

**FINAL REPORT TO THE UNIVERSITY OF HAWAI'I AT HILO
MARINE OPTION PROGRAM**

Dolphin Quest Internship

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Abstract

Dolphins and whales have been studied in many areas of science, one of which is behavior and cognition. An important relationship exists between laboratory research and field research in understanding the lives of marine mammals. Through research, scientists now have a greater understanding of bottlenose dolphin cognition, behavior, and linguistics. However, there are still many areas of cetacean behavior and physiology that are yet to be explored. Laboratory settings serve as an important environment where research can be carried out with a high level of control that could not be obtained in field studies. Dolphin Quest is a company dedicated to marine animal conservation, research, and education. My internship at their Hilton Waikoloa location on the Big Island of Hawaii, gave me an opportunity to gain valuable hands-on experience working with marine animals. I was able to shadow various staff and further my knowledge about bottlenose dolphin behavior, cognition, and training. I shadowed trainers in daily health assessments of the dolphins, participated in husbandry care, and assisted trainers in behavior training. I also was a part of the calf watch team who observed and recorded data of two newborn calves that were born during the time of my internship. I was able to gain experience in the field of animal training and worked with staff in teaching a novel behavior to an animal and creating a behavior pyramid for the learned behavior.

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Introduction

There are many different species in the family Delphinidae, with the most widely known being the bottlenose dolphin (*Tursiops* sp.). The bottlenose dolphin family includes both deep diving and shallow coastal dwelling species (*Tursiops truncatus*, *Tursiops aduncus*, and *Tursiops australis*). Coastal dolphins such as the bottlenose dolphin, *Tursiops truncatus*, have been widely studied and kept under human care in marine life facilities around the world. They are known to be very intelligent and charismatic, which makes them very popular and often featured in oceanarium shows. Whales and dolphins have long been studied in multiple areas of science such as behavior and cognition. This particular species of dolphin has provided many answers to questions of animal cognition and behavior. Some research suggests they have significant cognitive skills similar to findings in great apes (Highfill & Kuczaj, 2007).

Bottlenose dolphins are extremely social animals and each present different personalities and behavioral traits (Highfill & Kuczaj, 2007). They are very curious and playful animals, and we now know more about how mentally and socially complex these organisms are (Kuczaj et al, 2006). Most research on bottlenose dolphins has been done in controlled laboratory settings (Highfill & Kuczaj, 2010). These settings allow researchers to collect information in a controlled environment that otherwise would be difficult to perform in the wild. Through studying dolphin cognition, researchers have been able to explore sensory processes, cognitive characteristics and communication, which has increased our knowledge about the perceptual, cognitive, and social aspects of the dolphin (Herman, 2002). Measures of relative brain size place the bottlenose dolphin species second only to humans, and well above the great apes (Marino 1998; Ridgway & Tarpley 1996). Dolphins have been observed in both the laboratory and in the wild, with each environment allowing for different variables. Laboratory settings allow for a high level of control while field studies allow for naturally expressed behaviors, which can provide external validity for observations in the laboratory (Pack, 2010). Most scientific research on bottlenose dolphins has come from captive facilities and laboratories which have substantially contributed to our cetacean knowledge and understanding.

The Kewalo Basin Marine Mammal Laboratory in Honolulu established many of the early language work with bottlenose dolphins and set goals to study perception, cognition, and communication. Founded by marine biologist and psychology professor Louis Herman, the research laboratory produced several scientific papers on dolphin language comprehension showing that dolphins have capabilities of processing both semantic and syntactic information (Herman et al. 1984, Herman 1986, Herman & Uyeyama 1999). This research revealed that dolphins have the capability of understanding changes in word order that changes the meaning of the sentence. In a different study by Stan Kuczaj, research shows evidence of dolphin personality that is stable and consistent across time and context (Kuczaj et al, 2012). Through these research studies and many more, we now have a greater understanding about marine mammal cognition, behavior, communication, and linguistics. Most of these studies were performed in laboratory environments, however. Often laboratory researchers access the findings of others studying dolphins in the wild to interpret how their findings may

manifest themselves in dolphins in their natural habitat. To continue to expand our knowledge of these organisms, we need to continue to promote conservation and educate the public on marine mammals and how to protect them in the wild and under human care.

