



Humpback

Whales

And The

California—

Costa Rica

Connection

By

John Calambokidis

Just 30 years ago, the humpback whales off central California, hunted from whaling stations based in San Francisco Bay, were nearly wiped out. Then, in the 1980s, sightings began increasing, suggesting recovery. Still, little was known about how many whales there were feeding off California, where they were coming from, and where they migrated to each winter.

Humpback whales in the North Pacific had generally been thought to spend their winter months, in warm waters near the tropics, in three primary regions: the waters near Mexico, Hawaii, and Japan. Their movements are part of an annual cycle typical of most baleen whales which spend their summers feeding in high-latitude colder waters, and migrate in the winter to low-latitude warmer waters where they mate and give birth. In the North Pacific, humpback whales feed primarily in coastal waters from southern California to Alaska, along the Aleutian island chain, and south to waters off northern Japan.

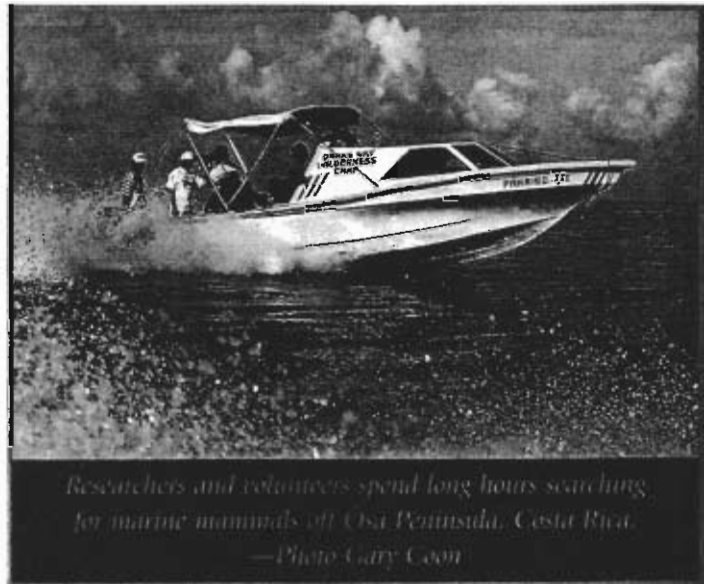
The humpbacks along California show up around June and stay for about six months. They spend their time feeding in the upwelling, nutrient rich waters along the coast where Cascadia Research, an independent marine mammal research organization that I work for, began studying them in 1986.

Before you can track a whale, you first need to be able to recognize it whenever it appears. Each humpback whale has distinct coloration markings on the underside of its tail flukes, much like every human has

distinct fingerprints. And each fluke has its own distinctive profile of peaks and valleys. We now have a whole gallery of photographs, and, by avoiding duplication, we can estimate population sizes, and follow their migration routes. Variations of this technique for identifying individual humpback, gray,

2,000 blue whales.

Despite our success, we still didn't know where all these humpback whales went in the winter, although we assumed that they moved south, off Mexico. We first became intrigued about the California-Costa Rica connection around 1988, after we heard about sightings of



Researchers and volunteers spend long hours searching for marine mammals off Costa Rica.
—Photo Gary Coon

right, killer, blue, and fin whales have been the foundation for revolutionizing our knowledge of these species over the last two decades.

When we began identifying humpbacks, we were primarily trying to find out how many whales were feeding in the Gulf of the Farallones National Marine Sanctuary off San Francisco. Since then our research has been expanded to include waters off all of California, Oregon, and Washington. We have identified more than 900 different humpback whales and more than a thousand blue whales. From this we have determined that, at any one time, there are about 700 humpbacks in this population and, spread out over a much wider area, some

humpback whales off Costa Rica in the winter. Our request for photographs produced two separate responses and, from the four images sent, we immediately recognized three individuals we had seen off California.

One of my colleagues at Cascadia Research, biologist Gretchen Steiger, published these surprising findings in *Marine Mammal Science*, but with such an extremely small sample, we couldn't reach any definitive conclusion about a whole population. The only way we were going to learn more about these animals off Costa Rica was to go there ourselves. We were joined in this effort to learn more about the Costa Rican humpback whales by Kristin Rasmussen, a biologist who

first worked with us studying humpback whales off California and had become fascinated with the humpback whales off Costa Rica after hearing them singing underwater while traveling in the area. Kristin, Gretchen, and I began searching for a way to conduct this research.

