



## **A73/ SPRINGER HEALTH EVALUATION, November, 2007**

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### **BACKGROUND:**

A73, a two year old, *Orcinus orca*, member of the Northern Resident Killer Whale population (NRKW) was sighted swimming alone, 12 Jan 2002, in Puget Sound, Washington, between the ferry terminals of Vashon Island and Southworth. She was reported to have a strong ketone like odor to her breath, bad skin, passing parasites and demonstrating needs for cohort tactile interaction and companionship. She also appeared underweight and during her five months in a limited area of Puget Sound, developed a strong affinity for the Vashon Ferry and small boats of all descriptions.

Management decisions were determined through analysis of blood samples collected from A73, without restraint, over the starboard side of a NOAA skiff on 8 and 10 May 2002. A Western Blot Test proved she was free of Inborn Errors of Metabolism. Additional hematology, erythrocyte sedimentation rate, hemoglobin, hematocrit, white blood cell total count, BUN and total protein were low normal. An exception was an above normal eosinophile count. She appeared bright, alert and responsive toward people in the skiff and the ketone smell was less than previously noted. Adult parasitic *Anisakis* worms were observed in defecations and *Crassicauda* ova were identified by fecal exam.

Based on the results of the Western Blot Test, indicating that she was free from Inborn Errors of Metabolism, and the presence of gastrointestinal nematode parasites, it was decided to intervene. A73 was collected from Puget Sound 13 June 2002, and placed in a 40 by 40 foot, 12 foot deep, rehabilitation pen in Clam Bay, adjacent to Port Orchard State Park, Manchester, Washington. The appearance of her skin (Attachment 1, top) indicated an unhealthy animal.

Live Atlantic salmon (locally farmed and antibiotic residue free) were offered to A73 through a 30-foot PVC tube to reduce habituation to humans. She ate 29 lbs. total during the first four days. This was not a sustainable diet so on day five, a stomach tube was passed to medicate her with an anthelmintic and 6 liters of water for rehydration. She ate 55 lbs of salmon two hours later and averaged 60 lbs daily salmon consumption until her

transport to Dong Chong Bay on Hanson Island in Johnstone Strait, BC, 13 July 2002. Thorough veterinary medical screening confirmed her suitability for translocation.

At that time, she was bright, alert and responsive, with an excellent appetite, no parasites, normal breath, improving skin, normal blood values and three consecutive negative titers to *Erysipelothrix*, Morbillivirus, Brucellosis and Leptospirosis. These findings were required for her translocation to Canadian waters. She had gained 150 pounds during rehabilitation, but was still considered by some to be small for her age, 1,370 lbs. and 11 feet 6 inches in length.

Upon arrival at Dong Chong Bay, BC, Canada, blood samples were collected by Vancouver Aquarium personnel (subsequently all found to be within normal limits) and A73 was placed in a temporary pen with many local native coho and chinook salmon. After several hours, she started vocalizing and eating. During that night, she was actively vocalizing with other A pod orcas passing by the mouth of the bay, feeding and occasionally breaching, (Attachment 2). She was released 18 hours post arrival, 14 July 2002, when A pod members again swam by the bay and more mutual vocalizing occurred.

The morning of 16 July 2002, A73 was observed near Donegal Head, in Blackfish Sound, having traveled with A pod members to Robson Bight and back, at least 30 miles, in Johnstone Strait, only to be isolated once again. She was soliciting attention from two small fishing boats, and then swam under our vessel, the Shelmar, to approach a small sailboat, taking to the people aboard a short piece of wood balanced just in front of her left pectoral flipper, which she was waving in the air. She was obviously exhausted, had regressed to previously recorded Puget Sound behavior patterns by approaching small vessels but was swimming slowly, and breathing at 10 to 15 second intervals, the orca equivalent of panting.

