

Porcupine Husbandry Survey

Hystrix cristata

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

Are your porcupines housed primarily indoors?

Response

yes
yes
yes
no
No - completely outdoors
Yes

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

What are the dimensions of your indoor exhibit?

Response

36x12
12' w x 24' l
30' x 30'
N/A

Approximately 15' x 15'

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

Is there shifting capability?

Response

yes
yes
no
Yes

No

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo

North Carolina Zoo

San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

Please describe the general design of your indoor exhibit?

Response

three areas with combination cement trees, brsh,
this exhibit was in a nocturnal building; concrete flooring with some raised gunite type
rock formation that sloped as high as 6 feet in areas; below the raised area was a
"cave" that abutted the front glass viewing area

triangular shaped indoor exhibit, floor surface gunnite covered with bark mulch;
concrete walls 4' high, 3 sides, glass/windows, 4th side
N/A

The sleeping area is flat for substrate. The exhibit has two windows: one facing
outdoors, the other facing the public. The main area has a more "rocky" surface with
several fake boulders and one movable boulder. This area is broken up by a drain
tunn

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo

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

Response

Planting mulch
the floor was not covered; brushed and smooth concrete
bark mulch
Dirt and Cedar chips, gunnite and concrete, mulch.

Santa Ana Zoo
Utah's Hogle Zoo

Straw is used in the sleeping area; bark or leaves are used in other areas. Some of the floor is left bare.

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

What cage furniture do you use?

Response

logs, limbs, bones
deadfall and other logs
rocks, logs
Tree stumps, pine branches, rocks, waterfall, pool

Movable boulder, logs, substrate

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

What type of heating and ventilation system do you use?

Response

central
building is on a central system; maintained as close to mid-70's as possible
forced air heat, fans in summer
Heat lamp in ceiling of cage/bed area. No vent system - outside.

The exhibit is inside a heated building and air conditioned in the summer with an evaporative cooler.

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

What is the average temperature range of your indoor exhibit?

Response

68-78 deg. F
mid 70's to low 80's
60 degrees in winter- 90 degrees in summer
N/A

~65-70 degrees

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

Is the exhibit on a light cycle?

Response

yes
yes
no
Yes

No

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

If so, what is the day/night cycle?

Response

37967
reverse, on timers- 11hrs. night, 13hrs. day
natural light cycle via windows
Natural (outside)

N/A

Question:

Do your porcupines have an outdoor exhibit?

Institution

Louisiana Purchase Gardens and Zoo
 Nashville Zoo
 North Carolina Zoo
 San Diego Zoo
 Santa Ana Zoo
 Utah's Hogle Zoo

Response

no
 no
 no
 yes
 Yes - only display space
 No

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

Louisiana Purchase Gardens and Zoo
 Nashville Zoo
 North Carolina Zoo
 San Diego Zoo
 Santa Ana Zoo
 Utah's Hogle Zoo

Response

No
 No-out year round
 N/A

Question:**If so, what are your temperature guidelines?****Institution**

Louisiana Purchase Gardens and Zoo
 Nashville Zoo
 North Carolina Zoo
 San Diego Zoo
 Santa Ana Zoo
 Utah's Hogle Zoo

Response

Temp range is mid 30's to 110
 N/A

Question:**Do you have an indoor holding area?****Institution**

Louisiana Purchase Gardens and Zoo
 Nashville Zoo
 North Carolina Zoo
 San Diego Zoo
 Santa Ana Zoo
 Utah's Hogle Zoo

Response

Yes
 no
 No

Question:**What is the dimension of your indoor holding space?****Institution**

Louisiana Purchase Gardens and Zoo
 Nashville Zoo
 North Carolina Zoo
 San Diego Zoo
 Santa Ana Zoo
 Utah's Hogle Zoo

Response

2 faceted: indoor holding space = 4'10"x3'3"x5'2" Outdoor yard (incorporated w/holding) off exhibit=9'8"x4'3"x5'5" Concrete and chain-link

N/A

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

Louisiana Purchase Gardens and Zoo
 Nashville Zoo
 North Carolina Zoo

Response

San Diego Zoo	Enter from exhibit through a guillotine door into an area with a concrete floor and gunnite and chain link walls, no roof.
Santa Ana Zoo	
Utah's Hogle Zoo	N/A

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

Louisiana Purchase Gardens and Zoo	
Nashville Zoo	
North Carolina Zoo	
San Diego Zoo	Natural
Santa Ana Zoo	
Utah's Hogle Zoo	N/A