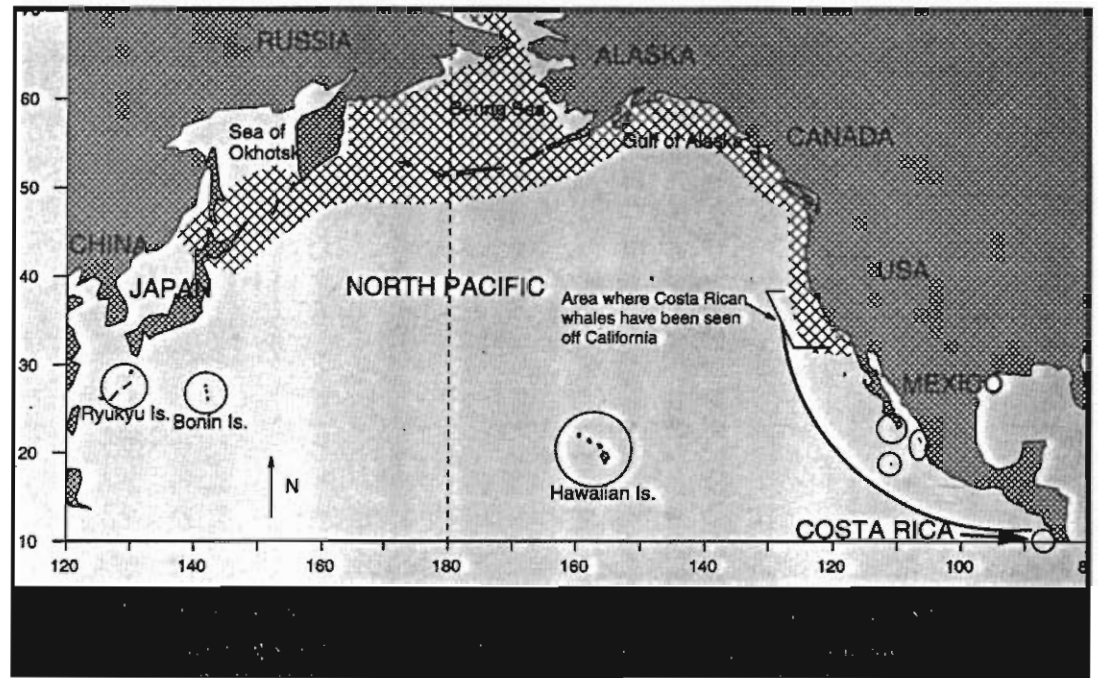
In 1995 we contacted the Oceanic Society to enlist their assistance, and, over the next two years, teams of volunteers, organized by Oceanic Society and Cascadia Research joined our research effort to study humpback whales and other marine mammals off Costa Rica.

We had several scientific objectives. First, we wanted to get an idea of how many humpback whales inhabited these waters each winter; second, figure out where they were coming from; and third, we wanted to examine their behavior and determine whether these whales were giving birth in the area.



Back at the lodge, expedition participants study photographs of flukes, looking for unique marks that identify individual whales.
Photo Gretchen Steiger

Because relatively little was known about any marine mammal species off Costa Rica, we were also interested in documenting which other marine mammals frequent-



ed these waters.

Our base was, and is, Drake Bay Wilderness Camp, on the Osa Peninsula, Costa Rica. This remote wilderness lodge is set near one of Costa Rica's largest parks, Corcovado National Park. When we weren't busy conducting our research, we were enter-

colored toucans perch high in the trees, howler monkeys cry, and great blue morpho butterflies flit between blooms.

Small teams of volunteers would stay with us for a week, much of the time spent in 24-foot fiberglass boats searching the coastal waters. Fortunately, sightings of dolphins were frequent and kept up everyone's enthusiasm, but looking for humpback whales was, as one volunteer expressed it, "like searching for chocolate chips in a stadium with brown carpet."

Nevertheless, our volunteers were largely responsible for not only finding the whales and dolphins, but also recording much of the data once we encountered them. This included recording our position from a handheld GPS, identifying the species seen, estimating the number of animals in the group, and recording the behaviors of the animals.

One thing we learned very quickly was that photo-identification was harder on the wintering grounds than when they are feeding. Off

California, humpback whales often raise their flukes prior to making a deep dive. Off Costa Rica, humpback whale movements were more erratic and they often did not raise their flukes. This may have been because many of these whales were only making shallow dives. Obtaining ideal identification photographs required more time and patience.