This was the critical point of her translocation. The four boats all left the area obligating her to survive on her own. A73 was reported pushing a small fishing boat the morning of 17 July 2002, and was seen among humpback whales and other orcas later that day. A major public relations effort was mounted through Straitwatch Canada and First Nation Kwakiutl tribe members to inform the public and first nation boaters and fishermen that they had to avoid "Springer." Her behavior would not change, so small boat operators had to change theirs and back away from her, without exception. The effort was effective and she left Johnstone Strait, with her adoptive A Pod cohorts, during the month of October, 2002.

It is felt that A73's temporary "adoption" by a young adult female orca without calves of her own is what "saved" her. Her attention switched to other killer whales when she was finally allowed to join a group.<sup>1</sup>

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<sup>1</sup> Francis, D., and G. Hewlett, Operation Orca, Springer, Luna and the struggle to Save West Coast Killer Whales, 2007, Harbour Publishing. [www.harbourpublishing.com](http://www.harbourpublishing.com).

Schroeder observed A73 during July of 2003, with two unidentified orcas, presumed to be A Pod members. She appeared to have experienced a successful translocation from Puget Sound to Johnstone Strait. She was often seen during the '03 and '04 whale watching seasons by many experienced observers including Jim Borrowman and Wayne Garton of Stubbs Island Charters, Telegraph Cove, and Bill Mackay of Mackay Whale Watching, (Attachment 3) Port McNeill, as well as DFO scientists including Graeme Ellis. She continued to behave normally and avoided approaching vessels. She had become a local celebrity, and a real human interest/natural history story for the whale watching community.

On 17 August 2005, based on information from John Ford, DFO Canada, the authors, aboard Shelmar, entered the Nodales Channel and observed A73 with pod members, A11, A56, A28, A42, A66, A79 and A13 (male). A73 appeared bright, alert and totally involved with her congeners. She had obviously continued to grow. In the opinion of some, she was considered to be smaller than expected of a five and one half year old female orca. Her skin had continued to improve, but was still somewhat grayish and mottled behind her dorsal fin from top midline, extending ventrally approximately 18 inches; extending caudally and tapering dorsally approximately 35 inches. From that point to her fluke tips her skin looked as normal as all other observed orcas.

A73's dive intervals and speed was identical to the rest of the pods'. At one point she and A79, approximately one and one half years old, rapidly approached Shelmar's port side and quickly returned to the rest of the pod. Perhaps this was curiosity, or exploration of a faintly remembered environmental sound. She did not repeat this behavior again that day or during two subsequent sightings. A13 was swimming separately during this time, as was A28. All were swimming between three and five knots. It was reported that the pod left that area 19 August 2005.

Dr. Paul Spong, 21 August 2005, reported, "Springer is a normal little orca." Whale Watch vessel Captains Jim Borrowman and Bill Mackay had seen no interaction between A73 and small boats or pieces of wood.

As reported in HEALTH ASSESSMENT, A73, dba, SPRINGER, 2005,<sup>2</sup> the collection, rehabilitation and relocation of A73 was unprecedented and an unequivocal success. "She is a normal orca in her natural environment. It is of great interest to continue monitoring this unique animal, adding to knowledge of the species, orca pod dynamics and giving credibility to similar efforts should they become necessary in the future. When will she deliver her first calf? "

## **HEALTH EVALUATION,**

During the Stubbs Island whale watching tour for the attendees of the five years Springer Relocation Anniversary, 14 July 2007, she was observed by those aboard the vessel, including Schroeder and photographed by Wood, (Attachment 4) east of Telegraph Cove

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<sup>2</sup>Schroeder, J.P., Bain, D, Wood, B, 2005, Health Assessment A73, dba Springer, Report to NMFS Office of Protected Resources

in the Johnstone Strait. She was in the company of A13, A56 and A11. She appeared to have continued growing normally since 2005. Her skin appeared normal. No difference was noted in her behavior patterns and she looked as healthy and active as she did in 2005. A13 is the male orca she was reported with in the Nodales Channel in our 2005 report. She had been reported in the Nodales Channel 13 July, 2007, and with other APod orcas, A4s, A12s and A5s just before 9 am, 14 July North of Port Hardy heading toward Johnstone Strait.

