

# BALEEN WHALES OF THE SALISH SEA



## Gray Whale

ESCHRICHTIUS ROBUSTUS



Baleen whale (filter-feeder);  
two blowholes side-by-side



Known for their heart-shaped blow



35-50 feet long



Group of about 12-14 "Sounders"  
visits Puget Sound in the Spring



Can weigh around  
52,000 pounds



Longest migration of any mammal; certain  
individuals travel – 13,700 miles, round trip



Cold water feeding and  
Warm water breeding



Prey types:  
Amphipods – ghost shrimp - mysids



## Gray Whale

### WHAT'S IN A NAME?

This whale's Latin name, *Eschrichtius robustus*, comes from: Eschrichtius – named after the Danish zoologist who worked with these animals, and robustus – meaning “strong”.

The common name “gray whale” comes from the gray patches and white mottling on the whale's skin and may also be in honor of British zoologist John Edward Gray.

**Interesting fact:** in the North Pacific gray whales were very heavily hunted, particularly in their breeding and birthing lagoons in Baja Mexico. Whalers would enter the lagoons to harpoon the young calves, and the protective mothers would then attack the small boats, earning them the nickname “devilfish”.

Today, they have gone from ‘devilfish’ to gentle giants. Gray whales by nature are very curious, gentle, and friendly and a small percentage of them have become ‘amistosos’ or ‘friendlies’ in the protected lagoons of Baja. They will approach small boats, sometimes even lifting their young calves up to waiting hands eager to make contact. The purpose of this behavior is unknown and almost always takes place in these protected birthing lagoons.



## Gray Whale

### WHAT'S A BALEEN WHALE?

The most obvious difference between a toothed whale and a baleen whale is the way that they feed and what's inside their mouth.

Toothed whales (including all dolphins and porpoises) have teeth made of bone, like we do, and actively hunt fish, squid, and other sea creatures, including marine mammals and other small whales, dolphins, and porpoises. In many toothed whale species, their teeth help them capture, bite, and tear their food into smaller pieces before swallowing.

There are exceptions; certain species may only have teeth for part of their lifespan or not use them for feeding purposes, at all.

Baleen whales have several hundred plates that hang from their upper jaw, instead of teeth. These plates are made of keratin, the same substance as our hair and fingernails, and are used to filter food from the water or the sediment. Once the food has been trapped in the baleen plates, the whales will use their massive tongues to scrape the food off and swallow it. Gray whales are predominantly bottom feeders, filtering sediment to find their food, and are the only baleen whale that primarily feeds in the sediment this way.



### GHOST SHRIMP



# BALEEN WHALES OF THE SALISH SEA



## Gray Whale

### WHAT'S A BALEEN WHALE?

In addition to the way that baleen whales feed versus the way toothed whales feed, baleen whales also have two blowholes while toothed whales only have one.

Both toothed whales and baleen whales are mammals and must come to the surface to breathe air, like humans do. They inhale and exhale air through their blowholes, located at their top of their heads.

While it isn't entirely known why toothed whales have one blowhole while baleen whales have two, when looking at the evolutionary aspects of the skull in toothed whales versus baleen whales, toothed whales' skulls are more asymmetrical. It is thought that toothed whales' melons (the organ at the front of the head that helps to direct echolocation clicks away from the body) may be the reason for this difference. In contrast, baleen whales' skulls are more symmetrical, as they are not echolocators and do not have a melon.



## Gray Whale

### HISTORY OF WHALING

Gray whales were heavily hunted throughout history. Two populations in the Atlantic were hunted to extinction by the 1700s; in the Pacific they were almost extirpated in the mid-1800s, and again pushed to the brink in the early 1900s. Protection from commercial whaling in 1947 allowed the population to recover to roughly 20,000 animals and they were removed from the Endangered Species List in 1994. Since then, gray whales have experienced two Unusual Mortality Events (UME) with dramatic die-offs possibly related to malnutrition. The first UME took place in 1999-2000, resulting in a loss of roughly a quarter of the overall population. Since then, the population had recovered to an estimated 27,000 individuals. A new UME was declared in 2019 with nutritional stress questions resurfacing. It's too early to determine the cause and how this has affected the overall population.



