

**Porcupine Husbandry Survey** *Coendou prehensilis*

**Question:**

**Are your porcupines housed primarily indoors?**

**Institution**

**Response**

Albuquerque Biological Park  
Baltimore Zoo  
Brandywine Zoo  
Brevard  
Central Florida Zoo  
Cincinnati Zoo and Botanical Garden  
Lake Superior Zoo  
Los Angeles Zoo  
Tautphaus Park Zoo  
Virginia Zoological Park  
Wildlife Conservation Society / Bronx Zoo

yes  
yes  
yes  
NO  
no  
yes  
Yes  
Yes  
yes - she is an education animal in off-exhibit holding.  
yes  
yes

**Question:**

**What are the dimensions of your indoor exhibit?**

**Institution**

**Response**

Albuquerque Biological Park  
Baltimore Zoo  
Brandywine Zoo  
Brevard  
Central Florida Zoo  
Cincinnati Zoo and Botanical Garden  
  
Lake Superior Zoo  
Los Angeles Zoo  
Tautphaus Park Zoo  
Virginia Zoological Park  
Wildlife Conservation Society / Bronx Zoo

20ft X 15ft X 12ft  
8'h X 6'd X 8' w  
9' l x 5'w x 7'h  
  
6' wide, 3' deep in front, shelf rock face, 6' high extending back an additional 4'  
6'x18'x10'x6'x16'x24' [An "L" shape]  
15'6"x17'6"  
5'x10'x10'  
20' long X 8' wide X 7' high  
15' L x 6' W x 10'H

**Question:**

**Is there shifting capability?**

**Institution**

**Response**

Albuquerque Biological Park  
Baltimore Zoo  
Brandywine Zoo  
Brevard  
Central Florida Zoo  
Cincinnati Zoo and Botanical Garden  
Lake Superior Zoo  
Los Angeles Zoo  
Tautphaus Park Zoo  
Virginia Zoological Park  
Wildlife Conservation Society / Bronx Zoo

no  
no  
no  
  
  
no  
No  
No  
No  
No  
yes, but it is not used- too small (5'x3'x3')  
yes

**Question:**

**Please describe the general design of your indoor exhibit?**

**Institution**

**Response**

Albuquerque Biological Park

large exhibit with mud floor, granite walls, mesh front and top; branches throughout the exhibit

Baltimore Zoo	the indoor holding is our only holding area. As an education animal, the porcupine is taken out on programs 3-4X per week. He also has access to an outdoor exercise area and an additional indoor area. The enclosure was constructed in 2001, designed an
Brandywine Zoo	rectangle with very large log laying horizontal and several vines intertwined
Brevard Central Florida Zoo Cincinnati Zoo and Botanical Garden	glass viewing window in the front; rock face through the rest with 4' deep rock shelf 6' up; branches provided for climbing up and down from the ground to the rock shelf
Lake Superior Zoo Los Angeles Zoo	concrete block walls I-shaped, glass windows glass fronted indoor exhibit with rainforest murals, skylights allow some natural lighting in addition to fluorescent and vitalite lighting.
Tautphaus Park Zoo	Corners cage with heavy-duty 1" square mesh in a larger multispecies holding area.
Virginia Zoological Park	concrete floor with approximately 1' wide pool, 10" deep, for the length of the exhibit; crepe myrtle trees at each end and in center; branches running length of exhibit at mid level with several branches to ground; glass on 3 sides, back wall concrete,
Wildlife Conservation Society / Bronx Zoo	artificial trees, vines, glass front, natural perches, pool, concrete floor and walls

**Question:**

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

**Institution**

**Response**

Albuquerque Biological Park Baltimore Zoo	mud/dirt We do not use a substrate on the floor, he rarely comes to the floor. He does receive straw as bedding in his kennel.
Brandywine Zoo Brevard Central Florida Zoo Cincinnati Zoo and Botanical Garden	cement floor, envirodri paper bedding concrete
Lake Superior Zoo Los Angeles Zoo Tautphaus Park Zoo	pine shavings, kitty litter in potty spots pine bark chips over concrete Cement floor with wood chip areas
Virginia Zoological Park Wildlife Conservation Society / Bronx Zoo	none none

**Question:**

**What cage furniture do you use?**

**Institution**

**Response**

Albuquerque Biological Park Baltimore Zoo	branches, logs, nest boxes (used for the birds in the exhibit, the porcupines sit on top of them) We use a portable perch made of Manzanita wood, originally constructed for parrots. Two food bowls are hung on walls around the enclosure and he is given a medium size kennel to sleep in. We change cage furniture monthly and offer a variety of addition
Brandywine Zoo Brevard	natural vines, branches, logs, rocks

Central Florida Zoo	
Cincinnati Zoo and Botanical Garden	6' long 4cm diameter branches
Lake Superior Zoo	concrete trees, ropes, real trees and branches
Los Angeles Zoo	exhibit is extensively perched with natural logs, most of horizontal perching is about 5 feet above the ground. Natural browse hung on limbs for decoration and enrichment (pine, eucalyptus, acacia etc.).
Tautphaus Park Zoo	Heavy plastic house with wood chips - primarily used as latrine, natural perches, shelves, logs.
Virginia Zoological Park	branches, crepe myrtle trees, hanging baskets with plants
Wildlife Conservation Society / Bronx Zoo	see above

**Question:**

**What type of heating and ventilation system do you use?**

**Institution**

**Response**

Alberquerque Biological Park	forced air with misting/foggers
Baltimore Zoo	We have automatic heating and AC, built into the central unit with the building, but run off a separate thermostat.
Brandywine Zoo	oil heat, various ventilation fans
Brevard	
Central Florida Zoo	
Cincinnati Zoo and Botanical Garden	boilers used to heat the entire building; electric fans vent the display (from the roof area)
Lake Superior Zoo	gas forced air, no ventilation
Los Angeles Zoo	Forced air heating and air conditioning. Thermostat controlled.
Tautphaus Park Zoo	Electric forced-air heat, large exhaust fan and open windows for ventilation/cooling.
Virginia Zoological Park	heat pumps and small exhaust fan
Wildlife Conservation Society / Bronx Zoo	air circulators that circulate hot or cold air depending on the season

