

**Partnering for Ohio Butterflies:  
An evaluation of educational events  
and temporary exhibits about butterflies  
at three zoos**

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## Overview

The Butterfly Conservation Initiative (BFCI) initiated a project to create a large-scale butterfly habitat at *the Wilds* in Ohio in conjunction with several AZA-accredited zoos in Ohio. Three of these Ohio zoos (Akron Zoo, Columbus Zoo and Aquarium, and Toledo Zoo) hosted butterfly or insect festivals during 2003 – 2004, which involved educational events and/or temporary exhibits. The purpose of these festivals was to build support for the restoration work and increase public understanding about the impacts of human activities on ecosystem health and function.

A series of evaluations were conducted to:

- Characterize the people who visited the butterfly festivals in terms of their knowledge and interest in butterflies
- Document visitor impressions of the butterfly festivals
- Determine if the butterfly festivals had any effect on visitor awareness/interest in insects in general and butterfly activities in particular

The survey instrument was designed by the Communications Research department at Brookfield Zoo and administered by volunteers at each of the three Ohio zoos during their respective festivals. The results will be provided for each of the three locations separately. Then a few comparisons will be made across the different events and institutions. Recommendations are then provided for future butterfly festivals and evaluations.

## Acknowledgements

A special thanks to the volunteers who collected data at the Akron, Columbus, and Toledo Zoos and to Eric Reinhard, Ruth Allard, and Shelly Grow for their assistance in coordinating data collecting efforts at the three locations. Funding for this study was provided by the George Gund Foundation.

## Evaluation of the Butterfly Garden & Festival at Akron Zoo

### Background Information

On Sunday, June 15, 2003 (10 am – 5 pm), the Akron Zoo hosted Zoobilation (a butterfly festival). The event focused on the opening of the Lehner Family Zoo Gardens, which has a butterfly theme, and on the zoo's 50<sup>th</sup> anniversary which had a 1950's Rock 'n Roll theme. There was a ribbon cutting ceremony and butterfly release at 11 am. All guests received a free butterfly fan and a copy of Ohio Wild, a children's magazine. A craft table was set up to create a butterfly Father's Day card. Interpreters were stationed throughout the Zoo Gardens to talk to visitors about the gardens and butterfly conservation. An educational display about butterflies was set up in Nature's View and another in the classroom. In Farmland, children were able to plant seeds in a container that they could take home. An educational skit about how people impact their environment was performed by zoo staff in Zoo Gardens. The weather was 78 degrees and sunny, and attendance was 2,251.

### Methods & Audience Characteristics

Volunteers at the Akron Zoo collected data throughout the day, following the sampling protocol outlined in Appendix A. The final sample included 60 adults who visited the Butterfly Garden & Festival and 127 adults who were intercepted before they entered the area. In both cases, the majority of respondents were Zoo members (67%), the majority had children (86%), and the majority were female (73%) (see Tables 1 – 3). Table 4 shows that most of the respondents had not visited the Wilds in SE Ohio (91%). Likewise, Table 5 shows that most of the respondents (92%) did not have special training or hobbies related to butterflies. The breakdown of respondent ages is shown in Table 6. Most of the respondents (69%) were 30 – 49 years old.

The survey instrument is included in Appendix B.

### Summary of Results

- In most cases, Festival/Garden attendees did not differ from non-attendees in how they answered the survey questions.
- People who visited the Festival/Garden rated their knowledge of butterflies as significantly higher than those who did not visit (mean of 2.39 on a 1 – 5 scale, compared to a mean of 2.01) (See Table 7).
- There were no differences in interest in doing butterfly-related behaviors between Festival goers and non-goers (Table 8). Attracting butterflies to your yard was the activity of greatest interest to both groups, followed by learning to identify butterflies, and learning about butterfly conservation issues.
- Of the three self-statements, both attendees and non-attendees were more likely to say they think about the impact of their actions on the natural world than to claim confidence in teaching others about environmental issues (Table 9).
- More than half of the people who visited the Festival/Garden claimed that it strongly encouraged them to help with butterfly conservation efforts (Table 10). (But see below.)
- The mean amount of time spent in the festival/garden was 19.7 minutes, with a range of 10 to 60 minutes (Table 11). The greater the time spent at the Festival/Garden, the more likely people said that it "increased their awareness of butterflies and their links to habitat and human activities", and

that it "provided them with ideas for how to help preserve butterflies and their habitats in their own backyard". But time spent at the Festival/Garden had no relationship to encouraging people to help with butterfly conservation efforts. (See Table 12).

- There were 14 responses to the "I never realized..." question, with several mentioning a particular fact about butterflies. Most of the 11 responses to the "It reminded me that..." question were related to the beauty of butterflies or the types of plants that attract them. (See Appendix C).
- When asked for their favorite part of the festival, a number of respondents mentioned the butterfly release. The maze and gardens were also popular responses. (See Appendix C).

In general, people who attended the Festival rated their knowledge of butterflies higher than those who did not attend. The more time people spent at the Festival, the more likely they were to say that the Festival increased their awareness of butterflies and that the Festival provided them with ideas for how to help preserve butterflies and their habitats.

A total of 104 people (56%) indicated an interest in Ohio restoration projects for butterflies, and most provided phone numbers or emails. (See Appendix C.) The Festival did not influence the likelihood of whether people gave their names. In fact, significantly more of the people who were intercepted before the Festival provided their names (Chi-Square = 7.015,  $p < .01$ ). The people in Appendix C may be contacted in the future to invite them to restoration events, and see whether Festival attendees are more likely to attend them.

Table 1

			Visited butterfly garden and festival		Total
			No	Yes	
Are you a zoo member?	No	Count	39	15	54
		% within Visited butterfly garden and festival	33.6%	31.9%	33.1%
	Yes	Count	77	32	109
		% within Visited butterfly garden and festival	66.4%	68.1%	66.9%
Total		Count	116	47	163
		% within Visited butterfly garden and festival	100.0%	100.0%	100.0%

Table 2

			Visited butterfly garden and festival		Total
			No	Yes	
Do you have children?	No	Count	14	9	23
		% within Visited butterfly garden and festival	12.3%	20.0%	14.5%
	Yes	Count	100	36	136
		% within Visited butterfly garden and festival	87.7%	80.0%	85.5%
Total		Count	114	45	159
		% within Visited butterfly garden and festival	100.0%	100.0%	100.0%

Table 3

			Visited butterfly garden and festival		Total
			No	Yes	
Gender	Male	Count	33	11	44
		% within Visited butterfly garden and festival	28.2%	24.4%	27.2%
	Female	Count	84	34	118
		% within Visited butterfly garden and festival	71.8%	75.6%	72.8%
Total		Count	117	45	162
		% within Visited butterfly garden and festival	100.0%	100.0%	100.0%

Table 4

			Visited butterfly garden and festival		Total
			No	Yes	
Have you ever visited The Wilds in southeastern Ohio?	No	Count	104	43	147
		% within Visited butterfly garden and festival	91.2%	91.5%	91.3%
	Yes	Count	10	4	14
		% within Visited butterfly garden and festival	8.8%	8.5%	8.7%
Total		Count	114	47	161
		% within Visited butterfly garden and festival	100.0%	100.0%	100.0%

Table 5

			Visited butterfly garden and festival		Total
			No	Yes	
Special training or hobbies	No	Count	120	50	170
		% within Visited butterfly garden and festival	96.0%	83.3%	91.9%
	Yes	Count	5	10	15
		% within Visited butterfly garden and festival	4.0%	16.7%	8.1%
Total		Count	125	60	185
		% within Visited butterfly garden and festival	100.0%	100.0%	100.0%

Table 6

			Visited butterfly garden and festival		Total
			No	Yes	
Age groups	19-24 yrs old	Count	7	5	12
		% within Visited butterfly garden and festival	6.0%	11.1%	7.5%
	25-29 yrs old	Count	14	3	17
		% within Visited butterfly garden and festival	12.1%	6.7%	10.6%
	30-39 yrs old	Count	46	21	67
		% within Visited butterfly garden and festival	39.7%	46.7%	41.6%
	40-49 yrs old	Count	34	10	44
		% within Visited butterfly garden and festival	29.3%	22.2%	27.3%
	50-59 yrs old	Count	10	4	14
		% within Visited butterfly garden and festival	8.6%	8.9%	8.7%
	60-69 yrs old	Count	3	1	4
		% within Visited butterfly garden and festival	2.6%	2.2%	2.5%
	70 yrs old or older	Count	2	1	3
		% within Visited butterfly garden and festival	1.7%	2.2%	1.9%
Total		Count	116	45	161
		% within Visited butterfly garden and festival	100.0%	100.0%	100.0%

**Table 7: Butterfly Knowledge**

Average Ratings

	<b>Visited Butterfly Garden &amp; Festival (N = 60)</b>	<b>Did not visit Butterfly Garden &amp; Festival (N = 127)</b>
How would you rate your knowledge about butterflies?	2.39	2.01

Scale: 5 = Extremely knowledgeable, 1 = Not at all knowledgeable.

