Net Loss:

THE COSTS OF BOTTOM TRAWLING IN THE GULF OF ALASKA

OCEANA Protecting the World's Oceans

Net Loss:

THE COSTS OF BOTTOM TRAWLING IN THE GULF OF ALASKA

AUGUST 2022

Authors: Jon Warrenchuk, Jamie Karnik
Brianne Mecum, Ben Enticknap and Susan Murray
Designer: Brianne Mecum
DOI: 10.5281/zenodo.7023920

Contents

Salmon swim up a river near Cordova, Gulf of Alaska. © Erin Ranney
Front and back cover image: Corals in the Gulf of Alaska. © NOAA

Executive Summary

OCEANA

Bottom trawling is a type of fishing where huge nets are dragged for miles along the seafloor to catch flatfish like flounder or sole. Yet trawl nets also destroy ancient corals and other important habitats as they catch everything in their path. This habitat destruction has cascading impacts to fish and other sea life, ultimately threatening ocean ecosystems.

Our oceans face many threats including climate change, pollution, overfishing, bycatch, habitat destruction, and other human impacts. All of these put extreme stress on marine ecosystems. The cold and remote waters of the Gulf of Alaska are no exception; yet there is one human-caused threat that has a practical solution that has already been applied to most U.S. and Canadian waters from the U.S. Arctic to Southern California — freeze the footprint of bottom trawling.

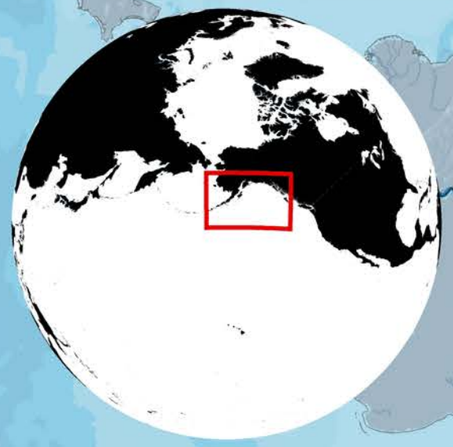
According to the National Academy of Sciences, bottom trawling is the most destructive form of fishing on seafloor habitat like corals and sponges. In addition to harming seafloor habitat, bottom trawlers in Alaska catch and often waste nontargeted salmon, halibut, crab and other species central to the lives of Alaskans. The Gulf of Alaska is the last place on the U.S. west coast where industrial bottom trawling can still be conducted in large areas of corals and other ocean habitats vital for fish and other animals.

However, there is a solution, one that has been implemented throughout much of the North Pacific. Oceana has worked with fishery managers, fishermen, indigenous communities, and other organizations to save seafloor habitat through a "freeze the footprint" approach to bottom trawling. In this approach, bottom trawling can only continue in areas that have already been trawled, protecting new areas from being destroyed and ensuring untrawled, vibrant habitats remain intact. The freeze the footprint approach also protects key seafloor habitats within the existing footprint such as coral gardens, seamounts, canyon heads, rocky reefs, and sponge beds. Along with limiting bycatch and protecting important ecological areas within the trawl footprint, this approach represents a win-win for healthy fisheries and healthy oceans.[1,2]

It's time to implement this same approach in the Gulf of Alaska. The North Pacific Fishery Management Council's "Essential Fish Habitat" review process is currently underway, where conservation measures for ocean habitats in Alaska are considered once every five years. This time measures must include freezing the footprint of bottom trawling in the Gulf of Alaska, limiting waste of nontargeted species like salmon and halibut, and protecting important ecological areas within the existing trawl footprint.

In the North Pacific, fishery managers have protected more than 1.3 million square miles of seafloor habitat. The Gulf of Alaska is the last place where a Freeze the Footprint approach has not been implemented, and there are enormous areas still under threat from bottom trawling.

OCEANA



ALASKA

Yukon R.

Kuskokwim R.

Susitna R.

Copper R.

Alsek R.

Stikine R.

Valdez

Anchorage

Cordova

Prince William Sound

Kenai Peninsula

Kenai

Seward

Cook Inlet

Ninilchik

Anchor Point

Homer

Tar Bank

Pamplona Spur

Yakutat Canyon

Yakutat

Alsek Canyon

Haines

Juneau

Elfin Cove

Chichagof Is.

Alexander Archipelago

Petersburg

Sitka

Baranof Is.

Ketchikan

1,000 m

ALASKA CURRENT

Fairweather Ground

Middleton Is.

Hinchinbrook Canyon

Amatuli Trough

Portlock Bank

200 m

Dixon Entrance

Queen Charlotte Islands

BERING SEA

GULF OF ALASKA

Togiak

Dillingham

Ekuk

Naknek

Egegik

Bristol Bay

Ugashik

Peninsula

Alaska Peninsula

Shelikof Strait

Ouzinkie

Kodiak

Kodiak Is.

Old Harbor

Shelikof Trough

Albatross Bank

Chirikof Is.

Snakehead Bank

ALASKA COASTAL CURRENT

ALASKAN STREAM

Sand Point

Shumagin Trough

Unimak Is.

King Cove

False Pass

Shumagin Islands

Shumagin Bank

200 m

Unimak Pass

Sanak Trough

Sanak Islands

Akutan

Dutch Harbor

Davidson Bank

1,000 m

ALEUTIAN TRENCH

NORTH PACIFIC OCEAN

0 50 100 200 Miles

Map: © Brianne Mecum | Oceana

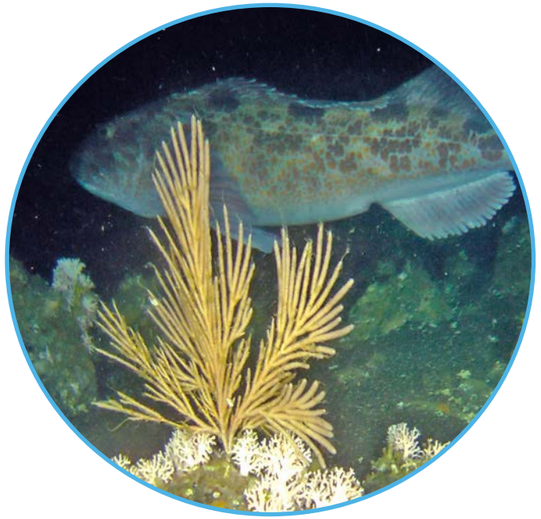
© Erin Ranney

The Gulf of Alaska Ecosystem

The Gulf of Alaska spans from the rocky coasts of the Alaska Peninsula to the inside waters of the Alexander Archipelago and has supported abundant fish and wildlife populations and thriving communities for thousands of years. Snow and glacial melt from large rivers feed into the Gulf and are circulated by massive ocean currents, creating a highly productive ecosystem. Home to some of the largest fishing ports in Alaska, the Gulf of Alaska supports vibrant coastal communities that rely directly on a healthy ocean.

