No. 16 · 2008

THE Blackfish Sounder

NEWSLETTER OF THE BRITISH COLUMBIA WILD KILLER WHALE ADOPTION PROGRAM

Surprise!

What type of whale is this and where was it seen? Find out on page 4.

H.FEARNBACH, NMML, NMFS PERMIT 782-1719

Each year when I review the articles for the *Blackfish Sounder* I'm struck by the incredible advances in the scientific understanding of killer whales that have occurred since Dr. Michael Bigg began studying the species 35 years ago.

Bigg's initial goal was simply to estimate the size of the population frequenting the waters of southern British Columbia. His realization that individuals can be distinguished by natural markings opened many new avenues of research—from studies of longevity, for example, to sophisticated analyses of association patterns and social structure. One discovery in particular rocked the scientific world: the existence of two fundamentally different kinds of killer whale—fish-eating residents and mammal-eating transients.

Following in Bigg's footsteps, Dr. John Ford opened up a new and fascinating area of research in the early 1980s with his ground-breaking studies of killer whale vocal dialects. And I was fortunate to be in the right time and place a decade later to apply new genetic methods to the analysis of mating patterns and population structure.

At that point, it seemed that we might soon run out of research questions. Boy, were we wrong, as you'll know if you've been keeping up with recent issues of the *Blackfish Sounder*!

Many of the articles in this year's edition have to do with the hunting behaviour of transient killer whales. This reflects growing scientific interest in how these top-level predators contribute to the structuring of ecosystems and influence the abundance, distribution and perhaps evolution of their prey. Other articles describe ongoing efforts to protect killer whales from new—or in some cases newly recognized—threats.

We hope you enjoy this issue, and we thank you once again for your ongoing support.

Lance Barrett-Lennard

Dr. Lance Barrett-Lennard
Senior Marine Mammal Research Scientist
Vancouver Aquarium Marine Science Centre

Visit our website!
www.killerwhale.org

INSIDE

The B.C. Wild Killer Whale Adoption Program, hosted by the Vancouver Aquarium Marine Science Centre, is an ongoing research and conservation effort for the protection of wild killer whales and their habitat.

vancouver aquarium™

Wave action

What do you do when lunch is sitting tantalizingly out of reach on an ice floe? You do "the wave," killer whale-style.

In this remarkable image (below) taken from a video, four Antarctic killer whales are seen surging in unison toward an ice floe and its crabeater seal occupant. A fifth whale, visible as a small bubble burst in the middle of the four whales, was perhaps a "position holder." The resulting wave washed the seal off the floe and into the jaws of one of the whales. Minutes later, it was released and clambered onto another floe. But not for long. The whales repeated their wave maneuver, once again tipping the hapless seal into the water. It was eventually consumed.

"This group of orcas are seal specialists and have perfected this cooperative wave-washing technique," says New Zealand researcher Ingrid Visser, who speculates that it may have been a training session for younger members of the pod. "It was amazing to see. In many years of observation this has only been seen a few times, and filmed even less."

See the short video for yourself at www.orcaresearch.org/dvd.htm

INGRID VISSER

VALERIE SHORE

Recovery strategy completed at last

Phew! It's been a bit of a roller-coaster ride, but the recovery strategy for B.C.'s resident killer whales is now finished and has been posted online. You can see it at www.sararegistry.gc.ca

Under the Canadian Species at Risk Act (SARA), a recovery plan must be developed for any species designated as threatened or endangered. The southern resident killer whales are classifed as endangered and the northern residents as threatened.

SARA is intended to ensure the scientific assessment and listing of species at risk, provide for their recovery, protect their critical habitat, and enable compensation, permits and enforcement.

The first step is a recovery strategy. This process—which is legally required within one or two years of a species being listed—presents a scientific assessment of the status of the species and the threats it faces, classifies critical habitat and sets recovery goals.

Preparation of a recovery strategy for resident Killer whales began in 2004, with a deadline of June 2006. It was developed by a 21-member team of killer whale scientists and other experts, which was co-chaired by the Vancouver Aquarium's Dr. Lance Barrett-Lennard.

The team completed its work in May 2006, one month ahead of schedule. But then it ran into problems. Over the next 18 months, the government tried to remove the section on critical habitat, soften the language on the impact of military sonar, and remove the section on threats to critical habitat.