**Question:**

**What is the average temperature range of your indoor exhibit?**

**Institution**

**Response**

Alberquerque Biological Park	78-82 degrees F
Baltimore Zoo	75 degrees F
Brandywine Zoo	75 degrees F in winter, summer building fluctuates with summer temps- building is not air-conditioned; usually doesn't go over 90 degrees F- use lots of fans to create a cool breeze
Brevard	
Central Florida Zoo	
Cincinnati Zoo and Botanical Garden	70-75 degrees F
Lake Superior Zoo	70 +/- 20 degrees F - Sometimes gets hotter in Summer
Los Angeles Zoo	approx 68-72 degrees F
Tautphaus Park Zoo	72-85F
Virginia Zoological Park	70-80 degrees F
Wildlife Conservation Society / Bronx Zoo	68-74 degrees F

**Question:**

**Is the exhibit on a light cycle?**

**Institution**

**Response**

Alberquerque Biological Park	no, has skylights
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Baltimore Zoo	yes
Brandywine Zoo	yes
Brevard	
Central Florida Zoo	
Cincinnati Zoo and Botanical Garden	yes
Lake Superior Zoo	Yes
Los Angeles Zoo	No
Tautphaus Park Zoo	No.
Virginia Zoological Park	yes
Wildlife Conservation Society / Bronx Zoo	yes

**Question:**

**Institution**

Alberquerque Biological Park  
 Baltimore Zoo  
 Brandywine Zoo  
 Brevard  
 Central Florida Zoo  
 Cincinnati Zoo and Botanical Garden  
 Lake Superior Zoo  
 Los Angeles Zoo  
 Tautphaus Park Zoo  
 Virginia Zoological Park  
  
 Wildlife Conservation Society / Bronx Zoo

**If so, what is the day/night cycle?**

**Response**

7am - 7pm light  
 follows outside natural light cycle  
  
 14 day (white light) hours, 10 night (blue light) hours  
 0.508333333  
 natural light  
  
 reverse cycle (see above), 12hr-12hr on timer (can be changed)  
  
 10am-10pm: night cycle  
 10pm-10am: day cycle

**Question:**

**Institution**

Alberquerque Biological Park  
 Baltimore Zoo  
 Brandywine Zoo  
 Brevard  
 Central Florida Zoo  
 Cincinnati Zoo and Botanical Garden  
 Lake Superior Zoo  
 Los Angeles Zoo  
 Tautphaus Park Zoo  
 Virginia Zoological Park  
 Wildlife Conservation Society / Bronx Zoo

**Do your porcupines have an outdoor exhibit?**

**Response**

yes (holding area only)  
 no  
 we have one porcupine who has access outside  
  
 yes  
 no  
 No  
 No  
 No  
 No  
 no  
 no

**Question:**

**Institution**

Alberquerque Biological Park  
 Baltimore Zoo  
 Brandywine Zoo  
 Brevard  
 Central Florida Zoo  
 Cincinnati Zoo and Botanical Garden  
 Lake Superior Zoo

**Do you have temperature restrictions for them to be outside?**

**Response**

yes  
 yes  
 yes  
  
 no

Los Angeles Zoo  
Tautphaus Park Zoo  
Virginia Zoological Park  
Wildlife Conservation Society / Bronx Zoo

yes (education animals)

**Question:**

**If so, what are your temperature guidelines?**

**Institution**

Alberquerque Biological Park  
Baltimore Zoo  
Brandywine Zoo

**Response**

above 75 degrees F  
not below 70 degrees  
high humidity, over 86 degrees, the one porcupine is very sensitive to these temperatures

Brevard  
Central Florida Zoo  
Cincinnati Zoo and Botanical Garden  
Lake Superior Zoo  
Los Angeles Zoo  
Tautphaus Park Zoo  
Virginia Zoological Park  
Wildlife Conservation Society / Bronx Zoo

65 degrees F: low, 85 degrees F: high

**Question:**

**Do you have an indoor holding area?**

**Institution**

Alberquerque Biological Park  
Baltimore Zoo  
Brandywine Zoo  
Brevard  
Central Florida Zoo  
Cincinnati Zoo and Botanical Garden  
Lake Superior Zoo  
Los Angeles Zoo  
Tautphaus Park Zoo  
Virginia Zoological Park  
Wildlife Conservation Society / Bronx Zoo

**Response**

yes  
yes  
No  
yes  
yes

**Question:**

**What is the dimension of your indoor holding space?**

**Institution**

Alberquerque Biological Park  
Baltimore Zoo  
Brandywine Zoo  
Brevard  
Central Florida Zoo  
Cincinnati Zoo and Botanical Garden  
Lake Superior Zoo  
Los Angeles Zoo  
Tautphaus Park Zoo  
Virginia Zoological Park  
Wildlife Conservation Society / Bronx Zoo

**Response**

4' x 2.5' x 6'  
5' x 3' x 6'  
4' X 4' X 7' high  
80"L x 40"W x 9'7"H

**Question:**

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

**Institution**

Albuquerque Biological Park

Baltimore Zoo

Brandywine Zoo

Brevard

Central Florida Zoo

Cincinnati Zoo and Botanical Garden

Lake Superior Zoo

Los Angeles Zoo

Tautphaus Park Zoo

Virginia Zoological Park

Wildlife Conservation Society / Bronx Zoo

**Response**

We have 3 groups of porcupines - 2 are exhibited as above - This porcupine is an education animal - Her holding cage is a small wire cage 4'x4'x6' - She goes out into the outside holding area during the day.