Graeme Ellis, DFO, Canada, reported that on 6 August 2007, A73 had approached his boat and he smelled a ketone like odor on her breath. The authors became concerned that if she was approaching Ellis's boat because of ketosis, or other metabolic problems, she may be reverting back to 2002 behaviors.

However, as a top of the food web predator, she may experience periods of fasting during which she reverts to liver based gluconeogenesis to produce energy. This physiological process can produce an excess of ketone bodies that may be excreted in the breath and urine.<sup>3</sup> In A73's case, the most optimistic conclusion is that if ketone bodies are smelled after she exercises following a period of fasting, she needs to eat again. It is unlikely that her initial test for Inborn Errors of Metabolism produced false results, but that is an extremely complex condition.<sup>4</sup> Ellis may have smelled her breath after a period of fasting.

Adding to the authors' concern, were reports that A73 had been briefly exposed to an oil spill in the Robson Bight, 20 August 2007. Being exposed to volatile hydrocarbon fumes could have exacerbated other conditions, if present. The hydrocarbon material included gasoline and diesel fuel in and for logging equipment carried on a barge, all of which spilled from the barge inside the boundary of Robson Bight. Bill Mackay reported the location as N50° 29' 729 latitude and W126° 34' 392, longitude, with the wind and tide holding the spill against Vancouver Island and moving it west. Mackay, who was monitoring the spill from his vessel, Niad, reported seeing A73, post spill, with her usual pod members all in good shape. In his opinion, as well as Spong and Symonds, the A30 pod spent more time in the area of the spill than others, moving to Blinkhorn Point than turning east back through the sheen. No orcas are missing or have been seen exhibiting respiratory distress or behavioral changes since the spill. Many of the orcas, including A73, have been absent from the area since 5 and 6 September. The authors observed the A30 pod members for six hours 20 September, 2007, and all appeared normal.

When cetaceans come to the surface to breathe in the area of an oil spill or in the spill itself, they can inhale polyaromatic hydrocarbon vapors that may result in lung injuries and oil that comes in contact with the animals' sensitive membranes and eyes may produce irritations.<sup>5</sup> Severe consequences occurred (from March, 1989, until 1997) to

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<sup>3</sup> Koeslag, J. H., T. D. Noaks, A. W. Sloan, 1980. Post Exercise Ketosis. *Journal of Physiology*, 301, 79-90.

<sup>4</sup> Taklad S. R., G. Uttam, and W. D. Graf. 2006. Inborn errors of metabolism in infancy and early childhood: an update. *American Family Physician*, 73:11 10 pp.

<sup>5</sup> Understanding Oil spills and Oil spill response, [www.epa.gov/oilspill/pdfs/chap5.pdf](http://www.epa.gov/oilspill/pdfs/chap5.pdf).

AB and AT1 Pods of killer whales after the *Exxon Valdez* oil spill in Prince William Sound, Alaska. Several orcas were missing and presumed dead following that spill.

Five other resident pods seen swimming through the oil-sheened waters after the *Valdez* spill have not experienced losses, however, these pods likely spent less time in the spill area and were observed only in the lighter sheens, which suggests that lesser degrees of exposure may not have been harmful to the whales.<sup>6</sup> We are hopeful that this is the case with A73, as has been reported, but continued monitoring of her health is critically important.

Reports from Helena Symonds, who tracked all orcas near the spill that day and night with her hydrophone array, indicate that A73 spent less time exposed to the possible negative impacts of the oil spill than other NRKW such as the A30s. Full evaluation of that data is being conducted by DFO officials.

Trained and experienced observers interviewed for this evaluation have seen A73 during the time following the 20 August oil spill. She left the area sometime between 5 and 6 September 2007. We were therefore unable to observe her directly as we did 14 July 2007, but all reports and indications are that she remains active, is integrated more with her cohorts and she and her pod's move from the area is entirely within normal limits.

## **INTERVIEWS:**

A73 approached Graeme Ellis's research vessel on 6 August, but, according to him, this is not unusual for her and other NRKW. However, Ellis reported smelling ketone bodies on A73's exhaled breath, but reported he smelled that from her on several occasions over the last four years, as well as from other NRKW. It is not unusual for A73 or other NRKW to approach his boat, and as mentioned above, this smell may be physiologically normal.