"The effect of any one of these changes would have been to significantly weaken the kinds of protection and conservation measures that would apply to killer whales," says Barrett-Lennard.

When the dust settled, all three proposed changes had been reversed and the recovery strategy was back on track—almost two years past the legal deadline.

"Some of the other language had been weakened a little, and the timeline for the next phase, the 'action plan,' has been extended," says Barrett-Lennard, "but I'm happy with it overall." The same team was expecting to write the action plan. But as the *Blackfish Sounder* went to press, Barrett-Lennard still hadn't heard whether the recovery team can proceed as is, or not.

"I've heard that similar things happened with other species' recovery plans, too," he says. "I'm proud of the Resident Killer Whale Recovery Team for holding its ground, and I think that its actions have established an important precedent that will ultimately benefit all at-risk species in Canada."

Clean-up promised for famous orca habitat

As you read this story, the BC and Canadian governments may finally be salvaging a fuel truck and other pieces of logging equipment—described by environmental groups as "a ticking time bomb"—from the seafloor of one of the world's best known killer whale habitats.

The two levels of government announced in April that they would jointly fund a $1-million recovery operation in Robson Bight (Michael Bigg) Ecological Reserve off northeastern Vancouver Island. But they could not commit to doing it before the northern resident killer whales return this summer.

The trouble began last Aug. 20 when a commercial barge tipped over in the bight, dumping its load—including an estimated 19,000 litres of diesel fuel and other oils—300 metres to the ocean floor.

Some of the fuel leaked immediately and quickly spread at the surface. Within a few hours, a slick extended 14 km down Johnstone Strait.

The spill couldn't have happened at a worse time or place. August is a peak month for northern resident killer whales in Johnstone Strait. A big part of the attraction is Robson Bight, where the whales frequently go to socialize and rub on pebbles at its beaches.

Two family groups of northern residents, the I15s and I30s, were nearby when the barge dumped its load. In fact, they were vocal during the incident. The hydrophones of OrcaLab on nearby Hanson Island recorded every jarring crash, bang and thud as the vehicles and equipment hit the seafloor.

Hear for yourself at www.killerwhale.org and listen for the orca calls in the background.

Confusion reigned in the days and weeks following the spill as two branches of the Canadian government disagreed over where the wreck was and how much oil had spilled. The main issue was whether the fully loaded tanker truck was still intact.

The original spill dispersed within a few days. But if there is more fuel down there and it leaks slowly or in one big blurp, the damage would be many orders of magnitude worse.

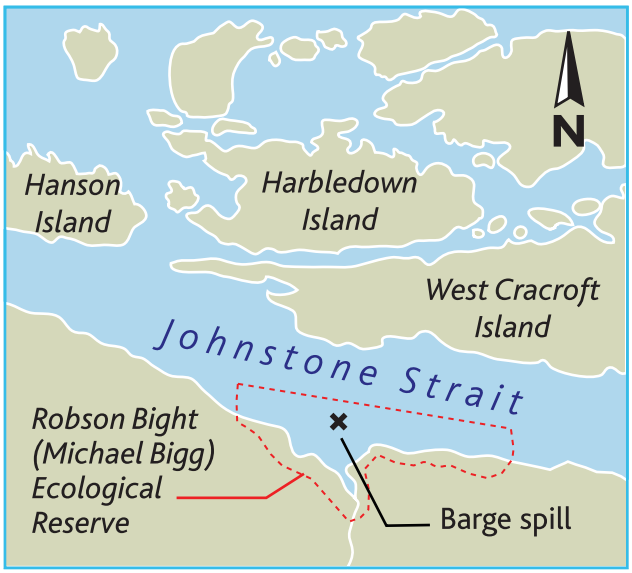
In December—after three months of pressure from environmental groups who raised funds for their own underwater inspection—the provincial government sent down a mini-sub to survey the wreckage. It found the fuel truck upright and intact.

Environmental groups immediately called for a salvage operation. But it took another four months for government to respond.

"Given that Robson Bight is an iconic reserve for our most iconic species, we're very pleased that the two governments have made this decision," says Barrett-Lennard. "It's a relief that the salvage operation will finally proceed, but there's a bigger lesson to be learned here. Our precious coast deserves a proper oil spill response system, especially given the increasing large ship traffic in this area."