# BALEEN WHALES OF THE SALISH SEA



## Gray Whale

### BEHAVIORS (AROUND THE PACIFIC)



**TOP LEFT:** “Blow” or “Spout” – the gray whale has two blowholes causing their exhalation to take on a heart-shaped appearance if seen from the right angle. This characteristic can help you distinguish grays from other Salish Sea baleen whales when you see them on the water.

**TOP RIGHT:** “Fluking,” “Diving,” or “Sounding” – Occurs in deeper water after a few subsequent breaths and is indicated by the whale’s “flukes” above the surface, caused when positioning the body for a deeper dive.

**LEFT:** “Spyhop” or “Aerial Scan” - a vertical move in which the gray whale’s head would come up out of the water, sometimes revealing the eyes. One theory is that whales spyhop to get a better view of activity on the surface of the water.



# BALEEN WHALES OF THE SALISH SEA



## Gray Whale

### BEHAVIORS (AROUND THE PACIFIC)



**TOP LEFT:** “Bottom Feeding” – typically occurs along the tideline in shallow waters when in the Salish Sea. Gray whales will drag one side of their face through the sediment to filter for ghost shrimp and crustaceans. Plumes of mud can be seen being pushed out through the baleen, effectively trapping their food in this filtration system. They then use their tongue to dislodge the food and swallow it.

**TOP RIGHT:** “Skimming” or “Surface Feeding” – Gray whales will also skim the surface, filtering water, to feed on other mysids.\*

**LEFT:** “Breaching” – jumping up out of the water to come crashing back down on the surface. It is assumed to be used to fluff off barnacles and lice, and may be a mode of acoustic communication, though exactly what they’re communicating is unknown. This behavior could also be a form of play. Some of these behaviors are more likely to be seen with more frequency in the warm-water breeding grounds than in cold-water feeding grounds.



# BALEEN WHALES OF THE SALISH SEA



## Gray Whale

COMMON BEHAVIORS SEEN ON THE WATER IN THE SALISH SEA



**TOP ROW: A SUCCESSION OF WHAT IT LOOKS LIKE TO SEE AN ACTIVE GRAY WHALE IN THE SALISH SEA**

**TOP LEFT PHOTO:** Blows or Spouts – the visible exhalation of a gray whale as the animal breaks the surface for a breath; **TOP MIDDLE PHOTO:** Surfacing – after the exhalation and inhalation of air, the gray whale may submerge itself, revealing its back and dorsal ridge in the process. Often, a few successions of breaths are taken before seeing the last behavior. **TOP RIGHT PHOTO:** Fluking or Diving – when a gray whale positions to take a deeper dive, showing the underside of the tail flukes (this typically will not happen if in shallow water).

**BOTTOM PHOTO:** Feeding in Shallow Water – when a gray whale is feeding in shallow water, it is common to see a portion of the pectoral fin and the tip of one side of the tail as it drags its jaw through the sediment. It is common for first time viewers to mistake this view for two separate whales if they don't know what they're seeing.





# BALEEN WHALES OF THE SALISH SEA



## Gray Whale

### MIGRATION: SPECIAL POINTS OF INTEREST

Gray whales are migratory, spending the winter at breeding and birthing lagoons in the warm waters of Baja, Mexico, then traveling to spend the summer in cold water feeding grounds in the Bering and Chukchi Seas. They make the longest migration of any mammal at 10,000-12,000 miles roundtrip.

There are special areas of interest along the gray whale migration route. The yellow markers indicate these areas, and the following pages provide more details.



