

Porcupine Husbandry Survey *Atherurus africanus*

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

Are your porcupines housed primarily indoors?

Response

yes
yes
yes
no
yes

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

What are the dimensions of your indoor exhibit?

Response

5ft X 10ft
7ft X 3ft X 6.5ft high
1000 sq ft

20'L x 15'W x 10'H

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

Is there shifting capability?

Response

no

yes
yes
yes

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo

Omaha's Henry Doorly Zoo

Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

Please describe the general design of your indoor exhibit?

Response

glass front, concrete floor, block walls
small exhibit in hallway of gorilla building. Front of display is glass. Display is elevated from the ground for viewing. Keeper door is access to the display. Forced air fan moves air from gorilla public hall to display. Walls are plaster board, li

the display has a curved shape with glass along the front for public viewing. Within the exhibit there are three artificial trees as well as numerous natural logs and rocks. The floor is uneven, mimicking African terrain.

artificial trees and vines, fiber glass floor and rocks, glass viewing window, natural perches, plastic plants

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

What type of substrate do you use in your porcupine exhibit?

Response

wood chips: usually a mix of pine and cottonwood
chopped tree bark
hardwood mulch

none for porcupines, but hay is given to bay duiker which shares the space

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo

What cage furniture do you use?

Response

logs
tree limbs and stumps

Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

natural logs, hollowed out stumps, artificial vines

see above

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo

Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

What type of heating and ventilation system do you use?

Response

gas heat- no forced ventilation- return air duct on heat/AC system
air from public hallway
chilled water cooling with hot water reheat capability; forced air ventilation with a min. of 10% fresh air always

air circulators that circulate hot or cold air depending on the season

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

What is the average temperature range of your indoor exhibit?

Response

69-79 degrees F
60-90+ degrees F
76 degrees F

68-74 degrees F

Question:

Institution

Is the exhibit on a light cycle?

Response

Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

no
yes, only used when necessary- animals are on display at all times
yes
yes

Question:

What is the dimension of your indoor holding space?

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo

Response

rectangular: 96 ft long X 29 ft wide X 99 ft high

Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

10ft X 6ft
3'L x 3'W x 4'H

Question:

Describe your indoor holding space (construction, layout, etc)

Institution

Folsom Children's Zoo

Response

wood chips on floor, hollow log for porcupines to sleep in, other logs for chewing and climbing, large stainless steel water tub; there are numerous branches above for the mouse lemur; (exhibit has 2 keeper doors as it used to be 2 separate rooms)

Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

rectangular shape, cinder block walls, epoxy sand floor mix (not concrete but just as hard), front of cage is 1 in welded chainlink
solid bottom, solid metal walls, open air box wire cage top

Question:

What type of heating and ventilation does your holding area have?

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo

Response

chilled water cooling with hot water reheat capability; forced air ventilation with a min. of 10% fresh air always

Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

forced air
open air top box wire cage gets heated by building heat, hot water pipes that run inside perimeter walls

Question:

What are the dimensions of your outdoor exhibit?

Institution

Folsom Children's Zoo

Response

Henry Doorly Zoo
Omaha's Henry Doorly Zoo

Virginia Zoological Park

Wildlife Conservation Society / Bronx Zoo

approximatley 4 ft X 10ft, kidney shaped, smaller area that opens to a larger area, soil and mulch substrate

Question:

Please describe your outdoor exhibit.

Institution

Response

Folsom Children's Zoo

Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park

Wildlife Conservation Society / Bronx Zoo

open topped with a dry moat , glass public walls, sides are fabricated rock work, small pool in back of exhibit, soil and mulch substrate with natural logs to hide under or chew, area of straw for bedding

Question:

Are your porcupines part of a mixed species exhibit?

Institution

Response

Folsom Children's Zoo

yes

Henry Doorly Zoo

yes

Omaha's Henry Doorly Zoo

yes

Virginia Zoological Park

no

Wildlife Conservation Society / Bronx Zoo

yes

Question:

If so, what species are they mixed with?

Institution

Response

Folsom Children's Zoo

mouse lemur, no problems

Henry Doorly Zoo

various birds

Omaha's Henry Doorly Zoo

bushbabies (Otolemur garneltii), sprinhaas (Pedetes capensis), aardvark (Orycteropus afer)

Virginia Zoological Park

Wildlife Conservation Society / Bronx Zoo

Rodrigues Fruit Bat, Senegal Bush Baby, Bay Duiker

Question:

Mixed Species / Comments:

Institution

Response

Henry Doorly Zoo

bird food had to be placed where porcupine couldn't climb to it

Omaha's Henry Doorly Zoo
Wildlife Conservation Society / Bronx Zoo
Wildlife Conservation Society / Bronx Zoo
Wildlife Conservation Society / Bronx Zoo

all species interact well together
Bat: no interaction
Bush Baby: no interaction
Duiker: sometimes we will find the porcupines in the shift with the Duikers; no conflict has been noted to date; porcupines enjoy hanging out with them

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

Are your porcupines singly housed?