But the humpback whales off Costa Rica provided something rarely experienced near California; we were sometimes serenaded with their haunting song. Some of our first encounters with humpback whales in Costa Rica came as we swam in the warm seas and heard this song from miles away. In our research we were equipped with hydrophones and recorders used to listen for and record these songs which are sung only by the males perhaps as a way to attract females. Humpback whales are probably best known for these complex songs, heard primarily on the wintering grounds.

We also enjoyed the



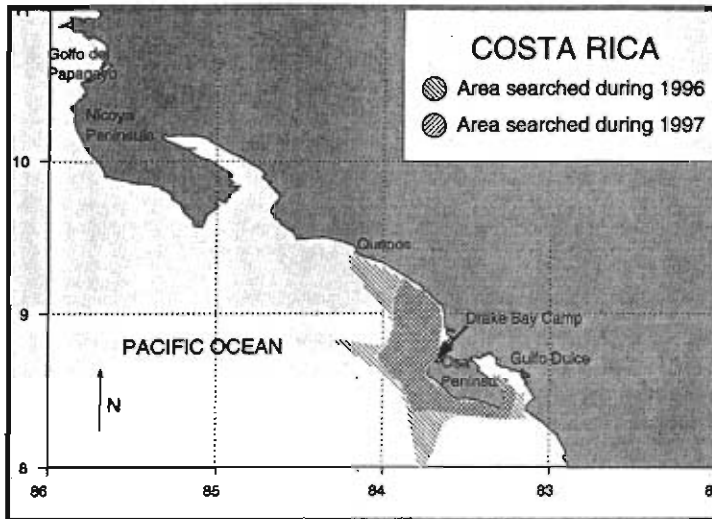
calm, warm boating conditions in Costa Rica, especially after the bumpy seas and chilling fog off California. Every morning, we set out from our tropical base camp in two different boats. Spending long hours in a boat in the tropical sun is exhausting, and we always tried to have one boat conduct a shorter easier route while the other embarked on a more ambitious survey. Much to our surprise, it was these ambitious trips that were always more popular.

Our surveys covered much of the southwestern coast of Costa Rica, we searched north as far as Quepos, and south into Golfo Dulce sometimes covering well over a hundred miles in a day. The boats had two separate engines, each with its own tiller. Our boat drivers would steer these boats by standing at the back holding one tiller in each hand; a feat requiring considerable skill and endurance.

In 1996 and 1997, we were able to conduct a total of 44 excursions. We saw whales on most occasions, particularly in 1997; we had 13 sightings of 19 humpback whales in 26 surveys in 1996, and 24 sightings of 40 humpback whales during 18 surveys in 1997. This sighting rate, which is lower than what you would find in the primary wintering areas of Mexico or Hawaii indicates that Costa Rica is an important wintering area, though not of equivalent size to the three principal regions.

There were several areas the humpbacks preferred and where we made most of our sightings. These included a shallow area off the east side of Isla de Caño, a small picturesque island just

ten miles from our base camp. Our trips farther afield were not wasted, however, and we also saw whales near another island aptly name Isla Ballena (Whale Island) as well as several other areas to the north and south. Most of the whales we saw were in shallow water (less than 150 feet), a



finding consistent with other preferred wintering areas for humpback whales.

It was crucially important to our objective of tracking the movements of these whales that we were able to obtain identification photographs of the majority of the humpback whales we saw. Thirty-seven distinctive photographic encounters confirmed at least 23 different individuals

And eighteen of those whales, some 78 percent, had previously crossed our paths off California. This matching percentage is higher than has been documented between any other winter and feeding regions. Given that Costa Rica is the farthest south wintering area for North Pacific humpback whales and California is the southernmost feeding area, perhaps the high correlation is not surprising.

Some of the transit times

between Costa Rica and California were amazingly short. I resighted a whale I saw off northern California on 1 December 1995 (one of my last surveys of the season) a mere 56 days later on 26 January 1996 during my first survey off Costa Rica. The straight-line distance between these two points is

3200 miles. The actual transit time was probably shorter because this whale likely stayed longer off California and arrived earlier off Costa Rica than was revealed by our observations. As coincidental as this pair of sightings seems, we have had several other resightings of the same whale thousands of miles away just a few months apart.

