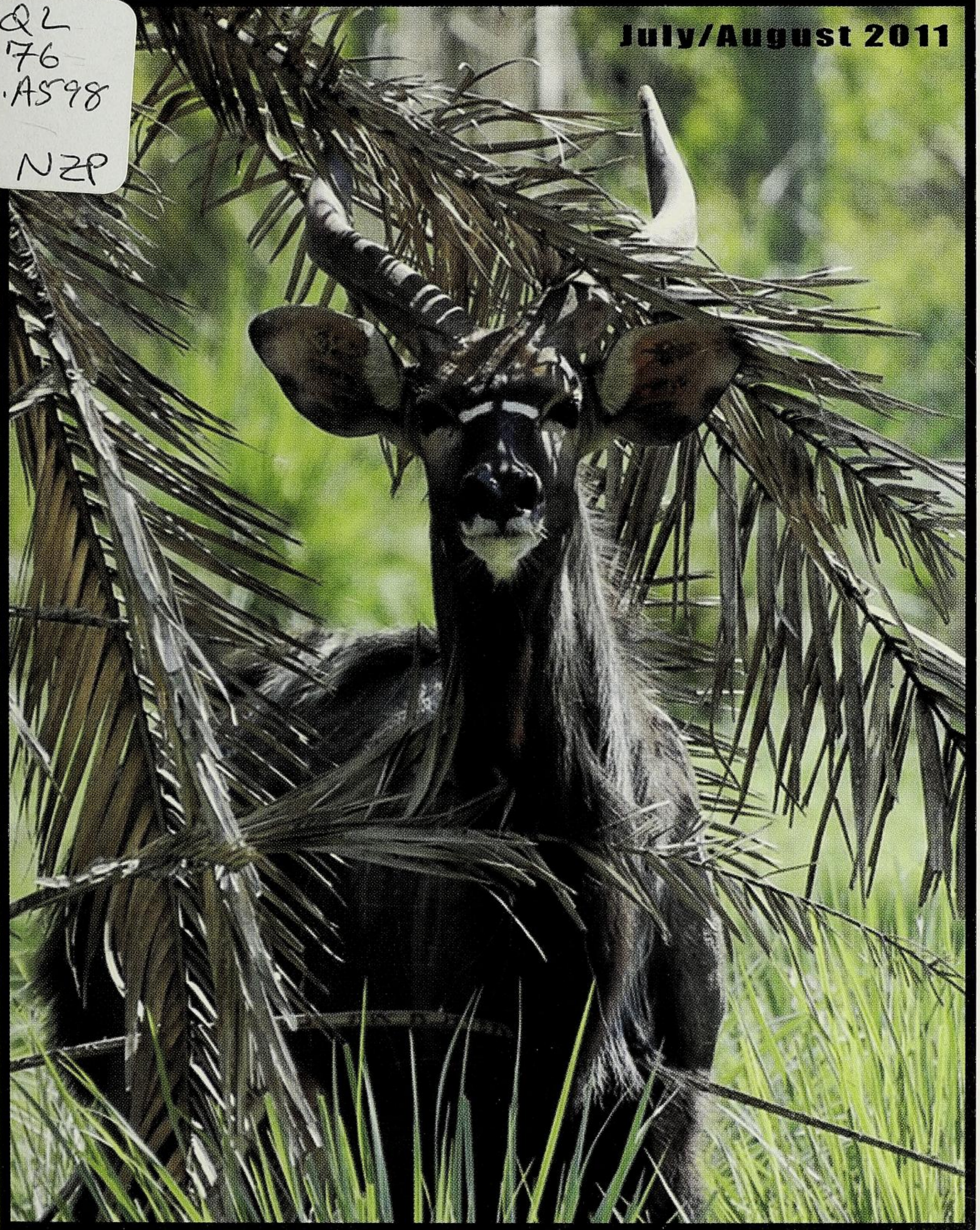


# ANIMAL KEEPERS' FORUM

July/August 2011

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**Dedicated Issue on Ungulate Husbandry,  
Training, Enrichment & Conservation**

