THE Blackfish Sounder

No.18 - 2010

NEWSLETTER OF THE BRITISH COLUMBIA WILD KILLER WHALE ADOPTION PROGRAM

PHOTO: LEE BARRETT-LENNARD

Scarlett Point light station, located about 15 kilometers northwest of Port Hardy, Vancouver Island

Our bountiful coast

Like many biologists, I have spent much of my career documenting growing threats to species and ecosystems. This year, however, I have a more optimistic outlook. I'm writing on the Aquarium's research boat Skana on B.C.'s beautiful central coast—an area I lived in two decades ago, first as a lighthouse keeper, then as a fledgling researcher.

Returning after so long, I'm struck by the abundance of life—the forests are lush and wolves, salmon, sea otters, humpback whales and seabirds abound. As do Pacific sardines—decimated 70 years ago by overfishing, re-appearing tentatively a decade ago, now back in vast schools.

Killer whales are also here in healthy numbers. Several days ago I watched high-spirited residents playing and feeding, and today transients ghosted by, on the lookout for seals. I know that the rebuilding web of life is fragile and easily disrupted…but at this moment, the sheer vitality of this small part of the world is nothing short of awesome.

Thank you for your support, and I hope that you enjoy this year's edition of the *Blackfish Sounder.*

Lance Barrett-Lennard

Dr. Lance Barrett-Lennard
Head, Cetacean Research Program
Vancouver Aquarium

Baby boom

One of the newest members of the A12 matriline, known to researchers as A91, surfaces playfully next to mom, Misty (A62). A91 is one of the 18 new calves spotted among the B.C.'s two resident killer whale populations in 2009. For more details, see Orca Update on p.6.

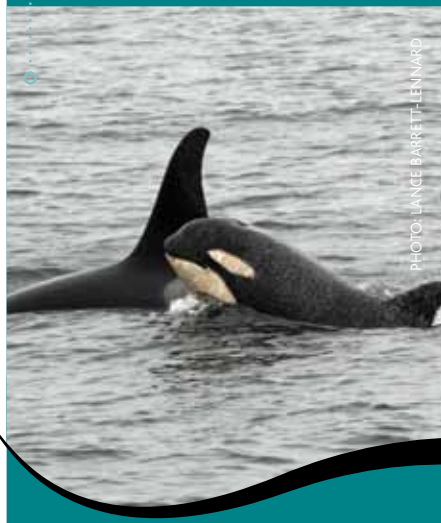


PHOTO: LANCE BARRETT-LENNARD

The B.C. Wild Killer Whale Adoption Program, launched in 1992 by the Vancouver Aquarium, raises funds to support ground-breaking research on wild killer whales—research that is proving essential in the effort to protect these magnificent animals and their habitat.

vancouver aquarium™

Our unique transients

The transient killer whales found off the B.C. coast should be reclassified as a distinct species, says an international team of scientists.

In a study released this spring, 16 scientists led by the US National Marine Fisheries Service examined the DNA of 139 killer whales from the North Pacific, North Atlantic and southern oceans.

They found that the population of 300 or so transients in the North Pacific is so globally distinct that it should be designated as a stand-alone species.

"Not only are [North Pacific transients] ecologically and morphologically distinct from other high-latitude killer whales, but genetically they are the most divergent type, diverging from all other killer whale types approximately 700,000 years ago," say the authors.

Currently, all killer whales around the world are classified as a single species. B.C.'s resident, transient and offshore killer whales are considered "ecotypes"—they live in the same region, but they eat different prey, and look and sound different. Transients never mix with other ecotypes.

"This a very exciting story," says the Vancouver Aquarium's Dr. Lance Barrett-Lennard. "We've suspected this for many years but just haven't had the evidence from other parts of the world that this study provides. This really helps us better understand the evolution of the species."