outreach building- Corners Limited cage. Wire mesh ceiling and front walls, rear window, smooth walls for cleaning, floor is trays filled with World's Best kitty litter, also offer a litter tray for urine (porc is potty trained)

concrete den area with oak branches

wire cage, wood branches, hide box, wire floor with pull out cleaning pan

box wire construction, sides and top, concrete floor

**Question:****Institution**

Albuquerque Biological Park

Baltimore Zoo

Brandywine Zoo

Brevard

Central Florida Zoo

Cincinnati Zoo and Botanical Garden

Lake Superior Zoo

Los Angeles Zoo

Tautphaus Park Zoo

Virginia Zoological Park

Wildlife Conservation Society / Bronx Zoo

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

Forced Air

air-conditioner in summer- 75 degrees F

space heater during winter months

forced air

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

**Question:****Institution**

Albuquerque Biological Park

Baltimore Zoo

Brandywine Zoo

Brevard

Central Florida Zoo

Cincinnati Zoo and Botanical Garden

Lake Superior Zoo

Los Angeles Zoo

Tautphaus Park Zoo

Virginia Zoological Park

Wildlife Conservation Society / Bronx Zoo

**What are the dimensions of your outdoor exhibit?****Response**

5'x5'x12' - Only used to hold the porcupine outside to get fresh air during the day.

20' x 8' x 5'

12x6x12      1

7' x 7' x 10'

**Question:**

**Institution**

Alberquerque Biological Park  
Baltimore Zoo  
Brandywine Zoo

**Please describe your outdoor exhibit.**

**Response**

Small round cage with branches and logs.  
  
natural floor- mulch, stones, leaves, etc.; natural exhibit with vines trees, bushes, vine cover on roof for a lot of shade; use hung dishes for food and water; only bring porcupine out during the day because if we leave her out overnight we have to give  
  
12 guage wire. Logs at all levels. Set in natural foliage. Hollowed out logs perfect for shelter.  
concrete floor, concrete rock work on backside of exhibit extending 10' high; concrete tree with hollowed out area (which can be heated); several oak branches, multiple feed stations, sprinkler system; 1" x 1" coated wire

Brevard

Central Florida Zoo

Cincinnati Zoo and Botanical Garden  
Lake Superior Zoo  
Los Angeles Zoo  
Tautphaus Park Zoo  
Virginia Zoological Park  
Wildlife Conservation Society / Bronx Zoo

**Question:**

**Institution**

Alberquerque Biological Park  
Baltimore Zoo  
Brandywine Zoo  
Brevard  
Central Florida Zoo  
Cincinnati Zoo and Botanical Garden  
Lake Superior Zoo  
Los Angeles Zoo  
Tautphaus Park Zoo  
Virginia Zoological Park  
  
Wildlife Conservation Society / Bronx Zoo

**Are your porcupines part of a mixed species exhibit?**

**Response**

Yes  
no  
yes  
NO  
no  
no  
Yes  
Yes  
  
no, they used to be in with common marmosets (2.0) and acouchi(0.1)  
yes

**Question:**

**Institution**

Alberquerque Biological Park  
Baltimore Zoo  
Brandywine Zoo

**If so, what species are they mixed with?**

**Response**

Assorted Birds  
  
domestic rabbit, box turtle; outreach animals have also mixed porcupines with goeldis and an old red handed tamarin

Brevard

Central Florida Zoo

Cincinnati Zoo and Botanical Garden

Lake Superior Zoo

Los Angeles Zoo

Tautphaus Park Zoo

Virginia Zoological Park

Octodon degus

3 banded armadillo - single male (Tolypeutes matacus)

Wildlife Conservation Society / Bronx Zoo

Douroncouli Monkey, Striped Skunks

**Question:**

**Institution**

Alberquerque Biological Park

Lake Superior Zoo

Los Angeles Zoo

Virginia Zoological Park

Wildlife Conservation Society / Bronx Zoo

Wildlife Conservation Society / Bronx Zoo

**Mixed Species / Comments:**

**Response**

The porcupines have been seen eating the birds food and vice a versa.

not good for degus - they (naturally) consume the phtp diet, not healthy for them

compatible species - porcupine occasionally attempts to enter armadillo nestbox w/armadillo in it, porcupine has not tried to injure armadillo

marmoset: one of the marmosets got quills in his face on a weekly basis

Monkey: there isn't any interaction between these two species, they seem to tolerate each other well

Skunk: skunks enjoy what the porcupines drop on the floor

**Question:**

**Institution**

Alberquerque Biological Park

Baltimore Zoo

Brandywine Zoo

Brevard

Central Florida Zoo

Cincinnati Zoo and Botanical Garden

Lake Superior Zoo

Los Angeles Zoo

Tautphaus Park Zoo

Virginia Zoological Park

Wildlife Conservation Society / Bronx Zoo

**Are your porcupines singly housed?**

**Response**

Yes and No

yes

yes (one adult) and no

Yes

no

yes

No

No

Yes

no, except education animals which are housed singly

no

**Question:**

**Institution**

Alberquerque Biological Park

Baltimore Zoo

Brandywine Zoo

Brevard

Central Florida Zoo

Cincinnati Zoo and Botanical Garden

Lake Superior Zoo

Los Angeles Zoo

Tautphaus Park Zoo

Virginia Zoological Park

Wildlife Conservation Society / Bronx Zoo

**If not, how many animals are housed together?**

**Response**

We have a single education animal - 1.1 in 1 cage (breeding pair) - 1.1 in another cage ( mom and offspring)

parents and one offspring

1.2

0.1.1

4.3

2 (1.1)