The Living Seafloor

Deep beneath the ocean's surface there is surprising diversity and an abundance of life on the seafloor of the Gulf of Alaska. Colorful, fragile and long-lived deep sea corals and sponges thrive in the cold, nutrient-rich waters, growing for hundreds of years to form essential habitat for fish and other animals. Yet these important habitats could be wiped out by a single pass of a bottom trawl net.



Along with spectacular coral gardens, the Gulf of Alaska contains kelp forests, eelgrass meadows, and deep-sea sponges—living habitat features used by fish, marine mammals and other animals for feeding, breeding and refuge. These living habitats, along with physical features of the seafloor like rocky reefs, pinnacles, or sand and cobblestone, affect the distribution and abundance of invertebrates and fish like crab, pollock, Pacific cod, halibut, sablefish, and a wide diversity of Northeast Pacific rockfishes. Further offshore, a dramatic shelf break drops to deeper and deeper areas, the majority of which are yet to be explored.

Most of what is known about life in the deep-sea is from records collected during research trawl surveys.

Very little of the ocean floor has been explored through the visual lens of submersibles or remotely operated vehicles (ROVs). Scientific data and observations across the Gulf of Alaska, however, paint a picture of a remarkable marine ecosystem.

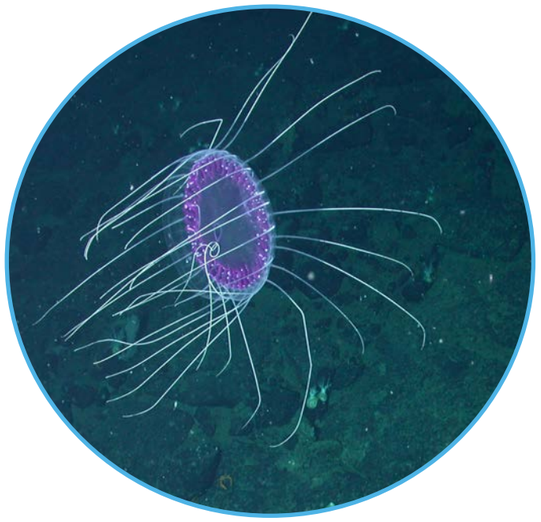
In May 2022, Oceana embarked on an eight-day expedition in the Gulf of Alaska, visiting 16 sites and completing 23 dives with an ROV and drop cameras. In that short amount of time, we discovered a new coral garden, groves of seawhips, and other key seafloor habitats for marine life. We also witnessed areas that had coral rubble on the seafloor—a sad aftermath of industrial bottom trawling with long-term impacts on the health and productivity of the Gulf of Alaska marine ecosystem.

Above photo: A lingcod and a gorgonian coral . © Oceana
Opposite page, top right: A purple jellyfish. © NOAA
Gulf of Alaska coastline. © Oceana

The Deep-Sea

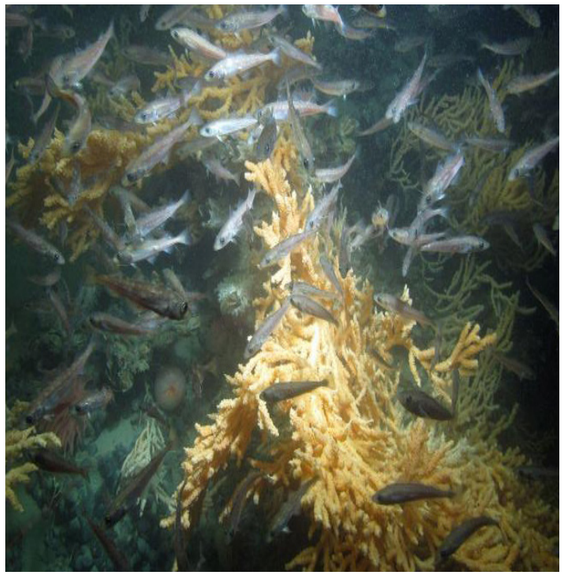
The deep-sea is the largest and least explored habitat on earth, and there are over 280,000 square miles of deep-sea habitat in the Gulf of Alaska. Scientists describe this expansive ocean region as the area beyond the continental shelf, deeper than 650 feet. This includes the continental slope, seamounts, vast ocean trenches and the deep-water column. Very little light reaches the deep and no light at all penetrates beyond 3,000 feet.

A diversity of fish, corals and sponges not only persevere, but thrive, in the cold darkness where they are uniquely adapted to the seemingly crushing conditions. Food filters down to the deep in the form of dead plankton and other small organisms. Other animals have adapted to survive in association with methane seeps and vents that fuel deep-sea ecosystems with chemical energy released from the earth's crust.[3,4] Well beyond the reach of surface storms, waves, and tides, deep-sea ecosystems are generally serene and typically undisturbed.



Yet even the far reaches of the deep remain vulnerable to human disturbance. And in the Gulf of Alaska, no threat is more direct than bottom trawling. At depths up to 3,300 feet, the massive steel doors and footrope of bottom trawl nets scrape and smother living seafloor habitats. As fishing technologies develop and expand, it is critical to prevent bottom trawls from shifting into new areas and reaching even greater depths.

A bat star and anemone in a hydrocoral garden s. © Oceana



Coral and sponge communities provide shelter for numerous fish species in the Gulf of Alaska. © NOAA

Deep sea corals grow incredibly slowly. But over time they create highly complex habitats commonly referred to as coral gardens. These coral gardens are home to a variety of marine life, from seafloor creatures like basket stars, anemones or sea stars, to shellfish like shrimp or crab, as well as many commercial fish species like rockfishes, cod and flatfishes. Fish and crab use deep-sea coral habitat for shelter and feeding sites where there is often increased prey abundance. Some rockfishes use the shelter of coral gardens as spawning and breeding habitat.[6]

Corals and large sponges in the Gulf of Alaska are Essential Fish Habitat (EFH) for juvenile and adult yelloweye rockfish.[7]

Coral Gardens

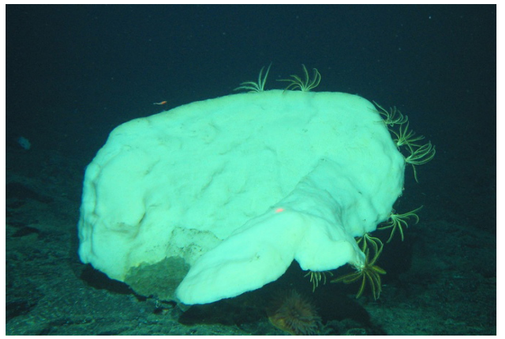
Corals are living animals, some of which can survive for thousands of years. An astounding 70 species of cold-water corals have been documented throughout the Gulf of Alaska.[5] Unlike their tropical reef-forming counterparts, these corals inhabit cold waters ranging from as shallow as 20 feet in nearshore bays to as deep as 15,000 feet on the slopes of offshore seamounts.[5] Gorgonians and black corals are most common in the Gulf of Alaska, but there are many more, including stony corals, hydrocorals and true soft corals.