KILLER WHALE CONTRACTS

How do different pods of resident killer whales divvy up the fish resources along the coast, especially when food is scarce? A study in Alaska's Resurrection Bay shows how different clans of killer whales routinely use the same habitat, but at different times of the year.

A clan is a group of pods with similar vocal dialects, indicating they're closely related. The study, led by Vancouver Aquarium research associate Dr. Harald Yurk, used a remote hydrophone to record the calls of any killer whales that came into the bay over a five-year span. Yurk, a specialist in killer whale acoustics, identified which pods made the recorded calls. The results? One clan of whales (AD) predominates in the spring, and whales from a larger clan (AB) are the most frequent winter visitors.

In the summer and fall, when fish are more abundant generally, the two clans mingle. So why do the ABs leave the bay in the spring? Probably because there's even better feeding about 160 km away at the chinook-rich Copper River.

Yurk recalls how killer whale research pioneer Michael Bigg half-joked that resident and transients had drawn up a contract on how to live on the same coast by eating different things. "Maybe he was right and killer whales create contracts to divide up resources and reduce competition," says Yurk. "Using remote acoustic monitoring, this study helps us better understand what killer whales are up to in the winter."

IMAGE: U.S. DEPARTMENT OF THE INTERIOR

RUFFLES GOES SOLO

Fifty-nine year-old Ruffles (J1), probably the best known and most recognizable member of the southern resident whales, raised a few eyebrows and created much online chatter this January when he appeared solo in Haro Strait off southern Vancouver Island.

He wandered back and forth on his own for two days, repeatedly issuing two short, plaintive calls—known to researchers as S42 and S40—that were hard not to interpret as "Where is everyone?" Although Ruffles often swims at some distance from the rest of J-pod, it was very unusual to see him totally alone. In the days preceding his appearance, J-pod had been seen or heard as far north as Alert Bay off northeastern Vancouver Island and in Georgia Strait.

The pod and Ruffles eventually reunited in Haro Strait. Had he lost them, or had he simply chosen a different route? We'll never know. "The calls show pretty clearly a high level of excitement," says Dr. John Ford, a researcher with Fisheries and Oceans Canada and a pioneer in killer whale acoustics. "They're not rare calls but it is unusual for one animal on his own to be using them over and over again like that. I think it was just a matter of him being separated and trying to make contact."

PHOTO: MEGHAN MCKILLOP

British Columbia west coast transients, T49B and T49B1

PHOTO: PAUL TIXIER

Type D killer whales found in the subantarctic

MAKE THAT FOUR

In the 2005 edition of *The Blackfish Sounder* we told you about three very distinct forms of killer whale in Antarctica—types A, B and C—each differing in physical appearance, behaviour and preferred habitat. Now a fourth, known as type D, is described in a 2010 study led by the same researcher—Dr. Robert Pitman from the Southwest Fisheries Science Center in La Jolla, California.

Type D killer whales sport a very distinctive feature—an extremely small eye patch—as well as a noticeably bulbous head. The dorsal fin is narrow with a sharply pointed tip and a distinct backward slant.

Sighting and stranding records suggest that type D killer whales are widely distributed in subantarctic seas, mainly in deep ocean, although they have been documented in New Zealand and the Crozet Island waters. Pod sizes are large—averaging more than 17 and it is believed that they do not interbreed or even mingle with other types of killer whales in the region. Little is known about their diet, although there is some evidence it includes fish.

WHALE EXPLORER

If there was a prize for a whale being in the strangest place, it would go to a grey whale spotted this spring—swimming in the Mediterranean Sea off Israel and later off northeastern Spain.

The sighting, described by one of many bewildered researchers as "the equivalent of finding a dinosaur in your backyard," is a mystery because Atlantic grey whales were exterminated by whalers by the late 1700s. Since it's unlikely that survivors remained undetected for centuries, this means that this 12-metre adult is either a very lost or very adventurous Pacific grey whale. How did it get there? It most likely swam through Arctic waters over North America or across the top of Russia "This is very cool in a big picture sense," says the Vancouver Aquarium's Dr. Lance Barrett-Lennard. "Over the years, there have been somewhat fanciful proposals to transplant Pacific grey whales to the Atlantic. This suggests the whales may eventually get back there on their own."

