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IMATA
International Marine Animal Trainers' Association

SOUNDINGS

Magazine of the International Marine Animal Trainers' Association

F.01

Swimming Through Hoops is NOT a Lost Art

Training Dolphins for the Collection of Dive Physiology Data







F.02

They're Not Old, They're Experienced!

Modifying husbandry & behavioral approaches to benefit our geriatric marine mammals

ISSN # 1007-016X

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Behavioral Management of a Physically Challenged Dolphin



Photo Credit: Dolphin Conservation Center at Marineland

IMATA

DEDICATED TO ADVANCING THE HUMANE CARE AND HANDLING OF MARINE ANIMALS BY FOSTERING COMMUNICATION BETWEEN PROFESSIONALS THAT SERVE MARINE ANIMAL SCIENCE THROUGH TRAINING, PUBLIC DISPLAY, RESEARCH, HUSBANDRY, CONSERVATION, AND EDUCATION.

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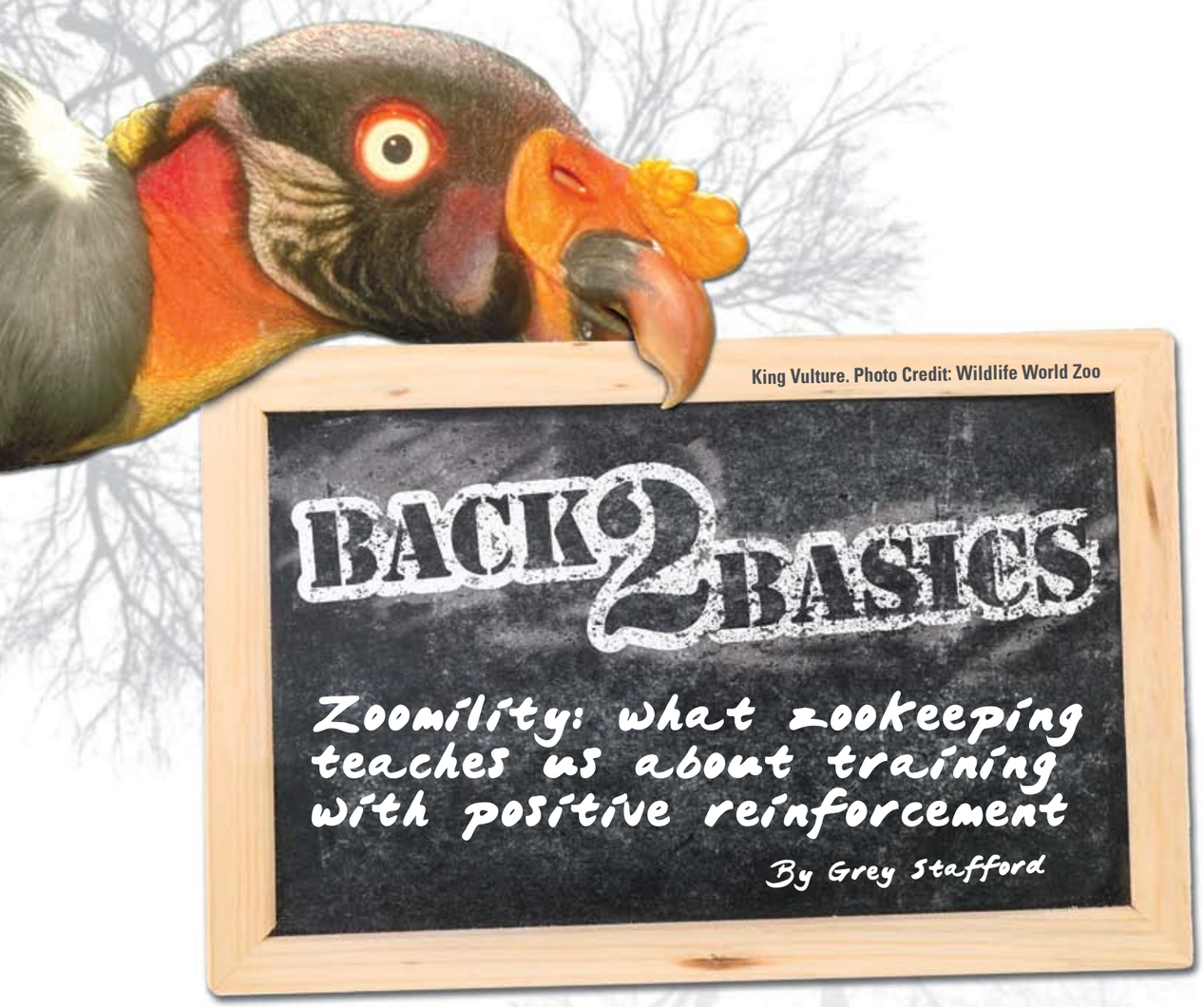
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King Vulture. Photo Credit: Wildlife World Zoo

"That bird will never work for a man."

That bird was a certain King Vulture I know named "Hoppy". He came with that little pearl of wisdom the day I accepted a job as Education Curator at a zoo. I quickly gathered that Hoppy's soon to be ex-caretaker was a bit concerned about the future of all the animals now that she was headed for a new zoo. Hoppy was and is no ordinary bird. Like me, he's been around since the mid 1960s. So we've both spent a lot of time in zoos, and we've both witnessed a revolution in animal training.

As it turned out, my predecessor was right. Early on, Hoppy's aggressive behaviors and overall, shall we say, lack of warmth posed a problem for my newly formed staff of inexperienced trainers and me. Over 40 years of training, a bird can see a lot of keepers, training styles, and methods. Why would we be any different from the mixed bag he had seen all of his life?

Fortunately for both Hoppy and me, the world of zoo animal training has made great strides over the past 20 years. Perhaps the most important change has been the realization that animals, even wild ones on public display, are being trained whether we caretakers intend it or not. No matter what the degree of contact, from near zero to extensive, keepers wield incredible influence over their charges. As a result, zoos are increasingly teaching wild and potentially dangerous animals how to safely participate in their own survival, in cooperation with their human caretakers.

This is made possible by the exclusive use of positive reinforcement—no punishment (i.e., corrections) allowed.

Why is it the world of accredited zoos has been able to embrace a "reinforcement only" mindset while the rest of the animal planet has been slow to follow? One reason may simply be that wild and in many cases endangered zoo animals are neither replaceable nor intimidated by the presence of humans. As in the case of our buddy Hoppy, zoo animals can't simply be turned over to the local shelter just because they aren't excelling at our training program. It means we need to train in the manner that ensures every animal learns how to be winner.

Sadly, the same cannot be said about human attitudes and awareness towards domestic pets. Not enough has changed since Karen Pryor first wrote Don't Shoot the Dog, despite all that we've seen and learned about behavior training with exotic species. We humans still punish pets because we can—not because it is in their or our best interest. Pet owners need to take a lesson from the keepers of exotic species—a lesson in zoomility.

So how did we turn it around for a bird that had become quite good at controlling his environment through aggression? Despite his history, Hoppy still had an important role to play in the education shows that took place three times a day. It was time to train in a manner that put Hoppy's interests ahead of our own.

First of all, we simplified Hoppy's life by limiting the number of people working with him to just two. This enabled us to maintain consistent criteria expectations from one day to the next, seven days a week. Every interaction was planned to the last detail including how long each session would be, what behavior approximations would be requested, and most importantly, when and where positive reinforcement would be offered.

Since many of his outbursts had resulted when people were working very close to him, we suspected Hoppy might have grown a bit farsighted. So to eliminate any frustration that hand feeding might be creating, leading to an aggressive response, we installed a small feeding platform near his favorite perch. If he was heeling with us, we made certain he was watching as we placed reinforcement a few steps in front of him.

As he learned where reinforcement (i.e., meat) could be found, we started to desensitize him to subtle changes to his environment. For example, we could freely swing open the door to his enclosure while he stayed put inside, resting on a perch or "target." For an animal with aggressive tendencies, this can be a very useful behavior! In time, we entered his home, cleaned it, and even approximated clipping his nails—all the while he remained calm and received intermittent reinforcement.

This is not to suggest that we didn't have an occasional setback. Even with only positive reinforcement training, we weren't about to erase a lifetime of learning experiences overnight. In fact, nearly 10 years later, my right calf still has the scar from Hoppy's powerful hooked beak. But within a few months of my arrival, Hoppy's behavior had dramatically improved—with a man, no less. For example, he consistently hopped onto a scale as part of our morning health assessment sessions, he safely participated in public education shows almost daily, and at age 33, Hoppy learned how to use a dog crate.

Even better, Hoppy's most revealing sign of progress in reducing his aggression was not the new behaviors he learned, but the new types of reinforcement he engaged in. While we started the training process using food (i.e., primary reinforcement), it turned out that he likes a good scratch all over his bald head. He even learned to play with a few toys. Not bad for an "old dog," so to speak. Best of all, he learned to associate people with positive reinforcement on a consistent basis, and displayed this as only a male King Vulture can. With outstretched wings and head drooping, day after day Hoppy paraded around his home whenever I entered the area. Who wouldn't be flattered!

Hoppy's story is just one example of the animals whose lives have been enhanced thanks to the exclusive use of positive reinforcement and the concepts related to it: desensitization, Least Reinforcing Scenario (LRS), and alternate response training. These tools not only help minimize the development and display of uncooperative behaviors in young animals, they also form the basis for rehabilitating older animals with severe aggressive histories. Together they give us hope that, given the right training situation, no animal is a lost cause. Provided, of course, that trainers are willing to adopt a little zoomility by placing the animal's success above their own egos.

It truly is an exciting time to be a zookeeper.

Many of today's zoo animals have learned to voluntarily and calmly engage in all sorts of complex behaviors that were unimaginable 20 years ago, including those that can cause momentary discomfort. From drawing blood samples to in vitro fertilization, and from daily weights to daily insulin injections, animals are doing amazing behaviors in cooperation with humans – all thanks to positive reinforcement.

Grey Stafford, PhD is the Director of Conservation and Communications for the Wildlife World Zoo near Phoenix, AZ and the author of Zoomility: Keeper Tales of Training with Positive Reinforcement.

This article first appeared in Chronicle of the Dog published by the Association of Pet Dog Trainers (www.apdt.com).

BACK TO BASICS is compiled by **Chris Davis.**

CONSERVATION BRIEFS

GOODBYE to the Caribbean Monk Seal



Caribbean monk seal in 1909.Photo Credit: NY Zoological society.



Hawaiian monk seal. Photo Credit: NMFS Pacific Island Fisheries Science Center

In June, federal officials declared the Caribbean monk seal (Monachus tropicalis) to be extinct. Listed as endangered in 1967, the Caribbean monk seal is the only seal species to become extinct due to human causes. First noted by Christopher Columbus on his second voyage to America, the Caribbean monk seal was called the "sea wolf" noting its size to be nearly 2.7 meters with a dark brown back and grey belly. The seal was easily hunted because of its resting, pupping, and nursing behaviors on the beaches. From 1700 through the 1900s, monk seals were killed for food and research while their blubber was used to make oils, lubrication, and coatings for boat bottoms. The skins were used for trunk linings, clothing, straps, and bags. Later, other factors played into the demise of the seal. Particularly sensitive to human interaction, their food supply of shellfish and finned fish were being over-fished. Once estimated at populations close to 250,000, the last confirmed sighting of the seal was in 1952 between Jamaica and Mexico's Yucatan Peninsula. Researchers worry that the Hawaiian and Mediterranean monk seals are in for a similar fate if protections are not created. The Hawaiian monk seal faces different challenges with increases in coastal development and marine debris as well as climate change. Less than 1,200 Hawaiian and 500 Mediterranean seals remain. (Associated Press)

UNDERWATER DESERTS?

With the rising temperatures of the worlds' oceans, researchers are observing an expansion of oxygen-starved areas in the seas. These low-oxygen zones in the equatorial Pacific and tropical Atlantic oceans are creating virtually underwater deserts devoid of nearly all organisms. Researchers are concerned as this trend could eventually threaten fisheries and coastal economies by shifting habitats and migrations of many commercially fished species like tuna and swordfish. These fishes, as well as many other species, cannot survive in oxygen-depleted waters. Warmer waters have reduced ability to absorb oxygen from the atmosphere. Circulation patterns also are thought to be responsible for the growing zones. Normally, oxygen is spread through the world's oceans by dense colder waters. These dense waters sink below surface currents at northern latitudes and eventually flow along the ocean floor to the south into the tropical low-oxygen areas. The warming trend, which raises the water's temperature in the north, makes the denser colder waters more buoyant. The buoyancy causes mixing with the choppy surface currents, rather than sinking below the currents to the ocean floors, to travel south to the equator. (Science Daily)

HOORAY FOR SHARKS!

In May 2008, NOAA fisheries proposed new guidelines to prevent over-fishing and to rebuild the number of sandbar and other shark species. Passing these measures in June, the regulations went into effect July 2008. Recent stock assessments indicate that the sandbar, porbeagle, and dusky sharks are severely over-fished. Since 2000, catching dusky sharks has been illegal, but these sharks are still taken by incidental catches seeking other species of sharks. The sandbar shark is the most valuable shark caught commercially in the Atlantic. Their fin is used in many dishes like shark fin soup. The recovery rate of the sandbar shark is very slow because the shark matures late, grows slowly, and produces few offspring. The numbers of sandbar sharks are 20% to 38% fewer than in the early 20th century before fishing began on sharks. The new regulation would require that all sharks be offloaded with their fins naturally attached. This regulation will help improve enforcement against shark finning. Also, all landing of sandbar sharks will be part of a research fishery. This regulation will assist in identification of shark species and improve on species-specific data collection such as shark life history, techniques to reduce by-catch, and offer data for future stock assessments. The take quota of sandbar sharks will be reduced from 1,017.0 metric tons to 87.9 metric tons, an 85% reduction per year from 2008 to 2012. Sandbar sharks comprise up to 60% of the annual, large coastal shark landings. The take quota of the porbeagle shark will be reduced from 92.0 metric tons to 1.7 metric tons per year. The guidelines will prohibit the landing of sandbar and silky sharks by recreational shark fishermen and examine quotas for other large coastal sharks. (NOAA)



Sandbar Shark. Photo Credit: NOAA



Porbeagle Shark. Photo Credit: NOAA

SAVE ENERGY

Fully shut down your printer and computer, rather than allowing them to go to "sleep" mode. In most homes, standby power accounts for about 7% of a home's total energy consumption, with some homes as high as 20%. (Ecologue)

Conservation Briefs is compiled by **Shelly Samm.**

Notices & Announcements

ELEPHANT RESEARCH AND CONSERVATION SYMPOSIUM

The Elephant Research and Conservation Symposium will take place 11-13 November 2008. The symposium will be hosted by the Nong-Nooch Tropical Garden & Resort in Pattaya. For further information contact Dr. Harald M. Schwammer at h.schwammer@zoovienna.at or visit their website at www.elephantconservation.org/2008symposium.php.

THE 5th CRISSY ZOOLOGICAL NUTRITION SYMPOSIUM

The 5th Crissy Zoological Nutrition Symposium will take place 12-13 December 2008 at the North Carolina State University School of Veterinary Medicine. This year's focus will be "Obesity in Zoological Species". For registration and a skeleton schedule please visit www.cvm.ncsu.ed/conted/zoonutrition/.

TRAINING WORKSHOP

Join the crew of Conservation Ambassadors and Dr. Grey Stafford, author of Zoomility: Keeper Tales of Training with Positive Reinforcement, for a unique animal training workshop featuring dozens of exotic species in beautiful Central California's wine country. The two-day event is open to anyone interested in learning how to train the way zoos and aquariums do – with the exclusive use of positive reinforcement. The workshop will be held 17-18 January 2009 in Paso Robles, California. Visit www.ireinforce.com for more information.

REGISTRATION FOR 2009 PROFESSIONAL TRAINING COURSES

The Association of Zoos and Aquariums has opened registration for the 2009 season of professional training courses. The courses being offered include Advanced Avian Program Management; Advances in Animal Keeping; Amphibian Biology, Conservation, and Management; Animal Training Applications in Zoo and Aquarium; Conservation Education; Creating Successful Exhibits; Crocodilian Biology and Captive Management; Institutional Record Keeping; Managing for Success: Career Development; Managing for Success: Organizational Development; Population Management I; Population Management II; and Principles of Elephant Management. Visit www.aza.org to register and find out more information about each course.