1.1

1.1

**Question:**

**Institution**

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

**Response**

Albuquerque Biological Park	We howdy them for a few days and then intro in an exhibit neither one has been in awhile, or in the largest of the howdy cages. We watch for aggression - biting, chasing. We have less aggression when they are introduced into a new cage for both of them
Baltimore Zoo	
Brandywine Zoo	have never had any problems with introductions
Brevard	If not related, same sex tends to fight.
Central Florida Zoo	
Cincinnati Zoo and Botanical Garden	
Lake Superior Zoo	I have a family group now. I have had no luck introducing foreign phtp. Much fighting and bloodshed.
Los Angeles Zoo	We currently have only a single male, but generally we house a pair without much trouble.
Tautphaus Park Zoo	
Virginia Zoological Park	our female was hand-raised and won't tolerate any other porcupines- she will quill her young to death at birth if they are not pulled immediately; she does tolerate the male she lives with
Wildlife Conservation Society / Bronx Zoo	

**Question:**

**Institution**

Albuquerque Biological Park  
 Baltimore Zoo  
 Brandywine Zoo  
 Brevard  
 Central Florida Zoo  
 Cincinnati Zoo and Botanical Garden  
 Lake Superior Zoo  
 Los Angeles Zoo  
 Tautphaus Park Zoo  
 Virginia Zoological Park  
 Wildlife Conservation Society / Bronx Zoo

**Do you separate animals at night?**

**Response**

Yes - For a couple of nights  
 no  
 No  
 no  
 no  
 No  
 No  
 no  
 no  
 no

**Question:**

**Institution**

Albuquerque Biological Park  
 Baltimore Zoo  
 Brandywine Zoo  
 Brevard

**Please describe your porcupine diet:**

**Response**

Rat chow, monkey chow, primate diet, corn, peanuts, sweet potato, carrot, apple, greens, grapes  
 45g ZuPreem canned primate diet, 75g apple, 35g carrot, 55g yam, 2 peanuts, 1 block lo protein monkey chow, 10g kale; corn on the cob, special veggies, melon, sunflower seed and squash are offered as treats.  
 this is for two porcs and is modified for the single adult housed separately: morning: .078kg apples, .016kg raw peanuts, .114kg banana w/o peel, .012kg omnivore biscuit (Mazuri), .068kg raw carrots, .248kg corn on the cob, .02kg fresh spinach; evening:  
 Primate biscuits, rodent blocks, sweet potato, carrot, spinach or kale, corn on the cob, banana, grapes and brocolli. Peanuts are offered during conditioning and enrichment.

Central Florida Zoo	Mazuri browse biscuit 2x daily; morning feeding accompanied with leafy greens, evening feeding accompanied with approximately 1 cup of produce
Cincinnati Zoo and Botanical Garden	1 raw yam thickly sliced, 1 raw carrot thickly sliced, 1 apple thickly sliced, 15 spinach leaves, 1 cup lab rat pellets
Lake Superior Zoo	Rodent chow as base, fresh fruits, veggies and greens also fed daily, but type is rotated for variety. Also get peanuts, hard nuts, bread, canned primate 1-2x weekly.
Los Angeles Zoo	Fed once daily in the evening. 2 leaves romaine lettuce, 1 banana peeled, 4 pcs monkey chow, 1/4 cup rodent block, 1 carrot, 1/2 apple, 2 sm raw yams, 1/4 ear corn (in rounds), handful peanuts - Items cut "chunky"
Tautphaus Park Zoo	1/2 apple chopped 1/2 c. sw. potato chopped 1/2 carrot sliced 1/2 c. greens 3/4 c. rodent blocks 3/4 c. leafeater (~12 biscuits) 1/2 banana 1/2 tsp clovite
Virginia Zoological Park	for 1.1: morning: 1 cup rodent chow, 1 cup peanuts and sunflower seeds, 2-1" slices of canned primate diet (Zupreem); evening: 1/2 apple, 1" slice sweet potato, 2-1" slices of carrot, 1 cup greens, 1 ear corn on the cob (sprinkled with Pervinal)
Wildlife Conservation Society / Bronx Zoo	25 rodent pellets each, 1 med. Carrot, 1 med. Yam, 1 apple, 1 banana, kale, treats include browse and mixed nuts

**Question:**

**Institution**

Albuquerque Biological Park  
Baltimore Zoo  
Brandywine Zoo  
Brevard  
Central Florida Zoo  
Cincinnati Zoo and Botanical Garden  
Lake Superior Zoo  
Los Angeles Zoo  
Tautphaus Park Zoo  
Virginia Zoological Park  
Wildlife Conservation Society / Bronx Zoo

**How is the diet presented?**

**Response**

In bowls  
chopped, into two small bowls, some scattered through enclosure  
in a rectangular metal dish  
Bowls in various parts of the exhibit, off the exhibit floor. Mostly placed in holders on logs.  
metal bowl placed in a variety of bowl holders throughout the exhibit  
food cut thick slices and served in a metal bowl  
Usually fed in 3 bowls rotated among 5 feeding stations. Whole food items sometimes hung. Sometimes use a puzzle feeder for pellets and nuts.  
diet is fed in a rubber tub on a tree limb - water is also offered this way  
In flat metal dish on floor.  
spread around exhibit, some in pans in trees  
in one hanging food pan that is shared by both animals

**Question:**

**Institution**

Albuquerque Biological Park

**How many times per day are the animals fed?**

**Response**

2 x day

Baltimore Zoo	once for main diet, periodically for training sessions and on programs
Brandywine Zoo	2x
Brevard	Twice
Central Florida Zoo	twice
Cincinnati Zoo and Botanical Garden	once in the afternoon
Lake Superior Zoo	1 x officially, usually leave a handful of pellets in AM
Los Angeles Zoo	once, in early evening by second shift keeper
Tautphaus Park Zoo	Once
Virginia Zoological Park	2x
Wildlife Conservation Society / Bronx Zoo	twice per day, the above diet is split in half

**Question:**

**How are your porcupines restrained for medical procedures?**

**Institution**

**Response**

Albuquerque Biological Park  
 If a visual only - We can grab by the tail and hold in our hand - Some we have to wear gloves - We have not had to sedate them