As the *Blackfish Sounder* went to press, the timing of the salvage operation had not been specified. The longer the tanker remains submerged, the more difficult it will become to recover safely.

Northern residents usually return to the Johnstone Strait area in mid- to late June.



Oil, water and whales

In the hours and days following the barge spill, an estimated 60 whales, or roughly 25 per cent of the northern resident community, swam through the slick. Some of them, such as the A30s, swam through it multiple times.

"We saw whales go through thin sheens of diesel," says the Vancouver Aquarium's Dr. Lance Barrett-Lennard, who arrived in the strait two days after the spill. "When they surfaced in clear water, there would be a slick coming off them. That tells you that they're picking it up on their skin, however temporarily."

Whales are not as immediately vulnerable to oil as marine animals with feathers or fur. But inhaling concentrated fumes can have serious health consequences, such as respiratory complications or other forms of lung damage. These effects may not appear until months or years after exposure.

Just as dangerous are the lingering effects of oil on rocky shorelines, where it can reside in the sediments and bio-accumulate in the food chain.

VALERIE SHORE

Class packages a big hit in schools

The Killer Whale Adoption Program's Class Adoption Package has received overwhelming support from teachers and groups around the world.

Introduced in 2006, the package was designed to personalize the involvement of students and provide expanded educational materials.

Even before the package was designed, teachers were introducing their students to the amazing world of whales by encouraging them to raise money as a group to adopt a killer whale.

In 1993, two years after the adoption program started, Ms. Lauderdale from Smithers, B.C., adopted Christie (D11) with her Grade 4 class. "The students were thrilled. They raised the money themselves and selected their own whale after carefully considering all the killer whales available for adoption," said Lauderdale.

Ms. Hansen from Surrey, B.C. is another teacher who encouraged her Division 3 class to adopt a killer whale long before the adoption program designed the special class package.

The Killer Whale Adoption Program thanks all the teachers and groups that have supported the program over the last 16 years. And special thanks go to our 2007 supporters of the class adoption.

If you and your class would like a Class Adoption Package, contact adoption@vanaqua.org or 604-659-3430.

Wait for me! Springer steals the show—again

What if you held a party for someone but the guest of honour didn't show?

That thought occurred to the group of researchers, government officials, animal care specialists and volunteers who gathered in Telegraph Cove on northeastern Vancouver Island in July 2007. They were there to celebrate the fifth anniversary of one of the most heartwarming wildlife stories in decades.

In 2002, an 18-month-old killer whale calf—identified as Springer (A73)—was discovered alone and sickly in Washington State's Puget Sound off southern Vancouver Island, hundreds of kilometres away from her pod's home range. Her mother, Sutlej (A45), was missing and presumed dead.

Following discussions with the Canadian government, the U.S. National Oceanic and Atmospheric Administration (NOAA) initiated an international, multi-agency effort to capture Springer, get her healthy, transport her home to Johnstone Strait and reunite her with her family.

It was an unprecedented operation, frought with risks and uncertainties. And it captured the imagination and hearts of millions around the world.

As everyone now knows, Springer was successfully reunited with great aunt Yakat (A11) and her family. For the most part, Springer has travelled with them ever since.

The 2007 reunion, organized by NOAA's Lynne Barre and Donna Sandstrom, opened with a First Nations welcome ceremony, followed by a panel discussion on lessons learned during the rescue.

In the afternoon, reunion participants travelled from Telegraph Cove, across Johnstone Strait, to OrcaLab on Hanson Island. But where, they wondered, was the guest of honour? Killer whales had not been seen in the area for many days. Would she miss her own party?


Springer makes her appearance.

LANCE BARRETT-LENNARD

Nope. Right on cue, word spread that Springer and the A11s had been spotted at the rear of several matrilines travelling down Johnstone Strait. Eager for a glimpse, the group ventured back into the strait and met up with the whales between Telegraph Cove and Robson Bight (Michael Bigg) Ecological Reserve. Smiles abounded as they watched the plump and healthy seven-year-old frolicking with her relatives. "It was a fantastic way to end the event," says Barrett-Lennard. "It was wonderful to see her doing so well."