NOTE: Means are statistically different at the  $p < .01$  level (t-test).**Table 8: 'Please rate your interest in the following topics.'**

Average Ratings

	<b>Visited Butterfly Garden &amp; Festival (N = 60)</b>	<b>Did not visit Butterfly Garden &amp; Festival (N = 127)</b>
Learning to identify butterflies	3.35	3.07
Raising caterpillars	2.47	2.13
Attracting butterflies to your yard	3.79	3.63
Doing something artistic involving butterflies	3.00	2.87
Learning about butterfly conservation issues	3.23	3.09
Volunteering to collect butterfly data	2.17	1.90
Volunteering to help restore butterfly habitat	2.24	2.17

Scale: 5 = Extremely interested, 1 = Not at all interested.

NOTE: No statistical differences detected at the  $p < .05$  level.**Table 9: 'How true are the following statements for you?'**

Average Ratings

	<b>Visited Butterfly Garden &amp; Festival (N = 60)</b>	<b>Did not visit Butterfly Garden &amp; Festival (N = 127)</b>
I am confident teaching others about environmental issues.	2.61	2.36
I lead a balanced life when it comes to my environmental impact.	3.29	3.08
I often think about whether or not my actions harm the natural world.	3.84	3.59

Scale: 5 = Extremely true, 1 = Not at all true.

NOTE: No statistical differences detected at the  $p < .05$  level.

Table 10: 'As a result of visiting the festival area, how would you rate the following statements?'

Frequency of Responses

	Not at all or Only slightly (1, 2)	Somewhat (3)	Very much so or For the most part (4, 5)	
The festival increased my awareness of butterflies and their links to habitat and human activities	31.6%	22.8%	45.6%	100%
The festival provided me with ideas as to how I can help preserve butterflies and their habitats in my own backyard	29.9%	22.8%	47.3%	100%
The festival encouraged me to help with conservation efforts of butterfly populations	22.4%	15.5%	62.1%	100%

Table 11: Minutes spent in festival area

	N	Minimum	Maximum	Mean	Std. Deviation
Minutes spent in festival area	36	10.00	60.00	19.7222	12.00859
Valid N (listwise)	36				

Table 12

		Minutes spent in festival area
The festival increased my awareness of butterflies and their links to habitat and human activities	Pearson Correlation	.473**
	Sig. (2-tailed)	.005
	N	34
The festival provided me with ideas as to how I can help preserve butterflies and their habitats in my own backyard	Pearson Correlation	.432*
	Sig. (2-tailed)	.011
	N	34
The festival encouraged me to help with conservation efforts of butterfly populations	Pearson Correlation	.313
	Sig. (2-tailed)	.067
	N	35

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

**APPENDIX A: Akron Sampling Plan**

1. Goal is to get 100 – 200 festival participants and 100 – 200 non-participants.
2. Collection strategy:
  - A. Approach will be something like “Hello, I’m [name] from the Akron Zoo and we really need your input to improve your experiences here. Please fill out this survey which should only take a couple of minutes.” (Put survey in front of person make it more difficult to refuse) If this does not work go to contingencies (e.g., emphasize the importance of this study, listen to the reasons why they say no and try to accommodate.) Note: Do not ask if they would like to fill out the survey, just make a direct request.
  - B. Time of collection: Should gather data throughout the day.
  - C. Sampling procedure: Establish some way to encourage the data collectors to get a random sample (rather than just people they would like to talk to). It helps to have a rule such as watching a line or doorway and selecting the 3rd group (or some other predetermined number) to pass it. Surveys should be given to adults (over 18 years old). Use some rule like the first adult on your left. If that adult refuses, you can ask one more time. Otherwise you can give it to whoever volunteers. Do not count groups that go through as collectors are talking to possible subjects. On a slow day, collectors may need to approach every group. You can divide the collection area into sections if it is crowded and if there are several data collectors. One data collector might be able to hand out two surveys & clipboards at once and keep track of the people filling them out.
  - D. Data collector should keep track of refusals by keeping a tally. A refusal is when no adult from the group agrees to participate.
  - E. Materials: Each collector will go out with 3 clipboards, a box of pencils (to give the visitors to write with), and thank you gifts (if used). Two clipboards are for the visitors and one is for the collector write on (it can have a cover sheet with a data and place to tally the number of refusals. Under that can be the blank surveys.)
  - F. Be sure to thank the visitors who participate. (We give something like a postcard to respondents as a “thank you” but it’s not critical. I don’t know what your budget allows.) The collectors should look over the surveys as they collect them, and they should fill in the date if the visitor forgets to do that. Also make sure both sides are completed.
  - G. Bad weather plan: There should be a comfortable place to go where visitors can complete the surveys if it is raining etc.

Make sure to gather and label all the data and mail to me for processing. (Send it some safe way.)

Questions? Call Carol Saunders, Ph.D.  
Brookfield Zoo  
(o) (708) 485-0263 x 371  
(h) (708) 485-7102



# Butterfly Survey



The Zoo wants to know about your interest and experiences related to butterflies. Please take a few minutes to answer the following questions.

Today's date: \_\_\_\_\_

## 1. How would you rate your knowledge about butterflies?

- Not at all knowledgeable    
  Only slightly knowledgeable    
  Somewhat knowledgeable    
  Knowledgeable    
  Extremely knowledgeable

## 2. Do you have any special training or hobbies related to butterflies?

- No    
  Yes    
 If yes, please describe: \_\_\_\_\_

## 3. Have you visited our insect fair?

- No (Skip to question #6)    
  Yes (Please complete the following two sentences about your insect fair experience)
- If yes, approximately how much time did you spend in the insect fair area? \_\_\_\_\_ minutes

I never realized that: \_\_\_\_\_

\_\_\_\_\_

It reminded me that: \_\_\_\_\_

\_\_\_\_\_

## 4. What was your favorite part of the insect fair? Why?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## 5. As a result of visiting the insect fair area, how would you rate the following statements?

	Not at all	Only slightly	Somewhat	For the most part	Very much so
- The fair increased my awareness of insects and their links to habitat and human activities.	<input type="checkbox"/>				
- The fair provided me with ideas as to how I can help preserve insects and their habitats in my own backyard.	<input type="checkbox"/>				
- The fair encouraged me to help with conservation efforts of insect populations.	<input type="checkbox"/>				

Please continue on other side

**6. Please rate your interest in the following topics.**

	Not at all interested	Only slightly interested	Somewhat interested	Interested	Extremely interested
- Learning to identify butterflies	<input type="checkbox"/>				
- Raising caterpillars	<input type="checkbox"/>				
- Attracting butterflies to your yard	<input type="checkbox"/>				
- Doing something artistic involving butterflies	<input type="checkbox"/>				
- Learning about butterfly conservation issues	<input type="checkbox"/>				
- Volunteering to collect butterfly data	<input type="checkbox"/>				
- Volunteering to help restore butterfly habitat	<input type="checkbox"/>				

*Please give us some information about yourself...*

**How many times have you visited the Zoo in the past 12 months (not including today)?** \_\_\_\_ times

**What is your age?** \_\_\_\_\_

**Are you:**  Male  Female

**Are you a Zoo member?**  No  Yes (How many years: \_\_\_\_\_)

**Do you have children?**  No  Yes (What ages: \_\_\_\_\_)

**Have you ever visited *the Wilds* in southeastern Ohio?**  No  Yes (When did you visit: \_\_\_\_\_)

**Your home Zip Code** \_\_\_\_\_

**How true are the following statements for you?**

	Not at all true	Only slightly true	Somewhat true	True	Extremely true
- I am confident teaching others about environmental issues.	<input type="checkbox"/>				
- I lead a balanced life when it comes to my environmental impact.	<input type="checkbox"/>				
- I often think about whether or not my actions harm the natural world.	<input type="checkbox"/>				

Several habitat restoration projects for butterflies are being planned in the Ohio area in the near future. If you are interested in finding out more about these efforts, please provide us your name and phone number.