SHADES OF GREY

Observers off the Victoria, B.C. waterfront did double-takes last December when they saw something white flashing among a group of transient killer whales. It was this calf, travelling with mom T68C.

It likely has Chidiak-Higashi syndrome—also seen in humans—that results in partial albinism. Over the years, the condition has been seen in several other transient killer whales.

PHOTO: CENTER FOR WHALE RESEARCH, PERMIT #DFO MML-20

A grey-coloured transient killer whale calf

Bad timing

A severe windstorm may have led to the death of a young killer whale calf near Victoria, B.C., this May. An analysis of the calf's DNA by the Vancouver Aquarium's Dr. Lance Barrett-Lennard and his research team determined that the calf was a member of the transient killer whale community.

The male calf—which a necropsy showed was basically healthy—appears to have died within a day or two of birth, around the time that a strong windstorm ripped through the region. Being born, and trying to nurse and breathe in huge waves may have contributed to the youngster's death.

"While it is always troubling to see a young killer whale die, there is some relief that the calf was not a member of the critically endangered southern resident population," says Barrett-Lennard. "Every death in that group moves them closer to a breaking point."

L113 rolls playfully across her mother's back

PHOTO: CENTER FOR WHALE RESEARCH, PERMIT #NMFS 532-1822

Southern residents working overtime

The whales need more fish—now.

That's the message that Dr. Ken Balcomb continues to hammer home to anyone who will listen—and those who try not to.

As founding director of the Center for Whale Research on San Juan Island in Washington State, Balcomb has spent the last 34 years documenting the lives of the three pods that make up the southern resident killer whale community.

The top priority for this endangered population—now numbering 87—is for humans to allow the whales sufficient fish, year-round, to survive and thrive, says Balcomb.

Balcomb and his team continue to see signs that the whales are working harder and longer to find a meal. Pods that once used to be inseparable are splitting up for days at a time and the whales are more often spread out over many square miles, foraging. "It's like having to work a 140-hour work week instead of a 40-hour week," he says.

"We have been too complacent about this wonderful natural environment around us," he says. "These whales are the best indicator we could have, but they will not be here in the future if we don't take immediate heed and deal with the wild salmon issue."

HOOKED ON CHINOOK

B.C.'s resident killer whales love to chow down on Fraser River chinook. That's what a new study has shown, based on an analysis of the DNA from fish scales and tissue left behind by foraging resident killer whales over three decades.

We've known for several years that chinook—the largest of the five Pacific salmon species—tops the menu for resident killer whales, but this is the first time that researchers have genetically tracked the source of the fish they're eating.

Analysis of samples collected around feeding northern resident whales reveals that 64 per cent of chinook came from the Fraser River. For southern resident whales, the Fraser River supplies 75 per cent of their chinook diet.

The most prevalent stock of Fraser chinook comes from the South Thompson, the largest tributary of the Fraser River.

"We sampled all over the coast, so we now have an extensive picture of what the whales are eating," says Dr. John Ford, senior marine mammal scientist in Canada's Department of Fisheries and Oceans (DFO) and lead author of the study. "Local rivers are important at certain times of the year, but it's clear that Fraser River chinook are hugely important to these animals."

Resident killer whales are so dependent on chinook that they make up about 90 per cent of their diet in their core habitats during July and August, notes the study.

PHOTO: KARL SOLOMON

This translates into as many as 1,400 fish a day for southern residents and 500 fish daily for northern residents, which spend less time feeding in their core habitats in the summer than their southern cousins.

The study also confirms the vital, long-term link between chinook abundance and resident killer whale survival. Northern residents are listed in Canada as threatened, while southern residents are endangered.