Shades of Moby Dick

Well okay, Herman Melville's fictitious white leviathan was a sperm whale. Ours is a killer whale and it is very real. This white adult male killer whale was spotted in early March by scientists aboard a fisheries research vessel off western Alaska's Aleutian Islands. It's believed to be a fish-eating or resident-type killer whale, which are the most frequently seen killer whales in the Aleutians during the summer. This winter sighting suggests they may be common year-round.

This whale is not a true albino because it has signs of darker pigmented areas on its body. Other sightings of a white killer whale have been reported previously in the Aleutians, as well as in the Bering Sea and off the Russian coast.

There is also a gene for white pigmentation in BC's transient killer whale community. Several "white" transients have been documented in the T2 bloodline. The most famous of these was a young female captured in 1970, later known as Chimo. Due to a genetic disorder related to her partial albinism, Chimo died of an infection in a Victoria, B.C. seaquarium in 1972.


Cover Photo

H.FEARNBACH, NMML, NMFS PERMIT 782-1719

MICHAEL DEROOS

Killers in the dark

A research team listens in to the nighttime adventures of transient killer whales

Do transient killer whales hunt at night? Yes, they do. A research team led by Dr. Volker Deecke has shown that darkness is no obstacle for these highly efficient predators. But the study tells us much more— it gives us new clues to how transients detect their prey, night or day.

We already know that fish-eating resident killer whales routinely use echolocation clicks while foraging, and that marine mammal-eating transients rarely do. This makes sense, since fish can't hear echolocation clicks, but seals, sea lions and porpoises can.

So how do transients find food in the dark?

To find answers, Deecke and his team spent two field seasons in southeast Alaska, tagging transient whales and following them around on their day and nighttime travels. Each tag package included a small radio transmitter and two tiny hydrophones.

"The hydrophones recorded underwater sound at a very high quality, so they could document everything the tagged animal heard or any sound it generated," says Deecke. Tags attached to the whales with harmless suction cups and were programmed to fall off after 16 hours.

The team tagged a total of 15 transients, and eight tags stayed attached for at least part of the night. So far, 16 "predation events" have been identified.

The telltale sound from the hydrophones was the crunch of bones as a prey animal was consumed.

"These results show that transients have no problems whatsoever to detect, hunt and capture prey at night," says Deecke. "This rules out the possibility that they rely entirely on their vision to hunt."

The results also offer strong evidence that the whales are using passive listening to detect their prey. One tag recorded the distinctive growling sounds of a male harbour seal, probably used as a territorial signal or to attract females. In this case, it attracted more than he bargained for.

"We can hear the growls grow progressively louder," says Deecke. "The final bout of two very loud growls is followed by a predation event 27 seconds later. No more growls after that."

The team followed whales up fjords with tidewater glaciers, where newly weaned and naïve harbour seal pups—the researchers call them "pupcorn"—are easy prey. One tagged juvenile whale was involved in as many as seven predation events during a four-hour period early one morning.

Deecke has been studying transient predation for nine years, but even he was surprised by the frequency of kills recorded by the tags.

"We were watching one group from 500 metres away and were completely oblivious to any predatory behaviour, yet the tag record clearly showed that they had made a kill," he says.

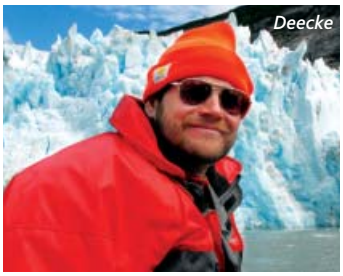
ARI SHAPIRO

Tag is visible in front of whale's saddle patch.

Deecke is a research fellow at the University of St. Andrew in Scotland and a research associate at the Vancouver Aquarium. The study was funded by the adoption program, the North Pacific Universities Marine Mammal Consortium, and the National Geographic Society.

Field notes

During daylight hours the team followed a tagged whale at distances of 1.6 km or more so they wouldn't influence its behaviour. At night they used radiotracking to stay with the tagged whale.