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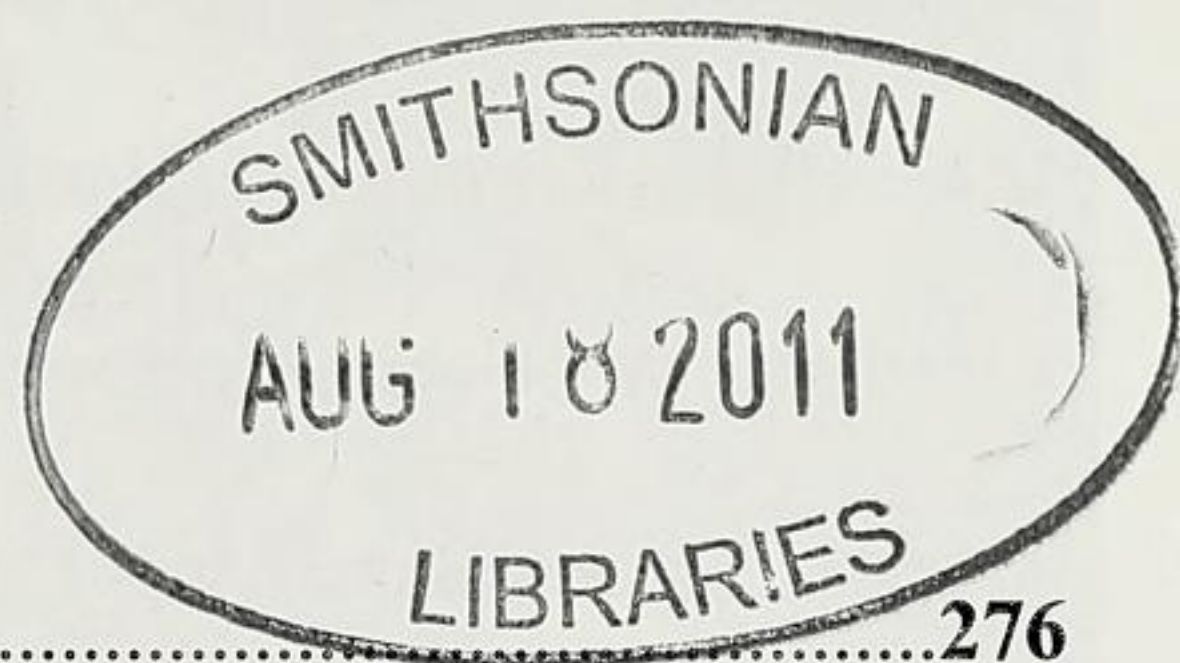
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**About the Cover** ~ This month's cover features a Lowland Nyala bull (*Tragelaphus angasii*) on the Pembe Savannah at Disney's Animal Kingdom Lodge in Lake Buena Vista, FL. This species is exhibited in a mixed-species display on the savannah outside of the Lodge where guests may observe the animals and their behaviors from their private balconies. The photographer for our Dedicated Ungulate Issue is Lindsey D. Kirkman, Animal Keeper at Disney's Animal Kingdom Lodge. Thank you, Lindsey!

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A planned and implemented enrichment program can contribute to better health by providing animals opportunities to exert some form of control over their environment [Baser, J., 1998; Carlstead & Shepherdson, 1994]. As it pertains to captive rhinos, we strive to encourage species-specific behaviors in rhinos while providing them response options to environmental change. This will ultimately result in their mental stimulation and the development of naturalistic behaviors [McIntyre and Coers, unk; Swaisgood and Shepherdson, 2005].

Each institution may have its own set of goals and criteria for the program, but fundamentally, you should start with an examination of the animal's natural history, activity patterns and behaviors seen in the wild, for example, demonstrating the use of black rhino prehensile lip by providing manipulative devices on exhibit for enrichment. Since rhinos spend the majority of their day eating we could look at modifying our feeding schedule or providing enrichment throughout the day rather than just once a day. We could also investigate the possibility of changing herd dynamics (or composition) with some species.