Dolphin Quest is a company dedicated to research, conservation, education, and awareness of marine life in our oceans. They're a company with an extensive educational program designed to educate the public on marine mammal communities and ecosystems. Dolphin Quest has three locations worldwide and it is at the location on the Big Island of Hawaii where I completed my internship. The internship allowed me to gain valuable knowledge and hands-on experience working with marine mammals, in particular bottlenose dolphins. I was interested in the training aspect of animal behavior and the cognitive processes dolphins go through when learning behaviors from humans. I was able to shadow different staff members and learn daily duties and husbandry techniques in caring for the animals. Dolphin Quest was an ideal setting to start my marine mammal experience as I learned about animals under human care as well as techniques used in animal training.

Objectives

- Learn about bottlenose dolphin behavior pyramids and training and better understand the cognitive processing of dolphins and their ability to learn tasks from humans
- Shadow husbandry staff while medically assessing and tending to the animals
- Gain valuable hands-on experience working with marine animals in the water
- Learn daily tasks such as food prep regimes for dolphins in human care
- Be apart of the baby watch team and assist in baby watch duties
- Potentially open up future career opportunities in the field of research and conservation with marine mammals

Material & Methods

Daily Duties

One of the first tasks when starting my internship was to learn all of the dolphins' names and distinguishing features. Dolphin Quest houses ten bottlenose dolphins, which increased to twelve by the end of my internship. Morning duties included fish prep of each dolphin's individual food quantity for that day. Each dolphin has its own food cooler that is labeled with a unique color code and is restocked multiple times a day. Throughout the day the dolphins change social groups and are moved to different lagoons. I learned how to "gate" animals to different lagoons and assisted other trainers in preparing groups for programs. Dolphin Quest allows Hilton guests to interact in programs with the dolphins and learn about marine mammal education and conservation. During my internship I joined other trainers in completing their annual "swim test" that included events such as treading water for five minutes, swimming the length of the main lagoon underwater while holding breath, and a 10 foot object retrieval free dive.

Behavior Pyramids & Training

A behavior pyramid is an instructional tool used by Dolphin Quest to outline the steps of a particular behavior and help make training of a behavior easy to understand by a new trainer. During my internship I learned how to create a behavior pyramid for a novel behavior that I was assigned to teach one of the dolphins. I was given the behavior of “mimic bubbles” to teach Keo, a 16 year old female bottlenose dolphin. Learning a new behavior does not happen instantly and I worked with Keo for two months while generating a behavior pyramid of my own for the “mimic bubbles” behavior. As well as training Keo my assigned behavior, I was also able to shadow and assist other trainers with the behaviors they were teaching. These included various husbandry positions, novel behaviors, and cognitive behaviors like shape recognition. Learning new things is cognitively stimulating for dolphins and certain behaviors like jumping are an extra way of exercising when in human care.

Husbandry

Animal husbandry is important in ensuring captive animals’ physical and emotional health and well-being. Dolphins in human care are taught from an early age various behaviors and body positions that help trainers medically assess and care for them. During my internship I learned and applied different husbandry techniques such as DDA (daily dolphin assessment) that involves looking over each dolphins entire body for any injuries and to check their overall health each day. We looked for fresh rake marks or lesions, looked at their teeth and eyes, and took a chuff sample from their blowhole each day. In the beginning of my internship two females were pregnant and due in the next few weeks so to check the health of their fetus, I shadowed senior staff in using an ultrasound machine. Other husbandry techniques I assisted in included hydration, urine and fecal samples, and abrasion treatment.

Calf Watch

Two female dolphins were pregnant and gave birth during my internship. Before the dolphins gave birth I assisted senior trainers in their ultrasounds and body temperature recording. I helped in above water observations watching the females closely for behavioral signs that could suggest they were in labor. In being part of the calf watch team, I assisted in underwater and above water observations, records, and PNB (project newborn) operations. After the births, I spent hourly intervals observing the newborn calf’s behavior underwater while recording behaviors such as nursing time, holds, fecal and milk dispersal, and the time the calf was solo on underwater paper charts. Each newborn calf required twenty-four hour observation for the first two weeks of its life.