VALERIE SHORE

Looking for the tags once they're off the whales "is always exciting and comparable to an over-gadgeted Easter egg hunt," says Deecke. The researchers locate the tag using a directional VHF antenna to home in on the tag's radio signal. "Echoes can be misleading in the narrow fjords and inlets of southeast Alaska, but in the end we got quite good and managed to find tags with minimal delays."

In the same study, a tag was attached to an Alaskan resident killer whale. The tag clearly recorded crunching sounds as fish were consumed. "This would be an extremely valuable tool to learn more about the hunting strategies residents use to detect, pursue and catch chinook salmon and other fish," says Deecke.

ORCA UPDATE

Many matrilines appeared unchanged in 2007. Everyone seems to be doing well in the A36, A12, A30, A24, A8, A23, A25, B7, G27, I11, R2, and R7 matrilines.

The C10 matriline welcomes **C28** who is the second calf for **Fifer** (C13), and new to the D11 matriline is **D25**, the second calf for **Christie** (D11). These two youngsters will be up for adoption next year if surveys confirm their survival this summer.

Sadly, young **Canoona** (A82) has been declared dead. The two-year-old had lost its mother (**Racey A59**) in 2005 and was struck by a boat in 2006. Canoona most likely died during the winter of 2006-07.

We also bid farewell to another youngster, **Ta-aack** (C25), the fourth calf of **Lama** (C8). As you may recall, Lama's daughter **Quadra** (C21) was killed in 2006 after being struck by a boat. However, her calf, **C27**, born in 2006, is being cared for by grandma Lama.

Nowish (D23)

New to the adoption list are; **Cordero** (A85), the first calf of **Nodales** (A51); **Cutter** (A86), the second calf of **Blinkhorn** (A54); **Naysash** (C26), the fifth calf of **Koeye** (C10); and **Nowish** (D23), the second calf of **Cascade** (D13).

It's a boy! **Diver** (C22) has started to "sprout," the term we use to describe the upward growth of a male's dorsal fin as he approaches sexual maturity.

On the transient scene, **Nitinat** (T12A) was spotted several times in 2007 without mother **Pachena** (T12), which is very unusual. And **Seaforth** (T29), who often travelled alone, has not been seen for several years. We'll keep you updated if these missing whales return. Calf **T2B1**, announced last year, was not observed with mother **Pedder** (T2B) in 2007 and is presumed dead.

T2C2, the second calf of **Tasu** (T2C), appears to have developed scoliosis and its long-term prognosis is not good. All other transients on our adoption list were seen in 2007 and appear to be doing well.

Fight or flight?

Imagine you're a baleen whale being pursued by hungry transient killer whales. Would you swim away as fast as you can? Or would you hold your ground and fight back?

That depends on what type of whale you are. If you're a minke, for example, you'll swim away as fast as your flukes can take you. But if you're a humpback, you'll likely use every weapon at your disposal to fight back.

"Baleen whales react in two very distinct ways to the prospect of getting eaten," says Dr. John Ford, a whale researcher with Fisheries and Oceans Canada. He recently co-authored an academic paper called "Fight or Flight: anti-predator strategies of baleen whales."

The paper proposes that, over the millennia, the pressures of killer whale predation have significantly shaped the life histories, social organization and behaviour of large whales.

Baleen whales include all large whales, except one (the sperm whale). Baleen whales in BC waters range in size from the eight-metre minke whale to the 30-metre blue whale.

The paper describes how each species of baleen whale uses either the "fight" or "flight" response to a killer whale attack. "Fight" is defined as self-defence by individuals, defence of calves by mothers, or coordinated defences by groups of whales.

"Fight" whales tend to have robust body shapes and are slow swimmers. They have their calves and migrate in coastal waters where they can hide in the shallows from predators.

"Fight" whales roll and thrash at their attackers with their pectoral flippers or powerful tails. They may gather into groups to mount a defence. Mothers vigorously defend their calves. "Fight" whales are humpbacks, greys, bowheads and right whales.

A minke whale flees from transient killer whales.

ELLEN HARTLMEIER

"Flight" behaviour is described as rapid swimming away—at speeds of 20 to 40 kph—from killer whales. "Flight" whales have streamlined body shapes and can sustain the speeds needed to outrun killer whales (top sustained speed is 20 kph).

If they're overtaken and attacked, "flight" whales can do little to defend themselves.