Name: \_\_\_\_\_ Phone number: \_\_\_\_\_ Email: \_\_\_\_\_

*Thanks again for your help!*

**APPENDIX C: Open-Ended Responses**

N = 60 total Festival surveys  
 Membership breakdown: 32 members, 15 non-members, and 13 unknown

**Responses to "I never realized that..."**

A total of 14 people (23%) provided responses to this question

Of the 32 zoo members, 8 provided responses

Of the 15 non-zoo members, 5 provided responses

1 response was given from the 13 visitors of unknown member status

Membership	Responses
Unknown	They are so pretty
No	More tree-like plants than thought there would be for a nature garden (vs. flowers)
No	Porcupines are huge
No	Various plants that attracted them
No	What they ate
No	Zoo bought more home for the zoo expanding
Yes	An apartment patio garden could attract butterflies
Yes	Butterflies like water so much
Yes	How butterflies affected the environment
Yes	I didn't spend enough learning time - I was "browsing" today
Yes	Info in building
Yes	The kids would have fun hearing bird calls
Yes	There were so many
Yes	They have compound eyes

**Responses to *"It reminded me that..."***

A total of 11 people (18%) provided responses to this question

Of the 32 zoo members, 8 provided responses

Of the 15 non-zoo members, 1 provided a response

2 responses were given from the 13 visitors of unknown member status

<b>Membership</b>	<b>Responses</b>
Unknown	How butterflies are so beautiful and colorful
Unknown	When was young - I had doctor that went to South America to collect
No	We need a place in the city to relax and also give room for animals
Yes	Butterflies are attracted to certain kinds of plants
Yes	Butterflies are important and beautiful
Yes	Butterflies are very beautiful creatures
Yes	Butterflies are important and beautiful part of our environment
Yes	I can do more to help the environment
Yes	I need to come back and learn some more
Yes	Life is simple
Yes	Some plantings are best for attracting butterflies

**Responses to "What was your favorite part of the festival?"... "Why?"**

A total of 49 people (82%) provided responses to this for this question

Of the 32 zoo members, 29 provided responses

Of the 15 non-zoo members, 10 provided responses

10 responses were given from the 13 visitors of unknown member status

Membership	Responses
Unknown	Bathrooms
Unknown	Butterfly maze
Unknown	Everything was good
Unknown	Everything! Kids enjoyed the animals, pony rides, and all creation!
Unknown	Fountains
Unknown	It's all new. The maze
Unknown	Maze - great way to interact with your child
Unknown	Maze - Just walking around
Unknown	Releasing the butterflies
Unknown	The new gardens
No	All of children's activities
No	Caterpillars in middle phase
No	Daughter loved the rabbits
No	Landscape design
No	Mosaic - (Tiger) painting art. New building - growing of zoo
No	Release of the butterflies
No	The actual butterflies
No	The butterflies
No	The fountains and the chair that looks like a butterfly
No	Water fountain and they walk way
Yes	Activities
Yes	Beautiful gardens
Yes	Butterfly maze
Yes	Clean, new, Beautifully landscaped
Yes	Everything
Yes	Gardens
Yes	I didn't know it was a "festival." I walked through the garden and went in the new building. I didn't notice anything about butterflies.
Yes	Kody= the worms in the gardener's shed Kayla= the beautiful carvings in the posts
Yes	Making the cards for dad
Yes	New buildings and animal exhibits and new gardens - beautiful
Yes	Okay - the ice cream- combination of music/animals etc. seeing the zoo improvements - WOW!
Yes	Planting arrangement - it looked nice
Yes	Releasing the Monarch butterflies into the garden

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Yes	Seeing the Monarch butterflies and this beautiful area
Yes	Simplicity
Yes	The beautiful colors
Yes	The butterfly maze, the gardens are absolutely beautiful. Love the landscaping. Everything is really fantastic.
Yes	The butterfly release.
Yes	The fountains were my son's favorite. We also liked the maze.
Yes	The garden
Yes	The maze - the kids liked it
Yes	The maze is a cute idea (The whole garden). It was peaceful and lovely.
Yes	The pants, waterfall, sculpture, education facility.
Yes	The releasing of the butterflies. It's so beautiful to see them take off for a new life.
Yes	Very informative - lots of hands on learning
Yes	Very interesting
Yes	Walking all the paths of the gardens with my family
Yes	Watching me 2, 3, and 5 year old
Yes	Watching the butterflies

## Evaluation of the Insect Fair at Columbus Zoo

### Background Information

An Insect Fair was held during 2003 at the Columbus Zoo and Aquarium on Sunday, October 19 (noon – 5 pm) and Monday, October 20 (9 am – 3 pm). Sunday was geared towards families and Monday mostly served school groups. Although there was no one exhibit that focussed only on butterflies, there was an arts and crafts activity where children make butterfly rings.

### Methods & Audience Characteristics

Volunteers at the Columbus Zoo collected data on both days, following the sampling protocol outlined in Appendix A. The final sample included 88 adults who visited the Insect Fair and 85 people who visited Columbus Zoo but did not attend the Insect Fair. In both cases, the majority of respondents were Zoo members (72%), the majority had children (75.3%), and the majority were female (72.3%) (see Tables 1 – 3). Table 4 shows that most of the respondents had not visited the Wilds in SE Ohio (72%), but significantly more of the Fair attendees had done so (39% compared to 17.5%). Likewise, Table 5 shows that most of the respondents (88%) did not have special training or hobbies related to butterflies, but significantly more Fair attendees had such training (17% compared to 6%). The breakdown of respondent ages is shown in Table 6. Most of the respondents (62%) were 30 – 49 years old.

The survey instrument is included in Appendix B.

### Summary of Results

- In most cases, Fair attendees did not differ from non-attendees in how they answered the survey questions.
- Of the various butterfly activities, the one of greatest interest to both attendees and non-attendees was attracting butterflies to your yard (see Table 8).
- Significantly more Fair attendees indicated an interest in volunteering to collect butterfly data (mean of 2.26 on a 1 – 5 scale, compared to a mean of 1.82 for non-attendees) (see Table 8).
- Significantly more Fair attendees indicated an interest in volunteering to help restore butterfly habitat (mean of 2.70 on a 1 – 5 scale, compared to a mean of 2.18) (see Table 8).
- Of the three self-statements, both attendees and non-attendees were more likely to say they think about the impact of their actions on the natural world than to claim confidence in teaching others about environmental issues (Table 9).
- More respondents indicated that the Fair increased their awareness of insects than encouraged them to help with conservation of insects (Table 10).
- The average time spent at the Fair was 42.24 minutes, with a range of 1 to 120 minutes.
- There was a significant correlation between the time spent at the Fair and the extent to which the respondent said the Fair increased their awareness of insects and their links to habitat and human activities. Time spent at the Fair was not correlated with the conservation-related questions (see Table 12).

- The open-ended responses to the prompt “I never realized that...” are shown in Appendix C. A number of respondents referred to physical characteristics of insects, such as size, and many expressed surprise at the number of types of insects. Other biological facts were mentioned.
- Appendix C also includes open-ended responses to the prompt “It reminded me that...” Many respondents referred to the overall importance of insects, and a few expressed a desire to explore their own backyard.
- When asked what was their favorite part of the Insect Fair, several respondents mentioned “eating bugs”. Many mentioned the live insects and seeing their children interact with them. A large number also referred to the crafts and activities (see Appendix C).

In general, people who attended the Insect Fair seemed to be leaving with an increased awareness of insects. In particular, attendees commented on such things as an appreciation of the many types of insects, their importance, and specific aspects of their physical characteristics. The more time people spent at the Fair, the more likely they were to say that the Fair increased their awareness of insects and their links to habitat and human activities.

Because the Fair focused on insects in general and not just butterflies, it is not surprising that Fair attendees did not differ from non-attendees in their interest in doing butterfly activities. There were some indicators that the Fair might be influencing a desire to volunteer to collect butterfly data or to help restore butterfly habitat. But this difference is more likely due to the fact that more Fair attendees had special training or hobbies related to butterflies. In order to claim that the Fair was having such an influence, a different sampling procedure would be necessary. It would be better to compare zoo visitors who intended to visit the Insect Fair with those who had indeed visited.

A total of 72 people (42%) indicated an interest in Ohio restoration projects for butterflies, and most provided phone numbers or emails. (See Appendix C.) There was no significant difference between Insect Fair attendees and non-attendees in terms of their likelihood to provide names (Chi-Square = .578,  $p > .05$ ). The people in Appendix C may be contacted in the future to invite them to restoration events, and see whether Festival attendees are more likely to attend them.