ZOOS AND AQUARIUMS COMMITTING TO CONSERVATION

The Zoos and Aquariums Committing to Conservation (ZACC) event will be hosted by the Houston Zoo in Houston, Texas from 23-26 January 2009. ZACC is a biannual event that promotes the role of zoos and aquariums in supporting conservation activities worldwide, both at their institutions and in the field. Bringing together individuals from different countries and disciplines, ZACC conferences help to build a stronger and more effective global network for wildlife and habitat conservation and to establish direct links to zoos, aquariums, and their constituencies. For information contact www.houstonzoo.org/zacc or conservation@houstonzoo.org.

IAATE 17TH ANNUAL CONFERENCE

The International Association of Avian Trainers and Educators annual conference will be hosted by the Cincinnati Zoo & Botanical Gardens. The conference will take place 24-28 February 2009 and will feature papers, posters, site visits, roundtables, vendors, and workshops. Topics include avian behavior, training, husbandry, conservation, strides in veterinary care, as well as show presentation, production, and educational content. For further information please visit www.iaate.org or contact Eddie Annal at ed.annal@cincinnatizoo.org.

CALL FOR PAPERS AND POSTERS

Share your knowledge, expertise, and experience with members of the International Association of Avian Trainers and Educators (IAATE). IAATE is soliciting papers on Training and Behavior; Shows and Education, Conservation, and Research; and Animal Management and Veterinary Medicine. Each paper will be allotted thirty minutes (twenty minutes for the presentation/ten minutes for questions and answers). Posters will be on display throughout the conference with time allotted to meet the authors. Electronic submission in MS Word is preferred. Submit abstracts by 1 October 2008 to Cassie Malina, 414 Broadway Ave., Orlando, FL 32803 or email CMa924@aol.com.

PROSIMIAN HUSBANDRY WORKSHOP

This workshop will be hosted by the Cleveland Metroparks Zoo from 30 April to 2 May 2009. The workshop will emphasize group discussion of captive prosimian husbandry and management issues. Look for registration, lodging, and workshop information at the workshop webpage, www.clemetzoo.com/prosimianworkshop, starting August 2008.

ANNUAL IAAAM MEETING AND CONFERENCE

The International Association for Aquatic Animal Medicine annual conference will take place 2 - 6 May 2009 located at the Radisson Hill Country Resort and Spa in San Antonio, Texas. Visit www.iaaam.org for more information.

INTERNATIONAL CONFERENCE ON ENVIRONMENTAL ENRICHMENT

From 31 May to 5 June 2009 the 9th Annual International Conference on Environmental Enrichment will take place in Torquay, Devon, UK. There has been a first call for papers and registration. Go to www.reec.info for details.

PHOTOS NEEDED

All IMATA members are invited to submit photographs and/or slides for use in Soundings magazine. Good quality digital images can now be accepted as well. Please identify the photographer for credit and mail your photos to Mark Todd, photo archivist, at the IMATA Central Office.

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Are you looking for an article from a past conference or an old issue of Soundings? IMATA's library is available for your use! You may order photocopies of articles from IMATA publications from the library at a cost of 25 cents per page, with a minimum charge of $1.00 per order. A complete index may be ordered from the library at a cost of $2.00. All requests must include payment in U.S. Currency, payable to IMATA. Please contact the librarian in writing at IMATA Library, Central Office, 1200 South Lake Shore Drive, Chicago, Illinois 60605, USA.

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2. **Click on edit profile and update your current information.**
3. **After updating your information, click on submit at the bottom of the page and recheck the information you just entered.**

That's all you have to do. Your changes are immediately entered into the website. If you have any problems, click on feedback, and write your questions in the comment section.

WEBSITE **Visit us online at www.imata.org.**

NOTICES AND ANNOUNCEMENTS is compiled by **Kylene Moore**.





Chief Editor's NOTE

BY PATRICK BERRY

Soundings Online ~ Go Green!!!

If you haven't had the opportunity, go online to see IMATA's newly enhanced website launched in October 2008. The site contains several membership benefits, for example you may or may not be aware the current issue of *Soundings* is available online to all members of IMATA at imata.org. The magazine and all back issues to 2005 are accessible in a PDF version at this time. In the near future all issues of *Soundings* dating to the very first production in 1976 will be available electronically to active, professional, and organizational members at the site. Even more exciting, beginning with the 2008 issues, all future *Soundings* will be available in a **Go Magazine** format on the IMATA website. **Go Magazine** differs greatly from a PDF document; it is a virtual electronic magazine which offers several enhanced features for viewing. *Soundings* **Go Magazine** online includes page flip technology, advanced search features, live email, web links, and navigation capabilities with drop down menus and more.

At this point you will continue to receive your hard copy of *Soundings* in the mail, but I encourage you to also access the online version. Going green is an important business strategy for our organization and this is one way of approximating to that end. IMATA President Shelley Ballmann announced in her recent President's Corner article the newly enhanced website, which is now live, including the format upgrade to *Soundings*. I am sure you will be pleased with the many enhancements to the site.

Please enjoy this issue of *Soundings* and when completed go to imata.org and check out another benefit to your IMATA membership – the improved website.

Patrick Berry

www.imata.org

CALL FOR NOMINATIONS

"The Sonny Allen Professional Achievement Award"

In an effort to publicly recognize individuals within IMATA who have clearly promoted the objectives and goals of our association, as well as made unique contributions to the field of marine animal training, public display, conservation, education, husbandry and/or research, IMATA developed a Professional Achievement Award to be presented at the annual conference. This award is to be given when it is deemed appropriate under the qualifications and procedures described below.

CANDIDATE QUALIFICATIONS

A candidate for this award must meet the following qualifications:

- Must be a Professional member in good standing at the time of nomination.
- Have sustained a Professional membership over five consecutive years immediately prior to the time of nomination.
- Is considered to have made unique contributions to marine animal training, public display, conservation, education, husbandry and/or research, which are in concert with the goals and objectives of the International Marine Animal Trainers' Association.
- Those contributions can be clearly shown to have made a substantial positive impact.

NOMINATION PROCEDURES

Any IMATA member in good standing may nominate an individual for this award with or without the candidate's consent. No one may nominate himself or herself. The individual making the nomination will be required to provide the following documentation:

1) A nomination must comprise a written statement of no more than 1,000 words, which concisely describes the candidate's:
   - Background and experience with marine animals.
   - History of membership in IMATA illustrating outstanding service to the Association and its members.
   - Unique contributions/achievements made and the manner in which they have supported IMATA's goals and objectives, including how they have advanced marine animal training, public display, conservation, education, husbandry and/or research.

2) A nomination must also include two letters of endorsement, which are submitted by Professional members in good standing. An additional letter may be obtained from someone not necessarily a member of IMATA, who can verify the candidate's qualifications.

Nominations for this award should be forwarded no later than 30 April 2009, to the Nominations and Elections Committee at the IMATA Central Office, 1200 South Lake Shore Drive, Chicago, IL, 60605 U.S.A. Or contact us by e-mail at elections@imata.org.

ELECTION RESULTS 08



By Billy Hurley
Past President



THIRD VICE PRESIDENT
BILL WOLDEN



PRESIDENT ELECT
DAVE ROBERTS



TREASURER
CHRIS DAVIS

This year's nominees for office comprise an outstanding group of animal professionals eager to help and willing to provide their expertise to IMATA's future. We are, as always, delighted to welcome interested professionals to run for office each year and to ultimately serve on IMATA's Board of Directors. If you are a professional member please consider this outstanding opportunity. Nominations for the 2009 Board of Directors will be announced in a few months, so get ready! This year's nominees have strong professional reputations and endorsement by their peers. Their direct involvement and critical decision-making will help shape the industry and IMATA's continuing legacy of excellence. The election process continues to draw the best in the business and we are pleased to announce three new Directors to our Board for three-year terms beginning in 2009. Please join the Board in welcoming our new Directors:

DIRECTORS, (3 year terms)
David "I'll lead you to the top baby" Roberts, President-Elect

Bill "Have you seen my fabulous awards ceremony" Wolden, 3rd Vice President

Chris "Pass the grits" Davis, Treasurer

The following Directors with their remaining terms in office will comprise next year's Board as well:

DIRECTORS, (2 years remaining in term)
Shelly Wood, Secretary
Eric Gaglione, 2nd Vice President
Michael Hunt, President

DIRECTORS, (1 year remaining in term)
Mike Osborn, 1st Vice President
Shelley Ballman, Past-President

Among the first order of business at this year's Executive Board Meeting in Cancun will be to finalize the election process by officially electing these three candidates to serve in the office that the membership voted them in. Hats off to all of the candidates who ran for office! Your willingness to serve is a credit to your professional involvement. Congratulations to our new Directors…we look forward to your contributions.

NOMINATIONS & ELECTIONS

"ENRICHMENT" FOR YOUR CAREER!

By Billy Hurley

Opportunities for career advancement and involvement in serious decision making regarding marine mammal science, animal training, and animal care is a common desire many of us have. Our own institutions can offer some of this career development when opportunities arise or new, supervisory positions open. However, as many of us know, these positions are far fewer than most of us would like and many qualified industry professionals miss the opportunity to involve themselves, and their ideas, in high level decision making. Critical information is lost when valued experience goes unrealized. Animals, young trainers, and peers benefit from solid leadership. IMATA can fill that gap by enabling your valuable leadership skills to get some exercise. Every year officer positions are open and can be filled by those in the professional membership category. This not only benefits IMATA and you, but also gives back to your home institution through your personal career enrichment and development. An excellent return on your time investment! Each officer of IMATA is supported by enthusiastic, nurturing individuals, able to lend a hand at a moments notice. The relationships, contacts, and information exchanged are reciprocal. IMATA benefits, your home institution benefits, and more importantly YOU benefit.

Our Board members are involved in a multitude of fascinating projects. Each project and committee generates a diverse series of tasks, reports, and important decision-making. They include topics and discussions involving:

- Legislation, regulations, and marine mammal standards
- Animal learning and training advancements and applications
- Medical applications and enrichment
- Publications, web site development, information content, scientific presentations
- Awards, recognition of contributions
- Budget preparation and administration
- Policy making
- Conference organization and site selection
- Membership administration
- Interface with other animal organizations such as AZA and the Alliance of Marine Mammal Parks and Aquariums

These, and many more are just a few of the topics in which you'll be directly involved. Being involved on the IMATA board is an education of a lifetime, and an invaluable career goal for many.

Elections for the 2009 to 2011 Board will be held soon and three critical officer slots become available to you. In this election year, the slots include: President-elect, 3rd Vice President, and Secretary. Following is a brief description of these positions. As you look at them, think of your own career development. Each position involves skills you will use throughout your career. Why not learn them with us?

★★★ PRESIDENT ELECT ★★★

Assists the current President in his duties and is responsible for assisting in the publication of the annual Conference Proceedings. Assumes the office of President the following year and serves as the Editorial Director of Soundings (assisting Chief Editor, Patrick Berry), and all other IMATA publications. The President establishes the yearly agenda then serves as Past President and the Chairperson of the Nominations and Elections Committee in the third year.

★★★THIRD VICE PRESIDENT★★★

The Third VP sets up the annual conference from beginning to end starting three years out - from the election of his or her conference site until the final song at the banquet. Planning and organization will be assisted by the Site Selection committee and the Conference Committee, as well as the Second VP and First VP, to which positions he or she will succeed each year.

★★★ SECRETARY ★★★

The secretary keeps the minutes of all meetings of the board of directors and the annual meetings of the membership. He/she works closely with the treasurer to process memberships, send out membership information and keeps membership database records. The secretary performs direct correspondence with the membership as directed by the board. The position is served for two years as secretary, with the third year as director at large, assisting the newly incoming board member in learning and transferring secretary duties.

No college, university, internship, seminar series, or supplemental education program can directly involve you in real issues and direct, impactful leadership involving the marine mammal profession. If you are serious about developing your career, then you recognize that involvement in IMATA is an important component in your professional development.

Should you wish to submit your name, or the name of a fellow member for nomination, please contact the Nominations and Elections Committee at:

IMATA
1200 South Lake Shore Drive
Chicago, Illinois 60605
USA

Or via email:
elections@imata.org

The nominations window will be closed on 1 February 2009. Professional members eligible to serve on IMATA's Board of Directors can be found on the IMATA website.

Swimming Through Hoops is NOT a Lost Art

Training Dolphins for the Collection of Dive Physiology Data

Barb Losch and Patrick Berry
The Seas, Epcot®, Walt Disney World® Resort

With recent studies suggesting wild cetaceans may be susceptible to trauma from gas emboli formation (Jepson et al., 2003) Dr. Terrie Williams from the University of California at Santa Cruz and Epcot's The Seas hope to discover what physiological safeguards operate during a dolphin's daily diving activities (Skrovan et al., 1999). To investigate how dolphins protect sensitive tissues such as the brain during dives, Dr. Williams is measuring the dolphins'metabolic and cardiovascular processes after remaining motionless at depth and then measuring those same processes after exercise at depth. To obtain these measurements the dolphins wear a heart rate monitor under a vest and either remain motionless, or exercise underwater for a set time period. At the conclusion of the timed interval, the dolphins station at the surface under a metabolic dome.

Some advantages of hosting the project at The Seas were: the 8.1 meter (27feet) depth of the main environment, existing public presentations geared towards research, and the availability of the four resident male Atlantic bottlenose dolphins *(Tursiops truncatus)*.

Dolphins and trainers were divided into teams with two trainers per dolphin. One trainer was designated as the primary trainer and the second was a backup. To facilitate training the project was divided into four tasks. Each of the four primary trainers had the flexibility of training each task in a way that best suited the animal they were training. Feasibly each dolphin could learn a task differently and at a different rate than their counterparts. This also meant that the secondary trainer had to follow the lead of the primary trainer, providing a great opportunity for team members to watch and learn from their counterparts. Needless to say, communication between trainers was essential.

A) Training Four Tasks

01) Vest Training

Trainers everywhere look for ways to incorporate existing behaviors in the initial stages of training a new behavior. It essentially gives trainers a head start in the training process. What existing behavior could be incorporated at the start of vest training? All of the dolphins at The Seas have been taught how to position themselves parallel to the side of the enclosure and allow a tape measure to encircle them. This girth measurement assists with morphometric data collection. Some trainers expanded on this behavior by using a folded towel in place of the tape measure. They gradually opened up the towel during training to simulate the width of the vest (photo #1). Other trainers waited and used the vest itself to provide desensitization while another incorporated a hug behavior during training. One dolphin took just a week to become acclimated to the vest while the youngest and least desensitized to the tape measure took almost a month. In addition to becoming habituated to the vest, the dolphins also had to allow a heart rate monitor to be placed under the vest. The monitor was held in place by two small suction cups. To simulate the monitor, all the trainers used eyecups for desensitization. The eyecups were placed on various parts of the dolphins' body, with most of the desensitization occurring in the area between the pectoral flippers (photo #2). All the dolphins had previous eyecup experience and were accustom to the eyecups, therefore this portion of vest training progressed quickly.

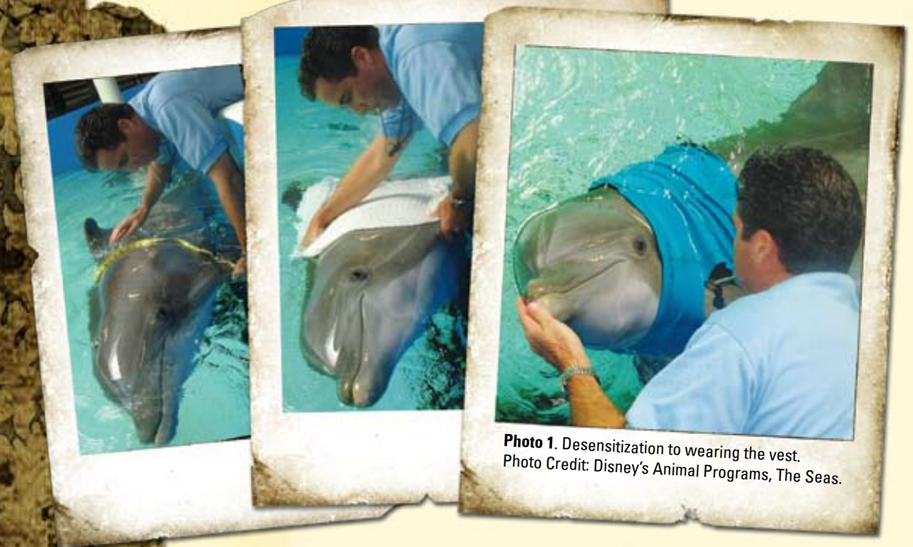


Photo 1. Desensitization to wearing the vest.
Photo Credit: Disney's Animal Programs, The Seas.