The study calculates that up to 1.8 million chinook salmon may be needed annually to support the recovery of these two whale populations over the next eight years.

"A high priority objective in the recovery strategy for resident killer whales is to ensure they have an adequate and accessible food supply to allow recovery," says Ford. "The next step is to factor this new information into fisheries management plans to protect the stocks that the whales need."

CSI: TRANSIENT KILLER WHALES

What are transients eating? DNA analysis gives us clear answers

You're watching a group of transient killer whales travel along the shoreline. They dive and minutes pass as you wait for them to reappear. You see a slight swirl in the water near where they went down. Minutes later, the whales surface and continue on their way.

What just happened? Did they make a kill? If so, what was it?

This all-too-common scenario underscores how difficult it can be for researchers to study an animal that spends more than 90 per cent of its time out of our sight. And it also reminds us of that old adage that we should never make assumptions.

Just ask Vancouver Aquarium whale researcher Dr. Lance Barrett-Lennard and lab technician Allyson Miscampbell. Every year, researchers and whalewatchers along the B.C. coast send them 15 to 20 bits of skin, flesh or tissue left floating in the wake of foraging transient killer whales.

"We do a genetic analysis of each sample to work out easily and reliably what species it came from," says Barrett-Lennard. "The results show that it can be quite deceptive to look at a group of feeding transients and be sure about what they're eating."

An attack that takes place off a seal haulout, for example, doesn't necessarily mean that a sample collected afterward comes from a seal. Even seasoned researchers can be fooled. One sample came with a note that the whales were seen attacking a Steller sea lion. The real victim turned out to be an elephant seal.

"Just because transients come roaring into an area and you see terrified harbour seals or sea otters scattering in all directions, it doesn't mean they were the target species," says Barrett-Lennard. "We never know for sure what's happening underwater."

Most of the samples collected over the last 15 years are from harbour seals and harbour porpoises. There are also remnants of sea lion, elephant seal, Dall's porpoise, Pacific white-sided dolphin, grey whale and minke whale. So far, there is no sea otter or humpback whale in the collection.

The most consistent surprise, says Barrett-Lennard, is the high proportion of harbour porpoise samples, even though few kills are actually reported. "This suggests that harbour porpoise is a bigger part of the diet than is apparent from watching the whales' behaviour."

Genetic forensics work is simple and definitive, says Barrett-Lennard, who is building a "library" of marine mammal samples. "In science we spend so much time debating possibilities, and even observational work can be tricky. But as the courts have determined in homicide cases, DNA analysis doesn't lie."

PHOTO: LANCE BARRETT-LENNARD

You can help prevent depredation

If you're a hungry killer whale and there's not much of your preferred food around, it's pretty hard to resist a free meal dangling on a hook or in a net in front of you.

That's why it's up to us to remove the temptation when we can.

Depredation is when whales steal fish from fishing gear. It's a growing problem in many parts of the world, resulting in economic losses to fishermen, increased pressure on fish stocks, and injury or death to the whales.

So far, depredation is not widespread on the B.C. coast, and everyone would like to keep it that way. The Department of Fisheries and Oceans (DFO) continues to monitor fishing activity in areas where incidents of killer whale depredation have been observed. Not surprisingly, these incidents seem to increase when salmon is scarce.

Depredation is a learned behaviour. Here's what you can do to prevent it:

- Don't feed whales
- Don't discard fish or fish guts when whales are present
- Don't fish when whales are nearby
- Fish in a different area
- Report depredation events to marinemammals@dfo-mpo.gc.ca

PHOTO: JARED TOWERS

A transient killer whale tossing a Dall's porpoise

Yoda (K36) doing a belly flop

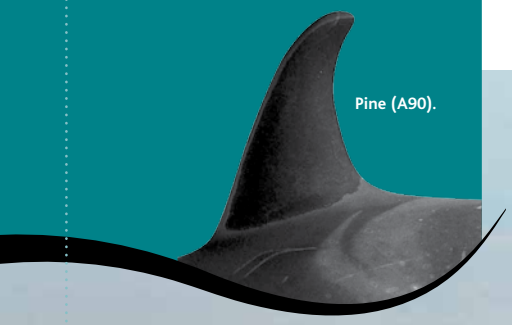
PHOTO: CENTER FOR WHALE RESEARCH, PERMIT #NMFS 532-1822

How do killer whales sleep?

