



**RIGHT
HERE
RIGHT
NOW**

THE OAKLAND ZOO IMPROVES THE LIVES OF THEIR ELEPHANTS

By COLLEEN KINZLEY

In 1991, we began managing our 1.3 African elephants using protected contact elephant management. Like most facilities, we changed to protected contact to increase keeper safety. After a short period of time we became advocates of protected contact because of how it enhanced the lives of the elephants. Free of human dominance and the threat of physical discipline, the elephants were able to behave more naturally.

No longer was it enough to provide husbandry and medical care. We wanted to know how much time our elephants were spending doing what and how that compared to elephants in the wild. We realized the best way to do that was to develop an elephant observation program and to use the information that we gained to make management changes that would promote the behavior that we wanted.

Decades of elephant field research have provided a wealth of information on the behavior and activity budgets of elephants in the wild (Wyatt and Eltringham, 1974; Douglas-Hamilton and Douglas-Hamilton, 1975; Hanks, 1979; Moss, 1988). Studies have shown that elephants are active much of the day and night and travel great distances. They are also socially and behaviorally complex animals, as demonstrated in behaviors like “aunting” towards calves and tool use (Douglas-Hamilton and Douglas-Hamilton, 1975;

Moss, 1988). From this information we were able to establish behavioral goals for our elephants. Although we recorded all behavior, our major goals were to increase feeding time, increase distance traveled and decrease abnormal, stereotypic behavior.

Initially, our observations took the form of ad libitum sampling or field notes (Martin and Bateson, 1987). We collected descriptive information about the activities, interactions, and locations of the elephants. Our elephant keepers and a few dedicated volunteers made up the initial elephant observation team compiling a couple hours of observation notes each week. The team would meet regularly to discuss what had been observed. This enabled us to understand what worked and what didn't work in terms of bringing us closer to our behavioral goals.

Early on we made a management change that would dramatically impact the elephants' behavior. We allowed the elephants to stay outside at night during mild weather. Night observations are done over the course of the week surrounding each full moon during the months that the elephants stay outside. The first shift starts at 5 pm and the last shift ends at 7 am. We found that allowing them to stay outside greatly increased their overall physical activity, increased species typical behaviors, and all but eliminated stereotypic behavior between the hours of 5 pm and 7 am. Stereotypic

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swaying, pacing and head bobbing are signs of anxiety, stress and /or boredom (Kieper, 1969; Laule, 1993; Weiss, 1968). We consider the amount of stereotypic activity the elephants engage in to be a direct measure of wellbeing. When the elephants were shifted inside at 4:30 pm one of our cows would spend up to five hours swaying. When they are outside at night her swaying is reduced to a maximum of thirty minutes. As is often the case, our indoor facility lacks the size and complexity of our outdoor facility. Each year in the spring we begin leaving the elephants outside when the overnight low reaches the low 50's F and the ground is dry. In the fall a combination of overnight lows below 50° and rain force us to bring them inside at night. Generally, they can be out all night for about eight months of the year. For the rest of the year daily weather conditions and the elephant's behavior determine when they are shifted indoors. If the weather is cold and wet they may come inside early; on mild days they stay outside until 11 pm. Currently, two of our elephants can be left with access to the outside during the winter months. Our future goals include facility changes that would allow all the elephants to choose between the indoors and the outdoors overnight year round.

In order to more effectively measure behavior we began using scan sampling at five-minute intervals along with ad libitum sampling for particular behaviors (Martin and Bateson, 1987). A count down beeper is used to measure five-minute intervals; on the beep the observer does an instantaneous scan then records on the data sheet the activity and location of each elephant and their proximity to one another. Ad libitum notations are taken continuously on any social interactions and or rare behaviors.

In the winter months, nighttime observations are done via time-lapse video that records each stall nightly. Unless the keepers detect something unusual during their morning check, data is only collected from the video one night each month. Daytime observations are done throughout the year but are now done at set observation times over the course of the day so that we can understand how management activities influence the elephants' behavior.

In 1994 observations revealed that our elephants were spending less than eight hours foraging and feeding over a 24-hour period. In the wild, elephants spend 16 to 18 hours per day feeding (Moss 1988; Eisenberg 1981; Estes 1999). While evaluating the elephant's nocturnal activities we discovered that within four hours they had finished the food left for them at the end of the day. We decided to begin feeding the elephants during the night to extend their feeding time. Their overnight diet was divided into five smaller feedings at 4 pm, 8 pm, 11 pm, 3 am and 6 am. Follow up observations revealed that these multiple feedings increased the overall time the elephants spent feeding and foraging by an average of 3.5 hours. However, the arrival of the night keeper for the 3 am feeding often woke the elephants and that they were awake and inactive by 5 am. The feeding schedule was adjusted to eliminate the 3 am feeding and the 6 am feeding was moved to 5 am.