Photo 2. Vest with heart rate monitor.
Photo Credit: Disney's Animal Programs, The Seas.

02) Stationary Breath Holds

The second task required the dolphins to perform stationary breath holds at 8.1 meters (photo #3). The dolphins were previously trained to go to any of the 12 underwater windows in the habitat. All that was needed was to lengthen the amount of time the dolphins were at the window and keep movement to a minimum. The trainers used the same method to train all four dolphins on this task. Using walkie-talkies for communication, a trainer at the surface sent the dolphins to a lower window. The trainer at the window targeted the dolphin and bridged for calm behavior. Duration at the window was slowly increased until the desired time period was achieved. The goal was to aim for at least five minutes or longer during these time durations. One challenge with this task was the history the dolphins had at the underwater windows. During daily presentations, the dolphins are allowed to surface for a breath at any time. For the purposes of this study, the dolphins had to hold their breath and wait until the trainer gave a signal before going to the surface. To counteract this strong existing behavior, all the trainers changed the context of the behavior. Trainers sent the dolphins to a non-presentation window and targeted them for brief periods of time, gave them a signal to surface and then repeated the process slowly increasing the time increments. The slow approximations worked and all of the dolphins are currently holding for three minutes or longer.

03) Exercise at Depth

The third task was to teach the dolphins to exercise at 8.1 meters. Trainers had different ideas for this task. One considered placing buoys in the habitat and training the dolphins to swim past them. Another option involved the dolphins responding to window taps at depth. Neither method kept the dolphins moving; they tended to stop at either the window or buoy. While, brainstorming among staff, the idea came up to use hula-hoops. The hoops were placed in a pattern or circuit in the hope that the dolphins would continue swimming. It was the perfect solution! Every trainer utilized the hoop method for training this task. Trainers started by incorporating an existing swim through a hoop behavior and then expanded it by adding additional hoops. The training started in the dolphins' back areas to take advantage of the shallow depth of 1.8 meters (6 ft). By gradually adding hoops, a circuit was eventually formed. Once the animals were comfortable going through the hoops in the shallow area, it was decided to then place the hoops at 8.1 meters out in the main environment



Photo 3. Stationary breath holds.
Photo Credit: Disney's Animal Programs, The Seas.

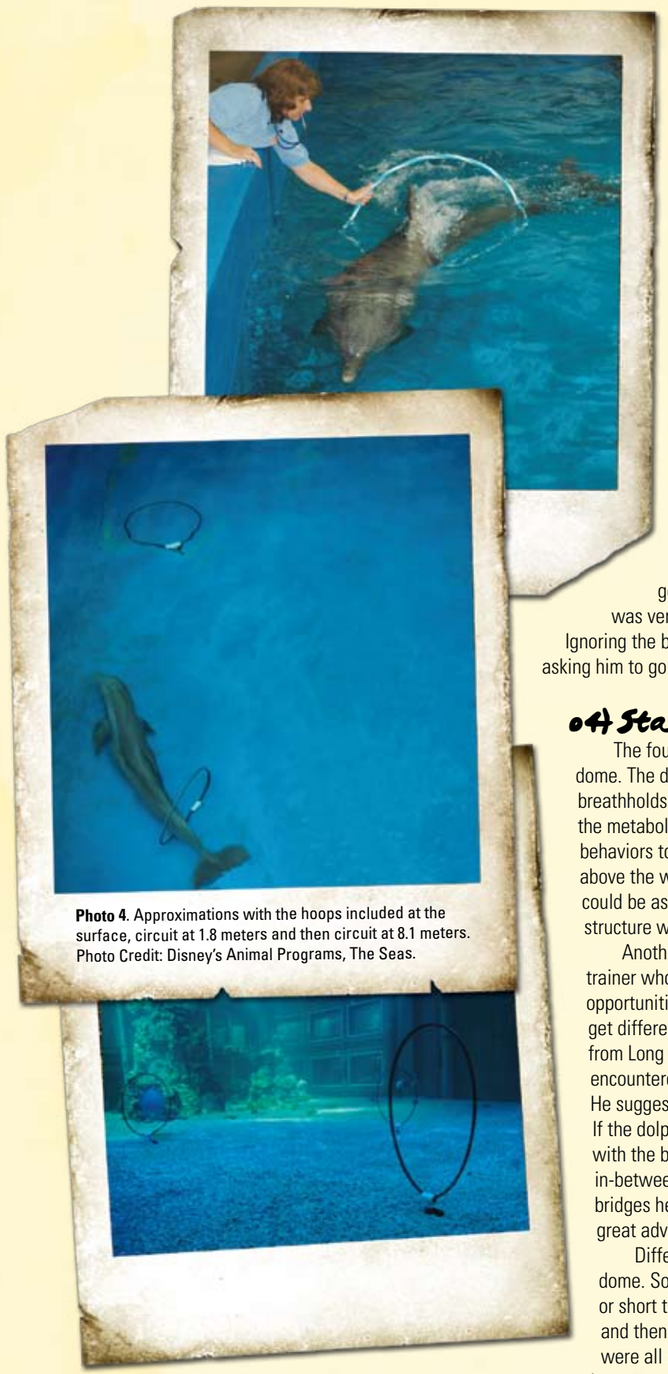


Photo 4. Approximations with the hoops included at the surface, circuit at 1.8 meters and then circuit at 8.1 meters. Photo Credit: Disney's Animal Programs, The Seas.

(photo #4). Some of the dolphins did not appear to notice the hoops when they were placed at depth. To solve this problem the trainers utilized different techniques. One trainer placed a hoop in front of one of the underwater windows and then tapped on that window. Hearing the tap, the dolphin descended, saw the hoop, and swam through it. Another trainer associated a signal with the hoops. Once the dolphin saw the signal, it looked for the hoops. A third technique involved having the dolphin swim through a hoop at the surface and then the trainer lowered that hoop and sent the dolphin to go through it at depth. All of the techniques worked, reinforcing the fact that there are as many ways to train a behavior as there are trainers.

Staff anticipated one significant challenge to this task, the placement and retrieval of the hoops. All the trainers agreed that the dolphins should never be asked to retrieve the hoops; they hoped that on seeing the hoops the dolphins would be motivated to go through them, not retrieve them. This sounded good in theory, but there is always that one dolphin that goes above and beyond the behavior to which they are being trained. Our biggest dolphin, Khyber, not only retrieved all the hoops, but he also tried to retrieve them as another dolphin was going through them. He also moved the hoops, making his own circuit. In one case, he moved a hoop close to a coral head and his circuit for that trial entailed going around the coral head, under a pipe, and through a hoop. This was very fun to watch and hard not to reinforce just for creativity's sake. Ignoring the behavior, resetting the circuit once he had dropped the hoop(s), and asking him to go through the circuit solved this problem on most days.

04) Stationing Under Metabolic Dome

The fourth and final task was training the dolphins to station under a dome. The dome was used to collect the dolphin's exhalate after their extended breathholds. An open-flow respirometer at the end of the dome measured the metabolic rate. Using our tried and true approach we tried to find existing behaviors to help with this task. One of our training platforms sits a few inches above the water. Some trainers took full advantage of this platform. The dolphin could be asked to station under the platform to simulate stationing under a structure while maintaining normal breathing.

Another helpful alternative to utilizing existing behaviors was to find a trainer who had trained the same or similar behaviors. Conferences are great opportunities to converse with other trainers, find out what they are doing, and get different ideas about training. At the 2005 IMATA conference, Brett Long, from Long Marine Lab, was kind enough to discuss training problems he had encountered while training the dome for a metabolic project with Dr. Williams. He suggested we vary our bridges while the dolphins were under the dome. If the dolphins were bridged during a breath they might associate breathing with the bridge resulting in excessive breaths. If the dolphin was bridged in-between the breaths, they might start holding their breath. Varying our bridges helped maintain normal breathing under the dome thanks to Brett's great advice.

Different methods of training were used to station the dolphins under the dome. Some trainers offered fish under the dome, others used hand targets or short target poles, and some asked the dolphins to go under the dome, and then quickly move out from under the dome. These different techniques were all successful. The dolphins also had to become accustomed to hose attachments, vacuum noise, air flow across their head, and the hood touching their back all for the purposes of collecting metabolic data with the dome (photo #5). These components were introduced in a variety of ways by each trainer. Some trainers went for broke and introduced several components at once while others introduced them separately, utilizing small successive approximations. Again, all the methods worked. Looking back on the training of all the tasks, no one technique stood out as being more successful than the other. The trainers utilized training tools which were successful with the animal they were working with and everyone met the timeline of the teams training objectives.

B) Project Goals

Having completed the training of the four tasks staff had to revisit the goals of the project. There were two conditions. The first was for the dolphin to wear the heart rate monitor under the vest, be sent to station at depth for a set time, and then head directly under the dome to collect the metabolic data. The second condition had the dolphin wearing the heart rate monitor under the vest, he would then be sent to exercise at depth for a set time period, and then swim directly under the dome to collect data. To reach these goals, we had to pair and chain tasks together.

01) Pairing Tasks

The vest had to be worn throughout the trials to hold the heart rate monitor in place. It had to be paired with all of the other tasks. The vest was easily paired with the stationary at depth and metabolic dome tasks. It was not so easy to pair the vest with the hoops. When asked to go through the hoops while wearing the vest it appeared the dolphins thought they were now bigger than the hoops and would not be able to fit through them – they reduced their forward momentum to almost a crawl. Over time, with patience, and practice, the dolphin's speed slowly increased.

02) Chaining Tasks

We also had to chain tasks together. The dome needed to be chained with the two breath-holding tasks. Staff decided to begin the chaining process during the initial stages of teaching the dome. The dolphins were asked for a behavior and then immediately after the bridge were sent under the dome. The dolphins soon learned that if the dome was in the water they would need to station under it after completing a behavior. This held true when either coming up from being stationary at depth or when completing a hoop circuit. Taps on the water near the dome also helped remind the dolphins to come to station under the dome immediately following the longer breath holds or hoop circuits. With the pairing and chaining of behaviors complete, numerous trials have been run and data is currently being analyzed.

Summary

What have we learned since starting this project?

- Different methods work. Observing different training techniques opens our mind to so many possibilities. It puts extra tools in that training toolbox we use when working with the animals.
- Network. It is important to network within your team and with trainers from other facilities.
- Research is so beneficial. It can tell us a great deal about the animals in our care and it gives the animals interesting puzzles to solve, enriching their lives.

The hard work, dedication, and expertise of the trainers at The Seas has led to the successful training and collection of dive physiology data with dolphins proving that swimming through hoops is not a lost art. Furthermore and better still, the data collected is not only leading to an improved understanding of the physiological responses of diving cetaceans, but also enriching our dolphin's daily lives and potentially helping their wild counterparts.

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Skrovan, R. C., Williams, T.M., Berry, P.S., Moore, P.W., and Davis, R.W. (1999). The diving physiology of bottlenose dolphins (*Tursiops truncatus*): II. Biomechanics and changes in buoyancy at depth. *Journal of Experimental Biology*, 202, 2749-2761.

All photo credits: Disney's Animal Programs, The Seas.





Photo 5. Approximations for stationing under the metabolic dome. Photo Credit: Disney's Animal Programs, The Seas.

F.02

They're not OLD, *they're* EXPERIENCED.

Modifying husbandry and behavioral approaches to benefit our geriatric marine mammals.

Kristi F. Burtis, Alan C. Garver, Bill G. Hoffman, David S. Roberts
SeaWorld, San Diego

With the advancement of training and veterinary treatment, animals in human care are living longer lives. Most facilities use consistent techniques to train and maintain animal behaviors. Below, we present several examples of adjustments made to assist SeaWorld San Diego's special needs animals. Some of you may already use some of these techniques but we hope that this paper will spark a greater interest in preparing and/or caring for your geriatric animals. Although this paper centers on marine mammals, these techniques can be used with any animal.

What do marine mammals and humans have in common? How many of you are trying to recall the five characteristics of a mammal? We do share those characteristics however, simply put: The one thing every creature has in common is: We all get old! The care and training of animals has traditionally been adapted from the knowledge gained from teaching and caring for people.

This paper will attempt to look at possible correlations between the care of geriatric people and our aging marine mammals. We will also examine the techniques that are being utilized with six different animals within the SeaWorld San Diego Park. The study subjects are: Bubbles, a 46-year-old female shortfin Pacific pilot whale (*Globicephala macrorhynchus*); Corky, a 44-year-old female killer whale (*Orcinus orca*) (both these animals perform in public shows); Gracie, a female Pacific bottlenose dolphin (*Tursiops truncatus*), who is 38 years old and participates in the Dolphin Interaction Program; Abner, a 23-year-old male California sea lion (*Zalophus californianus*); Lucy, a 15-year-old female Asian small-clawed-otter (*Aonyx cinerea*); and last, but certainly not least, Sea Hook, a 30-year-old Pacific walrus (*Odobenus rosmarus divergens*). The latter three animals perform in the Sea Lion and Otter Show.

As these animals have aged, we have noticed changes that present challenges to their care. Challenges to our training skills have included visual impairment, increased health concerns, the ability to maintain husbandry behaviors especially during illnesses, limited and changing physical abilities, social displacement, and creating time to maintain the trainer/animal relationship. In response to these challenges, several techniques have been developed and incorporated at SeaWorld to maintain these animals in their current roles. Successful techniques used with these six animals are: taking slower approximations, making the environment more stimulating creating selective social pairings, paying closer attention to relationships, continually reevaluating behavior, and adjusting S^d's when necessary.

In general, taking slower approximations is helpful when training any animal. Building a strong fundamental base of a behavior will aid in retraining that behavior. For the purposes of geriatric animals, it is beneficial to proactively establish criteria before training and maintaining behavior, especially when there is a physical limitation.

Socialization is different in every area and facility. While it is important to stimulate our older animals, we are careful whenever moving a more dominant animal in with a geriatric animal. There are several options when socializing older animals, but in each case, it is very similar to socializing any other animal. At Sea Lion and Otter Stadium, the trainers selected a large male sea lion that is known for his calm, non-aggressive behavior, to be housed with Abner when socializing him with a third, additional, animal.

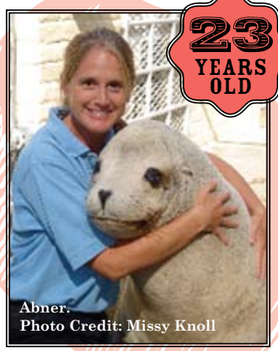


Gracie. Photo Credit: Vicki Weber

Often, adjusting an animal's environment to meet physical changes is necessary. Adding a medical pool or a roll cage to an area may stimulate the animal by changing the environment, as well as allowing you to start training husbandry behaviors using these modifications to assist in medical procedures should they become ill. In May 2007, SeaWorld San Diego completed a medical pool addition in the Dolphin Stadium. Bubbles, along with the other animals who reside at the Dolphin Stadium, was trained to enter into the medical pool, reinforced with primary, and then asked to leave the pool. Staff has increased the amount of time spent in the pool and offer many secondary reinforcers, such as toys, while the animals are in the medical pool. The next step will be to start closing the gates and reinforcing calm behavior. Once the animals have had sufficient opportunities for reinforcement, we will begin closing the gates, utilizing the false bottom to lift the animals, lower the animals, and ask them to leave the medical pool. We want to build a strong foundation of positive behavior prior to performing any medical procedures in the medical pool. This new training opportunity will allow Bubbles, as well as our other animals, to be more comfortable in future medical situations.