We also confirmed that Costa Rican waters are used as a birthing and nursery ground for humpback whales. In 1997 alone we saw mother-calf pairs on three occasions, and judging from their size, the calves appeared to be just a few weeks old. On another occasion we identified a whale off Costa Rica that must have been pregnant, for when we saw it again later that year off California she was accompanied by a calf.

The conspicuous pres-

ence of singing humpback whales indicates that mating was almost certainly taking place here. We were fortunate to hear humpback songs frequently and on several instances when the whale was singing directly underneath the boat, and the song was clearly heard without a hydrophone. On one occasion, while several of us were in the water, a whale sang nearby and we felt the vibrations of the song reverberate through our bodies. There is something indescribable about hearing—and feeling—a humpback whale sing. More than one person was moved to tears.

Singing has a practical value to researchers. We can confirm that the singers are males. Normally, determining sex of individuals in the field is very difficult. Being able to correlate an individual with its gender will help us analyze differences in the movements between the sexes.

These songs have also proved valuable for looking at how humpback whales on different wintering areas are related.

Another surprise from our research was the variety of other marine mammals we encountered, including two species of dolphins and five other species of whales. Given the limited information available on marine mammals in the coastal waters of Costa Rica, and that some of the species were being documented for the first time in these waters, these sightings were especially significant.

Our most common sightings were of spotted dolphins (*Stenella attenuata*), seen in a variety of locations, and ranging in groups

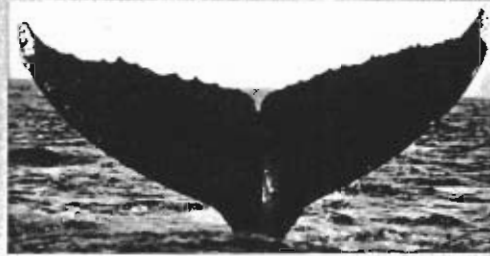
ALL HUMPBACK FLUKES ARE UNIQUE

of several animals to over 150. Once we saw a group of about 70 spotted dolphins feeding on small schooling fish along with a school of tuna. This association between dolphins and the tuna is what often gets the dolphins caught in tuna nets. Bottlenose dolphins (*Tursiops truncatus*) were not as common and were in smaller groups. On many occasions bottlenose dolphins were seen swimming with or near humpback whales.

We also have seen a number of large whales other than humpbacks. We spotted a group of sperm whales (*Physeter macrocephalus*) in deep water on one of our few surveys offshore. The identification photographs of their flukes will be compared to identification photographs from other parts of the North Pacific. A group of 40 false killer whales (*Pseudorca crassidens*) was seen near Isla de Caño in 1996. These false killer whales were displaying some of their characteristic acrobatic behavior by leaping clear of the water right next to our boat.

We also had a sighting of a mystery whale that we suspect was a fin whale (*Balaenoptera physalus*). This large baleen whale was unlike any we had previously seen in this area. "My heart raced when I first saw the size of the blow. I knew that this was not a humpback whale, but something much, much bigger" said Steiger. The whale we saw was clearly a baleen whale, with two external blow holes and a loud blow. It was quite large; we estimated

Two photographs of the same whale. The left was taken on 1 December 1995 off central California. The right was taken 56 days later, 3,200 miles away off Costa Rica. —Photos John Calambokidis



The secret to understanding whale behavior is to identify individual whales so that specific activities and migration routes can be studied. These photographs show the distinctive characteristics of humpback flukes.



