

# A73/ SPRINGER HEALTH EVALUATION



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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 January 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, was passing parasites, and demonstrating needs for tactile interaction and companionship. She also appeared underweight. During her five months in a limited area of Puget Sound, A73 developed a strong affinity for the Vashon Ferry, small boats of all descriptions and an approximately four foot long by 4inch diameter “stick”, which became important as her transition object from Puget Sound to Clam Bay, near Port Orchard, Washington, to Dong Chong Bay on Hansen Island, BC, and finally to her home in Johnstone Strait, BC.

Management decisions were determined following analysis of blood samples collected from A73, without restraint, over the starboard side of a NOAA skiff on 8 and 10 May 2002. This was the first time a wild orca had been blood sampled in its natural environment. 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, blood urea nitrogen (BUN) and total protein were low normal. An exception was an eosinophile count slightly above normal. 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, an unthrifty appearance 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 A73’s skin (Attachment 1), when coupled with other clinical signs and laboratory analysis, indicated an unhealthy animal. It was unlikely she would thrive in her present environment.

*Attachment 1*

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 pounds total during the first four days. This was not a diet adequate to sustain survival, so on day five, a stomach tube was passed to medicate her with an anthelmintic, fenbendazole, a horse and cattle dewormer, and 6 liters of water for rehydration. She ate 55 pounds of salmon two hours later and averaged a 60-pound daily salmon consumption until her transport to Dong Chong Bay on Hanson Island in Johnstone Strait, BC, 13 July 2002. Extensive veterinary medical screening, including blood gas analysis, hematology and electrolyte balance continued throughout the month confirming 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 *Eryispeothrix*, Morbilivirus, Brucellosis and Leptospirosis. Department of Fisheries and Oceans (DFO) Canada required these findings for her translocation to Canadian waters. A73 had gained 150 pounds during rehabilitation, but was still considered by some to be small for her age at 1,370 pounds 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](#)).

### A73 Springer 2007 Health Evaluation



*Attachment: 2*

She was released 18 hours post arrival, 14 July 2002, when A pod members again swam by the mouth of Dong Chong 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, in Johnstone Strait (at least 30 miles), only to be isolated once again. She was soliciting attention from two small fishing boats. She then swam under Captain Bob Wood's vessel, the Shelmar, to approach a small sailboat and take 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. This behavior demonstrated that she had regressed to previously recorded Puget Sound behavior patterns by approaching small vessels. She was obviously exhausted, swimming slowly, and continuously breathing at 10 to 15 second intervals, the orca equivalent of panting.

This was the critical point of her translocation. In response to our recommendations, the four boats all left the area obligating her to survive on her own. The morning of 17 July 2002, A73

was reported pushing a small fishing boat, and was seen among humpback whales and near other orcas later that day. A major public relations effort was mounted through Straitwatch Canada and First Nation Kwakiutl Tribal members to inform the public and First Nations 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 contributed an important element to the success of A73’s translocation. Her attention switched to other killer whales when she finally joined a pod of orcas, when they appeared to accept her presence.<sup>1</sup>

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, Port McNeill, as well as DFO scientists, primarily, Graeme Ellis. She continued to behave normally and avoided approaching vessels. A73, now popularly known as “Springer” had become a local celebrity and a real human interest/natural history story for the Telegraph Cove, Port McNeill whale watching communities.

On 17 August 2005, based on information from John Ford, DFO Canada, the authors entered the Nodales Channel aboard Shelmar and observed A73 with pod members, A11, A56, A28, A42, A66, A79, and A13 (male). A73 appeared bright, alert and totally involved with her fellow orcas. She had obviously continued to grow. In the opinion of some, she was considered to be smaller than expected for a 5.5 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 and 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 were identical to the rest of the pod’s. At one point she and A79, approximately 1.5 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, reported on 21 August 2005, “Springer is a normal little orca.” Whale watching vessel captains Jim Borrowman and Bill Mackay had seen no interaction between A73 and small boats or pieces of wood during the 2003 (Attachment 3), 2004 and 2005 summer whale watching seasons. These reports were consistent through 2007 and 2009.

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

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. That was also true during the authors 2007 and 2009 evaluation cruises. A73 has also been sighted during the summer of 2010. 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? How long will she continue to thrive?

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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.

## A73 Springer 2007 Health Evaluation



*Attachment: 3*

## HEALTH EVALUATIONS

During the Stubbs Island whale watching tour for the attendees of the Five Year Springer Relocation Anniversary, 14 July 2007, A73 was observed by many of those aboard the vessel Gikumi, including Schroeder, and photographed by Wood ([Attachment 4](#)), east of Telegraph Cove in the Johnstone Strait.