# BALEEN WHALES OF THE SALISH SEA



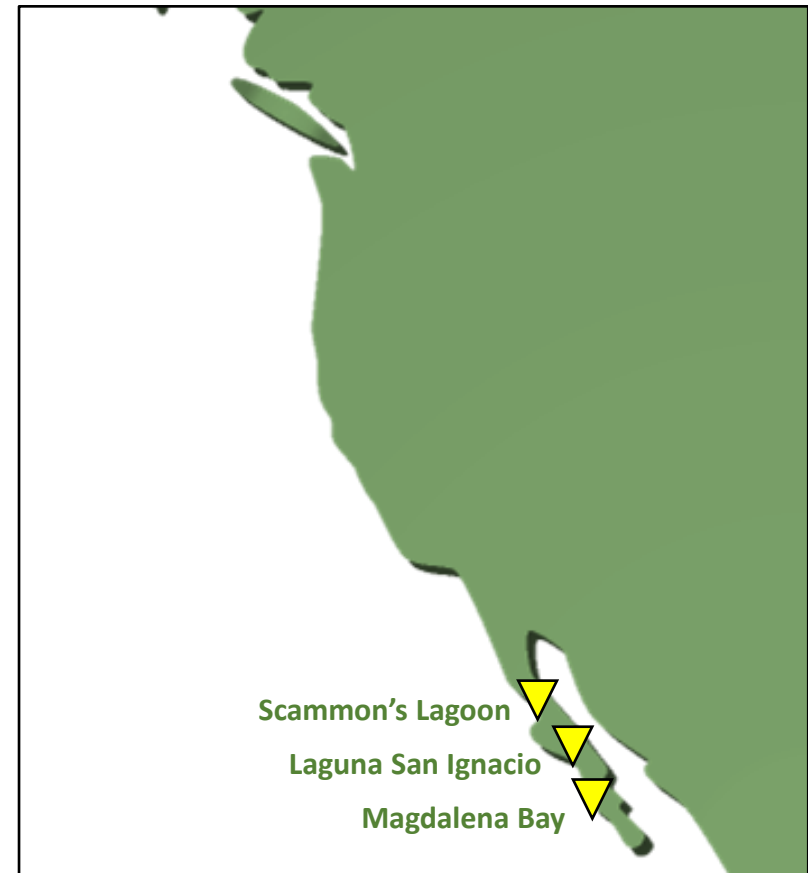
## Gray Whale

In the fall, gray whales begin migrating south along the Pacific coastline to the coastal waters and bays of Baja, Mexico. Here, females give birth in the protected waters, after having mated there the previous year.

The newborn whales are roughly a quarter to a third the length of their mothers, and they nurse on roughly 50 gallons of milk per day, which is 53% milk fat.

After two to three months, mother and calf head back north on a perilous journey, thousands of miles to where she will find food again for the first time in several months.

### MIGRATION: BIRTHING LAGOONS OF MEXICO



# BALEEN WHALES OF THE SALISH SEA



## Gray Whale

MIGRATION:  
LAGUNA SAN IGNACIO  
BAJA, MEXICO

The smallest and most pristine of the lagoons, and part of the Vizcaino Biosphere Reserve, Laguna San Ignacio came under threat in the 1990s when Mitsubishi and the Mexican government announced plans to build the world's largest salt factory along its shores. Environmental groups and the local Mexican people fought the development and were successful. Today, Laguna San Ignacio is the best place to see gray whales in a natural, highly regulated, and protected environment.

In addition to their amazing natural activities, some gray whales also exhibit friendly behavior in an incredible display of gentleness and trust. These "friendlies" approach boats and allow people to touch them and their newborn calves.



# BALEEN WHALES OF THE SALISH SEA



## Gray Whale

MIGRATION:  
PACIFIC CONTINENTAL SHELF

Not all gray whales travel the entire 5-6,000-mile journey from Mexico to the Arctic for summer feeding.

After several months without food, a few hundred gray whales called the **Pacific Coast Feeding Group (PCFG)**, find enough to feed on from a variety of prey types including vast swarms of mysids—small, shrimp-like crustaceans—among kelp beds along the coast from Northern California to Southeast Alaska. The same individuals return to these feeding areas each year, and mothers bring their young calves. Each gray whale is estimated to eat about a ton of mysids per day.

The PCFG is recognized by Canada and the IWC as a distinct unit based on photo-ID and differences in mitochondrial DNA which they inherit from their mothers.



# BALEEN WHALES OF THE SALISH SEA



## Gray Whale

MIGRATION:  
MONTEREY CANYON,  
CALIFORNIA

On their way north to feeding areas, gray whale mothers with calves tend to stay close to shore in the kelp, avoiding detection by hungry orcas. However, when they approach the vast Monterey Canyon, some gray whales take the shortcut across deeper water, where orcas can detect and hunt them more easily.