AMIGO



CIRCLES



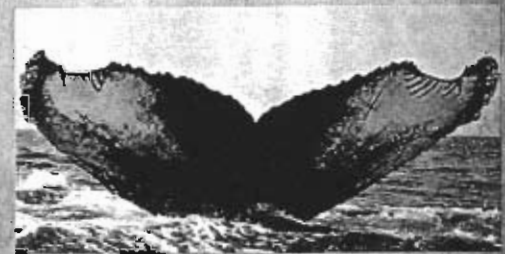
DIEGO



FLOPPY



ROMAN

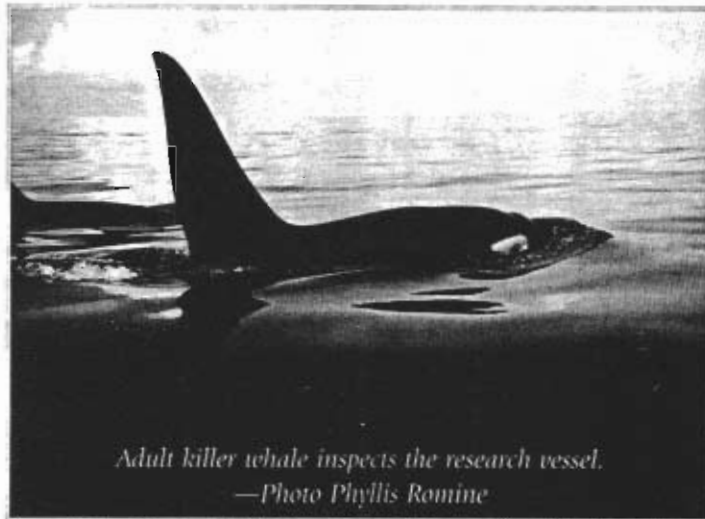


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that it was about 65-70 feet long. The dorsal fin was falcate (sickle-shaped), very tall and was located far back on the body. Though we suspect it was a fin whale it also had attributes of a sei whale (*B. borealis*) and we cannot rule out this species completely.

The most spectacular encounter came one February morning in 1997. It is rare to witness killer whales, or orcas (*Orcinus orca*) stalk and circle a humpback whale, and we were fortunate to observe just that. The sighting started off with a group of three orcas; one adult male, a smaller female or juvenile male, and a calf or yearling, that were headed north. Another adult male orca was about one mile to the west of this group and headed on a parallel course. As we fol-



Adult killer whale inspects the research vessel.
—Photo Phyllis Romine

lowed the three whales, a humpback whale, swimming east towards shore, crossed in front of the path of the three whales. Directly behind the humpback was the single adult male orca seen earlier. We suddenly realized that this orca appeared to be herding the humpback directly in front of the other three. All four of the orcas then circled the humpback. The humpback began thrashing wildly, making loud trumpet blows, and rapidly changing directions.

This whole interaction lasted about two minutes, and then the orcas stopped circling and continued northward. The humpback then swam away very rapidly; it was clear it wanted to be far from there. Few attacks of humpback whales by orcas have been witnessed although we know from the scarring on humpback whale bodies that they must occur fairly often. The orcas were probably testing the humpback whale for weakness and then continued on once it was apparent this was a capable and healthy animal.

Later, after the humpback was long gone, the orcas returned and swam along the side of our boat. First came the smallest whale, but soon all the whales were participating. The adult males stayed with the boat for an hour; they swam on their sides, upside down, and at one point, both males were swimming belly-to-belly right next to us. Watching these powerful, graceful animals as both aggressive and skilled predators of humpback whales one moment and seemingly playful, and romantic the next made the experience even more awe-inspiring. One of our drivers excitedly claimed it the best day of his

life on the water. Killer whales are rare enough in these waters that our boat drivers, including one with decades of experience, had never seen them before.

Next winter, we plan to be back off Costa Rica searching for humpbacks. Throughout the research we have been heartened by the help and cooperation we have received. Drake Bay Wilderness Camp, as well as other lodges in the region have been very enthusiastic. And, of course, the project would not have been possible without the help and enthusiasm of the Elderhostel volunteers and the organizational support of Oceanic Society.

As the demands on Central America's natural resources increase, so does the impact on its coastal waters. Marine mammals increasingly face the threats of entanglement in fishing nets, pollution, and disturbance. By continuing to document the variety of marine mammal species and the degree to which they use these waters, we will have a better understanding of how we can protect them. 🐋

JOHN CALAMBOKIDIS



John Calambokidis, founder of Cascadia Research and leader of the humpback whale expeditions to Costa Rica, dons headphones to listen to humpback whales singing.

—Photo Debby Frank and Paul Bailey

Species identified off Costa Rica, including number of times sighted, total number of animals.

SPECIES	1996		1997	
	TOTAL SIGHTINGS	TOTAL ANIMALS	TOTAL SIGHTINGS	TOTAL ANIMALS
Unidentified dolphin	26	120	8	33
Spotted dolphin	20	448	36	358
Bottlenose dolphin	8	53	2	7
Humpback whale	13	19	24	40
Sperm whale	2	5		
False killer whale	1	40		
Killer whale			2	8
Fin/Sei whale			1	1



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BEAKED WHALES SUCK • DOLPHIN SONAR • PIRATE WHALING