### A73 Springer 2007 Health Evaluation



Attachment: 4

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 with who she was reported in the Nodales Channel in 2005. She had been reported in the Nodales Channel 13 July, 2007, and with other A Pod orcas (A4s, A12s, and A5s) just before 9 am, 14 July 2007, north of Port Hardy heading toward Johnstone Strait.

Graeme Ellis, DFO, Canada, reported that on 6 August 2007, when A73 approached his boat he smelled a ketone-like odor on her breath. It was concerning if she was approaching Ellis's boat because of ketosis, or other metabolic problems, she may be reverting back to 2002 behaviors or has acquired some health problems.

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 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. Her healthy appearance to all observers during the 2009 summer season confirms this opinion.

In 2007, also adding to our 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. When cetaceans come to the surface to breathe in the vicinity of an oil spill, they may inhale polyaromatic hydrocarbon vapors that will result in lung pathology, and eyes will become inflamed.<sup>5</sup> Severe consequences occurred (from March 1989 until 1997) to orcas

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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).

in 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 oil 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, but continued longitudinal monitoring of her health is critically important and essential in adding to the orca knowledge base.

The hydrocarbon material spilled because of the 2007 barge sinking in Robson Bight included gasoline and diesel fuel for logging equipment contained in both equipment fuel tanks and in storage tanks. All of these toxins spilled from the barge inside the eastern boundary of the Bight. Bill Mackay reported the location as N50° 29' 729 latitude and W 126° 34' 392, longitude, with the wind and tide holding the spill against Vancouver Island and moving it west. Mackay, monitoring the spill from his vessel, *Niad*, reported seeing A73, post spill, with her usual pod members, all in good condition. In his opinion, as well as opinions expressed by Spong and Symonds, the A30 pod spent more time in the area of the spill than others, moving to Blinkhorn Point then turning east back through the sheen. None of these 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, 2007. The authors observed the A30 pod members for six hours 20 September 2007, and all appeared normal.

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 has been conducted by DFO Canada officials and confirmed. Trained and experienced observers interviewed for this evaluation have seen A73 multiple times following the 20 August 2007 oil spill. A73 left the Johnstone Strait area sometime between 5 and 6 September 2007. During 2009, we were unable to observe her directly as we

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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.

did in 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.

## **2009 INTERVIEWS**

**Dr. Schroeder, Bob Wood and Linda Rhodes (replaced by Jeff Foster 14 September) arrived in Telegraph Cove, aboard the Shelmar, 12 September 2009, to continue longitudinal monitoring of A73. We left 17 September 2009, observing only two A pod male orcas, A32 and A37 and one A pod of six to seven orcas during that time. The opinion among people interviewed was Springer had left for the year. Interviews conducted with persons observing A73 during the 2009 summer season will be added to relevant individual's 2007 interviews, as well as comments by additional observers of A73 during the 2009 season.**

A73 again approached Graeme Ellis's research vessel on 17 July, 2008, 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 previously in this report, this smell may be physiologically normal.

Ellis reported in 2007 that A73 appears to have gained weight since last season, but is still smaller than average for her age group, and reports in 2009 that she appears to be growing up. 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 orcas in the field. More importantly, as far as the health and welfare of A73 is concerned, Ellis also reports more play-like interaction time between her and the Northern Resident Killer Whales (NRKW) nearer her age group, which he interprets as a good sign of additional integration with the NRKWs. Ellis reports a well-adjusted, healthy, and normal orca. He finds her easy to recognize in the field due to her swimming patterns. He obtained above- and underwater photographs of her during summer 2009, and they demonstrate the appearance of her excellent health (Attachment 6,) as compared to her unthrifty and unhealthy appearance in 2002 (Attachment 1).

Ellis also reported in 2009 that he observed A73 making a kill, that she looks fine, and is obviously functioning as well as the rest of the A pod orcas he's observed over the years. He added, "She seemed to be in pretty good shape and appeared very energetic in a couple of fish chases she was involved in during our encounter".

Lance Barret-Lennard, Senior Marine Mammal Scientist, Vancouver Aquarium, concurred with Ellis about A73's size in 2007 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." His 2009 comments indicate a normal appearance, growth rate and behavior patterns of A73.

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 that 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 7th, 2007, 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 10th, 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 behavior 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.

Needless to say, seeing Springer and more than a dozen (16) of the 58 orcas who were impacted by the August 20th 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 nine A30's during breath collections for monitoring their microbial flora, 20 September 2007, and all appeared healthy, were seen feeding, 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 are collecting this data for analysis and future planning, as well as other oil spill information.