Guest Programs

Dolphin Quest Hawaii facilities are open to guests of the Hilton Waikoloa as well as various school groups and companies to interact with the dolphins and learn about marine animals and conservation. Throughout the day guest programs can range from 10-

minute meet and greets to 1-hour-45-minute full encounter programs. During my internship I shadowed and assisted trainers in guest programs that involved talking to guests, introducing a dolphin to guests in the water, and leading parts of a program. On the training side, during a program there is always an A-B trainer who is responsible for sending dolphins between groups and keeping track of the dolphin's behavior as well as the program time. I assisted in being the A-B trainer during guest programs and learned important hand signals to communicate with trainers across the lagoon.

Discussion

I spent the first few days of my internship learning all the dolphins' names and how to distinguish them in the water. Some of them have characteristic markings on their bodies like birthmarks and others have large rostrums, an overbite, or a particular coloring pattern. Their most distinguishing feature is the trailing edge of their dorsal fin, which is as unique as a fingerprint. One dolphin has a moon shape cutout, another has a tiny square cutout, and another has a wave pattern. I learned about morning fish prep and helped prepare daily food buckets. One of the more challenging parts of the internship was learning all the operations that took place daily and all the different protocols for various activities throughout the facility.

When building my behavior pyramid for Keo's mimic bubbles behavior I had to utilize my psychology knowledge and skills I had learned in my marine mammals behavior class at the University of Hawaii-Hilo. I had to think about how I was going to train a dolphin to do something without using my words. This technique was challenging at first but after a few trials I worked out a plan and began to teach Keo this new behavior. She already knew how to blow bubbles from a hand signal so I was trying to teach her to blow bubbles when I blew bubbles underwater with my mouth. Over two months she overcame hurdles and made great progress. She improved steadily and by the end of my internship she had made great advances but had not completely mastered the behavior. One of the main goals of my internship was to learn about dolphin cognition and behavior so I was excited to be able to train a novel behavior to a dolphin. I also assisted other trainers in the behaviors they were training other dolphins such as object shape recognition. This behavior involved the dolphin looking at a triangle and then swimming away and finding another triangle that was being held in the water along with other shapes. It was cognitive behaviors like this that I really enjoyed learning about and intrigued me more about dolphin training.

Another one of my objectives for this internship was to shadow husbandry staff and learn how dolphins are medically attended to while in human care. I was able to shadow and help trainers in a number of important husbandry duties throughout my internship. I mostly assisted in hydration and abrasion treatments, as well as shadowing staff during ultrasounds. I was fortunate that two female dolphins were in the latter terms of their pregnancies while I was at Dolphin Quest and I was able to be a part of the calf watch team, which I didn't expect in beginning my internship. I learned a great amount of information about dolphin gestation and had an unforgettable experience being able to

observe the newborns at less than 24 hours old. I was able to be in the water observing them and recording their nursing times and other behaviors to keep track of their overall health.

Conclusion

In beginning this internship I didn't really know what it would entail or what exactly I was going to be allowed to do. I had no idea I would get to be so hands on and interact with the dolphins in such an intimate manner. I was able to accomplish all of the objectives I set out to achieve. I learned about dolphin behavior and training, shadowed husbandry staff, and assisted in various medical treatments necessary for animals in human care. I was a part of the calf-watch team and was able to observe and record newborn calf behaviors up close and help monitor their progress. I was also able to train a new behavior to Keo in which I came up with the steps in a behavior pyramid in order to teach her the novel behavior.

Overall the experience was extremely beneficial in my future goal of working with marine mammals, in particular dolphins. I was able to shadow staff and trainers from various departments at Dolphin Quest and get a well-rounded feel for the industry of animal training. After the completion of my MOP internship I felt I still needed to learn more. The next semester I was given the opportunity to continue at Dolphin Quest with a level 2 Mentorship, which I will complete in May 2017. My last objective was to open up future career opportunities in the field of research and conservation with marine mammals and I definitely feel as though I have done that with this experience and with the connections I have made.

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