66] — Old Harbor, Ouzinkie, Adak, and Hoonah — have been able to actually acquire quota.

V. THE FUTURE OF ALASKA FISHERIES

If you have more questions than when you started...we've done our job. Hope you're feeling great. And a little bit awe-struck, and maybe even a little bit hungry.

Alaska fisheries and fisheries management are complicated — politically, economically, culturally, and biologically. Fishing in Alaska helps define cultures, pushed us to statehood, and remains one of Alaska's most integral (and contentious) resources.

Fifty-odd pages later, we hope that Fish 101 has given you some useful benchmarks for understanding Alaska fisheries and fisheries management — whether your goal is to present a rock-solid proposal to the BOF, do some detective work on the northern shrimp decline, or just have a better understanding the next time you're eating wild Alaskan seafood at the supermarket.

We've barely dipped our toes into the ocean of knowledge around Alaska fisheries and fisheries management. There's so much more to talk about!

(Fisheries 201, here we come!)

Thanks to Our Contributors

Thank you to our contributors: editors, reviewers, and people we called at the last minute when

[66] As of December 2018. Check here for a continually updated list.

we were wading through jargon — it wouldn't have happened without you:

Linda Behnken, Abigail Bliss, Forrest Bowers, Tom Bristol, Karla Bush, Shannon Carroll, Tim Clark, Sam Cunningham, Rachel Donkersloot, Angel Drobnica, Ian Dutton, Dan Falvey, Jeff Farvour, Duncan Fields, Louie Flora, Ricky Gease, Karen Gillis, Jessica Glass, Kristen Green, Glenn Haight, Elizabeth Herendeen, Kurt Iverson, Bob King, Gunnar Knapp, Michael Kohan, Reid Magdanz, Sarah Marrinan, Theresa Peterson, Stephanie Quinn-Davidson, Sunny Rice, Danielle Ringer, Ann Robertson, Annie Rosenthal, Alice Ruby, Robert Ruffner, Alyssa Russell, Nate Sievert, Phil Smith, Julie Speegle, Kate Troll, Abigail Turner, Bruce Twomley, Norm Van Vactor, and Bob Waldrop. Thanks to Simon Hook and Gordon Reeder for contributing photos.

Thanks to the Bering Sea Fishermen's Association and the State of Alaskan Salmon and People for your generous support.

And thanks to you, our readers!

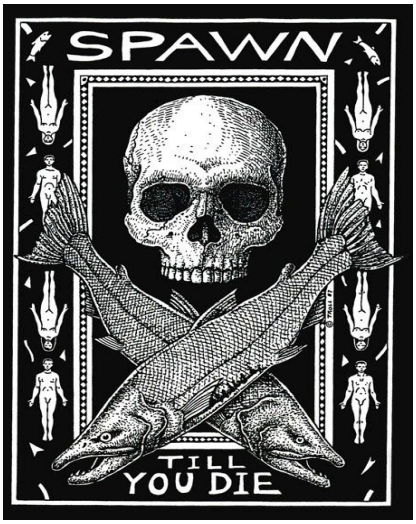
Photos and Graphics

Unless otherwise noted, the photos and graphics in this text were either created by our team or are publicly available for noncommercial reuse.

Additional photos and graphics were used with permission and are listed below:

- Photo of setnetting in Kotzebue (p. 15) is by Sadey Vogel.
- Map of federal fishing areas (p. 38) is from NOAA Fisheries.
- Map of IPHC regions (p. 43) is from the IPHC website.
- Artwork on p. 51 is by Ray Troll.