In 2009, Paul Spong reported an interesting year seeing A73 back with A24, "which is in a way natural since that is her closest relative" (Addendum 1). She was seen with the A11's in early summer and then with the A24's and finally in the middle of the A24's. In general, she still appears a bit smaller than her same age cohorts, and will occasionally go check a boat but no more than other orcas observed by Spong or Helena Symonds. Paul says that the experience of following Springer's success has been "fascinating".

Helena's impression of A73 in 2009, "she's back with granny, is vigorous, healthy and energetic."

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 ; "a huge lack of salmon" which 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 A73's health evaluation of 14 to 21 September, 2007, observed humpback whale activity seven days, and 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 fifty Stellar sea lions,

four harbor seals, and five California sea lions. There may be more competition for the fewer salmon returning in 2007, causing the killer whales to leave earlier than expected. Greatly reduced numbers of pinnipeds were observed during the 2009 cruise.

Jim and Mary Borrowman (Stubb's Whale Watching, Telegraph Cove, BC) reported the 2009 fish numbers are significantly better than in 2007, and that A73 was sighted on a regular basis during the 2009 tourist season. They report that the interest in sightings of A73 is waning, but the occasional visitor is there specifically to see Springer.

Bill Mackay, Mackay Whale Watching out of Port McNeill, BC,, reports regular sightings of A73 until 5 September 2007. She appeared normal to him and he expresses no cause for concern. In his opinion, she continues to be an orca of great interest and is constantly under close observation.

A73 was photographed in Johnstone Strait 19 July 2009, by Fiona for Mackay Whale Watching (attachment 7). Bill reports multiple sightings of A73 throughout the 2009 season, and that she always looks good.

Additional people interviewed in 2009 include Nic DeDeluk, the general manager of Straitwatch, reporting that she is aware of multiple sightings of A73, always in a positive way.

Lucas Clark and Marie Jerrod, Straitwatch volunteers also report positive multiple sightings of A73 during the 2009 season.

Erica and Julia naturalists and hosts in the Johnstone Strait Killer Whale Interpretive Center said they heard many reports of people getting to see Springer, and that some people come to Telegraph just for that reason alone.

Julia, a naturalist with Stubbs Island Whale Watching, reported that during the 2009 season she had seen Springer approach their boats in a way similar to that behavior exhibited by other killer whales.

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, to date. It is reasonable to expect that she may retain some curiosity toward vessels in her environment. It was of great concern to all involved that during her time in Puget Sound and rehabilitation she would become too habituated to vessels, to her detriment, possibly interfering with her relocation. This does not appear to be the case eight years post release into her native waters.

Little is known of the winter distribution and diet of the NRKW community, and the fact that Canada is addressing this in a proactive manner is encouraging for the long-range success of the longitudinal monitoring of A73.<sup>7</sup>

## CONCLUSIONS

- The rehabilitation and relocation of A73 during June 2002, remains a unique event becoming a model for interdisciplinary management of an abandoned, immature orca that has a chance for a healthy and normal life in its native habitat.
- A73 continues to be a normal orca in her natural environment, usually appearing in the Blackfish Sound, Johnstone Strait areas from late June to early September.
- She has returned to her native waters eight consecutive years following her relocation. (A73 was also observed during the summer of 2010, Bill Mackay, pers. comm.)
- 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, a member of the endangered Northern Resident Killer Whale Population, adding to knowledge of the species, orca pod dynamics, and to give credibility to similar rescue efforts in the future, should they become necessary.
- The 2007 oil spill exposure and subsequent changes in A73's critical habitat provide strong incentives to continue long term longitudinal monitoring of this special orca. Clean up of the 2007 oil spill has been completed by DFO Canada.
- 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. A73 may have reached sexual maturity, and may breed within the next five years.

## DISCUSSION

Many elements of the story of A73 are subjective. The objective elements necessary for a successful orca translocation are 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> were all a part of the successful translocation of A73.

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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.

<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).

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

The 2009 evaluation also noted descriptions of A73's, assertive, integration, play-like interactions and curiosity. "A73" is a scientific designator, but Springer is the name most often used for this young orca, similar to the immature orca described in van Ginneken's insightful novel. The stories of both young orcas, one real and the other fictional contain the classic elements of separation, initiation, and return, adding another dimension to the story of Springer.