Because our older animals are more experienced, we often utilize them in training new trainers or for performing in shows and interactions where a consistent base is needed. However, it is still imperative these animals continue to learn new behaviors. First and foremost, any behavior should be appropriate to their age. For example, if you decided you wanted to encourage your grandmother to get out and enjoy music, taking her to a rock concert might not be an appropriate start. Exposing her to a jazz concert first would be a more conservative approach! One such example of training new behaviors occurred in training water work with our walrus Sea Hook. Trainers do not currently utilize water work in their shows, but training this behavior with Sea Hook, who is completely blind, proved both reinforcing for Sea Hook and her trainers.

We all know that our animals establish social structures; however, trainers certainly have the ability to reinforce these structures. It is always important to maintain relationships with all of the animals, but more attention can be paid to the dominant and geriatric animal relationship. Clearly understood social structures decrease the likelihood of aggression between animals. At Shamu Stadium, one of the more common separations is to place Corky with the dominant female Kasatka and her calf Kalia. Shamu Stadium trainers can add an animal into that social structure, as it is clear that Kasatka is dominant. The trainers refrain from putting all the animals together as the social structure then becomes unclear and social aggression is more likely to occur.



Abner. Photo Credit: Missy Knoll

Relationships are important for all animals (including us). Most of us, as trainers, understand that a relationship is similar to a trained behavior. There are many ways in which to develop a strong understanding with an animal. One way is to train a new behavior, especially with an experienced animal that "knows everything." This challenges the animals mentally and physically, which in turn, develops further trust with the trainer. It is the combination of trust and confidence within the relationship that is necessary when asking for husbandry behaviors when animals are ill.



Bubbles. Photo Credit: Mike Aguilera

Here are a few examples of how we utilize our existing relationships to treat serious illnesses at SeaWorld San Diego. We encourage trainers to just spend time in the animal's environment giving them rubdowns. Corky the killer whale can have one or several trainers accomplishing this in one session, whereas, Abner and Gracie enjoy spending one-on-one time with each of their trainers. It was during a relationship session when Lucy's trainer palpated a lump. This information was immediately conveyed to our veterinarians, at which time, Lucy was diagnosed with mammary masses. Subsequently these were removed and Lucy is now doing well. Our sea lion, Abner, has cataracts with corresponding limited eyesight. He currently receives medications four times a day without incident. Trainers regularly apply skin lotion to Sea Hook, the walrus, who is completely blind and has been diagnosed with sensitive skin. Our relationship with Sea Hook enables us to work around her entire body, with her full cooperation. Bubbles, our pilot whale, has a history of chronic bacterial infections that occur either in her gastrointestinal system or in her lungs. In 2006, she became ill and needed antibiotic injections intramuscularly. Even while she was ill, we began approximations and within one week, we achieved our goal of training unrestrained injections. She participated for 28 days while receiving 56 intramuscular injections. Additionally, our veterinarians needed multiple samples to assist in their diagnoses. We trained an unrestrained tubing to get both stomach and fecal samples. She has been performing unrestrained blood samples for many years. Although she was now a very sick animal we were still successful in obtaining unrestrained injections, stomach, fecal, and blood samples all in the same day. Relationships are everyone's responsibility. As our facilities grow and change, additional tasks are regularly distributed to trainers and animals. It is imperative for management to recognize the time needed to cultivate and maintain these very important relationships.

Our next technique centers on behavior. Evaluating and determining age appropriate behavior for a geriatric animal will reduce the likelihood of having to re-train in the future. Be proactive by consulting with veterinarians, curators, and managers about animal behaviors. Make sure there is consensus on which behaviors may have an impact on an animal's health. In all areas of SeaWorld, we have not only limited the number of shows for our geriatric animals but we have also reviewed and limited the number of behaviors.

For example, this past summer, the trainers established a daily plan for Bubbles. This plan included shows where she did not participate, and when she did participate, the behaviors she emitted were documented. The adjustments we have made for Bubbles have resulted in fewer illnesses, and a more energetic and motivated animal. Some behaviors are also completely removed from an animal's repertoire. Bubbles is no longer asked to perform a belly breech as we have observed a correlation between belly breeches and her illnesses.

If you are unsure about eliminating a behavior, another approach is to modify the behavior. One example of modifying behavior is Abner, the sea lion, who was trained to participate in a cart ride. The trainers installed a ramp to make climbing up into the cart easier. Instead of climbing down the ramp and standing on his hind flippers, Abner is asked to jump into the water to perform the next sequence directly from the cart. Just this small change alone has alleviated pressure on his shoulders and decreases the likelihood of developing arthritis.

Adjusting S^d's enables us to continue to communicate with the animals despite vision loss or physical changes. This adjustment may be the most important of all the recommendations. Tactile S^d's are used with all of the animals and have been useful in maintaining geriatric animals in shows. Sea Hook now performs a kiss generated by a touch on her face and follows her trainer by maintaining a hand target. Gracie has had several S^d changes, when she is next to a fully-sighted dolphin the latter is given all visual S^d's while Gracie is given tactile S^d's. A 'pec dance' behavior is now emitted after a slap on the water. Her fast swim, bow, and chomp behaviors are now emitted by utilizing tactile S^d's. Corky performs her Zipper behavior (a series of low bows around the perimeter of the pool), currently with a visual S^d; the same S^d used for all of the animals. However, she understands a tactile S^d and trainers are working to train more of her existing behaviors to respond to tactile S^d's. Abner performs a behavior called a broken flipper, now solicited by a sweep of a finger along the side of his face indicating the direction of the behavior. Bubbles also performs a desensitization behavior, which involves a slow swim along the perimeter of the pool. The S^d is normally a line up followed by a point, however for Bubbles the S^d is now a line up followed by a sweep of a finger along the side of her melon.

Verbal and audio S^d's are also used. Sea Hook performs three different behaviors using either a tactile, audio, or verbal S^d. SeaWorld has found that working animals during a night show at Sea Lion and Otter has unique challenges associated with older animals. By changing S^d's to accommodate the animal, we can assist our animals in succeeding despite these challenges. Some animals may have limited eyesight, so being aware of trainer body position further assist the animals in visualizing the cue. When her trainers ask Bubbles for a bow, they position their body to her left. Bubbles can see more clearly from her left side, so, the trainers make eye contact first by standing to her left before asking for the behavior.

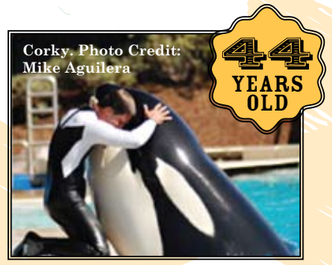
Finally, by establishing good, consistent criteria of behavior and continually re-evaluating those behaviors, we will continue to be proactive while stimulating and training healthy, experienced animals. In the British Medical Journal, Shell Oil published a paper concerning mortality rates in a study of older retired employees. Employees who retired at 55 had almost double the mortality risk than those who continued working into their 60's. Although the researchers could not explain this phenomenon, the authors believe the more active you are and the more you stimulate your brain, the longer you will live. If we can use adaptations in human training techniques and medical care for animals, we can certainly apply Shell Oil's research about retirement and its association with age to animals as well.

We should invest time in developing programs to assist our geriatric, or should we say experienced, animals. You will become a more knowledgeable and well-rounded trainer while making the lives of these animals more stimulating and productive!

Please contact Kristi.Burtis@SeaWorld.com if you would like to view video of any of the behaviors mentioned in this paper.

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Corky. Photo Credit: Mike Aguilera

REGIONAL REPORTS

The following reports were submitted for publication on 15 August 2008



The top view of the new Veterinary Centre of Ocean Park, Hong Kong.

ASIA REGION

Man Tik (Gary) Chu
Vancouver Aquarium
Vancouver, Canada

OCEAN PARK – *Hong Kong, CHINA*

The master re-development plan for Ocean Park is progressing at top speed. Upgrades to existing facilities are in progress and construction of a new Veterinary Center connected to five breeding pools for cetaceans, is expected to be completed in October 2008. Half of the existing bottlenose dolphin *(Tursiops aduncus)* collection will be moved into the new pools by end of 2008.

To mark the hosting of the Olympic Games in China, the Central Chinese Government gifted five Chinese sturgeons *(Acipenser sinensis)* to Hong Kong, which are now housed at a dedicated aquarium in Ocean Park. The 3500 m^2 (4200 yd^2) Chinese Sturgeon Aquarium opened on 8 August 2008. The Chinese sturgeons will gradually be acclimated to seawater in the aquarium and once this process is complete, another four acclimated Chinese sturgeons will join these five.

AUSTRALIA REGION

Darryl Pearce
Sea World Enterprises
Gold Coast, Australia

MARINELAND OF NEW ZEALAND – *Napier, NEW ZEALAND*

On 2 July 2008, the owners of Marineland of New Zealand and the Napier City Council voted 10-2 to close Marineland to the public when Kelly, the dolphin, dies. At this time, Marineland management still does not know what this means for the staff and animals.

The 38-year-old common dolphin *(Delphinus delphis)*, Kelly, continues to do well.

PET PORPOISE POOL – *Coffs Harbour, NEW SOUTH WALES*

All the animals are doing well at Pet Porpoise Pool. The staff is starting to incorporate some of the younger sea lions into the interactive shows with some new behaviors being added.

Solomon, one of the older male Australian sea lions *(Neophoca cinerea)* is being prepared to travel to Sea World for some urgent dental surgery next month.

The small group of little blue penguins *(Eudyptula minor)* is starting to nest.

SEA WORLD AUSTRALIA – *Gold Coast, QUEENSLAND*

In June 2008, Sea World introduced Sea World Whale Watch, a new level of education and entertainment with the natural experience of getting up close and personal with one of the world's largest mammals. Up to 10,000 humpback whales *(Megaptera novaeangliae)* migrate from Antarctica to the southern barrier reef each year to breed and have calves. Sea World Whale Watch's state-of-the-art whale watching vessel is the newest on the Gold Coast and the only vessel custom designed for environmentally friendly whale watching.

Sea World Whale Watch's new vessel.

Animal Adventures DVD department is adding another aspect for guests by including a DVD of their experience with the animals using a new state of the art DVD underwater recorder, computers, and burning equipment.

Sea World, in conjunction with the University of Queensland, collected samples from a number of dugongs *(Dugong dugon)* out of the population in Morton Bay. All the animals were blood sampled, measured, weighed and ultra sounded for pregnancy. Everyone involved over the weeklong trip was extremely happy as to the state of the bay and its inhabitants.

SYDNEY AQUARIUM – *Darling Harbour, AUSTRALIA*

The seal team at Sydney Aquarium has expanded with additional staff in line with the long-term plan of interactive encounters for the public. The Aquarium's fur seals and sea lions come from a variety of sources, and each has been individually assessed, with conditioned behaviors being standardized across the collection. Versatility is the major objective, and a major challenge for the team to achieve.

The newest recruit, Pasha, a Sub-Antarctic fur seal *(Arctocephalus tropicalis)*, has been continuing well with conditioning of husbandry behaviors.

Burleigh, a New Zealand fur seal, helped celebrate the Aquarium's 20th Anniversary, complete with a guest Olympic swimmer and shark-shaped cake.

During the winter stranding season, the aquarium was asked to assist with a young New Zealand fur seal *(Arctocephalus forsteri)*, which had suffered serious wounds by what appeared to be a shark. Although it is not uncommon for fur seals to be seen offshore and hauled out resting on beaches and rock platforms at this time, the nearest colony is about 250 km (150 miles) south of Sydney.

New nest boxes have been built and installed in the little penguin colony.

TARONGA ZOO – *Sydney, AUSTRALIA*

The Taronga Zoo recently launched a new seal show, including New Zealand fur seals, California sea lions *(Zalophus californianus)* and Australian sea lions. The new theatre has five access points for seals making animal change over's and number of animals available on stage easier.

Taronga has been involved in the rehabilitation of a young New Zealand fur seal with a large shark bite to his back, as well as many puncture wounds. The very young little seal looks to be joining the family at Taronga in the near future.

The staff has been recording the Fiordland crested penguins *(Eudyptes pachyrhynchus)* mating and incubating eggs behavior but no chicks have been sighted yet.

UNDERWATER WORLD – *Mooloolaba, QUEENSLAND*

The main seal enclosure at Underwater World is about to be modified with the installation of a new set and props ready for the new seal show. The new show concept has been chosen and is going to be an exciting new direction for Underwater World's "edutainment" style of show. The concept is still top secret as there is not a production date set at this time.

Bella, a female Australian fur seal *(Arctocephalus pusillius doriferus)*, will soon undergo a voluntary ultrasound to check for pregnancy.

CANADA REGION

Brian Sheehan
Vancouver Aquarium
Vancouver, Canada

PARC AQUARIUM DU QUÉBEC – *Quebec, QUEBEC*

The summer demonstrations and programs at Parc Aquarium du Quebec have been a great success with the addition of educational behaviors and music. Walrus *(Odobenus rosmarus divergens and Odobenus rosmarus rosmarus)* training has centered on displaying the different techniques used for locomotion and the physical characteristics of the pinniped families.

The Parc Aquarium du Quebec is a proud partner of the Réseau Québecois d'urgences pour les mammiferes marins or the Marine Mammal Rescue of Quebec. At the end of July, aquarium staff responded to a call from a local marina for a seal that appeared to be lost and disturbing resident's boats. Upon arrival, staff was surprised to identify the seal as a healthy 2008 male bearded seal pup *(Erignathus barbatus barbatus)*. This species is normally an ice-inhabiting seal found in the Arctic Ocean and adjacent seas and neither a resident nor visitor of the St-Lawrence River. Staff successfully rescued the seal, completed a physical exam, drew blood for analysis, and promptly transported the seal towards the northeast to colleagues in Tadoussac where the seal was released.



Ultrasound training with a walrus in Quebec.



The Delphinarium Muenster/Germany is pleased to announce that Paco, a 40-year-old Tucuxi *(Sotalia fluviatilis guyanensis)* is doing well. At this time he is the last known Tucuxi outside South America under human care.

VANCOUVER AQUARIUM – *Vancouver, BRITISH COLUMBIA*

Vancouver Aquarium staff has had a busy summer with the successful birth of a female beluga calf *(Delphinapterus leucas)* in early June. Mother and calf are doing well and the Arctic Canada habitat is even busier with the reintroduction of the calf's grandmother into the social group.

Construction has been completed on a new pen for the Steller sea lion *(Eumatopias jubatus)* open-water site. This will allow the number of Steller's at that site to potentially double.



Vancouver Aquarium staff has had a busy summer with the successful birth of a female beluga calf *(Delphinapterus leucas)* in early June.

Eyecup training is progressing well with the Pacific white-sided dolphins *(Lagenorhyncus obliquidens)*. There continues to be some experimentation with the best recipe for the edible eyecups.

The first stage of the research project looking at changes in the size of thyroid glands in Lags and Belugas has been successfully completed.

Congratulations goes to Gil Hewlett, former Manager of Special Projects at the Vancouver Aquarium, for winning first place in Foreword Magazine's Book of the Year Award in the Nature Category for his book Springer, Luna and the Struggle to Save West Coast Killer Whales.

CARIBBEAN ISLANDS REGION

Adrian Penny
Atlantis Paradise Island
Paradise Island, Bahamas

ATLANTIS PARADISE ISLAND – *Paradise Island, BAHAMAS*

Dolphin Cay, Atlantis, along with The Bahamas Marine Mammal Research Organization and the Department of Marine resources, hosted the Bahamas Marine Mammal Stranding Workshop. The two-day workshop brought together over 60 participants from all the Family Islands National Marine Fisheries Service including the National Marine Mammal Stranding Coordinator, Dr. Janet Whaley, Southeast Regional Atmospheric Administration Fisheries, Dr. Karleen Ketten, and from Woods Hole Oceanographic Institution, Dr Ruth Ewing. During the two-day event, participants from the Bahamas were advised of different species of stranded animals, local legislation, and the correct steps to take when dealing with stranded mammals.

Dolphin Cay would like to announce the successful birth of female dolphin calf, Palmer. Both mom and calf are doing fine.