Response

no
no
no
no

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

If not, how many animals are housed together?

Response

1.1
1.3
two males
0.2

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

Please describe any concerns or issues you may have regarding introductions between conspecifics.

Response

there has been some aggression during male and female introductions; we keep them together for a few hours during the day when we are interested in breeding them

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

Do you separate animals at night?

Response

no
no
no
no
they are not housed together; we move them to a common shift area when we want them to breed; in this area we can separate them and control their interaction

Question:

Institution

Folsom Children's Zoo

Please describe your porcupine diet:

Response

food is cut into various sizes; the diet consists of 1/2 potato, 1/2 apple, 1/2 orange, 1-1/2 bananas, and additions such as carrot, cucumber, celery, peaches, pear, grapes, berries; they also get rat blocks and gorilla biscuits on occasion

Henry Doorly Zoo
Omaha's Henry Doorly Zoo

fruits, vegetables, Purina rabbit chow
mix of sweet potatoes, celery, potatoes, apples, oranges, bananas, carrots, and kale

Virginia Zoological Park

each: am: 1/3 cup rodent chow M,W,F: 1/6 cup mixed seeds pm: 1/4c apple, 1/4c
carrot, 1/4c sweet potato, 1/4c greens

Wildlife Conservation Society / Bronx Zoo

300g greens, 100g (1/2) yam or carrot, 75 g rodent pellets; per animal weight: 4.0 kg

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

How is the diet presented?

Response

either in stainless steel bowl, scattered, or in boxes and bags
in a bowl, not plastic
given at two designated spots, with a small portion scattered
spread around outdoor exhibit unless it is raining
in a pan on the floor

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

How many times per day are the animals fed?

Response

twice
once
once
twice
once daily

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo

Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

How are your porcupines restrained for medical procedures?

Response

net
tranquilized
they are restrained by hand; keepers handling the animals wear protective gloves

squeeze cage trained for receiving vaccinations
these animals are often placed in an induction chamber and anesthetized with isoflurane gas

Question:

Institution

Folsom Children's Zoo

If you need to immobilize the animals, what drugs have you used and how would you describe their effectiveness:

Response

isoflurane, works well

Henry Doorly Zoo
Omaha's Henry Doorly Zoo

gas- isoflurine, seroflurine
seroflurane is administered by mask; this gas was very effective with this species

Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

they are often just placed in an induction chamber and induced with isoflurane gas alone

Question:

During an immobilization what, if any, problems have you seen?

Institution

Folsom Children's Zoo
Henry Doorly Zoo

Response

none
attempted to suture a wound and the skin tears so easily that the skin tore worse during the procedure
we have not had any problems with these animals during immobilization

Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

no problems thus far with anesthesia

Question:

What routine medical procedures do you perform on your porcupines?

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

Response

physical exams- teeth checked, temperature, weight
fecal exams
we do routine fecal exams as well as medical care when needed

no routine procedures are performed, only immobilization for physical exams or treatments, if needed for shipment or due to illness

Question:

What vaccinations do you use?

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

Response

none

IMRAB
no routine vaccinations are given; if any are given during an immobilization, it is rabies

Question:

What health concerns do you have that are specific to porcupines?

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

Response

none

cataracts/glaucoma, adenoma (one animal), candida, strongyloides

Question:

Have you successfully bred this species at your institution?

Institution

Response

Folsom Children's Zoo	no
Henry Doorly Zoo	yes
Omaha's Henry Doorly Zoo	no
Virginia Zoological Park	no
Wildlife Conservation Society / Bronx Zoo	yes

Question:

Institution

Folsom Children's Zoo	
Henry Doorly Zoo	yes
Omaha's Henry Doorly Zoo	
Virginia Zoological Park	
Wildlife Conservation Society / Bronx Zoo	no

Do you keep the sexes together at all times?

Response

Question:

Institution

Folsom Children's Zoo	
Henry Doorly Zoo	no
Omaha's Henry Doorly Zoo	
Virginia Zoological Park	
Wildlife Conservation Society / Bronx Zoo	yes

Do you introduce the sexes for breeding?

Response

Question:

Institution

Folsom Children's Zoo	
Henry Doorly Zoo	
Omaha's Henry Doorly Zoo	
Virginia Zoological Park	
Wildlife Conservation Society / Bronx Zoo	

If you introduce the sexes for breeding, please describe your introduction protocol:

Response

we put them in a holding area that is split in half with one animal on each side; we put them together and watch for signs of aggression and copulation

Question:

Institution

Folsom Children's Zoo	
Henry Doorly Zoo	

If they remain together, have you seen any aggression by either adult towards the newborns?