Baltimore Zoo	anesthesia
Brandywine Zoo	initially hold with leather glove, towels and newspaper used as a barrier- doesn't work real well; fortunately most of our porcupines are tolerant of handling
Brevard	Isoflurane
Central Florida Zoo	place porcupine in large plastic container (using gloves) and hook gas into hole designed into container until sedated
Cincinnati Zoo and Botanical Garden	use of thick leather gloves
Lake Superior Zoo	Wrapped in towel, held with gloves and gassed down
Los Angeles Zoo	gas anesthesia
Tautphaus Park Zoo	Hand held for most procedures. Pole syringe also effective.
Virginia Zoological Park	immobilized or squeeze cage
Wildlife Conservation Society / Bronx Zoo	these animals are often placed in an induction chamber where isoflurane gas is introduced for anesthesia

**Question:**

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

**Institution**

**Response**

Albuquerque Biological Park	
Baltimore Zoo	isoflurane, very effective
Brandywine Zoo	haven't anesthetized in a very long time- data is probably outdated at this point
Brevard	Same as above
Central Florida Zoo	chamber induction with 5% isoflurane in oxygen (3L/min), then maintained on 2-3% isoflurane in oxygen (3L/min)
Cincinnati Zoo and Botanical Garden	
Lake Superior Zoo	isoflurane - works good once excitement stage is passed. Fast recovery.
Los Angeles Zoo	isoflurane gas - good results
Tautphaus Park Zoo	Pole syringe to administer ketamine and xylazine has been done once. Worked very well.
Virginia Zoological Park	ketamine- very good results

Wildlife Conservation Society / Bronx Zoo

given the smaller size of the prehensile-tail porcupine these animals are often placed in an induction chamber where isoflurane gas can be introduced without manual restraint; once the animal is asleep, he/she can be removed from the box and continue rec

**Question:**

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

**Institution**

**Response**

Alberquerque Biological Park  
Baltimore Zoo  
Brandywine Zoo  
Brevard  
Central Florida Zoo  
Cincinnati Zoo and Botanical Garden  
Lake Superior Zoo  
Los Angeles Zoo  
Tautphaus Park Zoo  
Virginia Zoological Park  
Wildlife Conservation Society / Bronx Zoo

None  
loss of quills during gas down  
None  
None  
none  
none

**Question:**

**What routine medical procedures do you perform on your porcupines?**

**Institution**

**Response**

Alberquerque Biological Park  
Baltimore Zoo  
Brandywine Zoo  
Brevard  
Central Florida Zoo  
Cincinnati Zoo and Botanical Garden  
Lake Superior Zoo  
Los Angeles Zoo  
Tautphaus Park Zoo  
Virginia Zoological Park  
Wildlife Conservation Society / Bronx Zoo

None  
annual physicals  
fecals  
None  
annual exams  
yearly physicals, fecals e/6 mo, nail trims as needed  
None at this time  
complete physical every other year  
yearly gastrolith check by x-ray and palpations, surgery to remove if necessary  
physical examination, bloodwork, fecal floats and cultures are routinely performed on incoming animals being introduced into the collection; medical procedures are performed on current collection porcupines only if indicated (symptoms of illness observe

**Question:**

**What vaccinations do you use?**

**Institution**

**Response**

Alberquerque Biological Park  
Baltimore Zoo  
Brandywine Zoo  
Brevard  
Central Florida Zoo  
Cincinnati Zoo and Botanical Garden  
Lake Superior Zoo  
Los Angeles Zoo  
Tautphaus Park Zoo

None  
rabies (education animal)  
none  
None  
rabies every year  
none  
None  
None

Virginia Zoological Park	none
Wildlife Conservation Society / Bronx Zoo	no routine vaccinations are given; rabies vaccines are provided in education animals

**Question:**

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

**Institution**

**Response**

Albuquerque Biological Park  
 Baltimore Zoo  
 Brandywine Zoo  
 Brevard

Overgrown teeth, dry skin  
  
 mostly watching feces- have had diarrhea periodically  
 Parasites, we received a pair with whipworm which is hard to get rid of and salmonella has also been a problem.

Central Florida Zoo  
 Cincinnati Zoo and Botanical Garden  
 Lake Superior Zoo  
 Los Angeles Zoo  
 Tautphaus Park Zoo  
 Virginia Zoological Park

None  
 None  
 recently; monkey pox, but not concerned that much in zoo; our North American Porcupines when we had them had a titer for Toxo, so we just took precautions, esp. for women that were or could become pregnant

Wildlife Conservation Society / Bronx Zoo

gastric trichobezoars, dystocia, salmonella

**Question:**

**Have you successfully bred this species at your institution?**

**Institution**

**Response**

Albuquerque Biological Park  
 Baltimore Zoo  
 Brandywine Zoo  
 Brevard  
 Central Florida Zoo  
 Cincinnati Zoo and Botanical Garden  
 Lake Superior Zoo  
 Los Angeles Zoo  
 Tautphaus Park Zoo  
 Virginia Zoological Park  
 Wildlife Conservation Society / Bronx Zoo

Yes  
 no  
 yes  
 Yes  
 yes  
 no  
 Yes  
 No  
 N/A - single animal  
 yes  
 yes

**Question:**

**Do you keep the sexes together at all times?**

**Institution**

**Response**

Albuquerque Biological Park  
 Baltimore Zoo  
 Brandywine Zoo  
 Brevard  
 Central Florida Zoo  
 Cincinnati Zoo and Botanical Garden  
 Lake Superior Zoo  
 Los Angeles Zoo  
 Tautphaus Park Zoo  
 Virginia Zoological Park

Yes  
  
 yes  
 Yes  
 yes (currently without a male)  
  