Once the orcas find the gray whales, they separate the mother from her baby and eventually drown and make a meal of the calf. It is possible that transient orcas consume up to 1/3 of gray whale calves each year.



# BALEEN WHALES OF THE SALISH SEA



## Gray Whale

### MIGRATION: POSSESSION SOUND & SARATOGA PASSAGE

About a dozen gray whales, known as the North Puget Sound gray whales, or “Sounders,” break off their northern migration to feed for two to three months each spring in Puget Sound before continuing their journey north to Alaska.

Shallow mudflats in Saratoga Passage, and along south Whidbey and Camano Islands, are habitat for ghost shrimp and other invertebrates buried in the sediment. The Sounders seem to know where to find these shrimp and how to safely feed in the shallow waters. Some individuals from this group have been returning here since 1990 and appear to have discovered this area during years of elevated mortality when they were seeking productive areas to feed not too far off their migration route.



# BALEEN WHALES OF THE SALISH SEA



## *Gray Whale*

MIGRATION:  
FALSE PASS, ALASKA

Most of the gray whales heading to Arctic feeding grounds take a short cut through a narrow channel in the Aleutian Islands called False Pass. Waiting there are groups of mammal-eating orcas intent on drowning and eating gray whale calves.

Gray whale calves' carcasses are often dragged into the shallows where they are feasted upon for several days.

Predation by orcas is a major cause of gray whale calf mortality. Gray whales often shift their migration routes in areas where they have encountered mammal-eating orcas in the past.



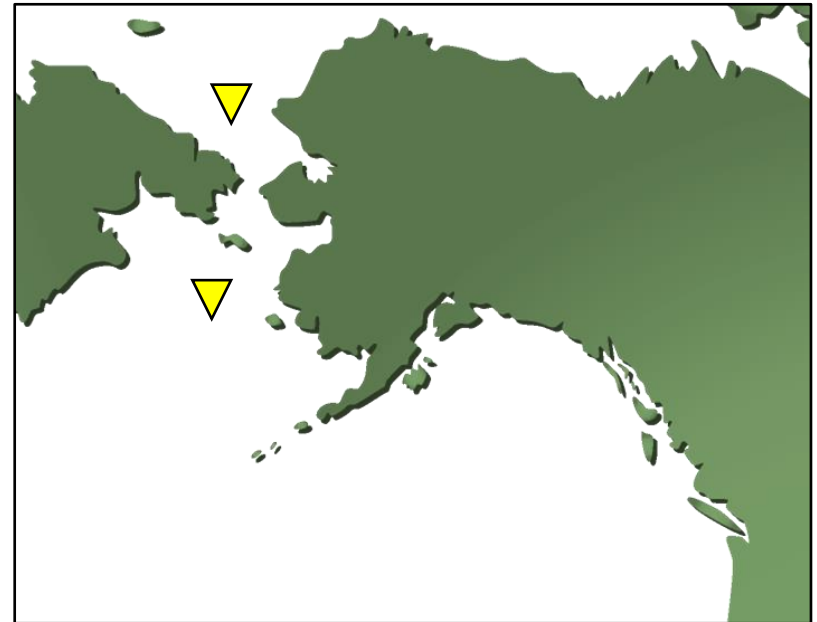
# BALEEN WHALES OF THE SALISH SEA



## Gray Whale

MIGRATION:  
BERING & CHUKCHI SEAS

In late spring and summer, most eastern Pacific gray whales arrive in the northern Bering and south Chukchi seas. Here, they filter tons of shrimp-like organisms, called amphipods, through their baleen plates. They are also opportunistic feeders and will occasionally eat other prey items such as marine worms, krill, or small forage fish.



Climate change may be affecting gray whales in a few ways. As the Arctic ice caps retreat, this may create added access to more ice-free feeding areas. However, warming oceans may also negatively affect the primary prey of gray whales.