Response

no, sexes are not separated prior to the birth; no there is no aggression

Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

the male and female are separated before birth

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

Do you make any special preparations for the birth?

Response

no

no

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

If yes, what are they?

Response

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

How long do you leave the offspring with the mother before moving them?

Response

depends on the sex of the offspring

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

How long have you been able to keep the offspring with the parents?

Response

we observed no behavioral cause to separate the young

the porcupines we have are mother and daughter
until offspring was sexually mature

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo

What concerns do you have when housing the group together?

Response

we cleaned with the animals in the display and had to give mother and young several feet of space to keep the female from trying to bite us

Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

Have you ever hand to pull offspring for any reason?

Response

no

no

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

Have you hand reared offspring?

Response

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

If yes, please describe your protocol (formula used, number of feedings, when weaned, etc.).

Response

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

Have you used any type of contraception for your porcupines?

Response

yes
no

no
no

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

If yes, what have you used and was it successful?

Response

neutered male

Question:

Institution

Folsom Children's Zoo

Are any of your porcupines used for educational purposes or public demonstrations?

Response

no

Henry Doorly Zoo no
Omaha's Henry Doorly Zoo no
Virginia Zoological Park no
Wildlife Conservation Society / Bronx Zoo not this species

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

If yes, how is the porcupine used?

Response

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

Do you consider it a successful outreach animal?

Response

no

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

What behaviors have you trained?

Response

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

If your porcupines are not used for demonstrations, have you trained any husbandry behaviors?

Response

no
yes
yes
no

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

If yes, what behaviors have you trained?

Response

basic training, porcupines will go to the feeding area so the keepers can get a good look at the animals
squeeze cage trained, will enter, door shut and squeezed down to give vaccinations

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo

Do you have any plans for future training ?

Response

no- these animals were transferred within the zoo (no longer have them)

Omaha's Henry Doorly Zoo no
Virginia Zoological Park yes
Wildlife Conservation Society / Bronx Zoo yes

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

What behaviors would you most like to train?

Response

possible scale training; we currently get them to go in a kennel and then weigh; would like them to station on a scale eventually target, for better visual physical examination

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

Do you provide your porcupines with environmental enrichment?

Response

yes
yes
yes
yes
yes

Question:

Institution

Folsom Children's Zoo

Henry Doorly Zoo
Omaha's Henry Doorly Zoo

Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

If yes, please list what you use for enrichment and if possible comment on the success of the items:

Response

boxes and bags filled with shredded paper and food- they love these; another favorite is bundles of sticks with the bark still attached; moving cage furniture is good because they will climb and explore everything; any kind of large nut is great; we have

browse and wood to chew on were what they enjoyed
whole logs, they seem to enjoy housing inside; whole fruits- enjoyed; pinecone rolled in peanutbutter and seeds- enjoyed; honey- enjoyed; browse- chewed up; grass sod- dug into it

most often browse, spreading diet all over exhibit, large pile of mulch for them to spread around; favorite browse is mulberry
natural chew logs, cardboard boxes, browse, ice blocks with fruit inside

Question:

Institution

Folsom Children's Zoo
Henry Doorly Zoo
Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

Have you ever shipped a porcupine?

Response

yes
yes
no
no
yes

Question:

Institution

Folsom Children's Zoo

Henry Doorly Zoo

If yes, please describe your shipping crate (dimensions, construction, etc.)

Response

2ft X 3ft stainless steel with holes on all sides; it has a mesh bottom for easy cleaning; everything is stainless steel
the porcupines would start chewing holes in any plastic crate even if they were only being held in them for a short period of time. If shipped in a pet kennel they would chew out of it.

Omaha's Henry Doorly Zoo
Virginia Zoological Park
Wildlife Conservation Society / Bronx Zoo

we use International Air Transport Association guidelines when shipping porcupines

Question:

Institution

Folsom Children's Zoo

Henry Doorly Zoo

Omaha's Henry Doorly Zoo

Virginia Zoological Park

Wildlife Conservation Society / Bronx Zoo

Comments or ideas to include in the Husbandry Standards:

Response

These guys like to play in the water and should be given access to a small pool when possible

some animals were more aggressive than others and were more of a risk to anyone cleaning. Some were not bothered by cleaning and others needed a buffer zone. Wood provided for them helps keep them from chewing on the display. They would chew on anything.

if kept outside, watch cold temperatures, minor frost bite on tails from exposure; given access to inside if 50 degrees F or below