Rockfish and urchins congregate around a large red tree coral in the Gulf of Alaska. © NOAA

Sponge Gardens

While they may resemble a plant, sponges are living animals that filter water through their porous bodies to feed. There are 50 confirmed sponge species in the Gulf of Alaska but scientists suspect there may be as many as 80 or more.[8] Like corals, sponges are a major component of the Gulf of Alaska's living marine habitat and an integral part of the region's seafloor ecosystems. Gardens of large sponges, often found with corals, are used by fish and other invertebrates for shelter, breeding and feeding, supporting food webs and helping to maintain the Gulf's deep-sea biodiversity.

A pregnant rockfish takes shelter in a glass sponge. © NOAA



A white vase sponge with yellow crinoids in the Gulf of Alaska. © NOAA

What is Essential Fish Habitat?

"Essential Fish Habitat" is a legal term describing the habitat essential for feeding, breeding and growth of managed fish species. The National Marine Fisheries Service is required by law to identify these habitats, minimize impacts to the habitat and identify actions to conserve and enhance such habitat.

Gulf of Alaska
Protected Seamounts

Unimak Seamount
Derickson Seamount
Sirius Seamount
Chirikof & Marchand Seamounts
Patton Seamount
Odessey Seamount
Dall Seamount
Kodiak Seamount
Quinn Seamount
Giacomini Seamount
Welker Seamount
Brown Seamount
Dickins Seamount
Denson Seamount

OCEANA

Sea Whip Groves

Sea whips and sea pens found in the Gulf of Alaska are a type of habitat-forming cold-water coral. They grow in soft sediments along the continental shelf and can create vertical habitat almost three feet in height in what would otherwise be a flat featureless plain. Sea whip groves provide cover from predators and enhance the abundance and availability of prey species. For example, Pacific ocean perch (a type of rockfish) have been observed using sea whip groves as shelter at night after feeding on krill above the groves during the day.[9]

A dense sea pen grove. © NOAA
Above photo: Various rockfish species in the Gulf of Alaska. © NOAA

Seamounts

From microscopic plankton to the largest whales, seamounts provide an essential foundation for life in the Gulf of Alaska. These underwater mountains forged by volcanic activity are biological hotpots that rise above the surrounding basin floor. Deep underwater currents climb along the base of seamounts toward the ocean surface, mixing with nutrients and light and sparking oases of life. These deep mountain chains support unique ecosystems distinct from the surrounding area with communities of deep-sea corals, sponges, octopi, and fish.

The Gulf of Alaska contains over 100 seamounts that rise over 3,000 feet and most remain unnamed, let alone explored.[10] Their remoteness, hundreds of miles from land, means many have never been fished and are likely pristine. These living habitats are also sensitive and vulnerable to fishing impacts. As such, in 2006, the National Marine Fisheries Service designated 15 protected areas for seamounts in the Gulf of Alaska where all bottom contact fishing gears are prohibited. It's time for NMFS to finish the job and similarly protect all seamounts in the Gulf of Alaska.

Bottom Trawling and Habitat Impacts

Bottom trawlers drag enormous nets for up to 15 miles along the seafloor, gouging and furrowing the bottom which in turn damages and destroys essential fish habitats. Corals, sponges and other living creatures, which can live for centuries, are uprooted and smashed.

Bottom trawling is the most destructive form of industrial fishing on sensitive seafloor habitats. It is also an indiscriminate fishing method. While a handful of animals such as some crabs, snails and sea stars may pass under or through the gear, alive or in pieces, the net fills with both intended and unintended catch of fish, crabs, marine mammals, corals, sponges, and other living seafloor habitat. The intended catch is kept for sale and everything else caught in the net—the unintended catch, or "bycatch"—is discarded dead or dying, or ground into fishmeal.

The Fisheries Service estimates that in the last 20 years, at least 26% of the seafloor in Alaska less than 3,000 feet deep has been trawled. This includes thousands of square miles of Gulf of Alaska seafloor trawled each year.[11]

Seafloor habitat that is continually trawled is in a constant state of disturbance and recovery, becoming patchy, less structured and less diverse as rock piles are scattered, bedforms are smoothed over, and long-lived corals and sponges are destroyed.

The seafloor community changes, favoring faster-growing organisms and scavengers, and the remaining seafloor animals are smaller and younger.[12,13,14,15]

Pristine seafloor habitat can be changed forever by one pass of a trawl that obliterates corals, sponges, and other habitats that can take hundreds of years to grow. Bottom trawling reduces the complexity, diversity and productivity of seafloor habitats and repeated trawling can result in significant ecological changes.[15]

> They came to the Sand Point area, Shumagin Bank area, and fished it hard. Since then those fishing grounds have never been the same. Those 200-pound halibut are all gone along with the small and medium size fish and everything else. No starfish hanging on the ground line, no cod fish or rock fish or crabs. No skate eggs or skates or scallops. That spot was dragged and dragged and scraped and scraped and now it's dead, nothing.
>
> **JIM RICHARDS**
> *F/V Bergen*