# BALEEN WHALES OF THE SALISH SEA

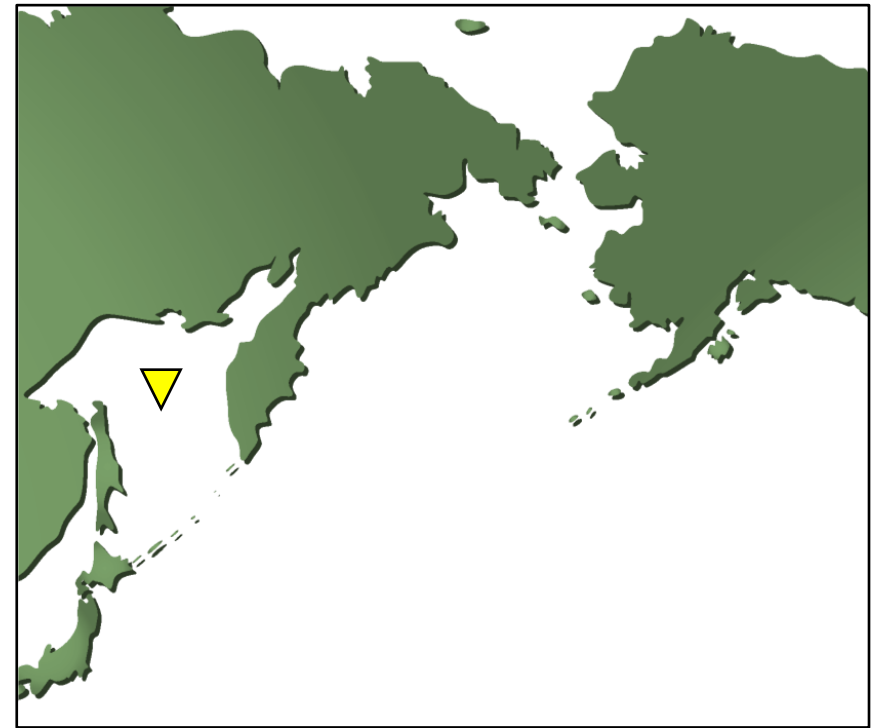


## Gray Whale

MIGRATION:  
SEA OF OKHOTSK, RUSSIA

Western Pacific gray whales were once believed extinct, but in the 1970s about 130 were discovered off Sakhalin Island, Russia which is their only known feeding ground. They currently number 200 individuals and are listed internationally as critically endangered.

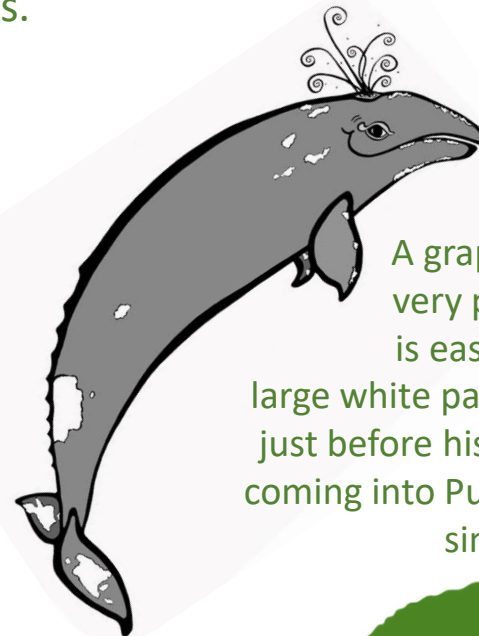
Originally thought to be a distinct population, recent satellite tagging and photo identification data are showing that many of the western gray whales are traveling across the Pacific Ocean and joining the eastern Pacific population on their migration to Baja. These recent findings have called into question the status and number of western gray whales.



## Gray Whale

### HISTORY OF THE “SOUNDERS”: A UNIQUE GROUP OF GRAY WHALES

The North Puget Sound gray whales, also known as the "Sounders," represent roughly a dozen individual whales, part of the larger population of the Eastern North Pacific gray whales. They are also sometimes referred to as the Puget Sound Regulars or the Saratoga Grays. During their northern migration from Baja California, these individuals break off their migration route to feed on ghost shrimp for 2-3 months each spring (approx. March-May) in the North Puget Sound waters. They then continue north to the Bering and Chukchi seas for summer feeding. In the North Puget Sound, they are generally spotted feeding around the southern ends of Whidbey and Camano Island, Saratoga Passage, Port Susan, Gedney/Hat Island, and the Snohomish River Delta. Feeding pits, large pits in the sediment layer created when the whales forage for ghost shrimp close to shore, have been seen in these areas via satellite images.