"Flight" whales favour deep ocean habitats, where prolonged sprints away from predators are possible. Examples are blue, fin and minke whales.

Against all odds

Anyone who has watched killer whales attack gray whale calves is usually struck by how lopsided the battle seems to be. Separate the calf from its mother, and the conclusion seems inevitable. But not always.

In spring 2007, the Aquarium's Dr. Lance Barrett-Lennard travelled up to westernAlaska to study that region's killer whales. As in previous years, he and fellow researcher John Durban saw transients feeding on gray whale calf remains. But this time they witnessed more actual attacks, including one with a surprise ending.

LANCE BARRETT-LENNARD

The star of the incident was a young gray whale calf that had made the mistake of leaving its mother in the safety of the shallows, only to be swarmed by a group of transients. With killer whales all over it, grasping its flukes, flippers and throat pleats and pulling it further offshore, the calf seemed to go into shock and struggled weakly.

Just has things looked bleak for the calf, it suddenly recovered its strength, turned toward the beach and swam for its life, rolling rapidly as it went. "The effect was to dislodge the transients by scraping them off against the shallow bottom," says Barrett-Lennard. The calf got back to its mother, who positioned herself so that her baby was on the inside against the beach.

The calf had bite wounds on its tail and pectoral fins, but they likely weren't fatal. When the researchers left 45 minutes later, most of the transients had gone. It's not known whether the mother and calf safely left the beach.

Still, chalk one up for the underdog. "You tend to get very involved watching these encounters and I found myself cheering for the little gray whale in this one," says Barrett-Lennard. "The words coming out of my mouth were 'Go, go, go!'"

Project studies air quality for whales

B.O GARRETT

We all know how unpleasant it can be to walk near a busy street or highway and breathe in fumes from passing vehicles. Now imagine you're a southern resident killer whale being followed by boats up to 12 hours a day. Is your health at risk?

Cara Lachmuth, a graduate student at the University of British Columbia, plans to find out.

For her master's degree, Lachmuth is evaluating the quantities of airborne pollutants that are inhaled by killer whales, and estimating the physiological consequences of this exposure.

Exhaust pollutants such as carbon monoxide, nitrogen oxides, polycyclic aromatic hydrocarbons, and particulate matter are heavier than air and tend to accumulate at the water's surface where the whales breathe.

Lachmuth spent two weeks last summer in a tiny boat off southwest Vancouver Island, sampling air temperature and movement at the sea surface. She wanted to find out whether air conditions at "whale level" are conducive to pollutant accumulation. They are.

"If I had found out that pollutants readily disperse then there would have been no point continuing," she says.

The next step is to analyse air quality around the whales. It would take some very expensive equipment to do that in the field, so Lachmuth is modelling it instead. Her computer model simulates the dispersal of exhaust, and estimates air pollutant concentrations inhaled by the whales.

"I'm currently running simulations," says Lachmuth. "Next, I'll make a physiological model for killer whales to determine the consequences of exposure to the concentration of air pollutants predicted by the dispersion model."

The study will include conservation recommendations and may serve as the basis for regulatory changes to whalewatching.

Lachmuth's work is co-supervised by the Vancouver Aquarium's Dr. Lance Barrett-Lennard.

Meet an essential member of our research team

Poseidon, the Greek god of the sea, owed his powers to his trident. Killer whale researchers owe their powers to their research vessels.

Our researchers and graduate students have the *Tsitika*, a 5.5-metre, purpose-built research vessel. Commissioned in 1990 and named after the river that flows into Johnstone Strait at Robson Bight, the *Tsitika* was purchased with funds provided by Rudy North and Chevron Canada.

The vessel design incorporates features well-suited to marine research. To endure rough weather, the cabin originally had a hard top with hatches so that occupants could put their heads through to take pictures. This was eventually replaced with a soft top that is lighter and retractable.

Used extensively around the north and west of Vancouver and Vancouver Island, the *Tsitika* has logged thousands of kilometres over the years.

In 2006 the *Tsitika* was stolen from a marina in Vancouver. Fortunately, she turned up on a trailer not far from the marina. She had been stripped of her engine and electronics, but was otherwise undamaged.

We're happy to report that the *Tsitika* is now back to her former glory. With a little luck, she'll continue to take researchers to the whales and other marine mammals for many years to come.