 Yes  
 Yes  
 yes

Wildlife Conservation Society / Bronx Zoo      yes

**Question:**

**Institution**

Albuquerque Biological Park

Baltimore Zoo

Brandywine Zoo

Brevard

Central Florida Zoo

Cincinnati Zoo and Botanical Garden

Lake Superior Zoo

Los Angeles Zoo

Tautphaus Park Zoo

Virginia Zoological Park

Wildlife Conservation Society / Bronx Zoo

**Do you introduce the sexes for breeding?**

**Response**

Yes

No

no

No

no

**Question:**

**Institution**

Albuquerque Biological Park

Baltimore Zoo

Brandywine Zoo

Brevard

Central Florida Zoo

Cincinnati Zoo and Botanical Garden

Lake Superior Zoo

Los Angeles Zoo

Tautphaus Park Zoo

Virginia Zoological Park

Wildlife Conservation Society / Bronx Zoo

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

**Response**

We have 1 male that we alternate w/2 females - The male is left w/the female till after she gives birth, and is allowed to re-breed her after the birth. We keep them together for about 1 month, then he is pulled to be introduced to the other female.

we have always just put the porcupines together and had no problems; there is a definite preference in companions though

**Question:**

**Institution**

Albuquerque Biological Park

Baltimore Zoo

Brandywine Zoo

Brevard

Central Florida Zoo

Cincinnati Zoo and Botanical Garden

Lake Superior Zoo

Los Angeles Zoo

Tautphaus Park Zoo

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

**Response**

No

yes, so sexes are separated prior to birth

No

no

No

Virginia Zoological Park

males and females are not seperated before the birth; yes, the female will quill the young to death at birth (see above)

Wildlife Conservation Society / Bronx Zoo

no

**Question:**

**Do you make any special preparations for the birth?**

**Institution**

**Response**

Alberquerque Biological Park

No

Baltimore Zoo

Brandywine Zoo

no

Brevard

Increase diet

Central Florida Zoo

no

Cincinnati Zoo and Botanical Garden

Lake Superior Zoo

No - maybe increase diets

Los Angeles Zoo

Tautphaus Park Zoo

Virginia Zoological Park

no

Wildlife Conservation Society / Bronx Zoo

no

**Question:**

**If yes, what are they?**

**Institution**

**Response**

Alberquerque Biological Park

Baltimore Zoo

Brandywine Zoo

Brevard

Central Florida Zoo

Cincinnati Zoo and Botanical Garden

Lake Superior Zoo

Los Angeles Zoo

Tautphaus Park Zoo

Virginia Zoological Park

Wildlife Conservation Society / Bronx Zoo

**Question:**

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

**Institution**

**Response**

Alberquerque Biological Park

Our 1st birth was a small baby and we ended up pulling for hand feeding at about 10 days. Our second (we only have had 2) is still with mom - it is 3 months old now - they will stay together hopefully at least 6 months.

Baltimore Zoo

Brandywine Zoo

we have always had to hand-rear the young; however we try to keep the young with the parents all day as often as possible- it definetly promotes locomotor skills

Brevard

Stay in exhibit until transferred. Never has a problem with aggression with related animals.

Central Florida Zoo

Cincinnati Zoo and Botanical Garden

Lake Superior Zoo

until they have a new home

Los Angeles Zoo

Tautphaus Park Zoo

Virginia Zoological Park	remove immediately after birth due to past experience with this female
Wildlife Conservation Society / Bronx Zoo	depends on offspring sex

**Question:**

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

**Institution**

**Response**

Alberquerque Biological Park	
Baltimore Zoo	
Brandywine Zoo	
Brevard	Years
Central Florida Zoo	
Cincinnati Zoo and Botanical Garden	
Lake Superior Zoo	indefinitely
Los Angeles Zoo	
Tautphaus Park Zoo	
Virginia Zoological Park	
Wildlife Conservation Society / Bronx Zoo	

**Question:**

**What concerns do you have when housing the group together?**

**Institution**

**Response**

Alberquerque Biological Park	Making sure they all get enough food, aggression
Baltimore Zoo	
Brandywine Zoo	
Brevard	Inbreeding
Central Florida Zoo	
Cincinnati Zoo and Botanical Garden	
Lake Superior Zoo	inbreeding
Los Angeles Zoo	
Tautphaus Park Zoo	
Virginia Zoological Park	
Wildlife Conservation Society / Bronx Zoo	

**Question:**

**Have you ever had to pull offspring for any reason?**

**Institution**

**Response**

Alberquerque Biological Park	Yes
Baltimore Zoo	
Brandywine Zoo	yes
Brevard	No
Central Florida Zoo	no
Cincinnati Zoo and Botanical Garden	
Lake Superior Zoo	Yes
Los Angeles Zoo	
Tautphaus Park Zoo	
Virginia Zoological Park	yes
Wildlife Conservation Society / Bronx Zoo	yes

**Question:**

**Have you hand reared offspring?**

**Institution**

**Response**

Alberquerque Biological Park	Yes
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Baltimore Zoo	
Brandywine Zoo	yes
Brevard	No
Central Florida Zoo	no
Cincinnati Zoo and Botanical Garden	
Lake Superior Zoo	Yes
Los Angeles Zoo	
Tautphaus Park Zoo	
Virginia Zoological Park	yes
Wildlife Conservation Society / Bronx Zoo	

**Question:**

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

**Institution**

**Response**

Albuquerque Biological Park

We started w/ canned milk 2:1, until we got zoo matrix delivered (about 3 days). She was slowly switched to the recommended zoo matrix diet - she was fed 10% of body weight. Since she was 10 days old we were at 8 feedings/day for just a few days - then

Baltimore Zoo

Brandywine Zoo

weigh infant, start infant on mother's milk (milk mother several times per day), eventually switch infant to formula. FORMULA: make evaporated milk to boiled water 1:1 ratio, make Esbilac to boiled water 2:1 ratio, make Evaporated water mix to Esbilac m