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Tables 1 - 3

			Visited Insect Fair		Total
			No	Yes	
Are you a zoo member?	No	Count % within Visited Insect Fair	22 27.5%	22 28.6%	44 28.0%
	Yes	Count % within Visited Insect Fair	58 72.5%	55 71.4%	113 72.0%
Total		Count % within Visited Insect Fair	80 100.0%	77 100.0%	157 100.0%

			Visited Insect Fair		Total
			No	Yes	
Do you have children?	No	Count % within Visited Insect Fair	15 19.0%	23 30.7%	38 24.7%
	Yes	Count % within Visited Insect Fair	64 81.0%	52 69.3%	116 75.3%
Total		Count % within Visited Insect Fair	79 100.0%	75 100.0%	154 100.0%

			Visited Insect Fair		Total
			No	Yes	
Gender	Male	Count % within Visited Insect Fair	21 25.9%	23 29.5%	44 27.7%
	Female	Count % within Visited Insect Fair	60 74.1%	55 70.5%	115 72.3%
Total		Count % within Visited Insect Fair	81 100.0%	78 100.0%	159 100.0%

Table 4

			Visited Insect Fair		Total
			No	Yes	
Have you visited the Wilds in SE Ohio	No	Count % within Visited Insect Fair	66 82.5%	47 61.0%	113 72.0%
	Yes	Count % within Visited Insect Fair	14 17.5%	30 39.0%	44 28.0%
Total		Count % within Visited Insect Fair	80 100.0%	77 100.0%	157 100.0%

Pearson Chi Square <0.01. Difference is significant.

Table 5

		Visited Insect Fair		Total
		no	yes	
Special Training or hobbies	no	80 94.1%	73 83.0%	153 88.4%
	yes	5 5.9%	15 17.0%	20 11.6%
Total		85 100.0%	88 100.0%	173 100.0%

Pearson Chi Square <0.05. Difference is significant.

Table 6

			Visited Insect Fair		Total
			No	Yes	
Age Groups	12 yrs old and under	Count	3	9	12
		% within Visited Insect Fair	3.8%	11.5%	7.6%
	13-17 yrs old	Count	5	9	14
		% within Visited Insect Fair	6.3%	11.5%	8.9%
	18-24 yrs old	Count	4	5	9
		% within Visited Insect Fair	5.1%	6.4%	5.7%
	25-29 yrs old	Count	10	5	15
		% within Visited Insect Fair	12.7%	6.4%	9.6%
	30-39 yrs old	Count	32	33	65
		% within Visited Insect Fair	40.5%	42.3%	41.4%
	40-49 yrs old	Count	22	11	33
		% within Visited Insect Fair	27.8%	14.1%	21.0%
	50-59 yrs old	Count	2	5	7
		% within Visited Insect Fair	2.5%	6.4%	4.5%
	60-69 yrs old or older	Count	1	1	2
		% within Visited Insect Fair	1.3%	1.3%	1.3%
Total		Count	79	78	157
		% within Visited Insect Fair	100.0%	100.0%	100.0%

**Table 7. Butterfly Knowledge**  
Average Ratings

	<b>Visited Insect Fair (N=88)</b>	<b>Did not visit Insect Fair. (N=85)</b>
How would you rate your knowledge about butterflies?	2.64	2.42

Scale: 5= Extremely knowledgeable, 1 = Not at all knowledgeable

**Table 8. 'Please rate your interest in the following topics.'**  
Average Ratings

	<b>Visited Insect Fair (N=88)*</b>	<b>Did not visit Insect Fair. (N=85)*</b>
Learning to identify butterflies	3.41	3.15
Raising caterpillars	2.76	2.63
Attracting butterflies to your yard	4.01	3.89
Doing something artistic involving butterflies	3.11	2.99
Learning about butterfly conservation issues	3.24	3.19
Volunteering to collect butterfly data	2.26	1.82**
Volunteering to help restore butterfly habitat	2.70	2.18**

Scale: 5= Extremely interested, 1 = Not at all interested (N varies slightly by question. \*)  
Means are statistically different at the p< 0.05 level (t-test). \*\*

**Table 9. 'How true are the following statements for you?'**  
Average Ratings

	<b>Visited Insect Fair (N=88)*</b>	<b>Did not visit Insect Fair. (N=85)*</b>
I am confident teaching others about environmental issues.	2.68	2.36
I lead a balanced life when it comes to my environmental impact.	3.04	3.03
I often think about whether or not my actions harm the natural world.	3.69	3.51

Scale: 5= Extremely true, 1 = Not at all true (N varies slightly by question. \*)

Table 10. 'As a result of visiting the insect fair, how would you rate the following statements?'

Frequency of responses

	Not at all or Only slightly (1,2)	Somewhat (3)	Very much so or For the most part (4,5)
The fair increased my awareness of insects and their links to habitat and human activities.(N=87)	9.2%	20.7%	70.1%
The fair provided me with ideas as to how I can help preserve butterflies and their habitats in my own backyard.(N=87)	12.6%	29.9%	57.5%
The fair encouraged me to help with conservation efforts of insect populations.(N=86)	11.6%	26.7%	61.6%

Tables 11-12. Time Spent at Insect Fair & Correlations

Minutes spent	N	MINIMU	MAXIMU	Mean	Std.
insect fair	50	1	120	42.24	26.377
Valid N	50				

The fair has increased awareness of and their links to and human	Pearson	Minutes at insect
	Sig. (2-	.016
	N	49
The fair provided me ideas as to how I can preserve insects and habitats in my backyard	Pearson	.085
	Sig. (2-	.561
	N	49
The fair encouraged to help with efforts of population	Pearson	.145
	Sig. (2-	.326
	N	48
* .		

**APPENDIX A: Columbus Sampling Plan**

3. Goal is to get 100 – 200 insect fair participants and 100 – 200 non-participants.
4. Collection strategy:
  - H. Approach will be something like "Hello, I'm [name] from the Columbus Zoo and we really need your input to improve your experiences here. Please fill out this survey which should only take a couple of minutes." (Put survey in front of person make it more difficult to refuse) If this does not work go to contingencies (e.g., emphasize the importance of this study, listen to the reasons why they say no and try to accommodate.) Note: Do not ask if they would like to fill out the survey, just make a direct request.
  - I. Time of collection: Should gather data throughout the day.
  - J. Sampling procedure: Establish some way to encourage the data collectors to get a random sample (rather than just people they would like to talk to). It helps to have a rule such as watching a line or doorway and selecting the 3rd group (or some other predetermined number) to pass it. Surveys should be given to adults (over 18 years old). Use some rule like the first adult on your left. If that adult refuses, you can ask one more time. Otherwise you can give it to whoever volunteers. Do not count groups that go through as collectors are talking to possible subjects. On a slow day, collectors may need to approach every group. You can divide the collection area into sections if it is crowded and if there are several data collectors. One data collector might be able to hand out two surveys & clipboards at once and keep track of the people filling them out.
  - K. Data collector should keep track of refusals by keeping a tally. A refusal is when no adult from the group agrees to participate.
  - L. Materials: Each collector will go out with 3 clipboards, a box of pencils (to give the visitors to write with), and thank you gifts (if used). Two clipboards are for the visitors and one is for the collector write on (it can have a cover sheet with a data and place to tally the number of refusals. Under that can be the blank surveys.)
  - M. Be sure to thank the visitors who participate. (We give something like a postcard to respondents as a "thank you" but it's not critical. I don't know what your budget allows.) The collectors should look over the surveys as they collect them, and they should fill in the date if the visitor forgets to do that. Also make sure both sides are completed.
  - N. Bad weather plan: There should be a comfortable place to go where visitors can complete the surveys if it is raining etc.
  - O. Make sure to gather and label all the data and mail to me for processing. (Send it some safe way.)

Questions? Call Carol Saunders, Ph.D.  
Brookfield Zoo  
(o) (708) 485-0263 x 371  
(h) (708) 485-7102



# Butterfly Survey



The Zoo wants to know about your interest and experiences related to butterflies. Please take a few minutes to answer the following questions.

Today's date: \_\_\_\_\_

## 1. How would you rate your knowledge about butterflies?

- Not at all knowledgeable     
  Only slightly knowledgeable     
  Somewhat knowledgeable     
  Knowledgeable     
  Extremely knowledgeable

## 2. Do you have any special training or hobbies related to butterflies?

- No     
  Yes     
 If yes, please describe: \_\_\_\_\_

## 3. Have you visited our insect fair?

- No (Skip to question #6)     
  Yes (Please complete the following two sentences about your insect fair experience)
- If yes, approximately how much time did you spend in the insect fair area? \_\_\_\_\_ minutes

I never realized that: \_\_\_\_\_

\_\_\_\_\_

It reminded me that: \_\_\_\_\_

\_\_\_\_\_

## 4. What was your favorite part of the insect fair? Why?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## 5. As a result of visiting the insect fair area, how would you rate the following statements?