A graphic of #49 “Patch”, a very popular Sounder that is easily recognized by the large white patch on his right flank, just before his tail. Patch has been coming into Puget Sound every year since 1991.



# BALEEN WHALES OF THE SALISH SEA



## Gray Whale

### HISTORY OF THE “SOUNDERS”: A UNIQUE GROUP OF GRAY WHALES

The sex of 10 of these whales has been determined genetically from skin samples, 7 are male and 3 are female. None of the known females has been seen with a calf, though there have been periodic gaps in their visiting the area which may indicate they are calving some years but not bringing the calf to the area. This could be due to later timing in migration after having a calf, or to avoid risk to the calf with the dangerous technique of feeding in the shallows close to shore.

The first individuals were sighted in the early 1990s which was a period of high mortality in the gray whale population. A second wave of animals joined during the 1999-2000 Unusual Mortality Event that killed close to a third of the gray whale population.

Confirmed N Puget Sound gray whale IDs seen in multiple recent years compiled by Cascadia Research

ID	Name	Sex	1990	1991	1992	1993	1994	1995	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Yrs	
21	Shackleton	M	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	31	
22	Earhart	F	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	31	
44	Dubnuck	M	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	30	
49	Patch	M	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	30	
53	Little Patch	M	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	30	
56		M	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	30	
185		M							█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	23	
356									█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	22	
383		M							█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	22	
396		F							█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	22	
531		F							█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	21	
723	Lucyfer	M								█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	21	
2246																																3	
2249																																	2
2255																																	2

█ NPS area  
█ PCFG area only



# BALEEN WHALES OF THE SALISH SEA

## Gray Whale

### IDENTIFYING INDIVIDUALS

Gray whales are identified as individuals by photographing the sides of the whale (dorsal ridge area) as well as the underside of their tail flukes. Each individual adult has unique markings and patterns that are different from one another. Gray whales have some natural markings as well as a varying degree of white circular markings from where barnacles have lived and then fallen off, leaving this discoloration. Often, congregations of these barnacles, once dislodged, will leave larger white patches, making certain individuals easier to identify. This same occurrence happens on the underside of their tails.

Sometimes, the unique patterns and markings, or divots along the trailing edge of the tail, are considered when giving gray whales their nicknames.



# BALEEN WHALES OF THE SALISH SEA



## Gray Whale

INDIVIDUALS:  
#21 "SHACKLETON"

Male; First Identified: May 3<sup>rd</sup>, 1990. #21 "Shackleton" was identified during Cascadia Research Collective's initial survey of the North Puget Sound region. He appears to be one of the individuals who pioneered the risky feeding behavior in shallow intertidal waters, earning him the name "Shackleton" after the renowned polar explorer. He was originally identified with #22 "Earhart" who he is still frequently seen with. Shackleton rarely flukes when diving, possibly because of an injured peduncle. In 2008, Cascadia Research Collective was able to catch an exact departure date for him when he was spotted headed north along the southwest coast of Vancouver Island on May 24<sup>th</sup>.



\*Partial fluke shot; Shackleton is believed to have a peduncle injury causing him not to fluke too often.



# BALEEN WHALES OF THE SALISH SEA



## Gray Whale

INDIVIDUALS:  
#22 "EARHART"

Female; First Identified: May 3<sup>rd</sup>, 1990. #22 "Earhart" was one of the very first gray whales identified in Puget Sound and is one of the few females in the group. She was named after Amelia Earhart for her pioneering feeding technique in the intertidal waters. Since she has never been seen with a calf and there are gaps in sighting years, it is suspected that she does not enter Puget Sound during the years she has a calf. On April 23<sup>rd</sup>, 2017 Earhart was hit by boat and sustained an injury to her left side. The extent and severity of this injury was not known at the time, but she appears to have recovered and continues to return to Puget Sound each spring.