DOLPHIN ENCOUNTERS – *Nassau, BAHAMAS*

On 26 May 2008, Dolphin Encounters opened its new Sea Lion Encounter to the general public. Guests are able to interact with one of the California sea lions while standing on a waist deep underwater platform.

On 23 June, Maggie, one of the female sea lions, gave birth to a healthy male pup. This is the first sea lion to be born in the Bahamas.

The Education Department has had an extremely busy summer with over 1800 children participating in summer camps, dolphin interactions, and other educational offerings from June through August.

EUROPE NORTH CENTRAL REGION

Christiane Thiere
Tiergarten Nuremberg
Nuremberg, Germany

DOLFINARIUM HARDERWIJK – *Harderwijk, THE NETHERLANDS*

Dolfinarium Harderwijk hosted nine dolphins from Parc Astérix in Paris, France, while renovations were done to their dolphin pool. Both parks are owned by Compagnie des Alpes. In June 2008 the last visiting dolphin returned to their renovated exhibit in Paris.

The Dolfinarium staff is proud to announce the birth of two dolphins this spring. The male and female dolphin babies are developing well and one of the newborns was conceived through artificial insemination.

This year the rescue centre, SOS Dolfijn, housed five harbor porpoises *(Phocoena phocoena)* of which three animals were released after rehabilitation. The two non-releasable animals are housed in the permanent harbor porpoise exhibit at the park.

The walrus exhibit, which was built in 2006, houses six walruses, which are presented in a highly appreciated walrus show.

The experience of a sleepover with the dolphins has spread over the Netherlands. The program, Dreaming with the Dolphins, is fully booked and more than 1000 children are experiencing a great night at the Dolfinarium.

OUWEHANDS ZOO – *Rhenen, THE NETHERLANDS*

In July of 2008, the keepers at the Ouwehands Zoo celebrated the 50th birthday of Else, the harbor seal *(Phoca vitulina)*. Although Else is completely blind she is still doing well at the seal exhibit, which houses ten harbor seals.

The polar bears *(Ursus maritimus)* diet is currently being researched with hopes to change to a more natural diet with a seasonal pattern. Since spring 2008, the young male polar bear, Sprintertje is on exhibit daily and doing well together with his mother, Freedom.

At the Sea Lion Theatre, trainers and animals are working hard on new behaviors including water work that will be part of the new upcoming show.

TIERGARTEN NUREMBERG – *Nuremberg, GERMANY*

Flocke, a polar bear, was born at Tiergarten Nuremberg on 11 December 2007. On 8 January 2008 her mother, Vera, carried Flocke out of her den and left her alone in the outside exhibit. She was then hand-raised by staff. The Tiergarten Nuremberg registered more than 30 million visits on Flocke´s homepage (www.polarbear.nuernberg.de). On the homepage there is information about the environmental situation of polar bears.



Nuremberg Zoo's Flocke.

ZOO EMMEN – *Emmen, THE NETHERLANDS*

Zoo Emmen started training 2.7 California sea lions that range in age from 1-14 years. The goal is to train shows with only natural behaviors of the sea lions. A new team of four trainers is working alongside a head trainer to develop a presentation. Although there are many challenges, the team was successful in setting up a training program with the use of operant conditioning techniques. With the vet, steps are taken for a medical training program. This is beneficial as the young male, Sessantotto, has some health problems. The ultrasound training for pregnancy is still in training and two pups were born.

REGIONAL REPORTS

EUROPE NORTH EAST REGION

Sunna Edberg
Kolmarden, Sweden

FJORD & BÆLT – *Kerteminde, DENMARK*

This summer has been good at Fjord & Bælt. In June, the center hosted an international Ph.D. course on Research Training of Aquatic Animals.

Eigil, a male porpoise, has worked hard on a research project about fishing net detection in porpoises, and the project is still running.

Frigg, a harbor porpoise, has celebrated her 1st birthday. It was an exciting day with lots of activities at the center to mark this special event. The training staff is patiently waiting for her to start eating fish, so her training can begin.

Two of Fjord & Bælt's trainers are going to Long Marine Lab in Santa Cruz, California, to learn about the research training that is done at the lab.

KOLMARDEN – *Kolmarden, SWEDEN*

One staff member from Kolmarden's marine mammal department was sent to the international Ph.D. course on Research Training of Aquatic Animals at Fjord & Bælt. Kolmarden would like to congratulate Magnus Wahlberg and the rest of the staff at Fjord & Bælt for arranging this course.



New themed sea lion show at Kolmarden.

Two dolphin births *(Tursiops truncatus)* are expected in September.

The new dolphin show and the new themed seal and penguin presentation have been very appreciated by the guests this summer. There has been good attendance this summer despite a very rainy season.



Zoomarine Italy recorded a video with the famous detective dog Rex.

EUROPE SOUTH CENTRAL REGION

Virginie Roy
Nausicaa
Boulogne sur mer, France

SEAQUARIUM – *Le Grau du Roi, FRANCE*

This summer, two new harbor seal pups were born at the Seaquarium in France. Ounik gave birth on 18 July to a male pup, Wash, and Gloria gave birth on 22 July to another male, Teiko. It is the first time that males were born at the Seaquarium. Mothers and pups joined the rest of the group in the big pool with the sea lions *(Otaria byronia)* a few days after birth and everybody is doing very well.



This summer two harbor seal *(Phoca vitulina)* pups were born at Seaquarium in France.

MIDDLE EAST REGION

Oz Goffman
The Israel Marine Mammal Research and Assistance Center
Mt. Carmel, Israel

ATLANTIS, THE PALM – *Abu Dhabi, UNITED ARAB EMIRATES*

The collection of bottlenose dolphins at Dolphin Bay, Atlantis, Palm Jumeirah have been, and continue to make, huge training progress. Through behavioral conditioning, the husbandry program includes co-operative blood, fecal and gastric samples, amongst others, from all the dolphins in the collection.

Desensitization continues in the lagoons for interaction training with the dolphins, going through daily practice runs with invited guests to the facility.

The team of marine mammal specialists has grown considerably over the last few months. The team at Dolphin Bay now represents 15 nationalities and in the next few weeks the reservations/education staff starts.

THE ISRAEL MARINE MAMMAL RESEARCH AND ASSISTANCE CENTER – *Mt. Carmel, ISRAEL*

On 26 July 2008 a baleen whale was observed swimming inside Haifa Port, and IMMRAC's staff was on site following the whale until dark. Species identification was not final but the options were either an adult minke whale *(Balaenoptera acutorostrata)* or a young fin whale *(Balaenoptera physalus)*.

On 25 July 2008, a call from the Nature and Parks Authority noticed a small dolphin swimming in the shallow water around Hdeara's/Giv'at Olga's Beach. By the time that the IMMRAC crew arrived, the dolphin beached itself but was re-floated. Soon after, the dolphin died. The dolphin was transported to the IMMRAC's center in Michmoret for autopsy. It was an emaciated, young, 50 kg (110 lb), 202 cm (78 inch), male striped dolphin *(Stenella coeruleoalba)*. The autopsy revealed no obvious cause of death.

Marco, a young male social solitary bottlenose dolphin in Eilat, has become human friendly in the last three months. Marco approaches swimmers for rubbing and he also displays sexual and aggressive behaviors. The Israel Nature and Parks Authority and IMMRAC, will start monitoring Marco's dolphin-human interactions. Beach signs and flyers regarding swimming regulations with dolphins were made for hanging in the main beaches of Eilat and diving centers.

PACIFIC ISLANDS REGION

Stephanie Vlachos
Waimanalo, Hawaii

DOLPHIN QUEST HAWAII – *Waikoloa, HAWAII*

Dolphin Quest Hawaii continues to grow. Both calves, Hali'a and Hua, have been training and participating daily in guest interactions. Hali'a is busy learning bows, tail lobs, and spin swims. Hua is beginning to learn his husbandry behaviors including ultrasound layouts, dorsal present, and fluke present.

Dolphin Quest Hawaii is preparing for artificial insemination with its animals in the fall. All of the crew is anticipating future success with this endeavor.

MARINE MAMMAL RESEARCH PROGRAM, HAWAII INSTITUTE OF MARINE BIOLOGY, UNIVERSITY OF HAWAII – *Oahu, HAWAII*

The Marine Mammal Research Program is in the process of obtaining Ho'olono's first audiogram or hearing test by measuring his brain's response to sound. This is also known as the auditory evoked potential (AEP) technique. Ho`olono is an Atlantic bottlenose dolphin, and is 18 months old. He has been trained to wear suction cups that are embedded with sensors, which measure his brain's response to different frequencies of sound presented to him. Ho'olono also continues to build his repertoire of husbandry and play behaviors.



Ho'olono in position for an audiogram.

SOUTH AFRICA REGION

Gabby Harris
Durban, South Africa

BAYWORLD – *Port Elizabeth, SOUTH AFRICA*

At Bayworld, the two bottlenose dolphins are doing exceptionally well. The young female dolphin had routine chest x-rays taken in July.

After a long delay, Cherie Lawrence has filled the permanent position in the Oceanarium.

The chief Curator in the penguin department was lucky to visit two zoos in the United Kingdom recently, visiting Edinburgh and London Zoo. The breeding season has so far been successful with five new chicks in the enclosure. Twelve captive bred juveniles will be relocating to other facilities overseas at the end of July.

The stationing of gully sharks *(Triakis megalopterus)* in the predator tank has been successfully reintroduced and is doing very well.

Bayworld decided to open its doors to the public, and in three days of being opened over a thousand people attended.

SEA WORLD AT uSHAKA MARINE WORLD – *Durban, SOUTH AFRICA*

At Sea World at uShaka Marine World, the African penguin *(Spheniscus demersus)* colony is breeding well. The latest six chicks are about to be introduced back into the colony.

Sea World hosted, Reach for a Dream, for children who are terminally ill and have a dream of meeting dolphins. In the last month, Sea World hosted a group of forty-two HIV affected children.

SOUTH AMERICA/MEXICO REGION

Miguel Marques
Cancún, México

DOLPHINARIS – *Cancun, MEXICO*

At Dolphinaris, the Cozumel facility staff welcomed 1.2 dolphins *(Tursiops truncatus gilli)* on 10 February. Dolphinaris now holds three different species of dolphins, *Tursiops aduncus, Tursiops truncatus truncatus* and *Tursiops truncatus gilli*. The Dolphinaris family is growing, with five pregnancies this year.

U.S. MIDWEST REGION

Stacey Lonski
Indianapolis Zoo
Indianapolis, Indiana

BLANK PARK ZOO – *Des Moines, IOWA*

The Blank Park Zoo has had a successful season of training demonstrations. A bridge was installed connecting the main deck to the center island that allows the trainers to get closer to the public during the demonstrations.

Sushi, a female California sea lion, was showing difficulties using her hind flippers. She quickly responded to being trained for voluntarily x-rays and the procedure was successful.

BROOKFIELD ZOO – *Brookfield, ILLINOIS*

The Brookfield Zoo was sad to say goodbye to male dolphins, Lucky and Hastings, who left for Dolphin Connection in the spring.

Goodbye to senior trainer, Alicia Russell, who has been at the zoo for eight years and is leaving the field to pursue a new career.

INDIANAPOLIS ZOO – *Indianapolis, INDIANA*

The Indianapolis Zoo has had a busy but exciting summer this year. New training was accomplished with the two female polar bears, Tahtsa and Tundra. With the construction of a scale, Tahtsa is asked to gate onto the scale to obtain her weight. Tundra is using a tool through the gate and can create her own polar bear paintings.

Thanks to summer interns Abbie Mingus, Jess Kaplan, and Kritstine Miskimen. Welcome aboard Kelly Tabor who recently joined the staff after they said goodbye to Leigh Doney.

OCEANS OF FUN, INC. – *Milwaukee, WISCONSIN*

Oceans of Fun had another very busy and successful season of interactive programs and presentations. The stage area was remodeled to resemble a seaside village and was constructed from eco-friendly products.



New seaside look to Oceans of Fun.

All the animals are doing very well and the training staff is looking forward to training new and exciting behaviors in the next several months.

U.S. NORTHEAST REGION

Beth Manning
National Aquarium in Baltimore
Baltimore, Maryland

AQUARIUM OF NIAGARA – *Niagara Falls, NEW YORK*

In July at the Aquarium of Niagara, a 21-year-old blind California sea lion, Diamond, successfully underwent voluntary optic radiographs.

The staff is beginning water work with the 6-year-old male California sea lion, Jester, acquired from the US Navy in December of 2007. He has overcome many behavioral challenges through extensive training and enrichment.

The staff would like to bid a fond farewell to summer interns Joe Szramka and Corinne Dunkle.

The Aquarium welcomes back Spike, the North American porcupine *(Erethizon dorsatum)*, on loan from Hawk Creek Wildlife Center. He will be participating in feeding demonstrations and training of husbandry behaviors.

ATLANTIS MARINE WORLD – *Riverhead, Long Island, NEW YORK*

At Atlantis Marine World, 1.1 North American river otters *(Lontra canadensis)* were introduced to their new home and the exhibit, Otter Falls, on 29 June. The otters dug a den in the exhibit and have been a little elusive to the public.

Coral, the first harbor seal pup born at Atlantis Marine World, turned 1-year-old on 16 June. Her training is progressing very well.

The annual Regional Aquarium Workshop was held at Atlantis Marine World in the beginning of June and was attended by aquarists and biologists from around the world.

The Riverhead Foundation for Marine Research and Preservation is currently rehabilitating three yearling gray seals *(Halichoerus grypus)* and one yearling harp seal *(Pagophilus groenlandicus)*. In addition to the four seals, the Riverhead Foundation currently cares for five Atlantic green *(Chelonia mydas)* and four Kemp's Ridley *(Lepidochelys kempii)* sea turtles. The staff and volunteers are preparing for the upcoming sea turtle releases, which are planned for the next few weeks. These animals will be released off of Long Island and will be outfitted with satellite tags to monitor their post release movements and dive behavior. Tracking maps will be posted on the Riverhead Foundation website at www.riverheadfoundation.org

MYSTIC AQUARIUM INSTITUTE FOR EXPLORATION – *Mystic, CONNECTICUT*

The Pribilof Island and Penguin team at Mystic Aquarium welcomes trainer, Kyle Hurst and assistant trainer, Alex Mevs.

Congratulations to trainer, Kristen Patti, and Lucia, an adult female Steller sea lion, on their first behavioral blood sample.

The two African penguin chicks that hatched in January have both been determined to be male.

The Marine Theater team is finishing up their 8th season of summer shows with their 3.0 California sea lions. Hut, the newest addition, continues to do well learning to be a part of shows and is growing and learning each day.

Welcome to trainer, Christina Castiglione and thanks to seasonal trainer, Lynn Turcotte.

Inuk and Naku, two adult beluga whales, have been training to take part in an Energetic and Metabolism Study under the direction of Leslie Cornick and Dave Rosen. Data collections are scheduled to begin in August and the collected data will be used to estimate daily, seasonal, and annual caloric requirements for the Cook Inlet beluga whale population.

The entire Marine Mammals and Birds staff would like to give a warm thanks to summer interns Katie Bernabeo, Brittany Clark, Brooke DeSantis, Danielle Duquette, and Kasie Ziebarth.

NATIONAL AQUARIUM IN BALTIMORE – *Baltimore, MARYLAND*

The National Aquarium in Baltimore announces the birth of a female bottlenose dolphin calf, born 27 July to Chesapeake, a 16-year-old female. Both Chesapeake and her dam, Shiloh, have been raising the calf.

Foster, the male calf born in Sept 2007 has been progressing very well.

The marine mammal staff would like to thank aides Kristine Salerno and Mark Hendricks for their help through the summer season.

NEW ENGLAND AQUARIUM – *Boston, MASSACHUSETTS*

The New England Aquarium is excited to be breaking ground for a new marine mammal exhibit this fall. The three female fur seals *(Callorhinus ursinus)* will go to the New York Aquarium and the one male, Baranov, will go back to Mystic Aquarium.

A juvenile male harbor porpoise who stranded on Skaket Beach in Orleans, Massachusetts, on 17 February was brought to the New England Aquarium for rehabilitation. Oscar, as he was named, was fitted with a satellite tag that transmits every four days and he was released on 21 May. He has been traveling throughout the gulf of Maine and was close to the coast of Maine in August.