	Not at all	Only slightly	Somewhat	For the most part	Very much so
- The fair increased my awareness of insects and their links to habitat and human activities.	<input type="checkbox"/>				
- The fair provided me with ideas as to how I can help preserve insects and their habitats in my own backyard.	<input type="checkbox"/>				
- The fair encouraged me to help with conservation efforts of insect populations.	<input type="checkbox"/>				

Please continue on other side



# Butterfly Survey



## 6. Please rate your interest in the following topics.

	Not at all interested	Only slightly interested	Somewhat interested	Interested	Extremely interested
- Learning to identify butterflies	<input type="checkbox"/>				
- Raising caterpillars	<input type="checkbox"/>				
- Attracting butterflies to your yard	<input type="checkbox"/>				
- Doing something artistic involving butterflies	<input type="checkbox"/>				
- Learning about butterfly conservation issues	<input type="checkbox"/>				
- Volunteering to collect butterfly data	<input type="checkbox"/>				
- Volunteering to help restore butterfly habitat	<input type="checkbox"/>				

Please give us some information about yourself...

How many times have you visited the Zoo in the past 12 months (not including today)? \_\_\_\_ times

What is your age? \_\_\_\_\_

Are you:  Male  Female

Are you a Zoo member?  No  Yes (How many years: \_\_\_\_\_)

Do you have children?  No  Yes (What ages: \_\_\_\_\_)

Have you ever visited *the Wilds* in southeastern Ohio?  No  Yes (When did you visit: \_\_\_\_\_)

Your home Zip Code \_\_\_\_\_

## How true are the following statements for you?

	Not at all true	Only slightly true	Somewhat true	True	Extremely true
- I am confident teaching others about environmental issues.	<input type="checkbox"/>				
- I lead a balanced life when it comes to my environmental impact.	<input type="checkbox"/>				
- I often think about whether or not my actions harm the natural world.	<input type="checkbox"/>				

Several habitat restoration projects for butterflies are being planned in the Ohio area in the near future. If you are interested in finding out more about these efforts, please provide us your name and phone number.

Name: \_\_\_\_\_ Phone number: \_\_\_\_\_ Email: \_\_\_\_\_

*Thanks again for your help!*

**APPENDIX C: Open Ended Responses**

N = 88 total Festival surveys  
 Membership breakdown: 55 members, 22 non-members, and 11 unknown

**Responses to “I never realized that...”**

A total of 49 people (56%) provided responses to this question

Of the 55 zoo members, 33 provided responses

Of the 22 non-zoo members, 11 provided responses

5 responses were given from the 11 visitors of unknown member status

Membership	Responses
Unknown	Butterflies can have babies, but how
Unknown	Centipedes were so poisonous
Unknown	Praying mantis' don't bite
Unknown	There were butterflies in the arctic tundra
Unknown	There were so many types
No	A queen bee is different from other bees.
No	Butterflies have tiny scales on their wings
No	Dung beetles were brought to Australia from Africa
No	Dung beetles were introduced to Australia
No	Insects were interesting and useful to our society
No	Ladybug was Ohio's state insect
No	Praying mantis' are friendly
No	There are 150 species of ladybugs
No	There were so many different kinds
No	There weren't many huge butterflies
No	Things about tarantulas
Yes	1 in 4 animal species is a beetle
Yes	80% of all animals are insects
Yes	Brown recluse spiders were so small.
Yes	Butterflies have scales
Yes	Cicadas can be so big
Yes	Cockroaches feel like plastic
Yes	Cockroaches get caught in your hair
Yes	Insects were so interesting
Yes	It was here
Yes	Kids liked bugs so much
Yes	Ladybug was Ohio's state insect
Yes	Millipedes can be huge
Yes	Millipedes could be so large or long
Yes	Ohio had such a diverse insect population
Yes	So many butterflies in Ohio
Yes	Some bugs are so big

## Columbus Butterfly Report 10/19-20/03

Yes	Some butterflies were so big
Yes	Termites were good for the environment
Yes	The lady bug's real name is the ladybird beetle
Yes	There are 10,000 species of ants
Yes	There are many butterfly types
Yes	There are some butterflies that live over winter in Ohio
Yes	There was so many different kinds
Yes	There were leaf cutter ants
Yes	There were many butterflies in Ohio
Yes	There were so many bugs in the world
Yes	There were so many different butterflies in Ohio.
Yes	There were so many different kinds of insect types
Yes	There were so many different Ohio insects
Yes	There were so many different patterns on the wings
Yes	There's so much to learn about butterflies
Yes	They can fly so far
Yes	Walking sticks were spiny in some cases

**Responses to “It reminded me that...”**

A total of 42 people (48%) provided responses to this question

Of the 55 zoo members, 28 provided responses

Of the 22 non-zoo members, 10 provided responses

4 responses were given from the 11 visitors of unknown member status

Membership	Responses
Unknown	Don't kill insects
Unknown	How can a butterfly have babies
Unknown	I helped at the first fair 11.5 years ago
Unknown	There are so many connections between insects and other arthropods, the environment, bats and us.
No	All insects have a important job
No	Bugs are very important
No	I like butterflies
No	Insects are important too
No	Insects have an important ecological job
No	Nature is beautiful
No	Spiders are not insects
No	There are a lot of bugs
No	There are so many things yet to learn
No	There must be more aphids around then I thought
Yes	All creatures are important even the ones we don't like
Yes	All insects are beneficial
Yes	Ants build nests 7 feet tall.
Yes	Bugs are cool
Yes	Bugs are numerous
Yes	Butterflies are not the same as moths
Yes	Cockroaches are plasticity
Yes	Every insect has more than one name
Yes	I loved exploring bugs in my yard as a child and to encourage my children to explore
Yes	I need to be more aware in my own backyard
Yes	I should do more lessons about bugs in my classroom
Yes	I won't need to eat for a while, because I am grossed out
Yes	I'm glad we don't have millipedes around here that large
Yes	Insects are a part of nature
Yes	Insects are beautiful and important
Yes	Insects are cool.
Yes	Insects are important animals too.
Yes	Insects are very important
Yes	Insects can be beneficial to humans not just annoying pests
Yes	Insects play such a huge part in our environment
Yes	Nature is wonderful
Yes	There are a lot of insects

## Columbus Butterfly Report 10/19-20/03

Yes	There are differences no matter what you look at.
Yes	There are thousands of bugs
Yes	There were lots of insects
Yes	This is one of the zoo's best programs
Yes	We are being taken over by their incestuous, obsessive breeding habits
Yes	We shouldn't just swat at some of them

**Responses to “What was your favorite part of the Insect Fair? Why”**

A total of 79 people (90%) provided responses to this question

Of the 55 zoo members, 46 provided responses

Of the 22 non-zoo members. 22 provided responses

11 responses were given from the 11 visitors of unknown member status

Membership	Responses
Unknown	Crafts for the kids because it got them involved
Unknown	Drawing a bug for bats, because my daughter likes it.
Unknown	Impressive specimen display
Unknown	Live bugs
Unknown	Live insects
Unknown	Looking at real live insects- the children enjoyed that the most
Unknown	Making different thing and maybe the different bugs.
Unknown	OSU exhibit case, Ohio state insect exhibit
Unknown	Praying mantis, holding
Unknown	Stuff for kids- rare insects
Unknown	The great knowledge held and relayed by the many volunteers. The bug man and the OSU entomology guys and girls. Exhibits were fantastic. The bats too.
No	All of it was extremely helpful and educational. My students enjoyed it.
No	Beetles, because I think some of them are very beautiful
No	Crafts for kids
No	Eating the worm-it was daring and cool
No	Everything
No	Free stuff
No	Handouts to take with me
No	Kids would see the insects up close crafts were great too. Don' use glitter glue- it didn't dry in time and made a mess on hands and clothes
No	My favorite part is the tarantula. Why? Because they're furry and pretty.
No	OSU entomology
No	Seeing the live insects crawl on the children and then allowing them to make them
No	Spiders
No	The activities are fun
No	The bees
No	The bees my daughter loved how they can do different things and make honey
No	The bugs you got to eat, because we have never eaten one
No	The butterfly displays. Able to see all the varieties at one time and try to recall the names as I see them in the wild.
No	The live exhibits, love live animals
No	The live insects for my child and the crafts
No	The stamps are fun
No	Wonderful displays

