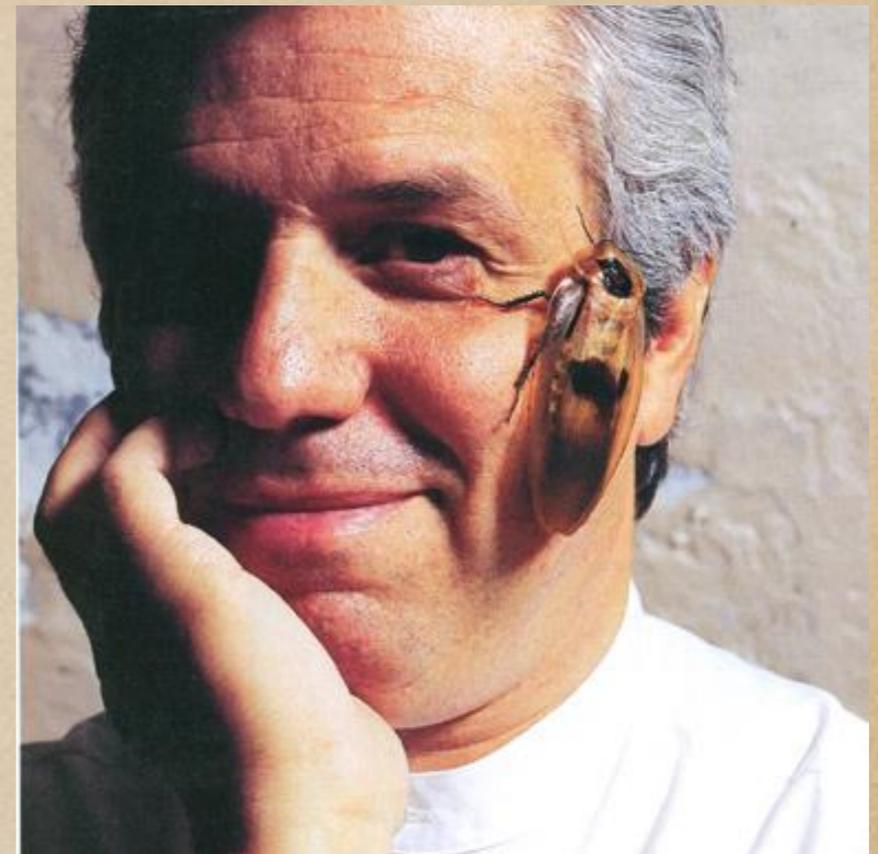


Butterfly feeders at the Philadelphia Children's Zoo opened 2013



Amanda Egan, Supervisor

From Concept
to Finish



Raymond Mendez, Work As Play

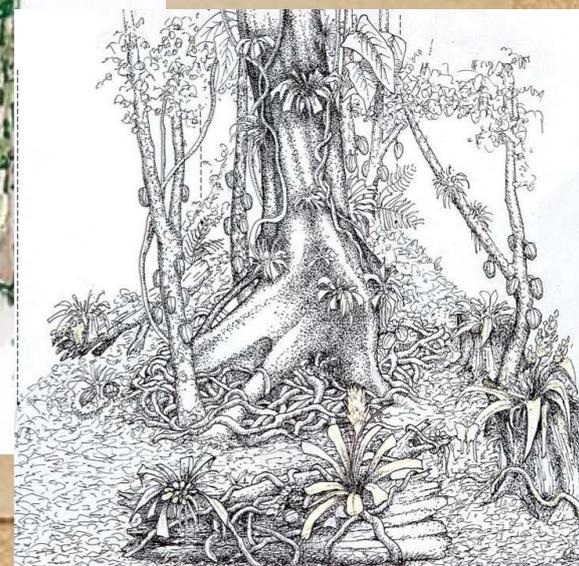
“In April 2013, the Philadelphia Zoo opened a brand new exhibit: at The Hamilton Family Children’s Zoo and Faris Family Education center. Inside the Education Center building, there are a number of animal exhibits including a butterfly exhibit that relates to how human behavior is having an impact on butterflies in the wild. Our exhibit houses Zebra longwing (*Heliconius charitonia*), Julia (*Dryas iulia*) and Gulf Fritillary (*Agraulis vanillae*) butterflies and is naturalistic in design and is paired with an exhibit interactive about water usage. We had never had a butterfly exhibit in our Zoo before so this one was a learning process for staff on how to best manage a group of butterflies for this display.” Amanda Egan