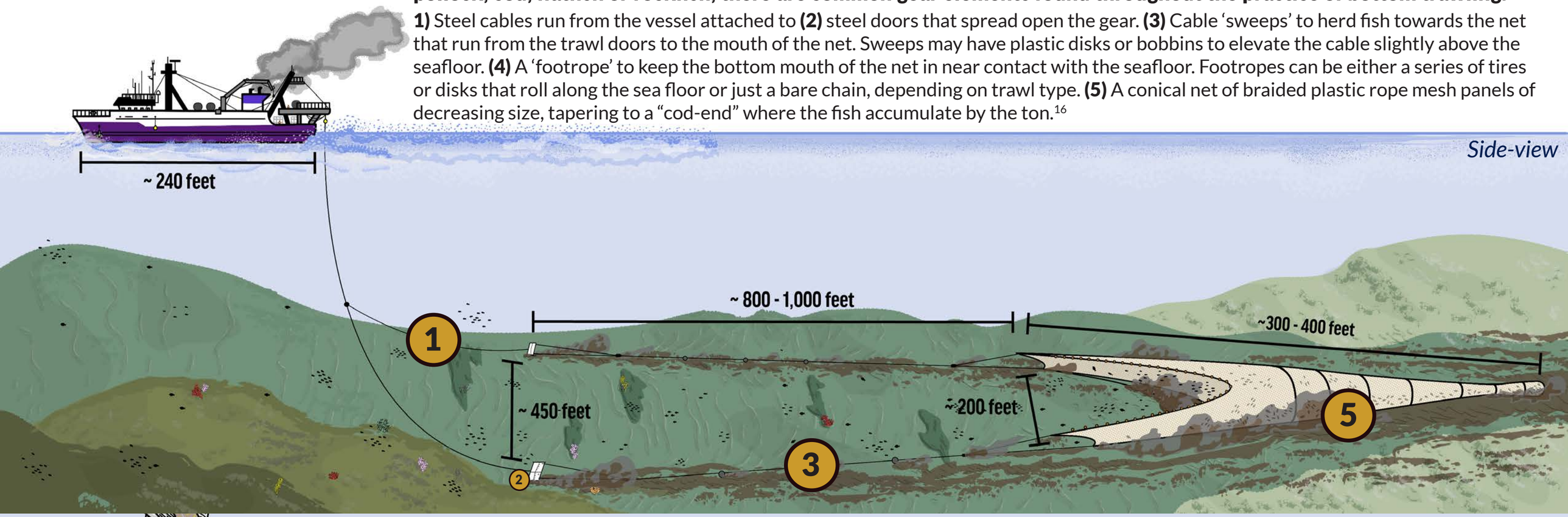
The stern of a trawl vessel in Kodiak. © Oceana
Photo opposite page: An undisturbed bubble gum coral provides shelter for a Pacific cod. © NOAA

OCEANA

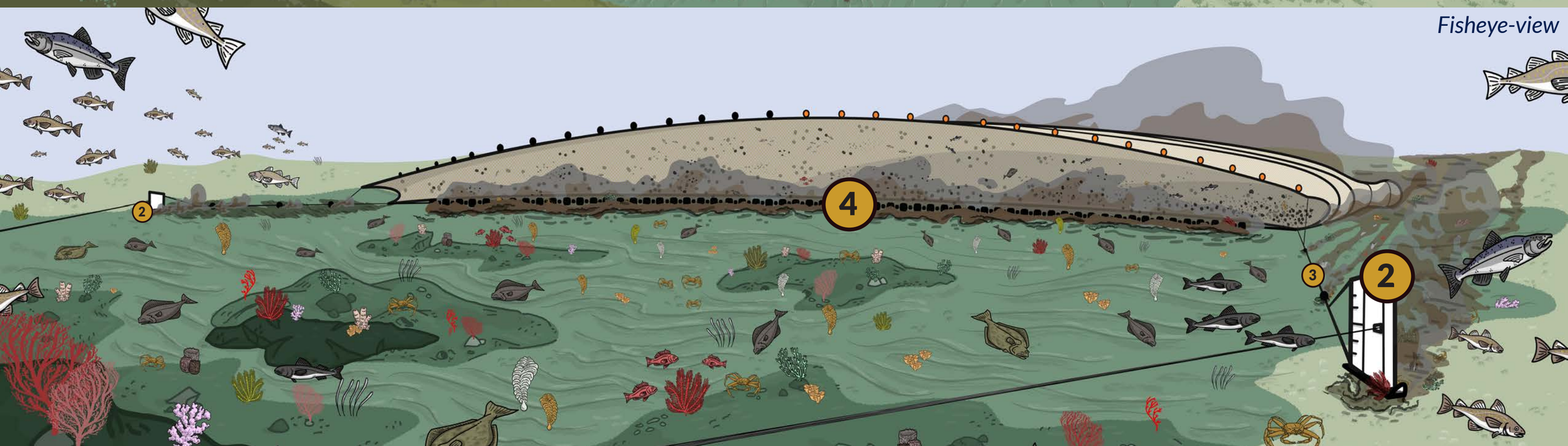
While factory trawlers and catcher vessel trawlers use different types of trawl gear for targeting pollock, cod, flatfish or rockfish, there are common gear elements found throughout the practice of bottom trawling:

1) Steel cables run from the vessel attached to **(2)** steel doors that spread open the gear. **(3)** Cable 'sweeps' to herd fish towards the net that run from the trawl doors to the mouth of the net. Sweeps may have plastic disks or bobbins to elevate the cable slightly above the seafloor. **(4)** A 'footrope' to keep the bottom mouth of the net in near contact with the seafloor. Footropes can be either a series of tires or disks that roll along the sea floor or just a bare chain, depending on trawl type. **(5)** A conical net of braided plastic rope mesh panels of decreasing size, tapering to a "cod-end" where the fish accumulate by the ton.[16]