**Columbus Butterfly Report 10/19-20/03**

Yes	All of the hands on activities for learning
Yes	All the areas set up for children. My daughter loved her visit.
Yes	All the information
Yes	All the variety and the scorpions
Yes	All the wonderful crafts for kids
Yes	All very interesting to me and the kids
Yes	Bats
Yes	Bug man interaction with insects
Yes	Butterflies
Yes	Butterflies, they are pretty
Yes	Children' crafts- my son loves crafts. Free seeds- they'll help us attract more butterflies to observe.
Yes	Crafts children enjoyed them
Yes	Crafts for the children were free
Yes	Crafts related to insects
Yes	Crafts/ info for my kids
Yes	Honeybee's and butterflies. Raw honey has the best ingredients and butterflies-start to finish are beautiful
Yes	How interactive everything was, the boys usually enjoyed themselves
Yes	I loved all of it. Education made fun for the kids. Way to go.
Yes	Kid friendly even for pre scholars
Yes	Kids activities
Yes	Leaving
Yes	Live butterflies
Yes	My son. He had a blast.
Yes	Puppet show- seeing the insect displays
Yes	Puppet show, very interactive with the children
Yes	Seeing all the displays
Yes	Seeing my granddaughter being comfortable and interested in the live displays
Yes	Seeing the kids discover insects
Yes	Spiders
Yes	The activities for my two-year-old - the little thing he can learn are great.
Yes	The child friendly atmosphere and awesome crafts. The exhibits from OSU were all so stunning
Yes	The cockroach, I got to pet it
Yes	The coloring time/stamps
Yes	The crafts are fun
Yes	The crafts, because I'm crafty
Yes	The crafts. My kids learned and had a good time
Yes	The crafts. The crafts, children enjoy the activities. Live bugs, way cool
Yes	The educational info, because it taught me a lot
Yes	The live bugs are interesting
Yes	The live bugs, because I've never held an Australian walking stick or eaten mealworms

**Columbus Butterfly Report 10/19-20/03**

Yes	The live insects
Yes	The nice exhibits and arts and crafts was very informative
Yes	The spiders are interesting
Yes	The various people talking about their interests
Yes	The very wide variety
Yes	Watching my children interact with all the different people
Yes	Watching my students touch the insects

## Evaluation of the Butterfly and Bug Festival at Toledo Zoo

### Background Information

A Butterfly and Bug Festival was held at the Toledo Zoo on August 28, 2004 (10 am – 4 pm). The day included free guided tours of: the zoo's nonpublic butterfly conservation center, a butterfly garden, and the invertebrate collection in the Museum of Science building. A butterfly gardening class and a workshop on how to photograph insects were also offered. The overcast day kept things slow for the first hour or so, but otherwise there was a steady flow of people passing through.

### Methods & Audience Characteristics

Volunteers at the Toledo Zoo collected data throughout the day, following the sampling protocol outlined in Appendix A. The final sample included 37 adults who visited the Butterfly and Bug Festival and 98 adults who were intercepted before they entered the area. Half of the Festival attendees were members, while most of the non-attendees were not members. The majority of both attendees and non-attendees had children (86%), and the majority were female (71%) (see Tables 1 – 3). Table 4 shows that most of the respondents had not visited the Wilds in SE Ohio (97%). Likewise, Table 5 shows that most of the respondents (95%) did not have special training or hobbies related to butterflies. The breakdown of respondent ages is shown in Table 6. Most of the respondents (56%) were 30 – 49 years old.

The survey instrument is included in Appendix B.

### Summary of Results

- In most cases, Festival attendees did not differ from non-attendees in how they answered the survey questions.
- People who visited the Festival rated their knowledge of butterflies as significantly higher than those who did not visit (mean of 2.59 on a 1 – 5 scale, compared to a mean of 1.96) (See Table 7).
- There were no differences in interest in doing butterfly-related behaviors between Festival goers and non-goers (Table 8). Attracting butterflies to your yard was the activity of greatest interest to both groups, followed by learning to identify butterflies, and learning about butterfly conservation issues.
- Of the three self-statements, both attendees and non-attendees were more likely to say they think about the impact of their actions on the natural world than to claim confidence in teaching others about environmental issues (Table 9).
- Half of the people who visited the Festival claimed that it increased their awareness of insects and their links to habitat and human activities (Table 10).
- The mean amount of time spent in the festival/garden was 43.0 minutes, with a range of 5 to 120 minutes (Table 11). The greater the time spent at the Festival, the more likely people said that it increased their awareness of butterflies and their links to habitat and human activities. (See Table 12).
- There were 18 responses to the "I never realized..." question. Several commented that they did not know there were so many butterflies or that so many were endangered. A few mentioned the relationship between Monarchs and milkweed. Looking at the 14 responses to the "It reminded me that..." question, many were related to how beautiful butterflies are or how awesome/precious nature is. It also reminded some people of doing projects at a young age. (See Appendix C).

## Comparison of Results

- When asked for their favorite part of the festival, a number of respondents mentioned the live displays of butterflies, including close-up looks, and the informative presenters. The hands-on experiences and crafts for the children were also popular. (See Appendix C).

In general, people who attended the Festival rated their knowledge of butterflies higher than those who did not attend. The more time people spent at the Festival, the more likely they were to say that the Festival increased their awareness of butterflies and their links to habitat and human activities.

A total of 97 people (72%) indicated an interest in learning more about habitat restoration projects for butterflies, and most provided either their phone numbers or emails. (See Appendix C.) There was no significant difference between Festival attendees and non-attendees in terms of their likelihood to provide names (Chi-Square = .039,  $p > .05$ ). The people in Appendix C may be contacted in the future to invite them to restoration events, and see whether Festival attendees are more likely to attend them.

Comparison of Results

Table 1

		Have you visited our Butterfly & Bug Festival today?		Total
		No	Yes	
Are you a zoo member?	Non-Member	62 66.7%	18 50.0%	80 62.0%
	Member	31 33.3%	18 50.0%	49 38.0%
Total		93 100.0%	36 100.0%	129 100.0%

Table 2

		Have you visited our Butterfly & Bug Festival today?		Total
		No	Yes	
Do you have children?	No	12 13.6%	6 16.7%	18 14.5%
	Yes	76 86.4%	30 83.3%	106 85.5%
Total		88 100.0%	36 100.0%	124 100.0%

Table 3

		Have you visited our Butterfly & Bug Festival today?		Total
		No	Yes	
Gender	Male	29 31.2%	8 22.2%	37 28.7%
	Female	64 68.8%	28 77.8%	92 71.3%
Total		93 100.0%	36 100.0%	129 100.0%

Table 4

		Have you visited our Butterfly & Bug Festival today?		Total
		No	Yes	
Have you ever visited the Wilds in southeastern Ohio?	No	87 95.6%	36 100.0%	123 96.9%
	Yes	4 4.4%	0 .0%	4 3.1%
Total		91 100.0%	36 100.0%	127 100.0%

**Table 5**

		Have you visited our Butterfly & Bug Festival today?		Total
		No	Yes	
Do you have any special training or hobbies related to butterflies?	No	95 96.0%	34 91.9%	129 94.9%
	Yes	4 4.0%	3 8.1%	7 5.1%
Total		99 100.0%	37 100.0%	136 100.0%

**Table 6**

		Have you visited our Butterfly & Bug Festival today?		Total
		No	Yes	
Age groups	19-24	8 8.8%	2 5.6%	10 7.9%
	25-29	13 14.3%	7 19.4%	20 15.7%
	30-39	30 33.0%	10 27.8%	40 31.5%
	40-49	22 24.2%	8 22.2%	30 23.6%
	50-59	13 14.3%	9 25.0%	22 17.3%
	60-69	5 5.5%	0 .0%	5 3.9%
	Total		91 100.0%	36 100.0%

**Table 7: 'How would you rate your knowledge about butterflies?'**

Average Ratings

	Visited Festival (N=37)	Did not visit Festival (N=98)
How would you rate your knowledge about butterflies?	2.59	1.96

Scale: 5= Extremely knowledgeable, 1 = Not at all knowledgeable  
Means are statistically different at the p< 0.05 level (t-test).

**Comparison of Results**

**Table 8: 'Please rate your interest in the following topics.'**

Average Ratings

	<b>Visited Festival (N=37)*</b>	<b>Did not visit Festival (N=98)*</b>
Learning to identify butterflies	3.32	2.90
Raising caterpillars	2.47	2.16
Attracting butterflies to your yard	3.56	3.29
Doing something artistic involving butterflies	2.97	2.57
Learning about butterfly conservation issues	3.18	2.75
Volunteering to collect butterfly data	2.09	2.01
Volunteering to help restore butterfly habitat	2.26	2.16

Scale: 5= Extremely interested, 1 = Not at all interested

\* N varies slightly by question.

No statistical differences in mean results  $p > 0.05$  level (t-test).

**Table 9: "How true are the following statements for you?"**

Average Ratings

	<b>Visited Festival (N=37)*</b>	<b>Did not visit Festival (N=98)*</b>
I am confident teaching others about environmental issues.	2.50	2.11
I lead a balanced life when it comes to my environmental impact.	3.11	2.86
I often think about whether or not my actions harm the natural world.	3.67	3.37

Scale: 5= Extremely true, 1 = Not at all true

\* N varies slightly by question.

No statistical differences in mean results  $p > 0.05$  level (t-test).