# Gray Whale

INDIVIDUALS:  
#44 "DUBKNUCK"

Male; First Identified: March 6<sup>th</sup>, 1991. #44 "Dubknuck" was named for the double knuckles along his back behind the dorsal hump. Dubknuck was first identified in southern Puget Sound in 1991 and was sighted multiple times in various locations around the Sound over the next month. On April 25<sup>th</sup>, he was seen in Port Susan, seeming to have discovered the productive feeding grounds in that area and joining some of the regular gray whales there. He has returned most years since 1991.



# BALEEN WHALES OF THE SALISH SEA



## Gray Whale

INDIVIDUALS:  
#49 "PATCH"

Male; First Identified: April 17<sup>th</sup>, 1991. #49 "Patch" is a local favorite who was first identified in Puget Sound in 1991 and has been seen every year since. He appears to leave the area in May and was seen heading north along Vancouver Island on May 7<sup>th</sup>, 2012. In April 2010 he was witnessed being harassed by Bigg's (Transient) orcas but was able to protect his vulnerable underside by turning over and then moved into shallower water for safety. On March 25<sup>th</sup>, 2016 Cascadia Research Collective deployed a video tag on Patch which showed him closely associating with gray whales #531 and #723. He was seen swimming beside them as well as resting on the bottom.





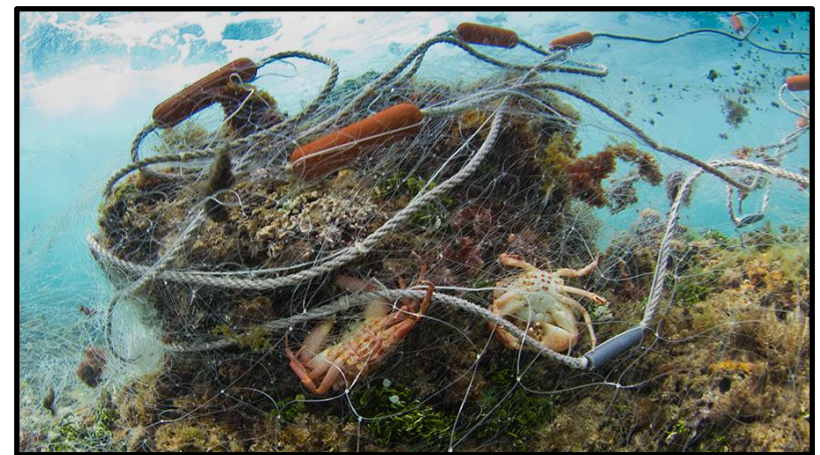
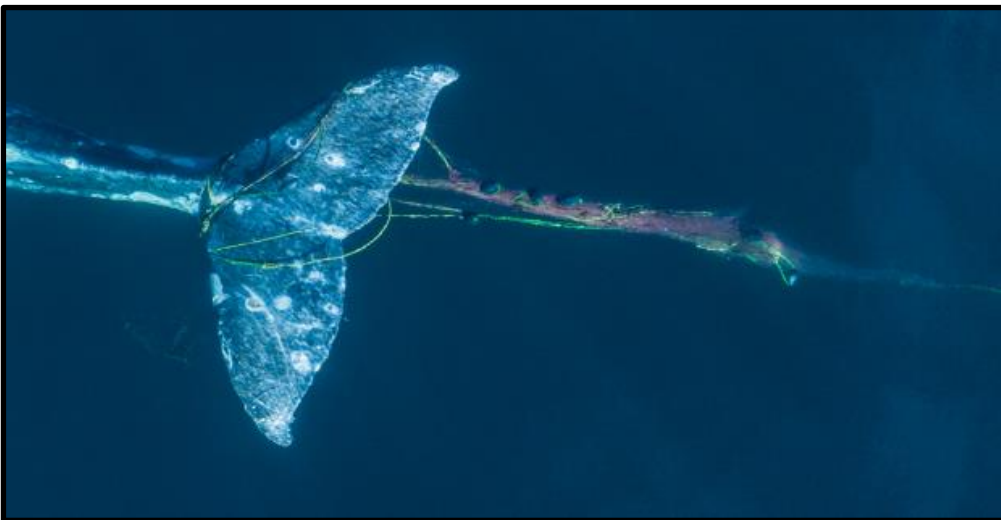
## Gray Whale