Ellis also reports that A73 appears to have gained weight since last season, but is still smaller than average for her age group. His opinion is valid, based on the depth of his experience observing orcas of known age. It is difficult to obtain objective measurements such as length, and weight of animals in the field. More importantly, as far as the health and welfare of A73 is concerned, he also reports more play like inter-action time between her and the NWKW nearer her age group, which he interprets as a good sign of additional integration with the NRKWs. She appears to Graeme to be a well-adjusted, healthy and normal orca. He finds her easy to recognize in the field due to her swimming patterns, primarily while breathing. He obtained above and underwater photographs of her this summer and they demonstrate her excellent health, (Attachment 1, bottom) as compared to her appearance in 2002, (Attachment 1, top).

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<sup>6</sup> National Marine Fisheries Service. 2006. Proposed Recovery Plan for Southern Resident Killer Whales (*Orcinus orca*). National Marine Fisheries Service, Northwest Region, Seattle, WA. 219 pp.

Lance Barret-Lennard, Senior Marine Mammal Scientist, Vancouver Aquarium, concurs with Ellis about A73's size and says that in "his own subjective experience, she is very small for her age. She swims very strongly and "assertively" for a whale her length. In other words, she looks like a four year old but swims like a seven year old."

Dr. Paul Spong and Helena Symonds, Orcalab, report observing A73 since 20 August 2007, and that she looks "great" in all aspects. Helena carefully tracked individual A pod whales at the time of and following the oil spill at Robson Bight, [www.orcalab.org](http://www.orcalab.org), Robson Bight oil spill update. Her results indicate A73 was exposed to the spill area for a significantly shorter time than was the A30 pod.

The definitive oil spill evaluation to date and "good news" follow up came from Paul Spong on November 15, 2007, when his excited email stated: "We have good Springer news... Springer has returned to Johnstone Strait, and she looks great! Almost 3 anxious months have passed since the tragic oil spill in Robson Bight, which exposed fully 25% of the Northern resident orca community to toxic diesel fumes. Springer's family, the A4 pod, was one of the groups which spent several hours amidst a dense diesel fog in Robson Bight the night after the incident. During the 2 weeks that followed, none of the A4s, including Springer, displayed obvious symptoms. But just the same, we were worried about them, and when they left we wondered if we would see all of them again."

"Two months later, on November 7<sup>th</sup>, we heard the welcome sounds of the A4 pod in Blackfish Sound once more. We thought the calls were probably from Springer's adoptive family, her great aunt Yakat's group within the A11 matriline, though we couldn't confirm their presence visually. An A5 group was with them, and a couple of days later they were joined by Scimitar's A12 family. On November 10<sup>th</sup>, we were able to see all 3 groups as they headed slowly north through Blackney Pass against a strongly flooding tide. The groups were quite mixed up, but we were fairly sure that all of the A12s, all of the A8s, and all of Yakat's group (including Springer) were there. We managed to get photographs of most of the orcas, to confirm their identities. All the behaviour looked, at least superficially, to be normal. The youngsters were in a playful mood, splashing about and flipping their flukes, and several of the orcas spent time foraging as they entered Blackfish Sound. Springer was traveling with her close cousins Nahwitti (A56) Current (A79) and Echo (A55). She appeared energetic, and her skin condition was the best we've ever seen it."

Spong continued, "Needless to say, seeing Springer and more than a dozen (16) of the 58 orcas who were impacted by the August 20<sup>th</sup> oil spill was heartwarming and reassuring. It's far too early to say that the orcas are all out of danger, but we can say that 3 months after the incident, everyone in these 3 families looks fine. That's good news."