The Ideas

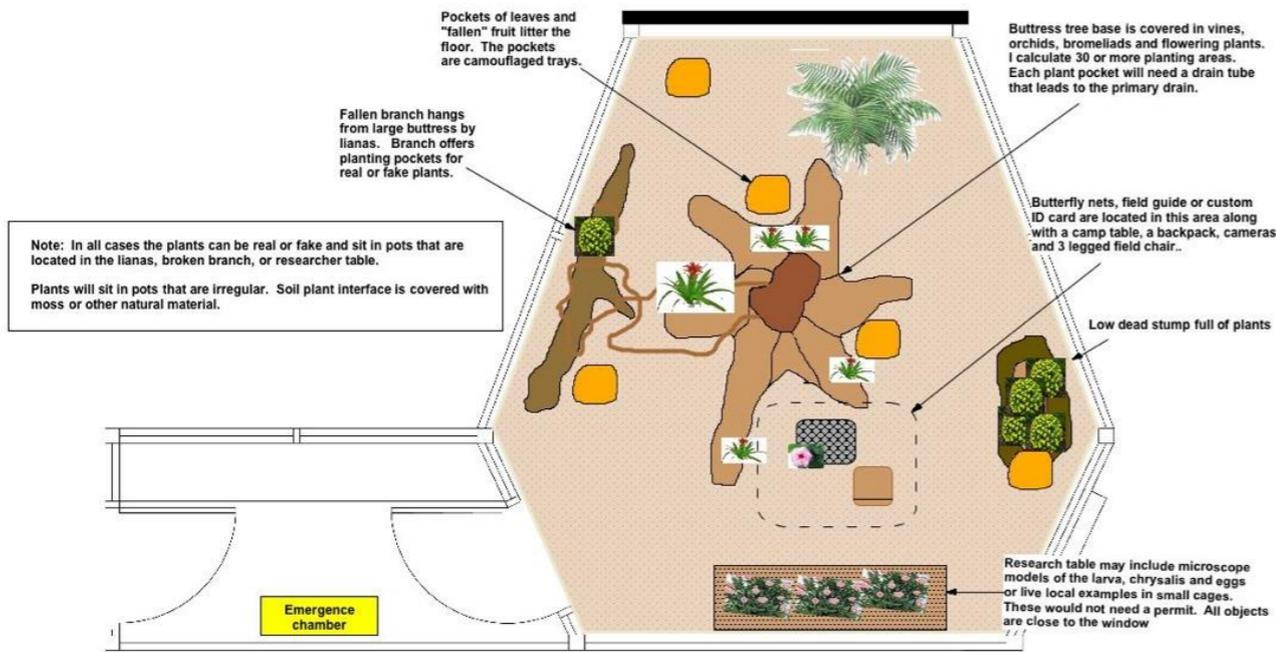


Animal exhibits are all linked to play and ecologically significant stories.
The principal directions for this came from the Zoo staff and C7A

We start with a story and an image.