Question: **What are the dimensions of your outdoor exhibit?**
Institution **Response**

Louisiana Purchase Gardens and Zoo	
Nashville Zoo	
North Carolina Zoo	
San Diego Zoo	18'x27'x4 1/2' Glass viewing panels along front
Santa Ana Zoo	15'x30'
Utah's Hogle Zoo	N/A

Question: **Please describe your outdoor exhibit.**
Institution **Response**

Louisiana Purchase Gardens and Zoo	
Nashville Zoo	
North Carolina Zoo	
San Diego Zoo	Waterfall ending in a pool in 1/2 of exhibit. Shelter cave on back wall next to waterfall has heat lamp capability for cold weather w/ small bark chips for substrate. Rest of exhibit dirt plus small bark chips. Metal bowl in concrete base provided for
Santa Ana Zoo	Semi-circular space, Soil substrate with wire mesh 2' below soil, cement block retaining wall on curved side, rock work on straight side, termite mound style shelter.
Utah's Hogle Zoo	N/A

Question: **Are your porcupines part of a mixed species exhibit?**
Institution **Response**

Louisiana Purchase Gardens and Zoo	no
Nashville Zoo	yes
North Carolina Zoo	yes
San Diego Zoo	No
Santa Ana Zoo	Yes-porcupines confined to their area, but Ring-tail lemurs, rock hyrax, trumpeter hornbills all have access to porcupine space.
Utah's Hogle Zoo	No

Question: **If so, what species are they mixed with?**
Institution **Response**

Louisiana Purchase Gardens and Zoo	We are going to try them with servals
Nashville Zoo	Indian Flying Fox, Pteropus giganteus
North Carolina Zoo	meerkats

San Diego Zoo
Santa Ana Zoo

Ring-tail lemurs, rock hyrax, trumpeter hornbills. There are dik-dik in the exhibit but they never jump the wall into the porcupine area.

Utah's Hogle Zoo

N/A

Question:

Institution

Nashville Zoo
North Carolina Zoo
San Diego Zoo
San Diego Zoo

Mixed Species / Comments:

Response

no interaction, no problems as bats perched in upper area of exhibit
have to watch porcupines- occasionally try to eat meerkat diet
1.2 Northern and Southern Crested Porcupines
0.1 Northern Crested Porcupine 1.1 So. African Crested Porcupine (3 1/2 yrs. Old) siblings
N/A
N/A
N/A
N/A

Utah's Hogle Zoo
Utah's Hogle Zoo
Utah's Hogle Zoo
Utah's Hogle Zoo

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

Are your porcupines singly housed?

Response

no
no
no
No
Currently we only have a single male - searching for mate.
No

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

If not, how many animals are housed together?

Response

pair (1.1)
2
2 females
1 to 2

Two

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

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

Response

housed together for many years, no introductions done in a very long time

Previous introduction of a female was uneventful.
Possibility of not getting along and fighting.

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo

Do you separate animals at night?

Response

no
yes
no
No
When we had a pair, there was no separation

Utah's Hogle Zoo

No

Question:
Institution

Louisiana Purchase Gardens and Zoo

Please describe your porcupine diet:
Response

Comercial rodent block, suplemented with yams, carrots, small amount of fruit

Nashville Zoo

North Carolina Zoo

170g Marion Leafeater, 128g Celery or celery ends, 114g carrot, 212g apple, 85g orange, 140g banana, 44g sweet potato, 72g turnip, 72g kale; 1 petform vitamin, ground and sprinkled over diet

San Diego Zoo

Daily: 2 cups 1/2" high fiber herbivore pellet, 10 pcs. Lagrge (gorilla size) dry folivore, 1/2 ear corn on the cob; One of these items daily: 1/5 head cabbage, 12 kale leaves, 8 leaves collard greens, 8 bunches spinach, 8 leaves dandelion greens, 2 car

Santa Ana Zoo

Fresh browse daily/free choice, 2809 gram apple,194 grams broccoli,86 grams carrot,150 grams romaine, 30 grams orange, 120 grams Mazuri primate browse biscuit, 260 grams yam. Note: all primate biscuit for lemurs also fed in porcupine area as the lemurs w

Utah's Hogle Zoo

(PER ANIMAL) 258 grams yam; 230 grams potato; 75 grams carrot; 209 grams apple; 148 grams primate browse chow; 32 grams kale; 260 grams spinach or arugula

Question:
Institution

Louisiana Purchase Gardens and Zoo

Nashville Zoo

North Carolina Zoo

San Diego Zoo

Santa Ana Zoo

Utah's Hogle Zoo

How is the diet presented?
Response

In pans, some hidden for enrichment

scattered in exhibit in am, separated and fed in dishes in pm

Large rectangular shallow metal pan

Place in large flatish stainless steel pan.