Side-view



Fisheye-view



Fisheries in the Gulf of Alaska

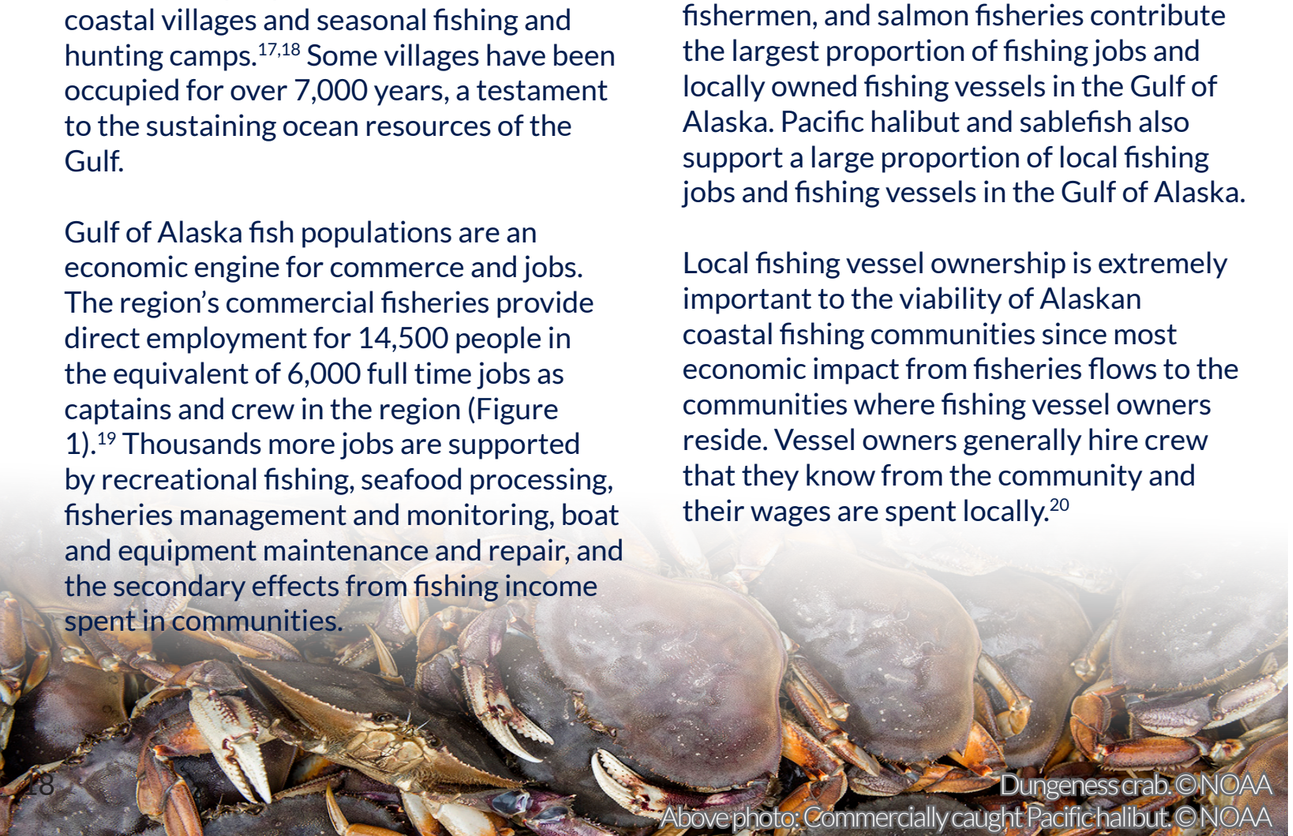
More than 40 species of fish and invertebrates are caught in the Gulf of Alaska. Salmon, crab, halibut, rockfish and other high value species are a source of jobs, food security and cultural identity for thousands of residents in the region. These same species are often caught and killed as bycatch in bottom trawl nets.

Indigenous peoples have utilized marine life sustainably from the Gulf of Alaska for millennia. Prior to Russian invasion in the 1700s, a population of 15 to 30 thousand Inupiat, Koniag, Tlingit, Sugpiak, and Athabaskan people lived in several hundred coastal villages and seasonal fishing and hunting camps.[17,18] Some villages have been occupied for over 7,000 years, a testament to the sustaining ocean resources of the Gulf.

Gulf of Alaska fish populations are an economic engine for commerce and jobs. The region's commercial fisheries provide direct employment for 14,500 people in the equivalent of 6,000 full time jobs as captains and crew in the region (Figure 1).[19] Thousands more jobs are supported by recreational fishing, seafood processing, fisheries management and monitoring, boat and equipment maintenance and repair, and the secondary effects from fishing income spent in communities.

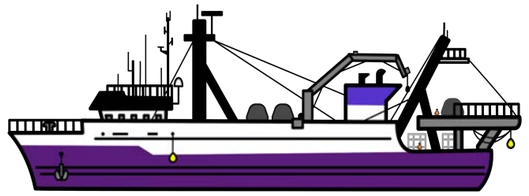
Salmon are the most important species in terms of total catch and value paid to local fishermen, and salmon fisheries contribute the largest proportion of fishing jobs and locally owned fishing vessels in the Gulf of Alaska. Pacific halibut and sablefish also support a large proportion of local fishing jobs and fishing vessels in the Gulf of Alaska.

Local fishing vessel ownership is extremely important to the viability of Alaskan coastal fishing communities since most economic impact from fisheries flows to the communities where fishing vessel owners reside. Vessel owners generally hire crew that they know from the community and their wages are spent locally.[20]



Dungeness crab. © NOAA
Above photo: Commercially caught Pacific halibut. © NOAA

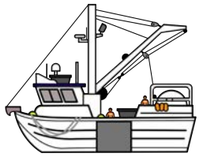
Trawl Fisheries



79 VESSELS

450 PEOPLE EMPLOYED

Small Boat Fisheries



5,400+ VESSELS

14,500 PEOPLE EMPLOYED

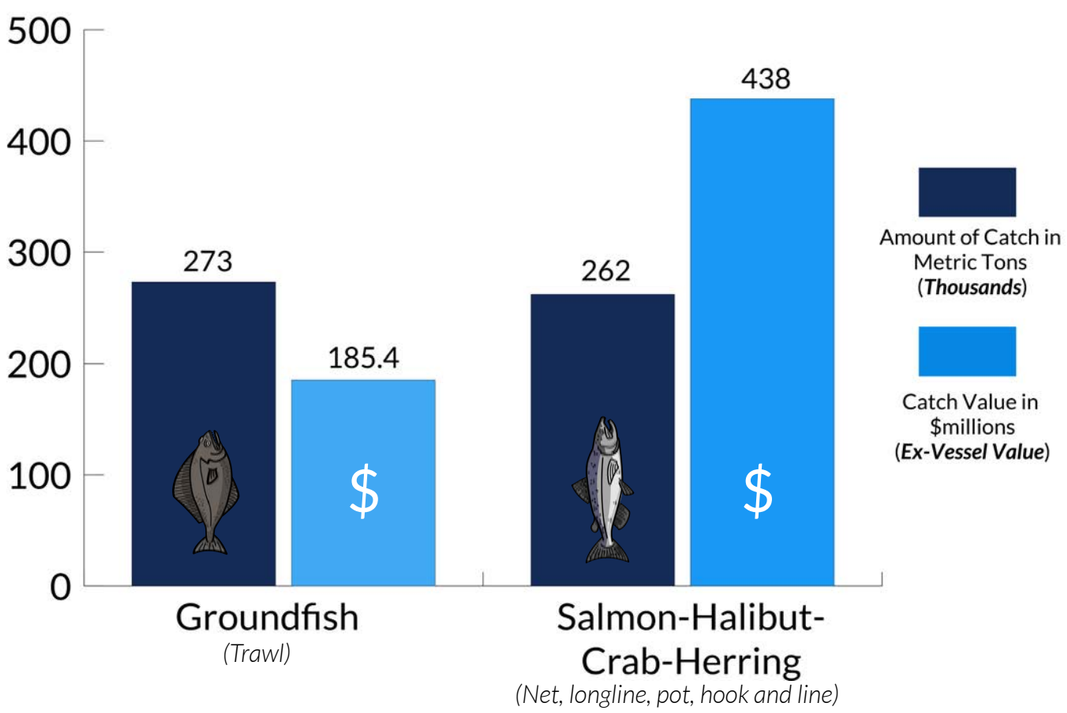


Figure 1: Economic comparison of the Gulf of Alaska's largest commercial fisheries.[19]

Trawl Fisheries in the Gulf of Alaska

Large volumes of "groundfish" (a catch-all term for finfish other than halibut and salmon) are caught by a relatively small number of trawl vessels. A trawler can drag up to 10 tons of marine life from the ocean floor in a single haul.