Brevard

Central Florida Zoo

Cincinnati Zoo and Botanical Garden

Lake Superior Zoo

Esbilac/water 1:2 flavored with small amount of fruit baby food or applesauce and rice cereal if not gaining. Feed 6 x day to start, decrease as grows wean at about 4 mo

Los Angeles Zoo

Tautphaus Park Zoo

Virginia Zoological Park

50/50 water/evaporated milk fed 3x/day; no more milk at all after 11 weeks

Wildlife Conservation Society / Bronx Zoo

the baby wasn't nursing; he was kept with mom in a separate holding area from the male; he was supplemented (4x) daily with bottle feedings

**Question:**

**Have you used any type of contraception for your porcupines?**

**Institution**

**Response**

Albuquerque Biological Park

No

Baltimore Zoo

Brandywine Zoo

no

Brevard

No

Central Florida Zoo

no

Cincinnati Zoo and Botanical Garden

Lake Superior Zoo

No

Los Angeles Zoo

Tautphaus Park Zoo

Virginia Zoological Park

no

Wildlife Conservation Society / Bronx Zoo no

**Question:**

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

**Institution**

**Response**

Albuquerque Biological Park  
Baltimore Zoo  
Brandywine Zoo  
Brevard  
Central Florida Zoo  
Cincinnati Zoo and Botanical Garden  
Lake Superior Zoo  
Los Angeles Zoo  
Tautphaus Park Zoo  
Virginia Zoological Park  
Wildlife Conservation Society / Bronx Zoo

**Question:**

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

**Institution**

**Response**

Albuquerque Biological Park  
Baltimore Zoo  
Brandywine Zoo  
Brevard  
Central Florida Zoo  
Cincinnati Zoo and Botanical Garden  
Lake Superior Zoo  
Los Angeles Zoo  
Tautphaus Park Zoo  
Virginia Zoological Park  
Wildlife Conservation Society / Bronx Zoo

Yes  
yes  
yes  
Yes  
yes  
yes  
Yes  
No  
Yes  
yes  
yes

**Question:**

**If yes, how is the porcupine used?**

**Institution**

**Response**

Albuquerque Biological Park  
  
Baltimore Zoo  
  
Brandywine Zoo  
  
Brevard  
Central Florida Zoo  
  
Cincinnati Zoo and Botanical Garden

Trainer or Docents handle her for guests. She is also taken out on the "Zoo To You" bus when the docents will be gone for a few days.  
  
he travels to schools, senior centers, PR/media events, festivals, and other off-grounds events. He is also used for on-ground classes, camps, events and other various educational opportunities  
  
outreach programs; can be handled by keeper, displayed; also placed on tables with food and will sit upright for visitors  
  
Placed on a log so it feels comfortable.  
  
our 1 month old offspring is being handled; we hope to take the baby to our black-tie event and possibly other PR outreaches  
  
our female porcupine has been used for on-grounds and off grounds lectures and educational presentations; she is comfortable being hand held and is crated for transportation; she is given a favorite food treat like banana or corn on the cob to eat and ho

Lake Superior Zoo  
Los Angeles Zoo  
Tautphaus Park Zoo  
Virginia Zoological Park  
Wildlife Conservation Society / Bronx Zoo

We have a tree stand porc goes on during talk. Kids are then able to approach and touch (and smell)

Animal Encounters shows on grounds and special events. She has gone off-site in past.

usually presented on a small crepe myrtle about 5' used in enclosed environment for special programs

**Question:**

**Institution**

Albuquerque Biological Park  
Baltimore Zoo  
Brandywine Zoo  
Brevard  
Central Florida Zoo  
Cincinnati Zoo and Botanical Garden  
Lake Superior Zoo  
Los Angeles Zoo  
Tautphaus Park Zoo  
Virginia Zoological Park  
Wildlife Conservation Society / Bronx Zoo

**Do you consider it a successful outreach animal?**

**Response**

Yes  
yes  
yes  
Most definitely  
it's too early to tell  
yes  
Yes  
Yes  
Yes  
yes  
yes

**Question:**

**Institution**

Albuquerque Biological Park  
Baltimore Zoo  
  
Brandywine Zoo  
Brevard  
Central Florida Zoo  
Cincinnati Zoo and Botanical Garden  
Lake Superior Zoo  
Los Angeles Zoo  
Tautphaus Park Zoo  
Virginia Zoological Park  
Wildlife Conservation Society / Bronx Zoo

**What behaviors have you trained?**

**Response**

Just to be handled  
He is target trained to stand on his hind legs showing his feet and his underbelly. He is trained to come out of his traveling kennel climb up a perch and sit at the top. He receives rewards at the top of his perch. Corn on the cob is the best reward  
  
none  
Crate trained  
  
no specific "trained behaviors" are used other than to have her sit on a table eating her food item  
Tolerate being picked up and touched, one will come when called, hand feed, allow nails to be trimmed  
  
Crate-trained in and out and onto a perch. She will maintain a "station" for banana.  
0.1 is crate trained  
handalable, sits for food rewards, will allow keeper to carry

**Question:**

**Institution**

Albuquerque Biological Park  
Baltimore Zoo  
Brandywine Zoo  
Brevard

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

**Response**

no

Central Florida Zoo	
Cincinnati Zoo and Botanical Garden	no
Lake Superior Zoo	
Los Angeles Zoo	Yes
Tautphaus Park Zoo	
Virginia Zoological Park	no
Wildlife Conservation Society / Bronx Zoo	

**Question:**

**Institution**

Albuquerque Biological Park  
 Baltimore Zoo  
 Brandywine Zoo  
 Brevard  
 Central Florida Zoo  
 Cincinnati Zoo and Botanical Garden  
 Lake Superior Zoo  
 Los Angeles Zoo  
  
 Tautphaus Park Zoo  
 Virginia Zoological Park  
 Wildlife Conservation Society / Bronx Zoo

**If yes, what behaviors have you trained?**

**Response**

Both animals were trained to crate. They were crated regularly for weighing.