Scatter feedings

Question:
Institution

Louisiana Purchase Gardens and Zoo

Nashville Zoo

North Carolina Zoo

San Diego Zoo

Santa Ana Zoo

Utah's Hogle Zoo

How many times per day are the animals fed?
Response

1

2

Once

Once

Two; Morning and afternoon

Question:

Institution

Louisiana Purchase Gardens and Zoo

Nashville Zoo

North Carolina Zoo

San Diego Zoo

Santa Ana Zoo

Utah's Hogle Zoo

How are your porcupines restrained for medical procedures?

Response

No treatment so far

for nail trims- walked into a wire cage and trim nails from below; would walk into a crate or squeeze cage and staff were able to pole inject

Anesthesia

Blow darted

Chemical restraint

Question:

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

Institution

Louisiana Purchase Gardens and Zoo
 Nashville Zoo
 North Carolina Zoo
 San Diego Zoo
 Santa Ana Zoo
 Utah's Hogle Zoo

Response

Consult vets
 Ketamine+Torbutol+Domitor. Procedure went well for this animal.
 Telazol (dart) supplemented with Ketamine.

Question:

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

Institution

Louisiana Purchase Gardens and Zoo
 Nashville Zoo
 North Carolina Zoo
 San Diego Zoo
 Santa Ana Zoo
 Utah's Hogle Zoo

Response

One female down with Ketamine+Acepromazine died after waking up. Histo report concluded death was from idiopathic anesthesia reaction.
 None

Question:

What routine medical procedures do you perform on your porcupines?

Institution

Louisiana Purchase Gardens and Zoo
 Nashville Zoo
 North Carolina Zoo
 San Diego Zoo
 Santa Ana Zoo
 Utah's Hogle Zoo

Response

monitoring for paracites

NO routine procedures done
 Annual exams; fecal exams

Question:

What vaccinations do you use?

Institution

Louisiana Purchase Gardens and Zoo
 Nashville Zoo
 North Carolina Zoo
 San Diego Zoo
 Santa Ana Zoo
 Utah's Hogle Zoo

Response

No vaccinations
 N/A

Question:

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

Institution

Louisiana Purchase Gardens and Zoo
 Nashville Zoo
 North Carolina Zoo
 San Diego Zoo
 Santa Ana Zoo
 Utah's Hogle Zoo

Response

tooth growth/ware

None at this time
 Infertility

Question:

Have you successfully bred this species at your institution?

Institution

Louisiana Purchase Gardens and Zoo

Response

none

Nashville Zoo	yes
North Carolina Zoo	no
San Diego Zoo	Yes
Santa Ana Zoo	Yes, one time
Utah's Hogle Zoo	Yes

Question:

Institution

Louisiana Purchase Gardens and Zoo
 Nashville Zoo
 North Carolina Zoo
 San Diego Zoo
 Santa Ana Zoo
 Utah's Hogle Zoo

Do you keep the sexes together at all times?

Response

yes

 Yes
 Yes
 Yes

Question:

Institution

Louisiana Purchase Gardens and Zoo
 Nashville Zoo
 North Carolina Zoo
 San Diego Zoo
 Santa Ana Zoo
 Utah's Hogle Zoo

Do you introduce the sexes for breeding?

Response

No
 Once introduced they were not separated.
 No; they are together all the time

Question:

Institution

Louisiana Purchase Gardens and Zoo
 Nashville Zoo
 North Carolina Zoo
 San Diego Zoo
 Santa Ana Zoo
 Utah's Hogle Zoo

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

Response

N/A

Question:

Institution

Louisiana Purchase Gardens and Zoo
 Nashville Zoo
 North Carolina Zoo
 San Diego Zoo
 Santa Ana Zoo
 Utah's Hogle Zoo

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

Response

N/A
 Not for the one time experienced.
 No

Question:

Institution

Louisiana Purchase Gardens and Zoo
 Nashville Zoo
 North Carolina Zoo
 San Diego Zoo
 Santa Ana Zoo

Do you make any special preparations for the birth?