### THREATS & HOW YOU CAN HELP

- **Entanglement in Fishing Gear**

Gray whales are at high risk of becoming entangled in fishing gear. Once entangled, whales may drag and swim with attached gear for long distances or be anchored in place and unable to swim. Events such as these result in fatigue, compromised feeding ability, or severe injury, which may ultimately lead to death. Crab pots are becoming an increasing threat along the west coast to all baleen whales.

- **How you can help:** Report an entangled whale so a professional team can respond and assist! Entanglement Reporting Hotline: 1-877-SOS-WHAL or U.S. Coast Guard VHF 16. If it's possible, collect any derelict fishing gear you can find and dispose of it properly. If you are unable but know where the gear is located, call the Derelict Gear Hotline: 1-800-853-1964. If you're a fisher, yourself, **always return to collect any fishing gear that you've used.** Research potential alternatives in the type of gear used for different fishing practices (there are scientists and technicians currently working on alternatives: <https://www.forbes.com/sites/ariellasimke/2020/03/14/new-pop-up-fishing-gear-could-reduce-whale-entanglements/#207a5f0f2b8c>).



## Gray Whale

### THREATS & HOW YOU CAN HELP

- **Ingesting Plastics & Trash – Causing Starvation and Death**

Gray whales are bottom feeders, scooping up the mud to filter ghost shrimp through their baleen. Plastic that has sunk to the bottom of the sea is a source of danger to gray whales because it gets stuck in the whales' stomachs and cannot be digested (the stomach won't break down the plastic). The whale thinks it's full and won't eat anymore. When this happens the whale's life is threatened because it can eventually die of starvation.

- **How you can help: always** dispose of trash where it belongs. Pick trash up in your neighborhood, local parks, near a stream, river, hiking trails, public beaches, and other public places. Even inland plastic and trash can get blown into a moving body of water that leads to the sea and the ocean.



\*National day to inspire clean-up events on any and every coast. Check local organizations for groups and involvement.



## Gray Whale

### THREATS & HOW YOU CAN HELP

- **Vessel Strikes**

Gray whales are vulnerable to vessel strikes because they feed and migrate along the U.S. west coast, which has some of the world's heaviest vessel traffic associated with some of the largest ports in the country. Gray whales may also be vulnerable to vessel strikes in the inland waters of Washington and in feeding areas along the Pacific coast.

- **How you can help:** Purchase American-made items. Shop local and sustainably. These two actions can help reduce the amount of freighters that cross the ocean to bring goods to North America. Also slow your vessel to 7 knots and keep a close watch when transiting through areas where gray whale reports have recently been made, or where whales are sighted often.



# BALEEN WHALES OF THE SALISH SEA



## Gray Whale

### THREATS & HOW YOU CAN HELP

- **2019 – 2021 Unusual Mortality Event (UME)**

Since January 1, 2019, elevated gray whale strandings have occurred along the west coast of North America from Mexico through Alaska. This event has been declared a UME. Full or partial necropsy examinations were conducted on a subset of the whales. Preliminary findings in several of the whales have shown evidence of emaciation. These findings are not consistent across all of the whales examined, so more research is needed.

As part of the UME investigation process, NOAA has assembled an independent team of scientists to coordinate with the Working Group on Marine Mammal Unusual Mortality Events to review the data collected, sample stranded whales, consider possible causal-linkages between the mortality event and recent ocean and ecosystem changes/stressors and determine the next steps for the investigation.

- **How you can help:** Report gray whales that appear to be stranded, whether live or dead, to a local Marine Mammal Stranding Network (Orca Network houses the Central Puget Sound Marine Mammal Stranding Network which encompasses Whidbey, Camano, much of Skagit, and north Snohomish Counties). Call 1-866-ORCANET or use U.S. Coast Guard VHF channel 16. Responders will assess the situation and may be able to perform a necropsy to gather vital health data on the individual.