Schroeder, Bain, Ellis and his research assistant observed the nine A30's during breath collections for monitoring their microbial flora, 20 September 2007, and all appeared healthy, were seen feeding and exhibiting normal behavior and breathing patterns. They appear to have experienced no ill effects from their exposure to volatile hydrocarbons,

though this may be misleading and careful long term monitoring is recommended. However, based on Symonds's interpretation from tracking the event, it is a plus that A73 was less exposed; apparently she approached the easterly edge of the spill and reversed her direction, leading to our optimistic opinion regarding her continued good health. DFO officials for analysis and future planning are collecting this data, as well as other oil spill information.

Jim Borrowman, Stubbs Island Whale Watching reported that he has observed A73 often since the oil spill and that she is fine. He observed her 5 September 2007, looking fit. He relates how the salmon run is very poor this year; "a huge lack of salmon" may explain the few killer whales in the area this time of year. Also, there is now an additional 11 outboard whale watching boats using the area. There have been 45 humpback whales identified over the last four to five years, a new finding.

The authors, during the period of this evaluation, 14 to 21 September 2007, observed humpback whale activity seven days, but killer whale activity two days, a reversal of past experience. We also observed an island haul-out area, in the middle of Blackfish Sound, with 50 Stellar sea lions, 4 harbor seals and five California sea lions. There may be more competition for the fewer salmon returning this year, causing the killer whales to leave earlier than expected.

Bill Mackay, Mackay Whale Watching, out of Port McNeill, reports regular sightings of A73 until 5 September. She appeared normal to him and he expresses no cause for concern. She continues to be an orca of great interest and is constantly under close observation.

Given A73's experience with vessels of all sizes since she became known to the public, with no negative interactions as far as is known, it may be expected that she retains some curiosity toward vessels in her environment. It was of great concern that during her time in Puget Sound and rehabilitation she would become too habituated to vessels, to her detriment. This does not appear to be the case five years post release into her native waters.

Little is known of the winter distribution and diet of the Northern Resident Killer Whales, and the fact that Canada is addressing this in a pro-active manner is encouraging for the long-range success of A73.<sup>7</sup>

## **CONCLUSIONS:**

- The rehabilitation and relocation of A73 remains a unique event that has become a model for handling an abandoned, immature orca that has a chance for a normal life in its native habitat.
- A73 continues to be a normal orca in her natural environment.

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<sup>7</sup> Resident Killer Whale Recovery Team, 2007. Recovery Strategy for the Northern and Southern Resident Killer Whales (*Orcinus orca*) in Canada. [Proposed]. *Species at Risk Act* Recovery Strategy Series, Fisheries and Oceans Canada, ix+80 pp.

- She has returned to her native waters for five consecutive years following her relocation.
- She is feeding, growing and developing normal social relationships with her cohorts.
- It is of great interest and importance to continue monitoring this unique animal, adding to knowledge of the species, orca pod dynamics and to give credibility to similar efforts, should they become necessary in the future.
- The oil spill exposure and apparent changes in her critical habitat provide strong incentives to continue long term longitudinal monitoring of this special orca.
- Long term monitoring is critical to track her “ketone” breath, especially since she was exposed to an oil spill.
- An objective way to compare her size to others in her age class should be explored, adding knowledge to monitoring and evaluation of her reproductive history.

## **DISCUSSION:**

Many elements of the story of A73 are unknown or unknowable. The objective elements necessary for a successful translocation are briefly outlined in Togetherness is our Home, An Orca’s Journey Through Life: a thorough medical screening, a search for her native pod, the selection of an area for gradual rehabilitation and long-term monitoring of the orca.<sup>8</sup>

The more unknowable elements, the subjective cognitive process of a young female orca removed from her natal pod are intriguingly explored in van Ginneken’s fictional story based on real events in the life of an orca named Gudrun, and from 20 years of observation of the everyday lives of orcas in both in their natural habitat and in captivity.

This evaluation also contains subjective descriptions of this orphaned orca, including assertive, integration, play like interactions and curiosity. A73 is a scientific designator, but Springer is the name most often used and that would fit the orca described in the story of Gudrun, and the story of Springer. The stories of both orcas contain the classic elements of separation, initiation and return. The story of Gudrun is heart warming and intuitive, and in this author’s opinion, adds a dimension to the story of Springer that would otherwise be unknowable.