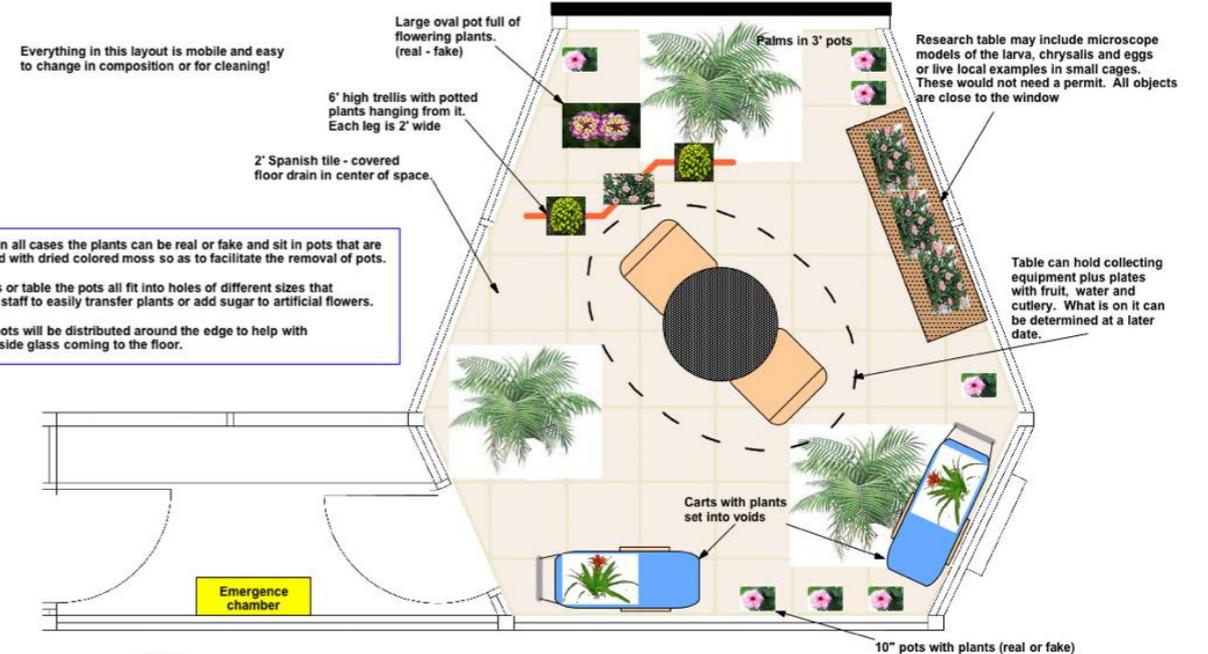
We create a plan and....



HFCZ & Education Center
Philadelphia Zoo

Butterfly Enclosure - Option B

Work As Play
8.29.2011



HFCZ & Education Center
Philadelphia Zoo

Butterfly Enclosure

Work As Play
8.29.2011



..... scale model



Challenges....

Species: Long Wings (Heliconia) Containment and emergence

Lights: 4' long X 6 units per pan X Full spectrum UV No real plants

Humidity: Set to a humidity sensor, simple outdoor mist system.

Temperature: Monitor set to ceiling mounted air system.

Mist system is by Mistymate: <http://www.mistymate.com/misting-systems.html?limit=all&mode=grid>