SIX FLAGS GREAT ADVENTURE AND WILD SAFARI – *Jackson, NEW JERSEY*

Dolphin Discovery at Six Flags Great Adventure and Wild Safari closed another successful season with the 2.0 bottlenose dolphins and 1.2 California sea lions. Anoki and Dichali, the 0.2 California sea lion pups have been progressing well with their water work desense and were integrated in the Frightfest Halloween Show.

Dolphins, Avalon and Cody, had a great show season and furthered their artificial insemination progress. In addition, two new programs were implemented, Trainer for a Day and an Externship Program.

Congratulations to Mike Miller, Nikki Aquilino, and Kaitlyn Bujnowski for completing their externship program.

Exploration Station was proud to close out its second successful season. In the off-season, the conservation message continues through the Wild Encounters outreach program. The training staff at Exploration Station would like to congratulate Maria DeLeon, Daniel Martin, Kelly Deatrick, and Kim Johnston for completing their externship programs.

SMITHSONIAN'S NATIONAL ZOOLOGICAL PARK – *Washington, D.C.*

The Smithsonian's National Zoological Park has a long history of utilizing training to facilitate care of its animal collection. Over the past few years the program is becoming more formalized, including hiring the facility's first curator of enrichment & training in June 2006. NZP includes the Zoo in Washington D.C. and the Conservation and Research Center in Front Royal, Virginia. Some of the

training that is taking place is crate training an adult male gharial *(Gavialis gangeticus)*, induction chamber training of a group of 6.0 Asian small-clawed otters *(Aonyx cinerea)*, voluntary x-ray with a female clouded leopard *(Neofelis nebulosa)*, scale training with prairie dogs *(Cynomys ludovicianus)* and dama gazelle *(Gazella dama)*, blood collection and ultrasound training with giant panda *(Ailuropoda melanoleuca)*, trailer training and aggression reduction training with a hand-raised Przewalski's horse *(Equus caballus przewalski)*, voluntary artificial insemination training of a white-naped crane *(Grus vipio)*, and tamer training with American bison *(Bison bison)*.

THE VIRGINIA AQUARIUM AND MARINE SCIENCE CENTER – *Virginia Beach, VIRGINIA*

The Virginia Aquarium and Marine Science Center's marine mammal staff wishes goodbye and best of luck to Brian Bunt as he moves on to his new job with SAIC in King's Bay, Georgia.

Earlier this year, the mammal department welcomed Tippy, a male North American river otter to the group. Tippy arrived in January from the Sedgwick County Zoo when he was less than a year old. Since that time, the mammal staff has been working very hard to acclimate him to his new environment and integrate him into the collection.

This summer marks the 8th season of the Virginia Aquarium's Seal Splash program. This has been the first season that the youngest harbor seal has participated in the program on a regular basis. Hector has been working on many new behaviors this summer but his favorite seems to be painting. All five of the harbor seals are now trained to paint and the profit from these paintings goes to support the Stranding Center.

The mammal staff continues to work on maintaining the voluntary blood behavior with all five harbor seals and has started to train voluntary fecal and gastric sampling.

U.S. NORTHWEST REGION

Cinthia Alia-Mitchell
Tualatin, Oregon

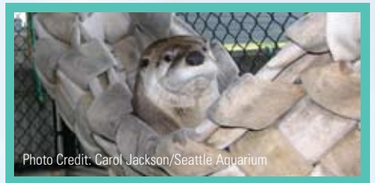
ALASKA SEALIFE CENTER – *Seward, ALASKA*

The Alaska SeaLife Center is happy to announce the addition of the Marine Mammal Encounter to the center's existing Puffin and Octopus Experience Encounters.

It has been a successful season, integrating 2.2 resident harbor seals into the program, where visitors can get an up-close and personal experience with marine mammals.

The mammal division is working to expand their husbandry program with juvenile harbor seal and Steller sea lion residents. Husbandry goals include voluntary blood draws and gastric tubing for the collection.

Members of the marine mammal staff and research department assisted in a collaborated effort with the Alaska Department of Fish and Game in support of an ongoing study investigating harbor seal glacial habitats. Mammal staff members also assisted with tracking and monitoring newborn Steller sea lion pups for the Alaska SeaLife Center's Chiswell Island Remote Monitoring Project.


Photo Credit: Carol Jackson/Seattle Aquarium

Waadah, a North American river otter, in his hammock.

With much sadness, Susitna, a captive female harbor seal, passed away in June.

The Marine Mammal Division welcomes back yearling harbor seal Tongass.

Farewell to Americorps volunteer Amber Stephens and welcome Americorps volunteer Brian Lynn.


Photo Credit: Kim Terrell, Dolphin Encounters

In June, Maggie, one of our female sea lions, gave birth to a healthy male pup.

OREGON COAST AQUARIUM – *Newport, OREGON*

The Oregon Coast Aquarium is in the process of marketing sea lion paintings and flipper prints for sale in the gift shop. The proceeds will be used to fund animal enrichment programs and professional development for animal husbandry staff.

The mammal department is currently constructing a new pool in preparation for potential breeding programs with the harbor seals.

The marine mammal department would like to thank seasonal staff, Ashley Coffey and summer intern, Rebecca Roush.

The aquarium will be hosting the PNDVA conference 11-14 September 2008 and The Inaugural Jellyfish Jubilee: A Celebration of Food and Wine Fundraiser for the Aquarium on 27 September.

U.S. SOUTH CENTRAL REGION

Cheryl Pappas
SeaWorld Orlando
Orlando, Florida

HOUSTON ZOO – *Houston, TEXAS*

In the spring of 2008, renovations to the sea lion holding area commenced at the Houston Zoo. The new roof allows for more headroom, natural light, and improved ventilation. The addition of several mesh windows in the holding area allows the sea lions to interact with staff outside of training sessions.

This summer, Dean arrived via FedEx from Sea Life Park, Hawaii. Dean is an intact California sea lion that weighs in at 295 kg (650 lb) and is 25 years old. His many years of interactive experience will be valuable for the Houston Zoo guests. His laid back temperament has proven a great match for the park's two young female California sea lions, as introductions continue to move along.

SEAWORLD SAN ANTONIO – *San Antonio, TEXAS*

Last year, SeaWorld San Antonio was pleased to welcome two new beluga calves to the beluga family. The park is happy to report that both male calves are doing well and are currently in the process of learning hand targets, mimic squirts, and vocals.

As the summer winds down, shows are still going well, and the staff is proud to announce the arrival of two more beluga calves born at the end of July. Both female, the calves are in good health and are bonding with their mothers.

TEXAS STATE AQUARIUM – *Corpus Christi, TEXAS*

The Texas State Aquarium has had a very successful summer. The Dolphin Bay staff incorporated several interactive segments into the summer show, which has had a great response from the public.

The staff recently trained Shadow, a male Atlantic bottlenose dolphin for a voluntary skin biopsy. The procedure involved passive restraint and voluntary injection training at the biopsy site. The final procedure took less than ten minutes, and the biopsy site is healing well.

U.S. SOUTHEAST REGION

Sarah Graff
Miami Seaquarium
Miami, Florida

AUDUBON AQUARIUM OF THE AMERICAS – *New Orleans, LOUISIANA*

At the Audubon Aquarium of the Americas, two southern sea otters *(Enhydra lutris)*, Buck and Emma are learning new husbandry behaviors for future physicals. Buck is known to be more aggressive and is learning to allow trainers and veterinarians to access any part of his body, especially his abdomen. This is safely performed through openings in an acrylic door that attaches to the otters' holding/medical room. In the future, veterinarians will be able to closely monitor his health between annual physicals without the use of anesthesia. Emma is learning to present a flipper for blood draws while on exhibit, eliminating the need to kennel her for every blood draw. These husbandry behaviors will allow for easier exams and check-ups between each annual physical.

Daily presentations with the zoo's 1.4 California sea lions are going well and trainers have recently begun to include water work during the presentations. They are in the beginning stages of training both voluntary temperature and voluntary intubation.

The sea lion trainers are happy to announce a new addition to the team, Ethan Porter, LSS technician for the sea lion habitat

DOLPHIN CONSERVATION CENTER AT MARINELAND – *Marineland, FLORIDA*

Dolphin Conservation Center at Marineland is pleased to announce the birth of 2.1 bottlenose dolphin calves in June 2008. All three calves were sired by a previously unrepresented founder male dolphin in his early forties, making the successful births even more significant.


Photo Credit: DCC staff

Two of the 3 calves born at Dolphin Conservation Center at Marineland in June 2008.

The Dolphin Conservation Field Station is nearing completion. The conservation messages promoted by the DCC can be put into action in the surrounding oceanic estuary system. The Field Station will also eventually assist in the rescue and rehabilitation of stranded small cetaceans in northeast Florida.

Congratulations to Laura Denum on her promotion to trainer and Maura Davis on her promotion to assistant trainer.

DOLPHIN CONNECTION – *Duck Key, FLORIDA*

Dolphin Connection had a great spring and summer season after Hawk's Cay Resort re-opened in February 2008 following a $34 million dollar renovation.

Two female Atlantic bottlenose dolphins, April and Allie, were successfully transported and introduced to the Minnesota Zoo in early January and are doing well.

Two new bottlenose dolphins, Lucky and Hastings, arrived from the Brookfield Zoo in March of 2008. They are acclimating well to their new home.

The training staff congratulates Haley Merritt as a new assistant trainer and welcomes back Tracy Gaudio Backhaus as supervisor.

GULF WORLD MARINE PARK – *Panama City Beach, FLORIDA*

The Gulf World Marine Park family welcomed the birth of a male harbor seal pup this past June. This is the fifth successful birth at Gulf World since the introduction of harbor seals to the park in 2004. The staff said good-bye to 1.2 harbor seals as they were transferred to the Miami Seaquarium.

The park welcomes, Sebastian, an adult male Atlantic bottlenose dolphin from SeaWorld Orlando. He is acclimating well to the rest of the collection of 2.5 Atlantic bottlenose dolphins and 3.4 rough-toothed dolphins *(Steno bredanensis)*.

This year the park has successfully rehabbed several different species of sea turtles. Over 50 sea turtles have been rehabbed and released in the past eight months. A loggerhead sea turtle *(Caretta caretta)* and a Kemp's Ridley sea turtle will soon be released.

MIAMI SEAQUARIUM – *Miami, FLORIDA*

On 25 June 2008, Miami Seaquarium welcomed 1.2 juvenile harbor seals from Gulf World in Panama City, Florida. The training staff has begun desensitization and husbandry training and looks forward to having them participate in daily shows. Future plans also include the development of a breeding program.

The Animal Care department continues rescuing and rehabilitating stranded manatees *(Trichechus manatus)*. On 15 June 2008, a baby manatee was rescued off the coast of Key Largo weighing only 29.5 kg (65 lb), she received around the clock care including nine bottle feedings per day and now weighs over 40.9 kg (90 lb). She was given the name Kiandra, which means water baby.

MOTE MARINE LABORATORY & AQUARIUM – *Sarasota, FLORIDA*

Mote Marine Lab resident manatees, Hugh and Buffett, have completed a behavioral audiogram and are in the final stages of a masked audiogram study. These research projects are adding to the knowledge about the hearing abilities of manatees and how they are impacted by human-generated noise in the wild. Two loggerhead sea turtles are participating in similar auditory research.

Mote's Dolphin and Whale Hospital is rehabilitating 2.0 pygmy killer whales *(Feresa attenuata)* that stranded near Boca Grand, Florida, on 16 June 2008. The animals are suffering from severe gastric, respiratory, and parasite infections. It is hoped that these animals can be successfully rehabilitated and released in the near future.

SEAWORLD ORLANDO – *Orlando, FLORIDA*

In the summer of 2009, SeaWorld will be debuting Manta, a new attraction that transitions guests from encountering rays in underwater flight into the sensation of actually being one. The journey begins as guests wind through caverns past ray-inspired art. Floor-to-ceiling windows will create mesmerizing face-to-fin encounters with 300 rays including shark rays *(Rhina ancylostoma)*, spotted eagle rays *(Aetobatus narinari)*, leopard rays, cownose rays *(Rhinoptera bonasus)*, and oscillate river rays. Manta will inspire riders with these amazing underwater animal habitats, then soar them face-down, in a horizontal position, aboard a manta-inspired flying coaster. With a wingspan of 3.6 m (12 ft), the giant manta will glide, swoop, and dive at speeds up to nearly 96 km/h (60 mph), through four inversions on 1,024 m (3,359 ft) of track.

SeaWorld Orlando and the Worlds of Discovery Parks would like to congratulate Kelly Flaherty-Clark on her promotion to Curator of Animal Training at SeaWorld Orlando. She succeeds Chuck Tompkins, who after many years with the Animal Training Department has moved into a corporate zoological position.



Manta – an exciting new attraction at SeaWorld Orlando opening in 2009.

THE SEAS, EPCOT – *Lake Buena Vista, FLORIDA*

The Seas hosted two visiting researchers for studies with their bottlenose dolphins. Jason Bruck, a Ph.D. candidate from the University of Chicago, is conducting a study to determine whether bottlenose dolphins have the ability to remember signature whistles of other dolphins they have had past interactions with. Jason is in the process of recording select dolphins in the Tursiops Breeding Consortium and playing back vocalizations to other select con-specifics and documenting their responses. Dr. Terrie Williams made her second appearance at The Seas to collect heart rate data for her dive physiology project. The dolphins have been trained to wear vests that are outfitted with heart rate monitors and an EKG device while exercising at depth and more. The purpose of the study is to determine what physiological dive responses safeguard marine mammals from decompression illness and whether these are compromised by elevated levels of locomotive activity.

U.S. SOUTHWEST MAINLAND REGION

Kristi Burtis
SeaWorld San Diego
San Diego, California

LONG MARINE LABORATORY – *Santa Cruz, CALIFORNIA*

The Marine Mammal Physiology Project, in conjunction with the California Department of Fish and Game, has now completed their study looking at the thermal effects of washing sea otters and determining the best recovery methods to aid in all future rehabilitation efforts. The knowledge gained in this study is currently being analyzed and prepared for publication.

The collaborative study looking at heart rate and how it is affected by diving and rapid changes in activity level continues to lurch forward into new territory. Additionally, the MMPP teamed up with O'Neill wetsuits and designed a unique wetsuit for the dolphins to wear to help hold all the heart rate equipment in place.

The MMPP celebrated the completion of its new stranding facility in late August. The facility has already participated in several stranding events including a neonatal Dalls porpoise *(Phocoenoides dalli)*. The staff is extremely excited about the new facility.

In September, staff members departed for Antarctica for two months to study the physiology of Weddell seals *(Leptonychotes weddellii)*.

MONTEREY BAY AQUARIUM – *Monterey, CALIFORNIA*

At Monterey Bay Aquarium, the eldest pair of African spotted-necked otters *(Lutra maculicollis)*, Denny and Neema, have reproduced successfully once again with the birth of their third healthy female pup this past June. The otter staff is looking forward to introducing the pup, named Ziwa, meaning lake or pond in Swahili.

At the sea otter exhibit, Rosa has accepted another stranded pup and has gone behind the scenes to the SORAC program in order to fulfill her duties as a surrogate mother for the fourth time. Joy is nearing the weaning period with her 7th surrogate pup and is scheduled to rejoin the other animals back on exhibit later in August.

The entire otter staff at the Monterey Bay Aquarium is thrilled to report that the first pup born to a surrogate-reared female in the wild has been confirmed. Number 339 stranded on 25 October 2005 at an estimated age of four weeks and was raised by Joy as her surrogate mother in SORAC. The research team will continue to monitor the pair out in the field and report on their success.

SEAWORLD SAN DIEGO – *San Diego, CALIFORNIA*

SeaWorld is pleased to announce that Dottie, a 21-year-old female bottlenose dolphin gave birth to a healthy calf on 14 July 2008. Both Mom and calf are doing well. Dottie's calf is the 72nd dolphin calf born at SeaWorld of San Diego.

Summer is well into full swing with three special night shows every night. Sea Lions Tonight offers guests a parodied view of all of SeaWorld's shows. Ignight is a supercharged display of dolphin and pilot whale *(Globicephala macrorhynchus)* behavior with pyrotechnics, set to a theme of fire and water. Shamu Rocks features Shamu and trainers in a rock and roll themed show.