While trawl vessels remove huge amounts of groundfish, they only provide a small proportion of the Gulf of Alaska fishing jobs. The Gulf of Alaska trawl fleet in recent years has employed an average of 450 crew in 255 crew positions, accounting for 4% of the direct fishing harvest jobs in the Gulf of Alaska, and 3% of its workers.[21]

Factory trawlers provide little direct fishing and no processing employment for Gulf of Alaska communities.[21] Gulf of Alaska communities get some benefit from fish landings taxes levied on the factory trawl catch. Recently, some factory trawl companies sued the State of Alaska to abolish these taxes but were ultimately unsuccessful.[22]

Bottom Trawling: A Checkered Past

In the 1960's and 70's, foreign factory trawlers expanded into Alaskan waters and overfished stocks of groundfish species like Pacific ocean perch, pollock and sablefish. This damaged habitat and displaced local fisheries and ultimately led to the creation of the offshore 200 nautical mile Exclusive Economic Zones (EEZ) for coastal nations to have more control over their fisheries.

Today, foreign fishing is not allowed within the U.S. EEZ off Alaska (Figure 2) but the groundfish fisheries are still industrial operations dominated by bottom trawling.

Walleye pollock. © NOAA
Above photo: Vessels from the Amendment 80 trawl fleet. © NOAA

Pacific cod trawling is most efficient when cod schools aggregate densely in the winter while preparing to spawn. Trawlers are permitted to target cod during this spawning period before the start of other cod fisheries, scattering the schools and damaging the seafloor while leaving fewer cod for other smaller pot and longline cod fisheries.

Rockfish trawling claims to be a midwater fishery, yet catches corals and sponges and is on the seafloor as often as 40% of the time.[11]

Pollock trawling is regulated as a midwater fishing practice yet some pollock trawls make contact with the seafloor up to 100% of the time.[11]

Flatfish trawling damages habitat and catches halibut and other valuable species while dragging up low value species like arrowtooth flounder. In some years, the value of halibut killed as bycatch during flatfish trawling rivals the value of the total catch of the flatfish species being targeted (Table 1).

Industrial bottom trawl gear on net reels. © NOAA

Bottom trawling represents a clear threat to essential fish habitats, fish populations and local fisheries in the Gulf of Alaska while providing minimal economic benefit to local people and communities.

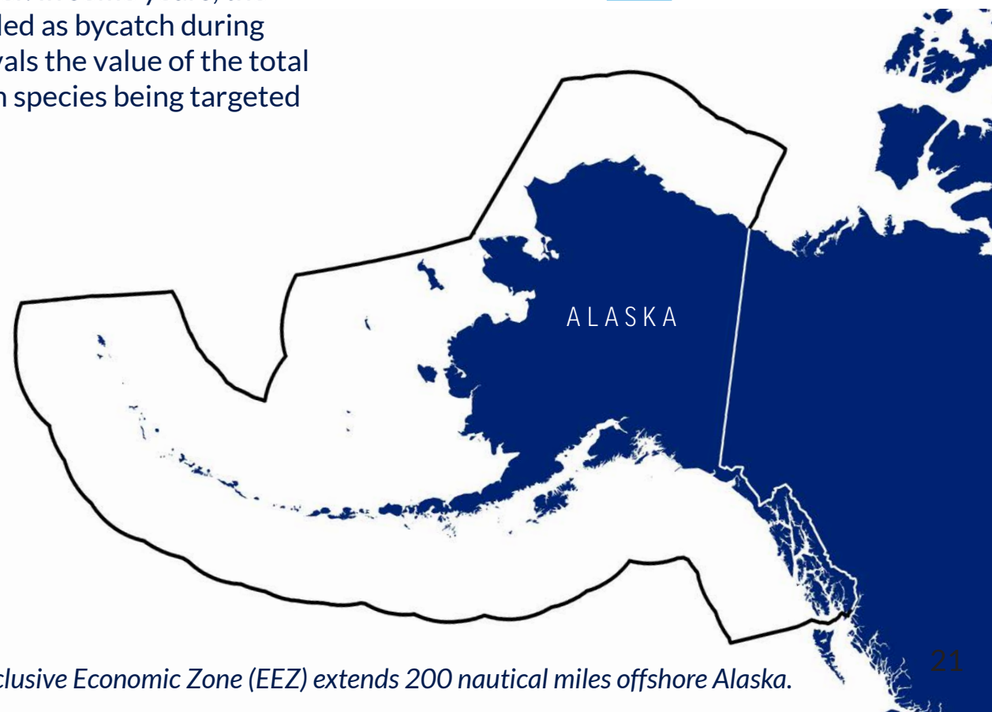


Figure 2: The U.S. Exclusive Economic Zone (EEZ) extends 200 nautical miles offshore Alaska.

Trawl Bycatch

While trawling can be profitable for a few participants, trawl nets catch and waste enormous numbers of salmon, halibut and other species. This catch of non-targeted species is known as "bycatch".

Fish, mammals, corals and other animals caught as bycatch are often tossed over the side dead or dying. Trawl fisheries in Alaska, especially bottom trawling, have discarded billions of animals as bycatch since trawling was introduced in 1960s. This includes salmon, halibut, rockfish, black cod, crab and other high value fish, living seafloor habitat like corals, sponges, and seawhips, and even seals, sea lions, dolphins and whales.