Another subjective, difficult to assess but critical element in the collection of an obviously ill and possibly immunocompromised, immature orca, is the cumulative effect that acute stressors may add to a system that has been subject to several chronic stressors<sup>9</sup>. Our goal in A73's 2002 collection was to reduce the effects of chronic and acute stressors, and to avoid additional stressors thereby minimizing the possibilities of infection by an opportunistic pathogen. English psychoanalyst, Donald Winnicott identifies transition objects as loosely equivalent to the security blanket, which can provide comfort to children involved in a traumatic event, and to which an infant evolves from complete dependence to a stage of relative independence. The "stick", referred to earlier in this report, presents an example of the successful use of a transition object used to ease A73's passage from Puget Sound to Johnstone Strait in 2002 by mitigating her stress level. She adopted the stick while in Puget sound, enjoyed its use for tactile input to the extent that she would follow it anywhere (which made the 8 May 2002 blood sample possible), had a remarkable interaction with it when she was first released into her rehabilitation pen and it was there, allowing visual assessment of her degree of appearing bright, alert and responsive throughout her residency in the pen in Clam Bay. It traveled to Dong Chong Bay with her.

## **AFTERWORD**

**This author will now describe the totally subjective part of the story of Springer's survival and the role in this story of her stick as a transition object. The 'Namgis First Nation people have a strong belief in the spiritual world and the Kwakwaka'wakw tribal members in Alert Bay have a special reverence for the killer whale as their spirit animal. A welcoming ceremony was held by**

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<sup>9</sup> Schroeder, J.P., S. Raverty, C. Cameron, E. Zabek, A. Eshghi, D. Bain, B Wood, L. Rhodes, and B. Hanson, 2009, Investigation into the Microbial Culture and Molecular Screening of exhaled breaths of Endangered Southern Resident Killer Whales (SRKW) and Pathogen Screening of the Sea-Surface Microlayer (SML) in Puget Sound. Proceedings, Puget Sound Georgia Basin Ecosystem Conference.

the chief of the tribe upon Springer's arrival in Dong Chong Bay in 2002, and a ceremonial dance was performed in honor of Springer celebrating the spiritual return of one of their own tribe. Wednesday, following the Sunday of A73's release, she was still actively interacting with small fishing vessels, and there was concern that people were not avoiding her as encouraged. We realized she would not change her behavior, and this behavior was not conducive to her survival. Her attraction to the "stick" and its success as a transition object was explained to members of the ceremonial dance group to see if they could use it in a ceremony dedicated to A73's successful translocation and acceptance back into her natal pod. Tom Sewid and others agreed to "do what they could ". We don't have firsthand knowledge of what was done, but we do know from that Wednesday afternoon on, there was a marked return by A73 to more normal wild orca behavior as described in this report, leading to her return home.

Springer's relocation represents the first time that a wild whale has ever been captured, rehabilitated, medically monitored, translocated back to its home range, and successfully released (Attachments 1, 5, 6, and 7). It was the most ambitious animal rescue ever mounted on the Pacific Coast.<sup>10</sup> This evaluation confirms the continued success of that effort.



*Attachment 5. Springer continues to return to Johnstone Strait with her family members (Springer July 17, 2008, Ellis).*

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<sup>10</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)



*attachment 6: 18 June 2009, off River's Inlet, BC, Graeme Ellis*



*Attachment 7: 19 July 2009, Johnstone Strait, Fiona-Mackay Whale Watching*

*Addendum 1*

A73 is the second known calf of A45. A45's first-born calf died during the first year of life. A45 herself died at about 18 years of age. A45 was the second known calf of A24. A24's first-born died during the first year of life. Her third-born died at about 2 years of age. Her fourth-born died before reaching age five. Her fifth-born died at about 2 years of age. A24, born around 1967, subsequently had three additional calves, in 1995, 1999 and 2003, and all were alive in 2007. A24 is an offspring of A10, who died shortly after being shot at about 40 years of age. A10's last calf, about one year old, died at about the same time as its mother. A10's 1973 calf also died in the first year of life. A11, A10's other known calf, was still alive in 2007 at about 50 years of age (see Bain 1988, Ford et al. 2000, Ellis et al. 2007).

Bain, D. E. 1988. An evaluation of evolutionary processes: studies of natural selection, dispersal, and cultural evolution in killer whales (*Orcinus orca*). Ph.D. Dissertation. University of California, Santa Cruz.

Ford, J. K. B., G. M. Ellis, and K. C. Balcomb. 2000. Killer whales: the natural history and genealogy of *Orcinus orca* in British Columbia and Washington State. 2nd ed. UBC Press, Vancouver, British Columbia.

Ellis, G. M., J. K. B. Ford and J. R. Towers. 2007. Northern resident killer whales in British Columbia: photo-identification catalogue 2007. Fisheries and Oceans Canada. 41 pp. Accessed at [www.pac.dfo-mpo.gc.ca/sci/sa/cetacean/NRKW%20catalogue%202007%20hi\\_res.pdf](http://www.pac.dfo-mpo.gc.ca/sci/sa/cetacean/NRKW%20catalogue%202007%20hi_res.pdf)

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