SIX FLAGS DISCOVERY KINGDOM – *Vallejo, CALIFORNIA*

Discovery Kingdom would like to congratulate Kim Lara on her promotion to Marine Mammal Manager, Leah Coombs to Supervisor of the Walrus Experience, Dianne Cameron to Whale Supervisor, and Jennifer Engelhoff to Supervisor of Dolphin Harbor.

At Shouka Stadium, Shouka, a 15-year-old killer whale *(Orcinus orca)*, was introduced to a 7-year-old dolphin named Cupid. Initial introductions have gone very well.

At Sea Lion Stadium, a baby sea lion, Ella, was rehabilitated after being rescued by the Channel Islands Marine and Wildlife Institute. She was recently released from quarantine and brought down to the stadium for integration.

REGIONAL REPORTS is compiled by **Beth Ament**.



BEHAVIORAL MANAGEMENT OF A PHYSICALLY CHALLENGED DOLPHIN

Abby N. Stone & Diane E. Young
Clearwater Marine Aquarium

THE STRANDING

In December 2005, Clearwater Marine Aquarium (CMA) admitted a stranded female bottlenose dolphin *(Tursiops truncatus)* calf named 'Winter' for rehabilitation. She sustained severe injuries associated with entanglement in an abandoned crab trap. Winter was approximately two months of age and presumed orphaned at the time of her stranding in the Indian River Lagoon, Florida. Assessment of her injuries revealed corneal abrasions and ulceration, deep lacerations around the pectoral fins, across the mouth, and around the entire circumference of the distal peduncle. The crab trap rope, acting like a tourniquet, had prevented blood flow to the posterior portion of the peduncle. The soft tissue of the flukes and distal peduncle surrounding several caudal vertebrae was necrotic, and the dermal layer of skin had already begun to shed away upon her arrival. Over the course of four months, Winter had lost the distal peduncle up to the original rope laceration, including several vertebrae. The last vertebra was then partially surgically removed, which aided in the growth of normal, healthy tissue, thereby eventually closing the wound.

PHOTO CREDITS: CLEARWATER MARINE AQUARIUM





CARE

After six months, Winter was considered rehabilitated; she had survived and, despite the loss of her tail, the wounds closed and she was otherwise a healthy animal. Our focus then became her long-term care: setting goals to manage a physically challenged dolphin. The goals set forth were for Winter to be adjusted to human care as well as to her new physical form and to be healthy. We wanted to ensure that she would have a good quality of life, one that was comparable to that of other dolphins under human care. Beyond that, we wanted to learn from the trials and tribulations of her long-term care and to utilize her presence at CMA to promote stewardship and awareness of the dangers these animals face as a result of human activities. Our approach started with the establishment of strong reinforcers, weaning, and the socialization of a young, naïve animal to a companion animal.

Our first priority was the development of a structured behavior management program. This was by far the best avenue to enrich her day-to-day activities. Implementing such a program meant a gradual shift in responsibilities from the Stranding Team to the Mammal Team. Winter was cared for by over 40 Stranding Team members, each interacting and interpreting her behavior differently. Developing strong dependable relationships, achieving more behavioral consistency and establishing effective reinforcers were our first initiatives.

Initially the focus was on weaning her from formula to fish with the pressing need for her to gain weight. After attempting other methods unsuccessfully, our approach was to wean her during training sessions using a stomach tube, which was easier and less invasive than using a hand. Within two weeks, the majority of her diet was solids and she was weaned from formula shortly thereafter, at six months of age. This change greatly enhanced the training staff's ability to apply reinforcement more effectively.

Logically, the presence of a conspecific, ideally a maternal female, would provide Winter with a level of species appropriate behaviors to model that human interaction and training could not duplicate. There were concerns about how Winter would be perceived and be accepted by another dolphin. Could she socialize normally or would she be ostracized? An older, generally timid, female resident named 'Panama' was selected as an acceptable candidate with previous experience interacting with other young, orphaned animals. There was some doubt, however, as to how Panama would respond to what she might perceive as a 'funny looking dolphin'. During the introduction, Panama did display aggression, which was uncharacteristic of her but did eventually tolerate Winter's presence. Today, Panama provides good companionship but has to date shown no maternal behavior towards Winter.

As might have been expected, we observed some regression in training with Winter, due both to the introductions as well as relocations to different pools. Considering her young age and need to progress quickly in the area of medical management, it was important to limit distractions and time constraints associated with having to work in close proximity with other animals. Trainers now found themselves competing with Panama, underlining the need for our relationship with Winter to be strong. We found it beneficial to separate Winter from Panama for a few hours each day, where we could work to strengthen relationships with both animals. The process of gating and separation to different pools was established almost immediately to avoid any development of fear. We invested a few days literally swimming her through the gates.

TRAINING AND PHYSICAL THERAPY

In keeping with our original goals for Winter, we placed great importance on challenging her while maintaining the 'fun' in training that we felt was so important to enriching her life. To achieve this, behaviors were selected based on observations of what she was physically capable of and comfortable doing in her free time, such as somersaults, porpoising, barrel rolls, and positioning vertically in the water.

Winter presented some unique challenges in the area of medical management. In learning to compensate for the lack of tail flukes, Winter had developed a method of sculling and a side-to-side, head to peduncle, wave-like movement similar to the undulations of a snake but to a much lesser degree. Daily physical therapy (PT) sessions were conducted to address some of the medical concerns associated with this learned movement, such as the abnormal development of the lateral muscles and the under-utilization of those muscles normally used for propulsion. Over-utilization of the former muscle groups began to produce a slight deviation in the peduncle similar to what is seen in beached animals that develop vertebral deviation. During PT the dorsal and ventral muscles and tendons of Winter's peduncle are stretched by the trainers to counteract the natural flexion or curling under of the peduncle that could result in a limited range of motion and contraction if left to its own. PT sessions were held two to three times daily and required one to three trainers working poolside. The objective is to align the calf's body parallel to the platform and stretch or bend at specific points along her peduncle. A few other approaches were considered, such as removing Winter from the pool, since it allowed for more stability and control. Winter would enter a stretcher voluntarily; it was not a practical approach for staff, as Winter was unusually tense during this process. Future plans include the utilization of an underwater platform during physical therapy sessions.

To track Winter's growth as it pertains to the development of her spine and muscles, as well as the progress of physical therapy, routine digital x-rays are scheduled on an on-going basis. Of particular interest is whether the x-rays show any evidence of scoliosis or individual vertebral change. The results of the initial x-rays taken in March of 2007 yielded no remarkable findings. At the time, Winter displayed a fairly significant s-shaped curve along her peduncle, which was equated more to the abnormal muscle development than the curvature of the spine. This s-shape significantly reduced over time through her daily physical therapy. X-rays taken in September of 2007 showed a fusion of the last two vertebrae, which we do not believe will affect her mobility and is generally not of concern.

AN UNUSUAL GOAL

The development of prosthetic flukes was one of the initiatives taken for improved care of Winter. Our belief was that a prosthetic would have a positive effect on the areas of medical management and physical maintenance of spinal architecture, as well as quality of life. While originally intended to give partially back what she had lost, medically it could also address several of the concerns regarding her physical development by simply enabling her to utilize a more normal method of propulsion, if only for a few hours each day. The concept was well received by staff and the public, but was it feasible? The obvious question was how to attach the prosthetic to her body. Attempting to replicate what nature designed was an ambitious project led by Kevin Carroll of Hanger Prosthetics Inc., a leading human prosthetics company. It involved a team of highly respected individuals including Dr. Mike Walsh, CMA veterinarian, as well as Dr. Juli Goldstein and Steve McCullough, from Harbor Branch, among others.

At a preliminary gathering to generate ideas, Mr. Carroll presented us with his initial model of the tail flukes and his proposed method of attachment. This model incorporated a silicone sleeve commonly used in human prosthetics, which is held in place by the powerful suction created against the skin. A metal disc at the end of the sleeve is the attachment point



for the prosthetic flukes. This original model became a platform for discussion to familiarize all members of the team with various options and constraints from both technical and medical standpoints. Medical concerns of Dr. Walsh included the delicate nature of a dolphin's skin and the risks associated with the friction of the prosthetic against the skin. Although the skin is partially protected by a silicone sleeve, the pressure from the up and down motion of the tail could transfer to the more solid portions of the mechanism and might cause skin damage. In order to avoid these problems, a crucial component to the prosthetic would be a breaking point or joint necessary to absorb pressure and to mimic the normal connection and movement of the fluke in relation to the peduncle. Other factors needed to be addressed as well, including the weight and buoyancy of the material. Behaviorally, any abrasions might decrease acceptance by Winter slowing future progress. Thus, both training and vet staff had to carefully monitor skin changes and review developments before they were applied. Skin changes included abrasions, bruising, and pressure points. Then we had to consider possible changes in buoyancy of the device, distance of her flukes in relation to the solid brace, size and thickness of the peduncle socket, the joint material and flexibility, and the actual brace itself as it relates to adherence to her skin. All of these considerations are constantly changing as we learn more and she continues to grow.



INNOVATION

The design process soon became one of idea development and application, then evaluation of progress and fit. Several prototypes were developed as new ideas were formulated, and as we discovered the need for changes both from the technical as well as medical aspects of the project. A critical point in this process occurred when the decision was made to go with a custom fitted sleeve as opposed to the generic one utilized initially. These modifications included using a different material for the new sleeve-- a thicker, silicone gel-based material that had never before been applied in this manner. It provided increased protection, addressing some of the medical concerns related to Winter's skin sensitivity, as well as better adherence to the peduncle. To provide a custom fit, we created a cast mold of her peduncle, a process that will be repeated routinely as she grows. In addition, instead of the prosthetic flukes attaching by the metal disc at the end of the sleeve a separate sleeve was constructed to fit over the primary one. This latter sleeve incorporates a brace to which the tail flukes attach.

TRAINING FOR THE FUTURE

From a training perspective, we had two major objectives using the prosthetic. The first was basic desensitization to the entire process and the various prototypes. The intervals between each new version of the sleeve allowed sufficient time for effective counter-conditioning to occur before the training for each prosthetic component. This also proved helpful as we progressed to a more advanced, multi-step process incorporating the secondary sleeve and brace, as the need for desensitization at this level was greatly reduced. Our second major objective was to emit the proper range of motion of the peduncle upon placement of the prosthetic tail. This goal is much more involved and is still on-going.

The first step in the application of the prosthetic sleeve was to establish the optimal layout. Ideally, the sleeve should be applied to dry skin as this allows for better adherence to the peduncle. Therefore, a vertical position would be the logical choice. This was an established behavior but was not preferable, as it would complicate many other aspects of the training process. A layout allowing us closer proximity to provide intermittent reinforcement and greater physical and stimulus control through eye contact and physical support was necessary. Moreover, it was important to provide the necessary support and stability to properly apply the sleeve, and so it was decided to incorporate two trainers working her parallel to a platform to begin training.

To approximate the length of time that she would need to wear the primary sleeve, less cumbersome and restrictive bands were made of the same material. Although snug against the skin, these bands did not create the suction needed to keep them in place with certain movements of her peduncle. Unfortunately, this resulted in a considerable regression in the behavior since she had learned that it was possible to remove them! In retrospect, if these smaller bands had not been introduced, the opportunity for this self-reinforcing behavior would not have presented itself, as the primary sleeve is difficult to remove without a concerted effort on Winter's part. To correct this, the majority of Winter's primary reinforcement was applied during the actual layout, while the sleeve was on, as opposed to reinforcing the completion of the behavior, i.e. once the prosthetic was removed. This was facilitated by our chosen layout position for her. Additionally, we anticipated the length of time we could successfully keep the sleeve on and used physical support to discourage her from breaking from her station.

Our first attempt at shaping the proper movement of the peduncle was to emit an 'up' motion, using a target or slap on the surface of the water paired with a continuous S^d. In doing this, several issues became apparent. Abnormal development of the peduncle caused a curvature or a downward, shrimp-like, curve to the tailstock, resulting in a motion that was more of a flail than an actual down/up stoke. Furthermore, the existence of bends in the peduncle due to abnormal development of the lateral muscles caused her peduncle to curve to either side on the upstroke. It became necessary to re-train the proper range of motion needed to utilize the prosthetic tail effectively, thereby avoiding injury such as muscle strain and skin damage. The behavior was done under greater stimulus control. To achieve this, a tactile cue was instituted to signify the timing and speed of the required up and down motion. The trainer glides a hand up the peduncle toward the dorsal fin, cuing Winter to drop the tailstock. Then the hand is moved down to the tip of the peduncle, cuing her to bring it back up. The speed at which the trainer moves the hand dictates Winter's speed in raising and lowering the peduncle. In addition to establishing these subtle cues, we also incorporated an arch behavior to strengthen the muscles associated with her upstroke. In doing this, we could limit the down stroke or shrimping of the peduncle and increase the range of the upstroke.

Once we decided that the desensitization process as well as the shaping of the proper motion of the peduncle had been established, it was time to combine the two. Up until this point, the trainers had physically supported the peduncle with the prosthetic sleeve in place. The next step would necessitate letting go of her body. We were concerned with giving her the opportunity to drift and/or to remove the prosthetic sleeve, an activity she found reinforcing in earlier stages of training. However, because both behaviors were trained using the identical layout as well as being worked consecutively, there was no confusion on Winter's part. She was preoccupied with the task at hand and was not presented with any opportunities to drift. However, some slight regression in range of motion was observed. Due to the thickness of the material, it was difficult for Winter to feel the trainer's cues on her peduncle. The large area utilized for the Sd was faded to a smaller section just above the sleeve, which helped to alleviate this problem. Later, the cue was given on her dorsal fin and than her rostrum in an effort to fade out the trainer's hands. We were then able to proceed with the approximations necessary to incorporate the actual flukes while systematically introducing the various components. The approximation flukes varied in size, thickness, and flexibility as part as the training process.



WHAT IS AHEAD?

As we progress in teaching Winter to use her prosthetic, this entire process continues to be reevaluated in all arenas: medical, technical, and behavioral. Major milestones still to come include her conceptualization of the prosthetic as her primary means of propulsion. To this end, our training goals will focus on ways to limit her propulsion by means of her standard lateral movements and/or sculling by using for example, alternate response training or differential reinforcement. Progress in the use of the artificial flukes by Winter will be partially evaluated by attempting to incorporate the use of movement analysis in comparing normal parameters such as range of motion of a tailed individual with those of Winter as the design and application process progresses.

The complexity and challenges of teaching an infant marine mammal to swim with prototype prosthetic tail flukes are still unfolding. We expect some setbacks. However, we also expect this learning process to be a counterbalanced by new information on prosthetic development, material application, and spin-offs that will benefit not only Winter, but also other individuals and species. Bandaging techniques for cetaceans will improve and others will be inspired to try more. Already, human amputees have benefited from the knowledge gained by these approaches, which take into account the unique qualities of cetacean skin. Winter will not wear her prosthetic continually, but if it can help to maintain the normal architecture of her vertebrae and improve her mobility and function even for a time it will be well worth the efforts.

Winter has been broadcast worldwide and her story has reached millions of people. Her tale puts a face to the concerns we all share about our ocean environment and the need to educate others about the harmful effects some human activities have on the planet. We encourage our visitors to be inspired and to join us in the preservation of our environment and the conservation of marine mammals.

EDITORS NOTE:

This paper received the following awards during the 35th IMATA conference at Indianapolis, IN: the 1st place Outernet Technology Awards and the 2nd place Husbandry Training Award.

TRAINER'S FORUM



Photo Credit: Bob McMains

QUESTION: What is the process of introducing a new animal into your population?

ANSWER 1: In recent years we have been working our show exhibit with an all male group here in Dolfinarium Harderwijk. During this time we have successfully introduced male juveniles into the established adult group. The juveniles were born in our lagoon exhibit.

This has to be one of the most exciting and fragile training and socialization procedures we have taken on because (to be honest) we have absolutely no idea how the dolphins will react to one another. All we know is which dolphin is dominant and which dolphin is subdominant in the group. But we do have some tools to ensure that the introduction will go as smoothly as possible.