However, bycatch estimates in the trawl catcher vessel fleet are uncertain and likely underestimated. In recent years only 1 out of 6 of these bottom trawl trips was observed by a federal fisheries observer.[23]

Who's Watching the Fleet? The Need For Fishery Observers

Fishery observers are trained scientists who identify, count and monitor what fishing vessels catch, a crucial element of managing bycatch in bottom trawl fisheries. However, bottom trawl vessels without an observer on board take longer trips and return with 30 percent more catch on average than observed trips, a phenomenon known as the "observer effect" where vessels behave differently when an observer is on board. With only about 16% of trips[24] in the Gulf of Alaska observed, we don't know the true amount of bycatch occurring in these trawl fisheries.

In recent years, flatfish bottom trawl vessels in the Gulf of Alaska have caught and wasted so much halibut as bycatch that the value of their bycatch has outpaced the actual value of the fishery. For example, in 2017 Gulf flatfish trawlers caught $6 million worth of arrowtooth flounder in targeted catch and discarded $9.8 million worth of Pacific halibut as bycatch.[21]

Trawl Fishery	Halibut Mortality	Halibut Value Lost
Flatfish	1,735,030 lbs.	$9,800,000
Pacific cod	452,126 lbs.	$2,500,000
Pollock	307,919 lbs.	$1,700,000
Rockfish/Sablefish	205,084 lbs.	$1,100,000
Total	2,750,159 lbs.	$15,100,000

Table 1: Average annual halibut bycatch mortality in Gulf of Alaska trawl fisheries, 2015-2019.[21]

Trawl vessels in the Gulf of Alaska discard an estimated 24 million lbs. of bycatch each year, including:[25,26,27]

ROCKFISH
5.5 million lbs.

FLATFISH
4.6 million lbs.

HALIBUT
2.7 million lbs.

SABLEFISH
1.6 million lbs.

POLLOCK
3.1 million lbs.

PACIFIC COD
900,000 lbs.

TANNER CRAB
100,000 crab

CHINOOK SALMON
21,000 salmon

Pacific white-sided dolphins killed by a trawl fishery in Alaska. Obtained via FOIA request by Oceana.

Over 150,000 lbs. of living seafloor habitat including corals and sponges are caught as bycatch every year by trawl fisheries in the Gulf of Alaska.[27]

Policy Recommendations

Bottom trawling damages seafloor habitats and threatens the sustainability of local fisheries throughout the Gulf of Alaska. Fishery managers have a responsibility to take action to protect ocean habitats and minimize the damage from bottom trawling. This can be done in a way that helps ensure vibrant fisheries, healthy oceans and thriving local communities exist into the future.

1. Freeze the Bottom Trawl Footprint in the Gulf of Alaska

Federal fishery managers must build on their precautionary approach to habitat conservation by freezing the footprint of bottom trawling in the Gulf of Alaska and protecting key areas within the footprint. This fundamental conservation approach is necessary to prevent the expansion of bottom trawling into new areas, and to protect corals, sponges and other living seafloor habitat that still exist inside the footprint. This approach is an established practice in many regions and it is consistent with NOAA's Deep-sea Coral and Sponge Strategic Plan.[28] It has already been implemented off much of the U.S. West Coast, British Columbia, Bering Sea and Arctic. But not, however, in the Gulf of Alaska.

While some areas in the Gulf of Alaska have already been closed to bottom trawling, including off Southeast Alaska and some offshore seamounts, the vast majority of the central and western Gulf of Alaska remains open to bottom trawling.

2. Protect Priority Habitats Within the Trawl Footprint

Ecologically important and sensitive habitat features like rocky reefs, coral and sponge gardens, sea whip groves, and submarine canyons that are within the bottom trawl footprint should also be protected. Bottom trawl closures are an important tool for protecting areas known to contain sensitive habitats. Conservation areas can be identified by mapping the location and extent of priority habitat features and bottom trawl fishing effort, so that conservation actions protect important ecological areas but avoid core fishing grounds.

3. Reduce Bycatch and Establish 100% Observer Coverage in Gulf of Alaska Trawl Fisheries

Observer coverage is needed on all Gulf of Alaska trawling vessels. This will provide the best and most timely data that managers need to ensure trawl vessels do not exceed bycatch limits. Fishery managers must also establish hard caps on the amount of bycatch trawlers are allowed to catch, especially as valuable fish populations, such as salmon and halibut, are in decline across much of Alaska and many local, directed fisheries are asked to catch less.

Kodiak coastline. © Oceana

Above photo: A dusky rockfish hides underneath a bubblegum coral. © NOAA

Conclusion

The choices we make today in the Gulf of Alaska will cascade for generations and determine whether the region remains a vibrant ocean ecosystem home to abundant fish and wildlife, where people can live and thrive in partnership with the sea as they have for thousands of years.

Protecting corals, sponges and other vibrant and important habitats from bottom trawling is fundamental to that healthy future, especially considering the global threats our oceans face from climate change and other large scale human impacts we are still struggling to comprehend.

Right now, the North Pacific Fishery Management Council is in the process of their Essential Fish Habitat review to identify habitats that may be at risk from fishing and developing measures to protect them. This happens only once every five years, and we cannot afford to wait any longer to protect long-lived corals, sponges and other essential habitat areas in the Gulf of Alaska.

Join us today as we work to freeze the footprint of bottom trawling in the Gulf of Alaska, protect priority habitats within the trawl footprint, and reduce the waste of salmon, halibut, crab, corals and other species central to the lives of thousands of Alaskans.

Visit www.oceana.org/gulfofalaska to learn more and take action today.