VANCOUVER AQUARIUM

Thanks for your support

The 2007 Michael A. Bigg Graduate Student Award helped get master's student Cara Lachmuth onto the water last summer to test air quality for killer whales. Lachmuth thanks donors of the Killer Whale Adoption Program for their generous contribution to her research. The 2008 Michael A. Bigg Award will be presented this fall. Nominations are currently being accepted.

DINNER TO GO

Since beginning the western Alaska study (see Against all odds, p.6), 135 transient killer whales have been identified for the first time, including 12 new ones in 2007.

The records are being added to a consolidated catalogue of transients in the eastern Aleutian Islands.

Before the study began in 2002, very little was known about killer whales in the region. The Aquarium's Lance Barrett-Lennard is working with Craig Matkin of Alaska's North Gulf Oceanic Society and John Durban of the Center for Whale Research to photograph, record sounds and take tiny biopsy samples from killer whales in the region.

The 12 new whales identified in 2007 "looked to us like interlopers," reports Barrett-Lennard. They breezed in from offshore and headed straight for a gray whale carcass left by another group of transients. When the researchers approached, the whales sped off carrying large chunks of gray whale blubber and flesh.

"Some pieces were the size of washing machines," says a bemused Barrett-Lennard. "Every time they surfaced, they would leave an oil slick from the blubber. It was like leaving footprints for us to follow."

Quebec researcher kicks off visiting scientist program

In 2007 the Vancouver Aquarium created a visiting scientist position to allow researchers on study leave from their parent institutions to join the team in the Aquarium's Levy Marine Mammal Research Centre.

Michaud

JANIE GIARD, GREMM

Last September, beluga researcher Robert Michaud, founding director of the Quebec-based Group for Research and Education on Marine Mammals (GREMM), joined the team as the inaugural visiting scientist.

Michaud has been studying the beluga whale population in the St. Lawrence River for 25 years and is actively involved in education and conservation initiatives to protect the whales and their marine environment.

Having worked with wild cetaceans all of his career, Michaud was very curious about the captive research performed at the Aquarium by PhD candidate Valeria Vergara. He was thrilled when Vergara rushed into his office one day after listening to his recordings from wild belugas.

She wanted to know what the wild belugas were doing during the recording. The vocalizations were almost identical to ones she had recorded from Aurora, a new beluga mother at the Aquarium.

"It is these moments that are very enlightening, to match vocalizations in captive animals with those in the wild," says Michaud. "It is difficult to pick out patterns in the sounds of wild belugas, which are often in large herds with many individuals involved in different behaviours."

Before he returns to Quebec, Michaud will join the Aquarium's Dr. Lance Barrett-Lennard on a week-long research trip. "I have yet to see killer whales in the wild, and I am very much looking forward to it," he says.

The 2008-09 visiting scientist will be renowned Russian researcher Dr. Olga Filatova from the University of Moscow, who is studying the acoustic dialects of killer whales in Russia's far east.

YOUR ARTWORK

Thank you to all the talented young artists who contributed some great killer whale drawings. Sorry we can't show them all, but here's a sampling.

Artwork, upper left: **Joshua Zeps**, age 7 (UK). Bottom left: **Riley Lucente,** age 8 (Granada Hills, California). Bottom right: **Seanette Ree Lagace** and **Kaitlin Perignon**, (L'Ecole du pacifique–Sechelt, B.C.).

THANK YOU

Thank you to the following people who continue to lend their time and energy to the adoption program: **Graeme Ellis**, for organizing the ID photos; **Wilf Hatch** for long hours in the dark room; **Graeme Ellis, Jim Borrowman, Jared Tower, Alexandra Morton, John Ford** and the many other contributors to the photo ID study that makes this program possible. A big thank you to the following research patron and extended members who made very generous contributions to our program this year: **Karen Hanson** and **Stan Hutchings; Charlotte** and **Mike Higgins; Michiru Takashi Ogino; Raylene Kwasnicki; Cari, Amelia** and **Aleya Schmidt; Susie Pok-Stein; Manpreet Harjot; Amneet Deol;** and **Eddy Samaniego.** And a very special thank you to all whale adopters for continuing to make this program possible.

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