One of the most important rules in the beginning is to ensure that the established male group is a stable group and the dolphin/s that are going to be introduced are also healthy and fit.

At first we will only bring juveniles into the pool where the adult males are in a controlled environment, bridging and rewarding the whole time. We will feed the new dolphins as a group next to the established group and then take them away; this whole process will take 20-40 seconds. We will also ask some for small basic behaviors where the dolphin's head will remain above water, for example, vocalizing or spitting water. We will do this sort of session up to ten times before taking the next step.

Eventually, there is no way around it, and at some point you are going to put these dolphins together. This is always done in a controlled situation, holding the adult male group and bringing the juvenile/s into the group.

Once we have given the end of session S^{d} then the real exploring begins. You can expect to see some white water or surf at this point. We normally do not allow this to go on for too long, maybe 30 seconds and then we will recall the dolphins. Hopefully they will go to their set groups, if not then we will send them back to their original pool.

If they refuse and choose to stay with their new pool mates then we will not reward the incorrect dolphin at this point and reward the rest but not too heavily. Then just after we give the end of session S^{d} we recall immediately. After doing this a few times the groups are normally formed back into the original plan. We then decide to either to take the juveniles away or leave them with the adults. Normally in the beginning we take them away and in due course extend the time they are together.

After a few days of doing this, our intention is to leave them together for approximately one hour. Once the introduction has taken place, two trainers stay around the stage or feeding platform areas with fish, when they see no rough interaction within the whole group the trainers will bridge and reward in the correct groups. We may bridge and reward as one group for variety. After a few days of doing this we then extend the length of the time that the dolphins are together.

If the park is open, the dolphins will be separated every day for show purposes. When the park is closed in the winter we have more options with the length of time that the dolphins are together.

The next step is to decide whether or not the whole group is stable enough to spend the whole night together. When this occurs, the curator, head trainer, or senior trainer will be present that night to observe the dolphin's behavior and for the possibility of separating the group if their interactions get too rough. Always after the first few nights together we will separate the juvenile group the next morning for a certain time, so that other training goals can be worked on and also to give the two groups some form of rest and change.

Once we are happy that the interaction that has taken place is down to a minimum then we will stop with the night observations and ask our night security to look in on them during their working hours.

Every morning we will do a husbandry check just to see if new rake marks are visible, and if necessary, a blood draw or temperature count for control.

This whole process is monitored with the use of video which is essential when reviewed by the trainers group. We review not only the behavior of the group but every individual dolphin.

Is it also important to be very patient with this introduction and not to push too much. This process will take time and we are always aware of the option to take a step back once in awhile if needed. Observe your dolphins and the new social group forming and the interaction that is taking place. Be aware of how you can influence the socialization of these dolphins and ensure that you have the most positive environment possible.

Steve Hearn
Head of the Dolphin Department
Dolfinarium Harderwijk
The Netherlands.

ANSWER 2: As a founding member of the Atlantic Bottlenose Dolphin Breeding Consortium, Dolphin Connection is frequently involved in the relocation of dolphins, both nationally and internationally for a variety of reasons, serving as both the sending and receiving facility. Regardless of the sizeable amount of logistical details necessary to plan a transport, our primary concern is the health and welfare of the animals we relocate, and this includes focusing on a smooth and stress-free acclimation at the receiving facility. Although the details are unclear from the question, our answer will focus on the transport of a bottlenose dolphin to a novel facility.

Our process for success begins at the decision-making stage, which includes multi-institutional discussions concerning the reasons, usually genetic or welfare related, that the move may be necessary (i.e. a sub-adult male of breeding age is housed with his mother, a sub-adult female of breeding age is housed with her father, a sub-adult male requires another male for pair-bonding, etc.) We discuss the population dynamics that would result at both the sending and receiving facility, including all animals, not just the one(s) to be moved. Underlying the decisions, we do our best to mimic wild dolphin population dynamics as described by Dr. Randy Wells' studies in Sarasota, Florida, including keeping matrilineal lines together and stable, pair-bonding male dolphins and once established, moving these male pair-bonds as a team. We also do our best to follow the recommendations of the Alliance of Marine Mammal Parks and Aquariums animal management committee, which emphasizes that founder males and all females, regardless of generation, be placed in a natural breeding situation whenever possible. As a group, the Consortium also considers age to be a determining factor. Old age and geriatric conditions are considered reasons for retirement, which we feel is in the best interest of the dolphins involved.

Once all parties agree that a transport is in the best interest of both the animal population and the individual animal(s) involved, it is the animal training staff and the veterinary staffs that first begin the planning process by exchanging information that we feel is vital to a smooth acclimation. Videos of shows and/or interactive programs, behavior lists, training pyramids, hand signals, dietary needs, vitamin supplementation, and training and veterinary records are exchanged. This open sharing of information stimulates discussion and reveals much to the receiving staff concerning the dolphin's normal routine and health status prior to transport. To further this exercise, the receiving facility then sends a trainer to the sending facility one to two weeks prior to transport, actively working with the animal and the sending facility staff. We feel the knowledge gained during this time is invaluable to insuring a smooth acclimation. In a similar fashion, the sending facility identifies a trainer to remain at the receiving facility for one to two weeks post-transport, again to provide stability during the dolphin's acclimation to in a new environment.

Typically our males are moved together as a pair-bonded team, but sometimes we find it necessary to move a sub-adult male to be pair-bonded. In this instance, when a dolphin is moved alone to a new facility, we actively identify an animal, or group of animals, within the receiving facility that can be successfully housed with the arriving animal, to provide companionship during acclimation. We have found that this companionship accelerates the acclimation process and assists in nearly effortless introduction to the remainder of the population at a later date. As an aside, please remember we are introducing animals with known medical histories where quarantine practices are deemed unnecessary.

The newly transported animal will remain with the acclimation companion(s), and not introduced to the rest of the population, until it is deemed to be in good health. This is loosely determined by several factors, including regular eating habits, exhibition of normal behavior, and performance of basic trained behavior. It is our goal to assist the animal in reaching these milestones as soon as possible with frequent, short training sessions so that introductions to the full population can take place with little delay. We believe that postponing introductions to the group can contribute to unresolved conflict that is established through visual and/or acoustic contact, which can create difficulties when physical introductions are finally achieved.

Introductions to the group are typically achieved early in the day, allowing time for observation of interactions and ample time to reinforce calm, compatible behavior throughout the remainder of the day. Initial training sessions are frequent and short, with animals at station and trainers providing a fixed ratio of primary and secondary reinforcers. It is important to note that we also focus on the animals' behavior prior to stepping up for a session. To avoid inadvertently reinforcing undesirable behavior, we wait until the population is exhibiting calm behavior before beginning a session – even when we're not acclimating a new arrival! Night watch is also established for a few days, monitoring any problems that may arise. The knowledge gained concerning compatibility and natural behavior is invaluable, and should be applied to decisions concerning establishing stationing positions, and overall training approach, technique and application.

Further, we feel it is very important to utilize the experience and expertise of the sending facility trainer. While this trainer is invaluable for the dolphin in the initial days of acclimation, the trainer's real strength lies in coaching one or two receiving facility trainers who are trusted with building a new relationship with the new arrival during acclimation. We believe the choice of experienced and capable trainers for this task is essential. We have found that trainer mistakes at this stage can contribute to or even cause situations that can be detrimental to a smooth animal acclimation, including animal frustration or displaced aggression. Experienced trainers will skillfully avoid such stumbling blocks, resulting in a quick and easy acclimation. Successful acclimation is also a result of the receiving trainers gaining a true understanding of the animal's reinforcement history. One common mistake is made when alterations to hand signals and/or behavioral criteria are modified too early in the acclimation process, resulting in animal confusion and frustration - a scenario counterproductive to successful acclimation. Instead, we believe trainers should approach these changes slowly over an extended period of time.

We are very proud of our partnership with six other institutions in the breeding consortium. Together we continue to perfect our transport and acclimation procedures. Since the consortium's inception in 1999, we have all focused our efforts on the collective management of bottlenose dolphins to maximize natural breeding success. This has resulted in approximately 12 transports and acclimations that have resulted in 19 successful dolphin births. We wish you the very same success!

Doug and Cheryl Messinger and the Dolphin Connection training staff

ANSWER 3: At Chessington Zoo, we believe it's important to have a good line of communication with any facility from which we may receive an animal. This provides you (the receiving facility) with the opportunity to observe the husbandry and animal management procedures used by other organizations. You may even change or improve your own practices as a result. Typically, we would request a few weeks of behavioral records about the new animal prior to its arrival. The more detail you can obtain the better. Moving can be very stressful for any animal and small details such as favorite toys can be helpful during the settling in process. Once a new animal arrives at its new home there may also be quarantine protocols to consider.

With regard to sea lions, the composition (i.e. number of males & females) and the hierarchy of your group can influence how you would introduce new animals to one another. Age is also a key factor. It may sometimes be easier to introduce younger animals into an established group, rather than older dominant animals. If introducing an adult into an existing group of adults, it is good practice to conduct introductions slowly, such as one on one or as pairs to start, again depending on your group's behavior. There should be experienced trainers/keepers on hand for this critical stage to assess the new arrivals behavior including the impact this arrival has on the group. In February of

TRAINER'S FORUM cont.



Photo Credit: Kolmarden

2007 we successfully received and introduced an eight-month-old male sea lion pup (Andre) from Belfast Zoo in Northern Ireland into our existing group at the time of four males consisting of a 27-year-old bull, a 13-year-old castrated male and two 8-month-old pups.

Upon arrival, Andre was placed in a separate area away from the rest of the group where we could feed him and begin building a relationship. During this time both Andre and the rest of the group could still see and smell each other in order to satisfy their curiosity while we monitored their behavior. After an hour had passed, we began the introductions by simply letting Andre join the group. We were confident that the young male should have no issues with the older males and therefore concentrated our attention on the three pup's interactions. Group observations continued for an hour or more until we were satisfied that their behavior was stable. Eighteen months on, we continue to observe Andre's position among the pups as a confident, inquisitive and very noisy sea lion… he is from Ireland after all!

As with most animals, sea lions are adept at sorting out their own hierarchy and each introductory scenario will undoubtedly be different with every facility. We believe that if you are fully aware of the various factors that could affect the social balance of your existing group and it's newest members, while having the appropriate safety protocols in place, you are well on your way to achieving a successful introduction and a stable social group.

Training Staff
Chessington Zoo, UK

ANSWER 4: Introducing an animal to your existing population is an ever-changing process. One animal's needs will be different from another animal's needs. Consideration to the new animal, the existing animals, current social situations, facility design, and current facility activities for instance, all must be taken into consideration for each new case. For this answer we are only talking about our bottlenose dolphins.

When a new animal is to be moved to our facility we like one or two persons from our training team to spend a minimum of two weeks observing and later working with the animal in question in its old home. Observing their behavior in and out of training sessions, food preferences, trainer preferences, motivation, and history.

At least one trainer from the original facility needs to be accompanying the animal to the new facility and to stay for a minimum of two weeks helping the animal to adjust and coaching the new facilities training team. The trainer/s that spent time at the old facility should be the lead trainer/s for the animal and the only one/s working with the animal for as long as it is necessary. The time the animal needs to adjust differs depending on animal/animal connection, trainer/animal connection, introduction speed and success, and ability to adapt to the new environment. New trainers are added in at a speed suitable for the animal.

We are fortunate to have three different pool areas and one can easily be enclosed from the other areas. We can choose to place the new animal in a pool where it can only hear the other animals and by opening a gate, give our animals access to come and see the new animal through the gate mesh when the new animal has adjusted. Or it can be the opposite, the choice of the new animal to move forward and decide if it wants visual contact or not.

When to move on to the next step can be difficult. Preferably you want the new animal to eat and interact with its original trainer steadily before you move on and introduce animals but in some cases adding a new animal can help if the new animal is not adjusting (e.g. not eating or showing no interest in trainer interaction).

Introduction to the animals in the same space can be done quickly or slowly. A male to a small group of females could be done with the whole group at once after introducing them to each other through the gates. A female to a large group of animals with or without a breeding male should be done slowly and in different steps. The new female would first be paired with same sex animals in similar social hierarchy, and later slowly adding suitable individuals one at a time or a couple at a time. Next to last introducing the dominant female and lastly the breeding male.

As stated previously the scenario differs for every new situation but unfortunately not always in the best interest of all individuals. Sometimes you have to come up with less desirable solutions because of pregnancies, newborns, and activity demands.

Be observant and see which individuals the new animal bonds with and if it has any individuals it avoids. Look for precursors and be aware that you as a trainer have a big responsibility to detect behaviors that can make or break the success of the introduction and completion of a unified dolphin herd.

Training Staff
Kolmarden Zoo, Sweden

TRAINER'S FORUM is compiled by **Colleen Ast**.



IMATA
International Marine Animal Trainers' Association

WELCOME NEW MEMBERS

Membership Update

IMATA would like to welcome the following new members who have joined or rejoined the Association since the last issue of *Soundings*.

RAFAEL AMARO (AC)
Delfiniti Ixtapa

PABLO ARZATE CAPIN (AS)
Dolphin Discovery Cozumel

COURTNEY BACON (AS)
San Antonio Zoo

MARK BEILOCK (AC)
No Affiliation Listed

SARA BOCZAR (AS)
No Affiliation Listed

CHELSEA BROFMAN (AS)
No Affiliation Listed

DIANNE CAMERON (PR)
Six Flags Discovery Kingdom

JESSICA CILETTI (AC)
Dolphin Discovery

MAFALDA COELHO (AC)
Jardim ZoolUgico

LEAH COOMBS (PR)
Six Flags Discovery Kingdom

TARA CUCURELLO (AS)
No Affiliation Listed

COURTNEY DANCER (AS)
No Affiliation Listed

KELLY DAUB (PR)
SeaWorld San Diego

ELIZABETH DAVIDSON (AC)
No Affiliation Listed

HALEY DEBAUGH (AS)
No Affiliation Listed

LOUISE DELLAGROTTA (AS)
No Affiliation Listed

ALEXANDRA FRISCH (AS)
No Affiliation Listed

JILLIAN GONZALEZ (AS)
No Affiliation Listed

MAXINE GREGORY (AS)
No Affiliation Listed

LAUREN GRIMM (AS)
John G. Shedd Aquarium

JANNI HANSEN (AS)
Fjord and Baelt

LISA HOSTETLER (AS)
Akron Zoological Park

BETHANI JONES (AS)
No Affiliation Listed

HUNZA KOTAS (AC)
SAIC BioSolutions

KIMBERLY LARA (PR)
Six Flags Discovery Kingdom

NICOLE LUUKKO (AS)
No Affiliation Listed

GREG MCDONALD (OR)
Melbourne Zoo

BOB MCMAINS (PR)
SeaWorld San Diego

LESLIE MULL (AS)
No Affiliation Listed

MEREDITH MYERS-CAUDLE (AC)
SeaWorld Orlando

SHEA OVERCASH (AS)
Crescent Medical Research

JOURY PABLO (AC)
No Affiliation Listed

BECKY PARTLAND (AC)
Como Zoo

DAVID PERRI (PR)
Fort Dodge Animal Health

MAJA RASMUSSEN (PR)
Kattegatcentret

MARGARET REYNOLDS (AS)
Moody Gardens Aquarium

KASEY RICHARDS (AS)
No Affiliation Listed

BRIAN RUSSELL (AS)
Vici Metronics

CHARLENE SEARS (AS)
No Affiliation Listed

DAN SHINDER (OR)
Pices Seafood International

RITA SILVESTRE (AC)
Oltremare Italy

CHERIE SMITH (AS)
No Affiliation Listed

JAMIE SNYDER (AS)
No Affiliation Listed

CRAIG SOWDEN (OR)
Sydney Aquarium

JAMIE STEVENS (AC)
Dolphin Research Center

KELLY SUAREZ (AC)
Los Angeles Zoo

JODI TOPOL (AS)
No Affiliation Listed

DAVID VERHAGEN (AS)
No Affiliation Listed

SAMANTHA VITTUM (AS)
SAIC BioSolutions

CHEYENNE WHALEY (AS)
No Affiliation Listed

DEBBIE WINKLER (AS)
No Affiliation Listed

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