**Table 10: 'As a result of visiting the festival area, how would you rate the following statements?'**

Frequency of responses

	<b>Not at all or Only slightly (1,2)</b>	<b>Somewhat (3)</b>	<b>Very much so or For the most part (4,5)</b>
The festival increased my awareness of insects and their links to habitat and human activities.(N=42)	16.7%	33.3%	50.0%
The festival provided me with ideas as to how I can help preserve butterflies and their habitats in my own backyard.(N=41)	24.4%	39.0%	36.6%
The festival encouraged me to help with conservation efforts of insect populations.(N=41)	17.1%	41.5%	41.5%

**Table 11: Minutes spent in festival area**

	N	Minimum	Maximum	Mean	Std. Deviation
If yes, how much time did you spend in the festival area?	19	5.00	120.00	43.0263	41.32005

**Table 12**

**Correlations**

		If yes, how much time did you spend in the festival area?
The festival increased my awareness of insects & their links to habitat & human activities	Pearson Correlation	.470*
	Sig. (2-tailed)	.049
	N	18
The festival provided me with ideas as to how I can help preserve insects & their habitats	Pearson Correlation	.136
	Sig. (2-tailed)	.590
	N	18
The festival encourage me to help with conservation efforts of insect populations	Pearson Correlation	.175
	Sig. (2-tailed)	.487
	N	18

\*. Correlation is significant at the 0.05 level (2-tailed).

APPENDIX A: Toledo Sampling Plan

5. Goal is to get 100 – 200 insect fair participants and 100 – 200 non-participants.
6. Collection strategy:
  - P. Approach will be something like “Hello, I’m [name] from the Toledo Zoo and we really need your input to improve your experiences here. Please fill out this survey which should only take a couple of minutes.” (Put survey in front of person make it more difficult to refuse) If this does not work go to contingencies (e.g., emphasize the importance of this study, listen to the reasons why they say no and try to accommodate.) Note: Do not ask if they would like to fill out the survey, just make a direct request.
  - Q. Time of collection: Should gather data throughout the day.
  - R. Sampling procedure: Establish some way to encourage the data collectors to get a random sample (rather than just people they would like to talk to). It helps to have a rule such as watching a line or doorway and selecting the 3rd group (or some other predetermined number) to pass it. Surveys should be given to adults (over 18 years old). Use some rule like the first adult on your left. If that adult refuses, you can ask one more time. Otherwise you can give it to whoever volunteers. Do not count groups that go through as collectors are talking to possible subjects. On a slow day, collectors may need to approach every group. You can divide the collection area into sections if it is crowded and if there are several data collectors. One data collector might be able to hand out two surveys & clipboards at once and keep track of the people filling them out.
  - S. Data collector should keep track of refusals by keeping a tally. A refusal is when no adult from the group agrees to participate.
  - T. Materials: Each collector will go out with 3 clipboards, a box of pencils (to give the visitors to write with), and thank you gifts (if used). Two clipboards are for the visitors and one is for the collector write on (it can have a cover sheet with a data and place to tally the number of refusals. Under that can be the blank surveys.)
  - U. Be sure to thank the visitors who participate. (We give something like a postcard to respondents as a “thank you” but it’s not critical. I don’t know what your budget allows.) The collectors should look over the surveys as they collect them, and they should fill in the date if the visitor forgets to do that. Also make sure both sides are completed.
  - V. Bad weather plan: There should be a comfortable place to go where visitors can complete the surveys if it is raining etc.
  - W. Make sure to gather and label all the data and mail to me for processing. (Send it some safe way.)

Questions? Call Carol Saunders, Ph.D.  
Brookfield Zoo  
(o) (708) 485-0263 x 371  
(h) (708) 485-7102



# Butterfly Survey



The Zoo wants to know about your interest and experiences related to butterflies. Please take a few minutes to answer the following questions.

Today's date: \_\_\_\_\_

## 1. How would you rate your knowledge about butterflies?

- Not at all knowledgeable    
  Only slightly knowledgeable    
  Somewhat knowledgeable    
  Knowledgeable    
  Extremely knowledgeable

## 2. Do you have any special training or hobbies related to butterflies?

- No    
  Yes    
 If yes, please describe: \_\_\_\_\_

## 3. Have you visited our insect fair?

- No (Skip to question #6)    
  Yes (Please complete the following two sentences about your insect fair experience)
- If yes, approximately how much time did you spend in the insect fair area? \_\_\_\_\_ minutes

I never realized that: \_\_\_\_\_

\_\_\_\_\_

It reminded me that: \_\_\_\_\_

\_\_\_\_\_

## 4. What was your favorite part of the insect fair? Why?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## 5. As a result of visiting the insect fair area, how would you rate the following statements?

- |  | Not at all               | Only slightly            | Somewhat                 | For the most part        | Very much so             |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| - The fair increased my awareness of insects and their links to habitat and human activities.                  | <input type="checkbox"/> |
| - The fair provided me with ideas as to how I can help preserve insects and their habitats in my own backyard. | <input type="checkbox"/> |
| - The fair encouraged me to help with conservation efforts of insect populations.                              | <input type="checkbox"/> |

Please continue on other side

**6. Please rate your interest in the following topics.**

	Not at all interested	Only slightly interested	Somewhat interested	Interested	Extremely interested
- Learning to identify butterflies	<input type="checkbox"/>				
- Raising caterpillars	<input type="checkbox"/>				
- Attracting butterflies to your yard	<input type="checkbox"/>				
- Doing something artistic involving butterflies	<input type="checkbox"/>				
- Learning about butterfly conservation issues	<input type="checkbox"/>				
- Volunteering to collect butterfly data	<input type="checkbox"/>				
- Volunteering to help restore butterfly habitat	<input type="checkbox"/>				

*Please give us some information about yourself...*

**How many times have you visited the Zoo in the past 12 months (not including today)?** \_\_\_\_ times

**What is your age?** \_\_\_\_\_

**Are you:**  Male  Female

**Are you a Zoo member?**  No  Yes (How many years: \_\_\_\_\_)

**Do you have children?**  No  Yes (What ages: \_\_\_\_\_)

**Have you ever visited *the Wilds* in southeastern Ohio?**  No  Yes (When did you visit: \_\_\_\_\_)

**Your home Zip Code** \_\_\_\_\_

**How true are the following statements for you?**

	Not at all true	Only slightly true	Somewhat true	True	Extremely true
- I am confident teaching others about environmental issues.	<input type="checkbox"/>				
- I lead a balanced life when it comes to my environmental impact.	<input type="checkbox"/>				
- I often think about whether or not my actions harm the natural world.	<input type="checkbox"/>				

Several habitat restoration projects for butterflies are being planned in the Ohio area in the near future. If you are interested in finding out more about these efforts, please provide us your name and phone number.

Name: \_\_\_\_\_ Phone number: \_\_\_\_\_ Email: \_\_\_\_\_

*Thanks again for your help!*

**APPENDIX C: Open Ended Responses**

N = 37 total Festival surveys  
 Membership breakdown: 18 members, 18 non-members, 1 unknown

**Responses to “I never realized that...”**

A total of 18 people (49%) provided responses to this question

Of the 18 zoo members, 7 provided responses

Of the 18 non-zoo members, 11 provided responses

0 responses were given from the 1 visitor of unknown member status

Member	Q3b ‘ I never realized that...’
No	Butterflies are cool.
No	Butterflies would begin to disappear.
No	Cockroaches are big.
No	There are so many.
No	There such large millipedes.
No	There were so many different butterflies.
No	You can have butterflies of your own.
Yes	Butterflies do not make cocoons...they are chrysalis.
Yes	Monarchs eat only milkweed; that a life-cycle of a monarch is only 5 weeks & that can make a chrysalis in one day!
Yes	Monarchs like milkweed. So many are endangered.
Yes	N/A
Yes	So many butterflies are endangered.
Yes	So many were endangered.
Yes	So much diversity in the insect world.
Yes	The sizes and area that they live in varied so much.
Yes	There are so many different types of beetles.
Yes	There are so many different varieties of beetles.
Yes	There were so many beetles.

**Responses to “It reminded me that...”**

A total of 14 people (38%) provided responses to this question

Of the 18 zoo members, 7 provided responses

Of the 18 non-zoo members, 7 provided responses

0 responses were given from the 1 visitor of unknown member status

Member	Q3c. 'It reminded me that...'
No	Butterflies are a beautiful species and how awesome nature can be.
No	How beautiful they are.
No	Life is beautiful.
No	Nature is precious.
No	Of Elementary School
No	There are lots of insects.
No	There many amazing things to learn about the insect world.
Yes	All living things are important.
Yes	Always plenty to learn.
Yes	Even though most insects are creepy, they are still interesting and unique.
Yes	I should have paid more attention in science classes and to my natural surroundings.
Yes	N/A
Yes	The world is very large & complex.
Yes	When I did projects at a young age.