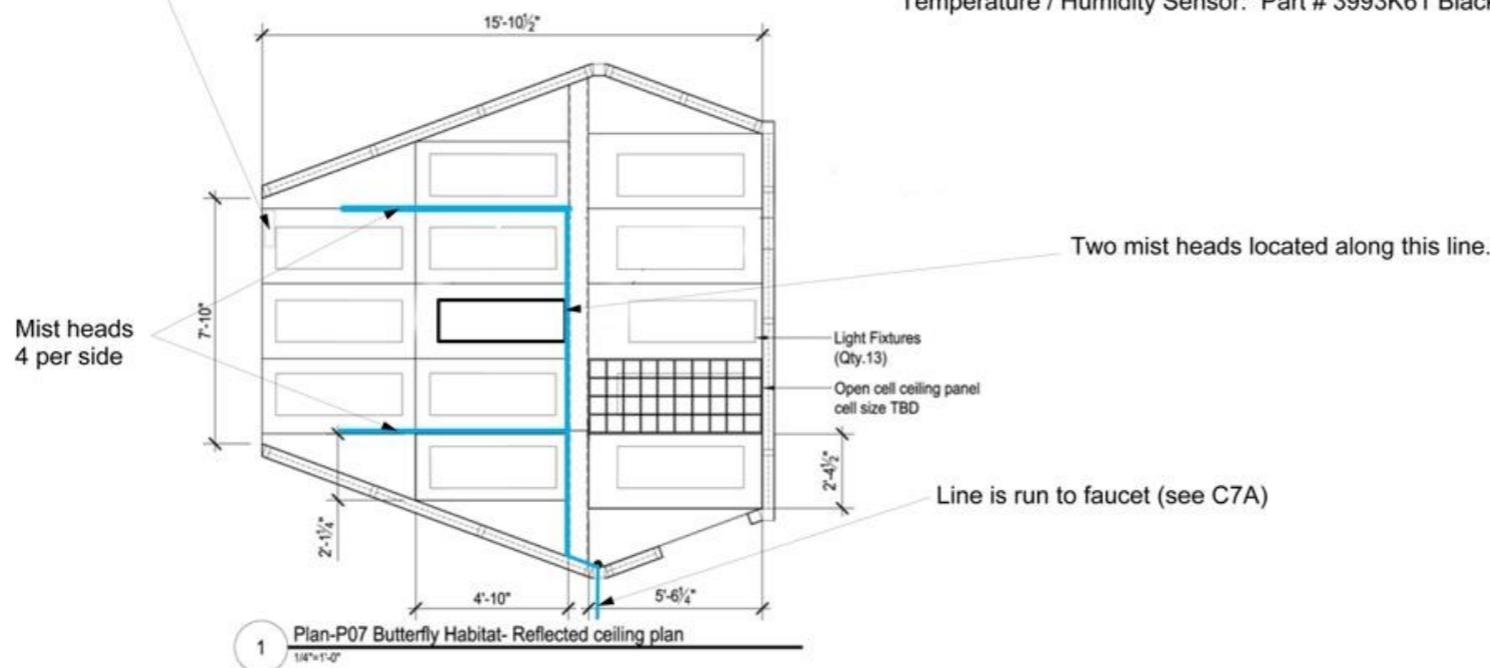
1. Butterfly habitat uses the Cool Patio 10 system.

1. Inline filter located at faucet.

Additional supply lines, mounting brackets as needed after field checking the system.

Temperature and Humidity Dial Indicator

Temperature / Humidity Sensor: Part # 3993K61 Black



Two mist heads located along this line.

Light Fixtures
(Qty. 13)
Open cell ceiling panel
cell size TBD

Line is run to faucet (see C7A)

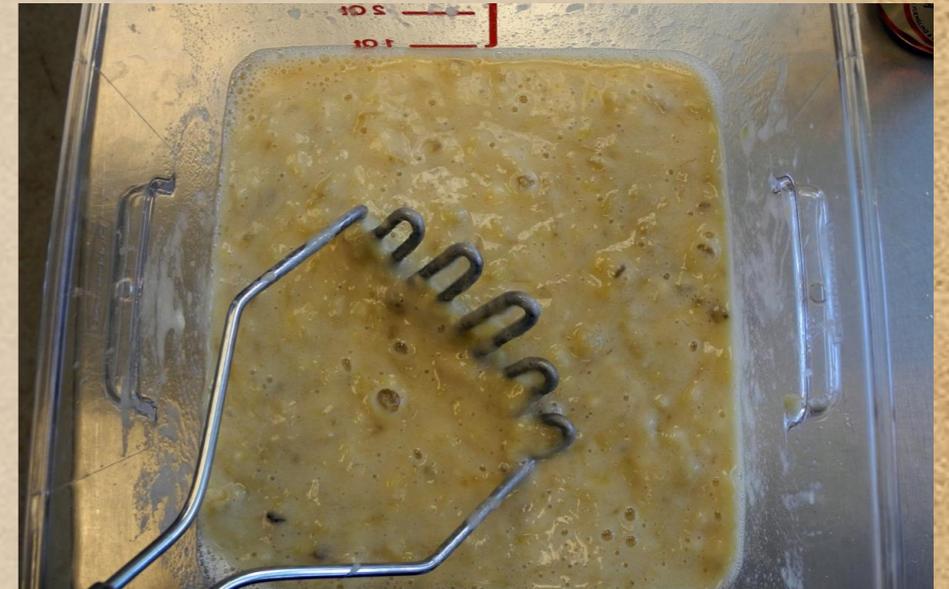




The Exhibit



Nothing ever works without great staff!