Springer’s relocation represented the first time that a wild whale had ever been captured, transported back to its home range and successfully released. It was the most ambitious animal rescue ever mounted on the Pacific Coast<sup>9</sup>. This evaluation confirms the continued success of that effort.

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<sup>8</sup> Van Ginneken, A, Togetherness is Our Home, An Orca’s Journey through Life. 2007, Booksurge Publishing. [www.booksurge.com](http://www.booksurge.com).

<sup>9</sup> Francis, D, and G. Hewlett, Operation Orca, Springer Luna and the Struggle to Save West Coast Killer Whales. 2007, Harbour Publishing, [www.harbourpublishing.com](http://www.harbourpublishing.com)

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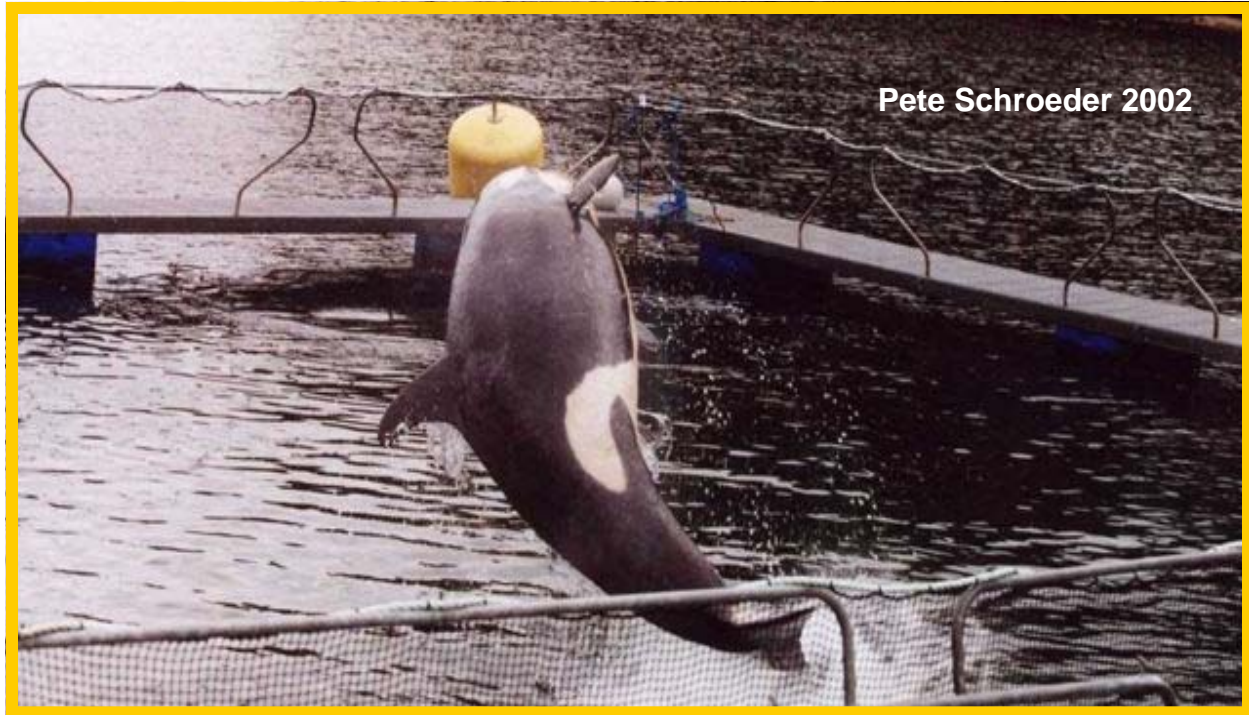
Matching funds were provided by Global Research and Rescue. [www.grrescue.com](http://www.grrescue.com).

*Photo attachments continue on following pages -*

## A73 Springer 2007 Health Evaluation



## A73 Springer 2007 Health Evaluation



*Attachment: 2*

## A73 Springer 2007 Health Evaluation



*Attachment: 3*

## A73 Springer 2007 Health Evaluation



Attachment: 4