**Responses to “What was your favorite part of the Insect Fair?...Why?”**

A total of 30 people (81%) provided responses to this question

Of the 18 zoo members, 19 provided responses

Of the 18 non-zoo members, 13 provided responses

0 responses were given from the 1 visitor of unknown member status

Member	Q4. 'What was your favorite part of the Insect Fair?...Why?'
No	All the different colors of butterflies.
No	Beatles & Cockroach - Helpful information.
No	Hands on experience for the children. I think it is very important for children to have positive life experiences.
No	I've never touched a scorpion.
No	Just the display out in the open.
No	Kids making things.
No	Making crafts & seeing animals.
No	The man holding the scorpion because he didn't get bit.
No	The Monarch life cycle exhibit.
No	The people.
No	Wings.
Yes	All displays of butterflies.
Yes	All the exhibits with Butterflies.
Yes	Butterfly
Yes	Butterfly making w/ my daughter.
Yes	Exposure to bugs and butterflies for my daughter.
Yes	I thought it was good and informative. The kids enjoyed the activities.
Yes	Looking at all the different kinds of butterflies.
Yes	Loundes Life Lab display. They answered questions about the life of a caterpillar/butterfly.
Yes	Monarch butterflies.
Yes	N/A
Yes	Puppet show & arts & crafts. Kids really enjoyed the activities!
Yes	Seeing all the butterflies up close because the wing patterns are beautiful and interesting.
Yes	The Butterfly Gardens. We were misled, we thought there would be live Butterflies.
Yes	The enthusiasm of the presenters and the interesting ways they presented their awesome knowledæ.
Yes	The kids enjoyed all of the different activities.
Yes	The live displays for me and the hands on for my daughter.
Yes	The live insects.
Yes	The specimen boxes & live butterflies & moth buckets.
Yes	Tour

## Comparison of Results across the Three Zoos

### Sample Sizes

The sampling goal was to get responses from 100 festival participants and 100 non-attendees at each zoo, but we were only able to attain the following:

Akron Zoo	60 Festival participants	127 Non-attendees	187 Total
Columbus Zoo	88 Festival participants	85 Non-attendees	173 Total
Toledo Zoo	37 Festival participants	98 Non-attendees	135 Total

### Audience Characteristics

There were many similarities across the three zoos. Both Festival participants and non-attendees tended to be 30 – 49 years old and female (approximately 72% at each zoo). They also tended to have children (75% had children at Columbus Zoo and 86% had children at the other two zoos). The majority of both Festival participants and non-attendees were members at the Akron and Columbus Zoos, while most were non-members at the Toledo Zoo.

The vast majority of the respondents had not visited *the Wilds* in SE Ohio, but of the three zoos, Columbus had the highest percentage of people who had been there (28%). This percentage was even higher for the Festival participants at Columbus (39%). At all three zoos, the vast majority of respondents did not have special training or hobbies related to butterflies. However, significantly more Festival participants at Columbus had such special backgrounds compared to their non-attendees.

### Visitor Use and Impressions of the Butterfly Festivals

The time spent at the various festivals varied across zoos:

Akron Zoo	Mean: 19.7 minutes	Range of 10 – 60 minutes
Columbus Zoo	Mean: 42.2 minutes	Range of 1 – 120 minutes
Toledo Zoo	Mean: 43.0 minutes	Range of 5 – 120 minutes

When asked to complete the phrase “*I never realized that...*”

The 14 people at the Akron Zoo who gave responses tended to mention a particular fact about butterflies.

The 49 people at the Columbus Zoo who gave responses tended to refer to physical characteristics of insects, such as size, and many expressed surprise at the number of types of insects. Other biological facts were mentioned.

Of the 18 people who gave responses at the Toledo Zoo, several commented that they did not know there were so many butterflies or that so many were endangered. A few mentioned the relationship between Monarchs and milkweed.

When asked to complete the phrase “*It reminded me that...*”

The 11 people at the Akron Zoo who gave responses tended to mention the beauty of butterflies or the types of plants that attract them.

Many of the 42 people at the Columbus Zoo who gave responses referred to the overall importance of insects, and a few expressed a desire to explore their own backyard.

Many of the 14 people at the Toledo Zoo who gave responses related to how beautiful butterflies are or how awesome/precious nature is. It also reminded some people of doing projects at a young age.

### When asked for their favorite part of the festival

A number of respondents at the Akron Zoo mentioned the butterfly release. The maze and gardens were also popular responses.

Several respondents at the Columbus Zoo mentioned “eating bugs”. Many mentioned the live insects and seeing their children interact with them. A large number also referred to the crafts and activities

A number of respondents at the Toledo Zoo mentioned the live displays of butterflies, including close-up looks, and the informative presenters. The hands-on experiences and crafts for the children were also popular.

### **Effect on Visitor Awareness and Interest in Butterflies**

At Akron Zoo, there was no difference in how Festival participants rated their knowledge of butterflies compared to non-attendees. But at the other two zoos, Festival participants reported a significantly greater knowledge of butterflies compared to people who did not attend the festivals at those zoos.

For all three zoos, there were usually no differences between Festival participants and non-attendees in their interest in doing butterfly-related behaviors. The activity of greatest interest to all groups was “attracting butterflies to your yard”, followed by “learning to identify butterflies” and “learning about butterfly conservation issues”. The only significant differences in interest emerged at the Columbus Zoo where Festival participants reported higher interests than non-attendees in “volunteering to help restore butterfly habitat” and “volunteering to collect butterfly data”.

For all three zoos, Festival participants and non-attendees were both more likely to say they “think about the impact of their actions on the natural world” than to claim confidence in teaching others about environmental issues.

Festival participants were asked how strongly they agreed with the following statements:

- 1) The festival increased my awareness of insects and their links to habitat and human activities.
- 2) The festival provided me with ideas as to how I can preserve butterflies and their habitats.
- 3) The festival encouraged me to help with conservation efforts of insect populations.

Over 50% of the Festival participants at Toledo agreed strongly with statement number 1.

Over 50% of the Festival participants at Akron agreed strongly with statement number 3.

Over 50% of the Festival participants at Columbus agreed strongly with all three statements.

For all three zoos, the more time people spent at the festivals, the more likely they were to say that the festival increased their “awareness of insects and their links to habitat and human activities”. For the Akron Zoo, there was also a significant relationship between time spent at the festival and likelihood to say the festival provided “ideas for how to help preserve butterflies and their habitats”.

Although there were no significant differences between Festival attendees and non-attendees, good percentage of all respondents indicated an interest in Ohio restoration projects for butterflies:

Akron Zoo	104 people (56%)
Columbus Zoo	72 people (42%)
Toledo Zoo	97 people (72%)

These people may be contacted in the future to see if they respond to invitations to attend such events at *the Wilds*.

## Recommendations for Future Festivals and Evaluations

Overall, the butterfly festivals at all three zoos included many creative ideas and were very popular. Although it is difficult to compare these festivals exactly since there were different features at each, a few patterns emerged that can inform future festivals. For example, respondents indicated that they especially enjoyed:

- Hands-on activities and crafts for children
- Close-up experiences with live butterflies
- Information about butterfly gardening and attracting butterflies to their yard
- Information about butterfly identification
- Information about butterfly conservation issues

In addition to being fun, the results suggest that butterfly festivals have the potential to increase “awareness of insects and their links to habitat”. The more time spent at the festivals, the more likely people were to claim this greater awareness. Also, based on how Festival participants and non-attendees rated their butterfly knowledge, the festivals seem to also increase knowledge about butterflies. Butterfly features and diversity were frequently mentioned in the open-ended comments. However, we must be cautious in interpreting the results since people who choose to attend butterfly festivals may have a greater knowledge to start with.

In general, it is always a challenge to manage volunteer data collectors from a distance. The best experimental design would be to compare Festival participants with people who intended to visit the festival but had not yet experienced it. This could be addressed by a better understanding of the festival layout and more careful sampling. Additional volunteer training would also help increase the sample sizes and richness of open-ended responses.

A future evaluation opportunity would be to follow up with those people who indicated an interest in habitat restoration. Those people could be provided with additional steps of how to get involved, with the chance to document whether or not they actually take the suggested steps. The evaluation could also determine whether Festival attendees are more likely to respond to such invitations. It was interesting that a sizable portion of the Columbus Zoo respondents had already visited *the Wilds*, and that group might be especially receptive to further involvement.

In conclusion, butterflies offer an exciting potential for studying the links between caring about a charismatic animal and conservation action. This study provides some feedback for how to engage and inform the public through butterfly festivals and how to measure the results.