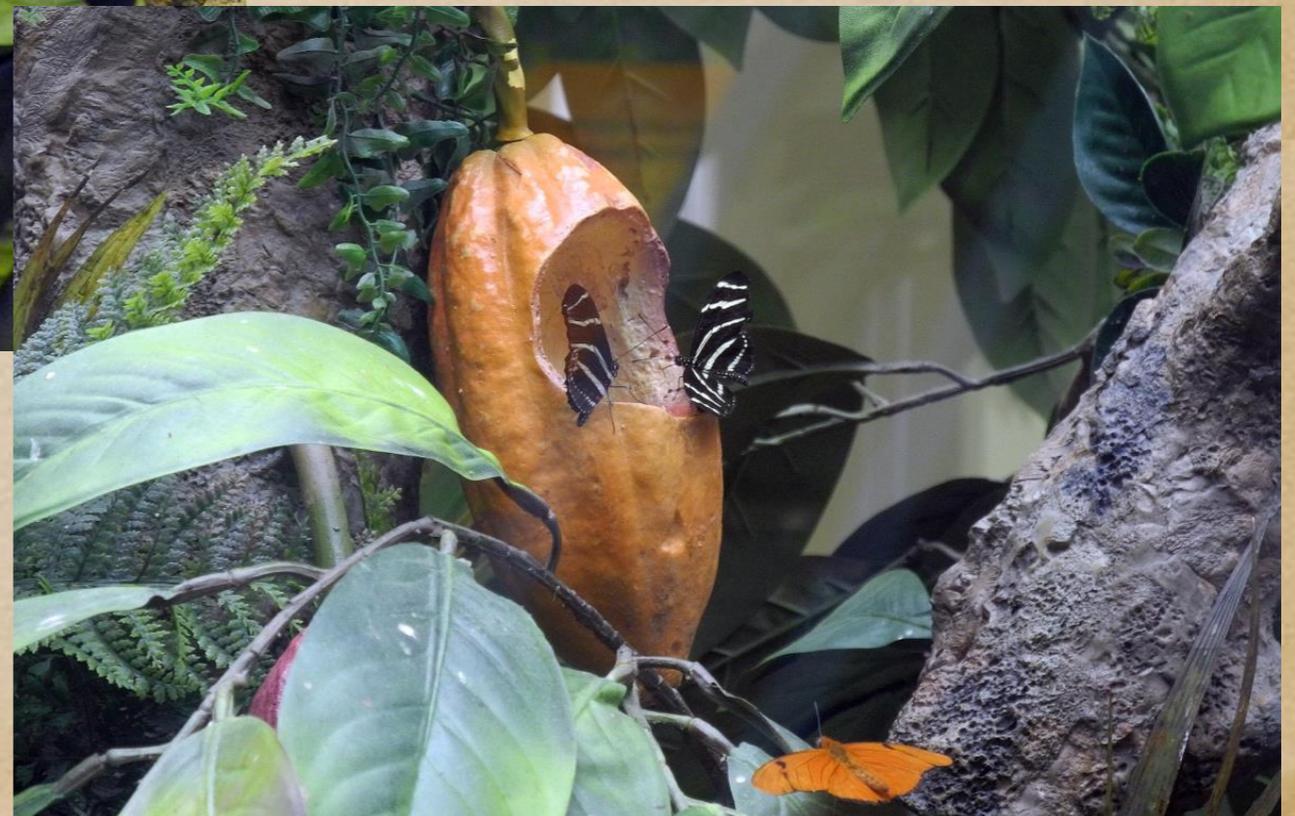


$\frac{1}{2}$ can of beer (we use Yuengling Lager) and ~ 5 very ripe bananas.
 $\frac{1}{2}$ cup of the mash is offered per day to the entire colony.
Mash is lightly dusted with a small pinch each of confectioner's sugar and bee pollen prior to being offered.