Killer whales need their sleep just as much as we do. But there's a big difference between us. All whales have to think about every breath they take. This limits how long they can sleep at one time.

Whales take "catnaps" by swimming slowly at or near the surface, rising every now and then to breathe. Family groups of killer whales often group closely together when they're resting, moving slowly forward in what is called a "resting line." These rest periods can last for a few minutes or several hours.

Some studies on dolphins have suggested they sleep by shutting down one hemisphere of their brain at a time, keeping the other half active to breathe, swim and be alert to their environment. This may also be the case for killer whales, since they are the largest members of the dolphin family.



Pine (A90).

PHOTO: J. HILDERING WWW.THEMARINEDETECTIVE.CA

A northern resident resting line

ORCA UPDATE

2009 was an exciting year of new arrivals! Thirteen new calves were spotted among the 16 northern resident pods and 5 new calves in the 3 southern resident pods.

Ten of these new babies were born to females in our adoption program. Researchers assign all killer whale calves with an alpha-numeric name when they are first identified. They are given "friendlier" names later, after surviving their first year.

In the A12 matriline, **Misty** (A62) welcomed her second calf **A91**, and **Eclipse** (A67) is a first-time mom with the birth of **A92**. In the A30 matriline, **Blinkhorn** (A54) gave birth to her third calf, **A93**, and **Kelsey** (A24), the matriarch of the A24 matriline, had her fourth calf, **A94**. The A23 matriline welcomed **A95**, the first calf of **Midsummer** (A69), and **Virago** (C19) in the C6 matriline became a first-time mom with the birth of **C31**.

Koeye (C10), the matriarch of the C10 matriline, gave birth to her sixth calf, **C30**, and her daughter **Fin** (C23) became a first-time mom with the birth of **C29**. Twelve-year old Fin surprised everyone giving birth at such a young age, and until now, researchers hadn't known whether Fin was a he or a she!

The J9 matriline made the news twice in 2009 with their two new arrivals. **Princess Angeline** (J17) gave birth to her third calf, **J44**, and her daughter **Polaris** (J28) became a first-time mom with the birth of **J46**.

Amid the good news, we sadly say goodbye to a couple of old friends. **Nimpkish** (A33) disappeared part-way through the summer of 2009. His mother, **Scimitar** (A12), spent a lot of time traveling alone and calling after her son, but unfortunately he did not reappear. We also bid farewell to **Geetla** (D15) and **Flash** (L73).

Five calves have joined the adoption program this year; **Cameleon** (A88), the third calf of **Sonora** (A42); **Kanish** (A89), the first calf of **Schooner** (A64); **Pine** (A90), the fifth calf of **Skagit** (A35); **Nasparti** (B17), the second calf of **Klaskish** (B14); and **Kelp** (K42), the third calf of **Lea** (K14).

In other news, we now know that **Tatchu** (G52) and **Glide** (G54) are both female. **Yoda** (K36), pictured above, is also a female, confirmed by a wonderful photo captured by the Center for Whale Research. And boys will be men! Both **Raven** (B15) and **Zayas** (I78) are starting to "sprout," the term used to describe the upward growth of a male's dorsal fin as he approaches sexual maturity.

OUR EYES ON THE OCEAN

Since 2000, the B.C. Cetacean Sightings Network (BCCSN) has used the eyes and expertise of people living and working along the coast to collect sightings of whales, dolphins, porpoises and sea turtles in British Columbia.