Holding facilities, exhibit spaces and/or any constraints that may be unique to your facility should be examined since these areas will directly impact your options for enrichment. The temperament and behavior of the specific individual(s) also needs to be taken into consideration. Once these criteria have been reviewed, a set of goals can be established. Generally speaking your primary goal should be to "promote opportunities for the expression of species-appropriate behaviors" [Joseph and Sevenich, 1999]. The Rhinoceros Husbandry Resource Manual [1996] clearly delineated the various functions enrichment can serve, such as (1) improving the well-being of the animal by increasing exercise, satisfying behavioral needs, and optimizing the level of stimulation that animals receive (2) educating zoo visitors by increasing the levels of natural and interesting behaviors, visibility and activity levels and (3) conserving endangered species by improving the success of captive breeding and reintroduction programs. This can be as simple as providing a wallow for mud bathing to complex environmental manipulation. The second goal of enrichment can be loosely defined as creating mental stimulation for the animal(s).

A successful enrichment program can be briefly summarized as:

- a) Establish goals for the program
- b) Create an enrichment approval form
  - State the purpose/goal of this enrichment
  - Provide detailed description of item (construction material, thickness, dimensions, size of holes, etc.)
  - Identify and address any facility or exhibit constraints that may be impacted
  - Identify and address any safety concerns
  - Cost estimates
- c) Identify approval protocol for enrichment submissions
- d) Create enrichment calendar (monthly or weekly) to ensure implementation schedule
- e) Determine how staff will document and/or track animal response to enrichment offered.



Creativity can be used to fabricate a unique device to suit your enrichment needs.  
*(Photo: Adam Felts)*



Some enrichment devices are manufactured for rhinos and other species that require additional strength and durability. *(Photo: Wendy Shaffstall)*

To accomplish the goals mentioned above, your plan should be tailored with a set of criteria for either the individual or the species in general. Your final proposal should then be submitted through the appropriate channels for approval. Ideally, an enrichment approval system should be set up to allow Keepers, Managers, and Veterinarians the ability to assess the proposed enrichment and approve/reject it. Institutions can alter their enrichment scheduling as well as vary the type of enrichment offered (ex: toy, food, sensory, environmental, behavioral and social) and keep track through their record-keeping or on a barn calendar [Connett, 2009]. One of the most intimidating aspects of enrichment is allocating the time to document animal behavior and/or responses to the enrichment offered, however, observations of responses can either be done in a direct, or indirect, manner as time allows. This data will enable you to evaluate if the enrichment goals have been met. Since enrichment is dynamic in nature, if you haven't reached your goal, you can make the necessary adjustments and be able to offer the most effective enrichment to the animal(s).

Enrichment can correlate aspects of ethology, psychology and animal husbandry to create a more stimulating environment for the animal [Mellen and Ellis, 1996]. This has led to the inclusion of enrichment options being incorporated into exhibit designs. Exhibit enrichment can be done by varying topography, landscaping, utilizing deadfall and trees, creating dirt mounds, planting vegetation, providing a wallow, and alternating the substrate (dirt, leaf litter, mulch, etc.). Other options (public view versus privacy, shaded area versus sun, etc.) can all provide the animal some control over their environment and make choices throughout the day. The aforementioned exhibit variables can contribute to an effective means of enrichment, especially when it can be used in conjunction with other approved enrichment. For instance, novel scents/perfumes/extracts can be used to create a "trail" throughout the exhibit, while holes drilled in deadfall can serve as an anchoring point for browse and either one can provide the potential for exploration and create options for the animal. The American Association of Zoo Keepers (AAZK) has created The Enrichment Notebook [2004] which provides suggested guidelines and contains information on exhibit enrichment, dietary enrichment and a section on safety considerations. Bear in mind that when you are using enrichment devices that are awkward and heavy, it is important to secure these items safely not only for the animals, but keeper staff as well. Fortunately, with the help of your maintenance team, these somewhat bulky items can be secured safely by using pulley systems and/or other equipment can be used to hoist devices to enable you to hang them higher. A synopsis of rhino enrichment options that are currently being used at zoological facilities can be found in Table 1. This table gives suggestions as to the primary area of use as well as its presentation. Some examples of enrichment type, and some options that can be used, are outlined below:

**Toy:**

- ◆ Boomer Ball®
- ◆ Weeble®
- ◆ Suspended log

**Food:**

- ◆ Scatter food around exhibit to stimulate grazing/foraging
- ◆ Place food items in enrichment devices to be randomly dispensed
- ◆ Fruits and vegetables frozen in bucket of water