What did we learn? Butterflies of different ages actually teach each other about food supplies and sources. Artificial diets and indoor enclosures work if all the animals needs are met. Longevity is not an issue under appropriate conditions.



“With a little extra effort and observation of butterfly behavior, we were able to make sure that our butterflies could eat without detracting from the beauty of the exhibit and even pose for the best visitor view while they ate!” Amanda Egan



Testing is Key:

“Butterflies were not observed responding to or drinking the Gatorade mixture and did not have a very good response to the hummingbird nectar so both were discontinued. The best response came from the sugar water mixture so we began to offer the sugar water mixture (with no added color) in all hanging cocoa pod feeders which were the most desirable feeders for the exhibit since they blended instead of detracting from the display like dishes did. The cocoa pod feeders were pink in the area where the sugar water liquid was placed so the combination of the pink color and the pure sugar water seemed to work the best to attract the butterflies to the cocoa pod feeders. For the banana mash, we had to go through the same trial and error process to find the right recipe that would work for the butterflies. The adjustments we made to the mash in the beginning were to refine the consistency. We found several butterflies landing and getting stuck if the mash was too runny but it also needed to be thin enough that it could be drawn up into the butterfly’s proboscis.”

“A glass bowl was set on top of the log feeder on the floor of the exhibit with a smaller, shallow bowl with pebbles placed on top of it. In order to encourage the butterflies to come to the second bowl we placed plastic purple flowers around the edge of the bowl. This was done because all three species in the exhibit are attracted to and eat from purple flowers in the wild (passion flower and lantana).

The butterflies are now regularly seen eating on the bowl at the bottom of the exhibit as well as the raised bowl in the middle of the exhibit. They are most often seen sitting on the edge of the hanging pod feeders with proboscis extended into the liquid." Amanda Egan