**Question:**

**Institution**

Albuquerque Biological Park  
 Baltimore Zoo  
 Brandywine Zoo  
 Brevard  
 Central Florida Zoo  
 Cincinnati Zoo and Botanical Garden  
 Lake Superior Zoo  
 Los Angeles Zoo  
 Tautphaus Park Zoo  
 Virginia Zoological Park  
 Wildlife Conservation Society / Bronx Zoo

**Do you have any plans for future training ?**

**Response**

no  
 Yes  
 yes  
 no  
 No - lack of time  
 No  
 Yes, as education program and staffing develops.  
 no  
 yes

**Question:**

**Institution**

Albuquerque Biological Park  
 Baltimore Zoo  
 Brandywine Zoo  
 Brevard  
 Central Florida Zoo  
 Cincinnati Zoo and Botanical Garden  
 Lake Superior Zoo  
  
 Los Angeles Zoo  
 Tautphaus Park Zoo

**What behaviors would you most like to train?**

**Response**

Nail Trim  
  
 Shift  
  
 crate training  
 They should know their names and come when called, enter/exit a crate readily. We have one that walks on a wheel and that is very cute.

Virginia Zoological Park  
Wildlife Conservation Society / Bronx Zoo

target, for physical (visual) examination - esp. for mom with a newborn

**Question:**

**Do you provide your porcupines with environmental enrichment?**

**Institution**

**Response**

Alberquerque Biological Park  
Baltimore Zoo  
Brandywine Zoo  
Brevard  
Central Florida Zoo  
Cincinnati Zoo and Botanical Garden  
Lake Superior Zoo  
Los Angeles Zoo  
Tautphaus Park Zoo  
Virginia Zoological Park  
Wildlife Conservation Society / Bronx Zoo

Yes  
yes  
yes  
Yes  
yes  
yes  
Yes  
Yes  
Yes  
yes  
yes

**Question:**

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

**Institution**

**Response**

Alberquerque Biological Park  
  
Baltimore Zoo  
  
  
Brandywine Zoo  
  
  
Brevard  
Central Florida Zoo  
  
  
Cincinnati Zoo and Botanical Garden  
  
  
Lake Superior Zoo  
  
Los Angeles Zoo  
  
Tautphaus Park Zoo

Food hidden in assorted boxes, bags - Good scents-ok, browse-good  
he is provided several enrichment items weekly and at least one daily. A portion of his diet is scattered around his enclosure, he gets a variety of additional produce. He receives browse weekly and is given the opportunity to exercise outside. He al  
  
scattered food, browse, outreach animal taken on short walks or allowed to run free in building hallways (loves this)  
  
our porcupines receive a variety of browse, favorites being hibiscus, sweet gum and sugar cane; we hide their food in the props and around the exhibit; they are given frozen treats, have a sprinkler system attached to exhibit and several perfumes/spices  
  
toiletpaper tubes stuffed with treats, newspaper balls, logs and branches, pine cones, boomer balls, boxes, frozen gatorade cubes, cereal, oyster crackers, popcorn, bread slices, non-toxic flowers, corn on the cob, novelty fruits, whole bananas, peanuts,  
  
Browse 9branch, tree and hay), puzzle feeders, ropes, wheel (only one uses it), boxes, bags, scents (? Effect), music/animal sounds (? Effect)  
  
Browse items hung in perching - porcupines enjoy "rearranging" them. They will eat acacia and mulberry browse. Corn cobs or appl halves hung on skewers in perching, also raw yams or carrots on skewers.  
  
antler sheds to chew on, shredded paper nests, whole fruits and vegetables, ice cubes with fruits & veggies. Her interest/attention span is relatively short for all.

Virginia Zoological Park

browse items, hanging baskets with plants, Christmas trees (seasonal), hanging wire basket puzzle feeder, spread diet throughout exhibit; all are considered successful; spices are pretty much ignored

Wildlife Conservation Society / Bronx Zoo

browse, chewing logs

**Question:**

**Institution**

Alberquerque Biological Park

Baltimore Zoo

Brandywine Zoo

Brevard

Central Florida Zoo

Cincinnati Zoo and Botanical Garden

Lake Superior Zoo

Los Angeles Zoo

Tautphaus Park Zoo

Virginia Zoological Park

Wildlife Conservation Society / Bronx Zoo

**Have you ever shipped a porcupine?**

**Response**

No

yes

Yes

yes

no

Yes

No

Not recently.

yes

yes

**Question:**

**Institution**

Alberquerque Biological Park

Baltimore Zoo

Brandywine Zoo

Brevard

Central Florida Zoo

Cincinnati Zoo and Botanical Garden

Lake Superior Zoo

Los Angeles Zoo

Tautphaus Park Zoo

Virginia Zoological Park

Wildlife Conservation Society / Bronx Zoo

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

**Response**

medium sized plastic dog carrier, Care Fresh paper bedding

Sky kennel, followed IATA's recommendations.

we shipped our juvenile in a standard large kennel with oak props

use a small dog crate

1"x 2" wire cage inside of a medium Vari-kennel; also have done 2 at once in a wood crate split in the center and lined with sheet metal

we use International Air Transport Association guidelines when shipping porcupines

**Question:**

**Institution**

Alberquerque Biological Park

Baltimore Zoo

Brandywine Zoo

Brevard

Central Florida Zoo

Cincinnati Zoo and Botanical Garden

Lake Superior Zoo

Los Angeles Zoo

Tautphaus Park Zoo

**Comments or ideas to include in the Husbandry Standards:**

**Response**

great survey

Virginia Zoological Park

our breeding female was hand-raised and does not make a good mother; hand-raised are great education animals but not good for parental care

Wildlife Conservation Society / Bronx Zoo