An Incomplete Glossary of Fisheries Terms



Alevin: A freshly hatched salmon still feeding off of the egg yolk in its nascent stream.
Anadromous: Fish that are born in freshwater, migrate to the ocean to grow into adults, and then return to freshwater to spawn. Salmon are a popular example.
Bycatch: The incidental fish you catch while targeting another species. If you're trying to catch pollock, and a salmon gets caught in in the net, it's bycatch.
Catcher-Processors: Also called factory trawlers and at-sea processors, these are large vessels that do everything from fishing to processing on their own.
Escapement: The number of fish allowed to escape the fishery and spawn.
Ex-vessel: Ex-vessel describes activities that relate to unloading fish. For instance, ex-vessel price (usually per pound) is the price that fishermen are paid for their catch when they deliver to the processor. Ex-vessel value describes the total value of a boat's catch — either per trip, or over a whole season.
Flatfish: Flatfish live life on the horizontal plane. Mature flatfish look like pancakes with both eyes on one side of their head. This configuration is useful since they swim along the ocean floor, moving their tails up and down instead of side-to-side. This term applies to a whole order of fish (Pleuronectiformes, if you're curious) including species like halibut, sole, flounder, turbot, plaice, and more.
Fry: A young fish that has started feeding, but still lives in freshwater.
Gillnet: A type of fishing net, used most notably in driftnetting and setnetting fishing.
Groundfish: "Groundfish" is a broad generalization used to refer to more than 90 different species of fish. In fishery management, the term is essentially a catch-all for commercially important fish or invertebrates that don't fall under other management plans — in other words, salmon, halibut, herring, and a few others are excluded from this definition. (It's worth noting that outside of fishery management, a groundfish is a fish that lives on or near the seafloor. In management, the term has little to do with where a fish lives.)
Hatchery: A nursery for fish. Hatcheries in Alaska fertilize and incubate salmon eggs, protecting the young fish before releasing them into the ocean, with the goal of boosting wild fish stocks. Hatchery fish return to the hatchery to spawn and die, just as other salmon return to the river where they were born.

Personal Use: Fish caught for personal use can literally only be consumed by you or your friends and family (i.e. NOT bartered or traded). This type of fishing is only available for Alaska residents.
Homeport: The port in which vessels originate or are registered.
Landings: Fish caught and brought to a processor
Pelagic: Midwater. "Non-pelagic" refers to the ocean floor.
Rationalization: Privatization of fishing access through transition to a catch-share system. Fishermen own the right to fish or catch a percentage of the total fishery, like owning stock in a company.
Redds: A nest of salmon eggs usually in the bed of a gravelly stream.
Run: Salmon travel from the ocean back to the stream they where they were born to spawn and die. The process of returning is called a run.

Seine: A type of fishing net that hangs vertically in the water. Used most notably in purse and beach seining fishing methods.
Smolt: A teenage salmon that migrates from freshwater to saltwater to begin adult life in the ocean.
Subsistence fishing: Fishing for personal consumption, bartering, or sharing, which is more extensive than personal use fishing (check here if you are still confused.) This type of fishing is only available to Alaska residents.

An Incomplete Guide to Fisheries Acronyms

AAs: Aquaculture Associations
- **CIAA:** Cook Inlet Aquaculture Association
- **CRAA:** Chignik Regional Aquaculture Association
- **KRAA:** Kodiak Regional Aquaculture Association
- **NSRAA:** Northern Southeast Regional Aquaculture Association
- **SSRAA:** Southern Southeast Regional Aquaculture Association

AI: Aleutian Islands
ACs: Advisory Committees
AFA: American Fisheries Act
ADF&G: Alaska Department of Fish & Game
ASMI: Alaska Seafood Marketing Institute
BOF: Board of Fisheries
BSAI: Bering Sea/Aleutian Islands
BBFA: Bristol Bay Fishermen's Association
BBR: Bristol Bay Reserve
CDQ: Community Development Quota
- **APICDA:** Aleutian Pribilof Island Community Development Association
- **BBEDC:** Bristol Bay Economic Development Corporation
- **CBSFA:** Central Bering Sea Fishermen's Association
- **CVRF:** Coastal Villages Region Fund
- **NSEDC:** Norton Sound Economic Development Corporation
- **YDFDA:** Yukon Delta Fisheries Development Association

CFEC: Commercial Fisheries Entry Commission
CQE: Community Quota Entities
CSF: Community-supported fisheries
EO: Emergency order
FAS: Frozen-at-sea
FMP: Fishery Management Plan
GOA: Gulf of Alaska
IFQ: Individual fishing quota
IPHC: International Pacific Halibut Commission
ITQ: Individual transferable quota
MSA: Magnuson-Stevens Act
NMFS: National Marine Fishery Service. Sometimes also referred to as NOAA Fisheries.
NOAA: National Oceanic and Atmospheric Administration
NPFMC: North Pacific Fishery Management Council
PSPA: Pacific Seafood Processors Association

RSDA: Regional Seafood Development Association

BBRSDA: Bristol Bay Regional Seafood Development Association

CR/PWS MA: Copper River/Prince William Sound Marketing Association

TAC: Total allowable catch

UFA: United Fishermen of Alaska