Philadelphia Zoo

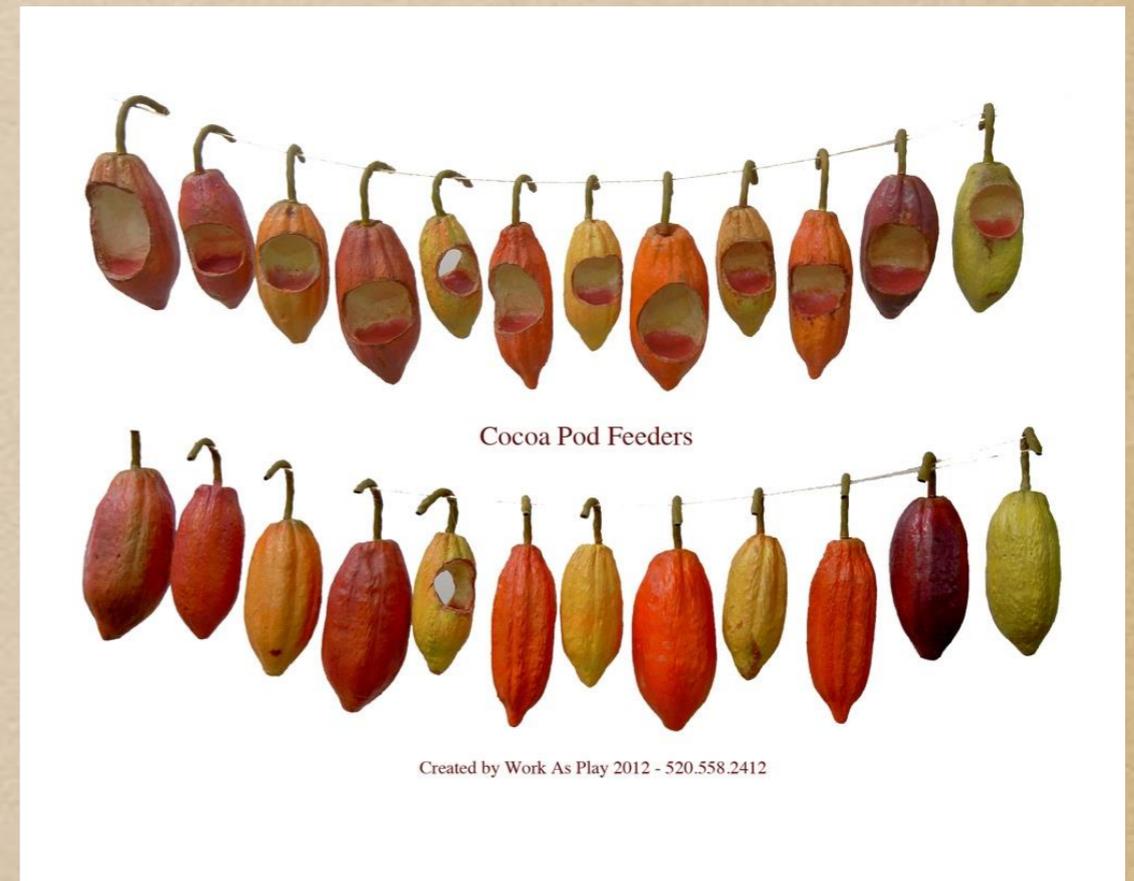
DIET RECORD

ANIMAL: Butterflies

LOCATION: KidZooU

- 46 Gulf fritillary
- 61 Julia butterfly
- 132 Zebra longwing butterfly
- 239 Enclosure total

	DATE /	DIET /	REMARKS
24-Feb-14			Diet for butterflies updated based on what keepers have found work best for the animals Please report any further updates
			Number of butterflies is very variable, caretakers will determine the amount of each item to offer daily
1)		Banana Mash Recipee	
		5 Very Ripe Bananas	} Amount of mash prepared at once can be increased keeping the proportion of ~ 5 ripe bananas to 1/2 cup of beer constant
		~1/2 can Beer	
		Instructions:	Mash bananas using potato masher, add in beer Mash should be runny - if too stiff add more beer
		Immediately:	Place 1/2 cup of mash in white containers Label containers butterfly mash and date Place lid on containers and Freeze
			} Can freeze up to 2 cups of mash in a container must use all of container in one day . Amount frozen/container is contingent on # of butterflies in colony
			Banana Mash Feeding
		Instructions:	Remove mash from freezer 24 hours prior to feeding, allow to sit on the counter in warm room to defrost and ferment. Divide mash between two bowls Prior to offering to butterflies, LIGHTLY sprinkle mix with bee pollen and confectionary sugar
2)		Sugar Water:	Combine 24 grams (~3 TBLS) confectionary sugar with 200 mL warm water, Sharke well. <i>use the same day prepared.</i>
		Feed:	Pour into 7 hanging cocoa pod feeders
			<i>All food will be offered daily and removed and replaced daily.</i>



Original diet recommendations made by Ray Mendez, diet updates made by Barbara Toddes and Philadelphia KZU keepers based on practical feeding experience and butterfly acceptance.

Butterfly Hatchery and cocoa pods
design and construction by WAP

Outcomes

It works, butterflies thrive, guests can easily see them and the emerging butterflies - new species to be added soon!

“Be it mentoring your community or looking for a buy-in for your projects, nothing works without wonderful partnerships. Respect each other, stick together, play, have passion and enjoy the process. It may not be easy but it can lead to great visitor experiences, healthy animals and perfect story telling environments.” RAM 2014

Architects: (David Ade) SMP Architects

Exhibit interactive partners: (Doug Simpson) C7A

Construction company: (Ed Byars) Maltbie



Work As Play

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Principal Designer

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Museum and Zoo Exhibit Development and Construction • Visitor Experience •
Radio Control / FX Model Making • Insect and Reptile Wrangling •
Nature Photography • Advocacy Storytelling Promoting Conservation Action



Trees & Foreground:
Dixon Studios