Some management changes have occurred more gradually. This was the case with the browse fed to the elephants. We began feeding browse opportunistically when edible trees were trimmed at the Zoo. The more browse we fed the more time was spent in browse related activities including peeling bark, stripping leaves, chewing and breaking branches. These were all behaviors that we wanted to encourage so we began gathering browse on a regular basis. Wooded areas surround our elephant facility so we would cut small trees with a hand saw and drag the trees back to the exhibit or barn.

Browse constitutes up to 70 percent of the diet of elephants in the wild and provides important nutritional benefits (McCullagh, 1969; Field and Ross, 1976; Sukumar, 1989). For these reasons and the extended feeding time that comes from manipulating browse we wanted to maximize the amount of browse given to our elephants. Browse acquisition has grown from a few pieces per day cut by hand to a multi-faceted program. Our keepers are trained in the use of chainsaws and travel to designated locations to gather browse most days. We coordinate with tree trimming services, state and local tree trimming departments as well as with Zoo members to pick up cut

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browse or have it delivered (Hackler, 2001). Browse is presented as tree trunks "planted" in the ground, branches hung high or buried, and truckloads dumped in piles in the exhibit (Hackler, 2001). More than any other enrichment or feeding strategy, browse has extended the elephants feeding time and increased natural behavior. Currently each elephant receives about 100 lbs of browse over the course of a twenty-four hour period, roughly half of their diet.

Future goals include the establishment of a browse farm and hiring a dedicated browse keeper so that we will be able to provide the elephants with a greater variety of browse.

Browse comes pre-packaged and the elephants have to work to get the desirable parts of the tree. To further extend feeding time we also wanted the elephants to work for the hay, pellet and produce portion of their diet. Plastic barrels from five to fifty-five gallons in size are used to package these foods. Various numbers and sizes of holes in the barrels enable the elephants to pull, bang, or roll food out. And of course food can be buried, hidden in straw, shavings, or bramble piles, skewered on branches, spread on rocks and bars and/or elevated in feeders. Our feeding techniques were successful in extending the elephants' feeding time but they often stood in one spot working on a barrel or browse.

Through our observations we calculated the approximate distance traveled by each elephant. By dividing the exhibit into measured blocks and recording each time an elephant moved from one block to another we are able to calculate conservatively the distance covered during the observation. Initially our elephants walked about a half a mile each day. The distance covered by elephants in the wild over a 24-hour period varies greatly but figures available on the lower end of the spectrum range from 7 to 13 miles per day (Sukumar, 2003).

From early on part of preparing the exhibit for our elephants in the morning has included spreading their diet and enrichment all over the exhibit. Even their flakes of hay are divided into about twenty small piles throughout the exhibit. The "spread" as it has become known occupies the elephants for one to two hours. They walk back and forth and up and down the exhibit seeking out their favorite treats first, then they come back around for the things they've passed up. Our observations revealed that this was their most active period of the day.

To increase their overall activity level, and the distance they covered in a day, we decided to move the elephants off exhibit during the middle of the day to do a spread. To our surprise, instead of get-

ting complaints about elephants being off exhibit, we began to draw large crowds. Our guests enjoy watching the keepers hide food, hang browse, spread hay and put out the variety of scheduled enrichments. After fifteen minutes the elephants return to the exhibit to search hiding places high and low, tear branches off suspended browse and dig through dirt piles. People so enjoyed watching the elephants engaged in natural foraging and browsing behavior that we now post the spread schedule. Although we were pleased that the spread was so popular with our guest, the real measure of success was the increase in the elephant's physical activity and the distance that they traveled. Six of their ten meals are fed as spreads that resulted in an average distance of two miles traveled per day.

The conversion to protected contact in 1991 resulted in the installation of an elephant restraint chute, hydraulically operated gates and doors, and a doubling of the outdoor space. Since that time, improving the lives of The Oakland Zoo's elephants consisted of creative management changes with minimal financial impact on the Zoo. In 2003 the Zoo again made a significant financial investment in improving the lives of the elephants by embarking on expansion of their outdoor living area. The outdoor area now consists of three off exhibit holding yards and an expanded exhibit totaling approximately six acres. The additional space allows the elephants to choose between full sun and deep shade in each outdoor enclosure. The exhibit and one of the holding yards are irrigated pastures allowing for grazing year round. Previously the elephants spent less than two percent of their time grazing since grass only grew on the edges of the exhibit that weren't hard packed dirt. In the new exhibit 12 to 23 percent of their time is spent grazing. The increased space and habitat complexity has also resulted in a 51 percent increase in distance traveled.

Creative management has allowed us to significantly narrow the gap between the major activities and time budgets of our elephants and that of elephants in the wild. However, the basic concepts of maximizing the time the elephants spend outside, providing their diet over all of their hours of activity and presenting their diet in a manner that encourages the elephants to either travel or work for food are the foundations of our management. Our facility expansion provided increased space and environmental complexity that significantly increased natural behavior while providing the elephants with much greater environmental control and choice.

COLLEEN KINZLEY IS GENERAL CURATOR AT THE OAKLAND ZOO

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