Response

n/a
 No

Utah's Hogle Zoo

No

Question:

If yes, what are they?

Institution

Response

Louisiana Purchase Gardens and Zoo

Nashville Zoo

North Carolina Zoo

San Diego Zoo

Santa Ana Zoo

Utah's Hogle Zoo

N/A

Question:

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

Institution

Response

Louisiana Purchase Gardens and Zoo

Nashville Zoo

North Carolina Zoo

San Diego Zoo

Santa Ana Zoo

We housed Dam and female offspring for (?) yrs.

Some remained with parents until shipped to another institution after 1 year of age.

Old records not clear on others as to length of time offspring stayed w/parents

Utah's Hogle Zoo

The offspring stay with the mother and father until they are ready to be moved to another institution, usually at about 6-8 months.

Question:

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

Institution

Response

Louisiana Purchase Gardens and Zoo

Nashville Zoo

North Carolina Zoo

San Diego Zoo

Santa Ana Zoo

Utah's Hogle Zoo

See above

Up to at least one year.

1-2 years. This was only because we were having difficulty surplussing (sp?) the offspring.

Question:

What concerns do you have when housing the group together?

Institution

Response

Louisiana Purchase Gardens and Zoo

Nashville Zoo

North Carolina Zoo

San Diego Zoo

Frequent weights taken (monthly if stable, weekly if fluctuating). All fed together so we need to confirm that everyone is getting their share.

Santa Ana Zoo

Utah's Hogle Zoo

The male becomes very aggressive when the youngsters are present. He settles down after several months.

Question:

Have you ever had to pull offspring for any reason?

Institution

Response

Louisiana Purchase Gardens and Zoo

Nashville Zoo

North Carolina Zoo

San Diego Zoo

Santa Ana Zoo
Utah's Hogle Zoo

No

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

Have you hand reared offspring?

Response

No
No

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

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

Response

N/A

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

Have you used any type of contraception for your porcupines?

Response

Yes
No

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo

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

Response

MGA implant used on one female in 1985. There are no further records of offspring from this female prior to her death but I am not sure how long she was with a male.

Utah's Hogle Zoo

N/A

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

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

Response

yes
no
No
No
No

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

If yes, how is the porcupine used?

Response

just their quills

N/A

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

Do you consider it a successful outreach animal?

Response

no

N/A

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

What behaviors have you trained?

Response

We are currently working on setting up a training program

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

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

Response

Yes

yes
No
Yes-
No

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo

Santa Ana Zoo
Utah's Hogle Zoo

If yes, what behaviors have you trained?

Response

Shifting

walking into live trap or crate
Will stand on chain link wall for food to provide visual of front foot pads and abdomen

Trained to step onto a scale for weights
N/A

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo

Do you have any plans for future training ?

Response

no

North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

No
Yes

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

What behaviors would you most like to train?

Response

We would like to train them so we can get accurate and routine weights and possibly crate train.

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

Do you provide your porcupines with environmental enrichment?

Response

yes
yes
yes
Yes
Yes
Yes

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

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

Response

Food, new wood, bones-they love to chew on the new wood
old antlers, logs, rawhide- items to chew on

Most enrichment provided is gnawing materials. They do enjoy digging in the dirt to the point where it occasionally needs replenishing.

A variety of browse, various types of wood to chew. The mixed species exhibit provides enrichment due to various animals going in and out of the porcupine space.

Logs: They Love them! Boxes: They tear them apart. Scents: Very little noticeable interest. New substrates: They enjoy. Antler: interested. Ice blocks w/fruit: They like. Bobbing for their dote: They enjoy. Snake skin: They shred. Moving furnitu

Question:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

Have you ever shipped a porcupine?

Response

yes
no
Yes
Yes
Yes

Question:

Institution

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

Response

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo

400 sky kennel

For transport to hospital we use a metal crate w/ removable doors.
We use a large (#300 or 400) Vari-kennel type crate with a wire mesh (1/4" mesh) liner inside. Bottom lined with shavings and straw. No water dish provided - place whole apple, yam, etc inside instead, as they chew up the water dishes.

Utah's Hogle Zoo

We constructed a metal crate several years ago that we went one out in. We have also sent them out in the medium sized Vari-Kennels.

Question:

Comments or ideas to include in the Husbandry Standards:

Institution

Louisiana Purchase Gardens and Zoo
Nashville Zoo
North Carolina Zoo
San Diego Zoo
Santa Ana Zoo
Utah's Hogle Zoo

Response

None at this time