Thanks to our 2,400-plus observers, the BCCSN now has more than 50,000 sightings of 23 cetacean and two sea turtle species. This valuable information is regularly used to help with conservation efforts.

Until recently, researchers were unable to determine whether a lack of sightings in a given location indicated a true absence of animals or an absence of observers looking in that area. To find out, BCCSN researchers developed a model to represent the travel patterns of their primary observers, such as whale-watching companies and lighthouse keepers.

When these patterns were combined using computer mapping technology, the result was a model indicating where observer effort is concentrated along the B.C. coast.

This "effort model" allows researchers to identify hotspots of each species, regardless of the amount of observer coverage in a given area. This, in turn, will facilitate a number of important analyses, including the identification of areas that represent a higher risk of whale/vessel collisions.

The more we know about the whales in B.C., the more we can help them. To report a sighting call 1-866-I-SAW-ONE, visit www.wildwhales.org, or email sightings@vanaqua.org.

The BCCSN is a collaboration between the Vancouver Aquarium's Cetacean Research Lab and Fisheries and Oceans Canada. It is based out of the Vancouver Aquarium.

Pare on duty

PHOTO: SERGE PARE

LIGHTKEEPER, WHALE SPOTTER—ALL IN A DAY'S WORK

Green Island Light is the northernmost light station in British Columbia. Located in the remote Chatham Sound region about 40 kilometers north of Prince Rupert, Green Island Light is one of only 27 light stations still staffed in the Canadian Pacific.

For the past 15 years, Serge Pare has been the principal light keeper on Green Island, ensuring that the light remains bright and relaying important weather information to mariners and aviators.

Some years ago, Pare was asked to adopt an additional role: observer for the B.C. Cetacean Sightings Network (BCCSN). Since then, he has meticulously recorded all whales, dolphins and porpoises he has seen. Pare has become one of the BCCSN's most dedicated observers, having contributed over 250 sightings.

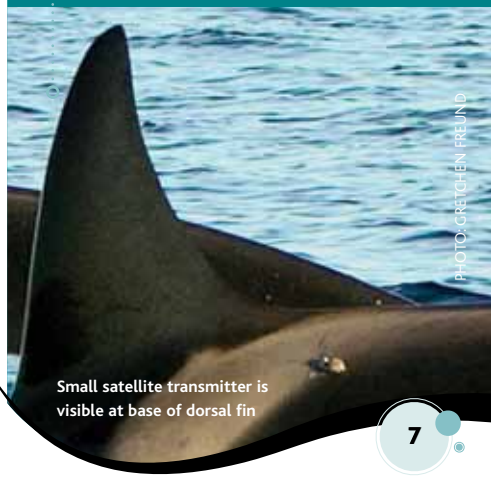
In fact, the success of the BCCSN is owed entirely to "citizen scientists" like Pare. Over 10 years, the network has received almost 3,000 sightings from 22 different light stations along the B.C. coast. These reports are invaluable, providing researchers with important information on the presence and distribution of cetaceans and sea turtles in some of B.C'.s most remote areas.

Whale wanderlust

Scientists have known for some time that killer whales can travel vast distances, but the extent and speed of their travels continue to amaze us. In 2009, researchers with the Orcas of the Canadian Arctic (OCA) study attached tiny satellite transmitters to two killer whales in Admiralty Inlet off northern Baffin Island.

They were able to download daily location information from the tagged whales. Signals from one of the whales lasted 90 days, long enough to record much zigzagging back and forth within Admiralty and Prince Regent inlets and then an astounding 5,400-kilometre journey to west of the Azores in the mid-Atlantic. "This is among the longest documented distances traveled by killer whales," says University of Manitoba PhD student Cory Matthews, who led the study.