**Sensory:**

- ◆ Use conspecific's dung for smell (olfaction)
- ◆ Play different animal vocalizations or hang bamboo "chimes" for hearing (audition)
- ◆ Mount street sweeper brush for touch (tactition)

**Environmental:**

- ◆ Changing substrate (leaf litter, dirt, mulch, etc.)
- ◆ Altering daily routine
- ◆ Rotating to different enclosure (pen)

**Behavioral:**

- ◆ Training new behaviors
- ◆ Training for veterinary procedures

**Social:**

- ◆ Creating mixed-species exhibit
- ◆ Rotating individuals (add or remove animals when possible)

Any ideas garnered from this table or list of options must be used in compliance with a facility's enrichment protocol, regulations and safety considerations.

We cannot overlook the fact that training for husbandry behaviors is not only stimulating for the animal, but can provide an invaluable opportunity for the veterinarian to perform diagnostic procedures with potentially less stress and more cooperation from the animal(s) [Dover, et al., 1994]. The chapter for training will delve more in-depth into this topic, but authors wanted to stress the enrichment aspect of the training process.

*The authors would like to express their sincere thanks to their colleagues on the International Rhino Keeper Association Board of Directors who graciously agreed to help revise and edit the rough draft. And they would also like to acknowledge the rhino keepers who submitted their enrichment suggestions via e-mail or through completing Rhino Keeper Workshop membership surveys.*

*This has been re-printed from the upcoming Rhinoceros Husbandry Manual (anticipated release in 2011) with permission from Editor, Adam Eyers and Rhino Advisory Group Committee Members, Steve Schurter and Randy Reiches.*

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**Table 1.** Synopsis of rhinoceros enrichment ideas

Enrichment option	Primary area of use:		Presentation:	
	on exhibit	holding area	suspended	ground
55 gallon plastic drum		X	X	X
"Amazing graze" (with biscuits, horse treats or produce inside)	X	X		X
Audio clips of rhino vocalizations or other species' vocalizations		X	X	
Beer kegs		X	X	X
Biscuits (gorilla sized leaf eater, apple and oat horse treats)	X	X		X
Boat mooring buoy		X	X	
Boomer balls	X	X	X	X
Bowling balls		X		X
Branch/twig with produce pieces skewered on it	X	X	X	X
Browse or approved plants	X	X	X	X
Brushes	X	X	X	
Brushing by keeper		X		
Cardboard boxes (with produce and without)		X		X
Firehose "wall"		X	X	
Frozen ice blocks (flavored/non-flavored, produce/without produce)	X	X		X
Large cardboard tubes		X		X
Logs, stumps, rootballs	X	X	X	X
Melons (whole or chunks)	X	X		X
Mirrors		X	X	
Misters	X	X	X	
Mud wallow	X	X		
Non-radial tire (with cuts in sidewall for safety)		X	X	
Oblong stone	X	X		X
"Painting" with non-toxic finger paint		X		
Paper grain bags filled with hay and/or produce		X	X	X
Paper mache balls	X	X	X	X
Peanut butter (on "furniture", toys, walls, etc)	X	X		
Planter buckets	X	X	X	X
Plastic carbonated beverage concentrate container		X	X	X
Plastic ice blocks and/or iceberg toys		X		X
Plastic jug feeder		X	X	
Pool	X	X		
Produce (can be used in a variety of means or in devices)	X	X	X	X
PVC tube with bells suspended inside		X	X	
PVC/Bamboo "chimes"		X	X	
Rolling treat buckets/feeders (with biscuits, produce and/or horse treats inside)		X		X
Scents, flavorings and/or extracts	X	X		X
Snow pile, snowpeople (with and without fruit mix sprinkled on them)		X		X
Substrate piles or rotation (dirt, gravel, sand, leaf litter)	X	X		
Traffic cone and/or pylon		X	X	
Training with keeper	X	X		
Triangle rattles		X	X	
Urine, feces, soiled bedding from other species or conspecifics	X	X		X
Weeble	X	X		X
Weeto	X	X		X

**Primary area of use** may be dictated by institution's guidelines and criteria.

**Presentation** format is the one that was most commonly cited as being used.