Sunset over volcanoes in the Gulf of Alaska . © Oceana

References

1. Shester G and Warrenchuk J (2007) US Pacific coast experiences in achieving deep-sea coral conservation and marine habitat protection. Bulletin of Marine Science, 81(3)169-184.
2. Shester GG, Enticknap B, Mecum B, Blacow-Draeger A, Brock T and Murray S (2021) A Win-Win for Deep-Sea Corals and Fishing: Increasing Seafloor Protections While Restoring Fishing Opportunities Off the United States West Coast. Frontiers in Marine Science, 1218. doi: 10.3389/fmars.2020.525619
3. Levin LA and Mendoza GF (2007) Community structure and nutrition of deep methane-seep macrobenthos from the North Pacific (Aleutian) Margin and the Gulf of Mexico (Florida Escarpment). Marine Ecology. doi: 10.1111/j.1439-0485.2006.00131.x
4. Levin LA, Baco AR, Bowden DA, et al. (2016) Hydrothermal Vents and Methane Seeps: Rethinking the Sphere of Influence. Frontiers in Marine Science 19 May 2016. doi: 10.3389/fmars.2016.00072
5. Stone RP and Cairns SD (2020) Deep-Sea Coral Taxa in the Alaska Region: Depth and Geographical Distribution (v. 2020). Available: https:// deepseacoraldata.noaa.gov/library/2020-regional-deep-sea-coral-specieslist
6. Stone RP and Shotwell SK (2007) State of Deep Coral Ecosystems in the Alaska Region: Gulf of Alaska, Bering Sea and the Aleutian Islands. pp. 65-108. In: Lumsden SE, Hourigan TF, Bruckner AW and Dorr G (eds.) The State of Deep Coral Ecosystems of the United States. NOAA Technical Memorandum CRCP-3. Silver Spring MD 365p.
7. North Pacific Fishery Management Council (NPFMC) (2020) Fishery Management Plan for Groundfish of the Gulf of Alaska. November 2020. Anchorage, Alaska.
8. Hoff GR, Malecha PW, Rooper CN, et al. (2021) Science Plan for the Alaska Deep-Sea Coral and Sponge Initiative (AKCSI): 2020-2023. AFSC Processed Rep. 2021- 01, 45 p. Alaska Fish. Sci. Cent., NOAA, Natl. Mar. Fish. Serv., 7600 Sand Point Way NE, Seattle WA 98115
9. Brodeur RD (2001) Habitat-specific distribution of Pacific ocean perch (Sebastes alutus) in Pribilof Canyon, Bering Sea. Cont Shelf Res 21:207–224
10. Chaytor JD, Keller RA, Duncan RA and Dziak RP (2007) Seamount morphology in the Bowie and Cobb hot spot trails, Gulf of Alaska. Geochem. Geophy. Geosy. 8(9) doi:10.1029/2007GC001712
11. Olson J, Smeltz S and Lewis S (2022) Effects of Fishing on EFH Discussion Paper. North Pacific Fishery Management Council. February 2022.
12. Auster PJ and Langton RW (1999) The Effects of Fishing on Fish Habitat. American Fisheries Society Symposium 22: 150-187.
13. Freese L, Auster PJ, Heifetz J and Wing BL (1999) Effects of trawling on seafloor habitat and associated invertebrate taxa in the Gulf of Alaska. Marine Ecology Progress Series, 182: 119-126.
14. McConnaughey RA, Mier KL and Dew CB (2000) An examination of chronic trawling effects on soft-bottom benthos of the eastern Bering Sea. ICES Journal of marine Science, 57(5) 1377-1388. doi: 10.1006/jmsc.2000.0906
15. National Research Council (NRC) (2002) Effects of Trawling and Dredging on Seafloor Habitat. Washington, D.C, National Academy of Sciences, National Research Council
16. Witherel D, Fey M and Fina M (2012) Fishing Fleet Profiles, North Pacific Fishery Management Council. 72p.
17. Clark DW (1975) Koniag-Pacific Eskimo Bibliography (No. 35). Ottawa: National Museums of Canada.
18. Knecht RA and Jordan RH (1985) Nunakakhnak: An Historic Period Koniag Village in Karluk, Kodiak Island, Alaska. Arctic Anthropology, pp.17-35.
19. McDowell Group (2020) The Economic value of Alaska's Seafood Industry. Available: https://www.alaskaseafood.org/wp-content/uploads/McDowell-Group_ASMI-Economic-Impacts-Report-JAN-2020.pdf
20. Watson B, Reimer MN, Guettabi M and Haynie A (2021) Commercial fisheries & local economies. Journal of Environmental Economics and Management, 106. doi.org/10.1016/j.jeem.2021.102419
21. Fissel B, Ableman A, Dalton M, et al. (2022) Stock Assessment and Fishery Evaluation Report for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea/Aleutian Island Area: Economic Status of the Groundfish Fisheries off Alaska, 2020 (noaa.gov)
22. Brehmer E (2020) Supreme Court hears case in dispute over fisheries landings tax. In Alaska Journal of Commerce. Available: https://www.alaskajournal.com/2020-10-28/supreme-court-hears-case-dispute-over-fisheries-landings-tax
23. Alaska Fisheries Science Center and Alaska Regional Office (2019) North Pacific Observer Program 2018 Annual Report. AFSC Processed Rep. 2019-04, 148 p. Alaska Fish. Sci. Cent., NOAA, Natl. Mar. Fish. Serv., 7600 Sand Point Way NE, Seattle WA 98115.
24. Alaska Fisheries Science Center and Alaska Regional Office (2021) North Pacific Observer Program 2020 Annual Report. AFSC Processed Rep. 2021-03, 143 p. Alaska Fish. Sci. Cent., NOAA, Natl. Mar. Fish. Serv., 7600 Sand Point Way NE, Seattle WA 98115.
25. Alaska Regional Office, NOAA Fisheries, U.S. Department of Commerce (2021) Observed and Monitored Catch Tables – total catch of groundfish and halibut (retained and discarded) summarized by area and gear type. Average annual groundfish and halibut discards by Gulf of Alaska trawl gear 2015-2019. Available: https:// www.fisheries.noaa.gov/alaska/fisheries-observers/observed-and-monitored-catch-tables
26. Alaska Regional Office, NOAA Fisheries, U.S. Department of Commerce (2022) Fisheries Catch and Landings Reports in Alaska, BSAI/GOA Combined - Prohibited Species. Average annual prohibited species discards and halibut mortality by Gulf of Alaska trawl gear 2015-2019. Available: https://www.fisheries.noaa.gov/alaska/commercial-fishing/fisheries-catch-and-landings-reports-alaska
27. Benaka LR, Bullock D, Hoover AL and Olsen NA, eds. (2019) U.S. National Bycatch Report First Edition Update 3. U.S. Dept. of Commerce, NOAA. NOAA Technical Memorandum NMFS-F/ SPO-190. 95p.
28. National Oceanic and Atmospheric Administration, Coral Reef Conservation Program (2010) NOAA Strategic Plan for Deep-Sea Coral and Sponge Ecosystems: Research, Management, and International Cooperation. Silver Spring, MD: NOAA Coral Reef Conservation Program. NOAA Technical Memorandum CRCP 11. 67p.

www.oceana.org/gulfofalaska

OCEANA Protecting the World's Oceans

Oceana is the largest international advocacy organization dedicated solely to ocean conservation. Oceana is rebuilding abundant and biodiverse oceans by winning science-based policies in countries that control one-third of the world's wild fish catch. With more than 225 victories that stop overfishing, habitat destruction, pollution, and the killing of threatened species like turtles and sharks, Oceana's campaigns are delivering results. A restored ocean means that 1 billion people can enjoy a healthy seafood meal, every day, forever. Together, we can save the oceans and help feed the world. Visit usa.oceana.org to learn more.