The Arctic to the Azores sprint took about a month—an average daily distance of 160 km. The whales' initial movements in the Arctic overlapped with those of their known prey, including narwhal, bowhead whales, belugas and seals. They headed for the Azores just before heavy ice moved in. "While we suspected these whales may over-winter in the open North Atlantic," Matthews says, "seeing the distance—and the rate at which they traveled—was pretty remarkable." The OCA team is made up of researchers from Fisheries and Oceans Canada, the University of Manitoba and northerners of Nunavut.



Small satellite transmitter is visible at base of dorsal fin

PHOTO: KRETCHEN FREUND

PHOTO: VALERIE SHORE

Blue whale

PHOTO: ANDREW TRITES

de Roos and Dr. Andrew Trites, director of the marine mammal research unit at UBC, in front of the completed blue whale skeleton

WHALE OF A PROJECT

Mike de Roos has never seen a living blue whale, yet he can tell you where every bone in its body is, in intricate detail.

De Roos was the master skeleton articulator behind the Blue Whale Project, a massive (literally!) endeavour to dig up, clean, reassemble and display the largest animal that has ever lived on Earth.

The 26-metre female blue whale washed ashore on Prince Edward Island in 1987 and was later buried nearby. There it lay for 20 years until it was acquired for display in the atrium of the University of British Columbia's new Beaty Biodiversity Museum—6,000 km away.

How do you dig up and move something that is longer than two school buses parked end-to-end and weighs an estimated 80 tonnes? Carefully.

De Roos and a large recovery team spent 10 days exhuming the carcass—which was largely intact—peeled off as much blubber and flesh as they could, and shipped the bones to Victoria, B.C. for cleaning and degreasing.

The bones made their final journey to Vancouver this spring, where the skeleton was reassembled and hung in the blue whale's signature lunge-feeding pose.

"It wasn't until we slid the tail into place and all the big pieces were connected that we were able to finally appreciate the majesty of this animal," says de Roos. "We hope she inspires many generations to come."

Read the full Blue Whale Project story at www.beatymuseum.ubc.ca/projblue01.html

♻ Printed on 100% post-consumer waste paper

THANK YOU

Thank you to the John & Pat McCutcheon Foundation for generously providing the B.C. Wild Killer Whale Adoption Program with a grant to help improve the efficiency of the program and make it possible for us to rebuild our outdated website.

Thank you to the following people who continue to lend their time and energy to the adoption program: Graeme Ellis, for giving us access to the northern resident and transient ID photos; Ken Balcomb for giving us access to the southern resident ID photos; Wilf Hatch for long hours in the dark room; Graeme Ellis, Jim Borrowman, Jared Towers, Alexandra Morton, John Ford, David Ellifrit, Ken Balcomb, John Durban and the many other contributors to the photo ID study that makes this program possible. A big thank you to the following research patrons and extended members who made very generous contributions to our program this year: Dale Waldorf, Benoit Brissart, Lorrie Loewen, Karen Hansen and Stan Hutchings, David and Janice Podmore, and Gayle Smith. Heartfelt thanks also to Mary Borrowman, Jackie Hildering, and the staff of Stubbs Island Whalewatching for their steadfast support and promotion of the Killer Whale Adoption Program. Finally, a very special thank you to all whale adopters for continuing to make this program possible.

THE Blackfish Sounder

NEWSLETTER OF THE BRITISH COLUMBIA WILD KILLER WHALE ADOPTION PROGRAM

is the annual newsletter of the B.C. Wild Killer Whale Adoption Program

c/o Vancouver Aquarium Marine Science Centre
P.O. Box 3232, Vancouver
B.C., V6B 3X8

Tel: (604) 659 – 3430
Fax: (604) 659 – 3599
E-mail: adoption@vanaqua.org
Website: www.killerwhale.org

Program supervisor
Dr. Lance Barrett-Lennard

Program coordinator
Meghan McKillop

Editor
Valerie Shore

Writers
Valerie Shore, Meghan McKillop, Iain Smith

Design and layout
Shane Mathewson