



# iSaveSpecies—Great Apes Summative Evaluation Report

---

## Columbus Zoo and Aquarium

March 2015

**Prepared by:**

Mary Ann Wojton, Ph. D.  
Joe E. Heimlich, Ph. D.

**Prepared for:**

Project Dragonfly at Miami University

*This project was completed with support from NSF DRL-1010938*

## Executive Summary

The iSaveSpecies project, created by Project Dragonfly at Miami University and a consortium of zoos and aquariums, designed and implemented a socially-networked exhibit system to engage family visitors to zoos and aquariums in inquiry and conservation. The first wave of the iSaveSpecies exhibit stations focused on *Great Apes*, allowing families to conduct research on captive ape populations and to help save wild apes by joining the work of experienced field conservationists. Participating zoos have incorporated three touchscreen-based research and action kiosks in or near their ape/bonobo/orangutan exhibits.

To support these efforts, the Lifelong Learning Group conducted a summative evaluation to determine the effectiveness of the iSaveSpecies electronic interactive kiosks at engaging families in inquiry, STEM, and conservation actions. The study was designed to answer the question: Do the iSaveSpecies kiosks achieve their desired (collective) outcomes?

Data for this study were collected at four different zoos. This report focuses on the Columbus Zoo; data were collected onsite at the Zoo from adult visitors (N=327) in the gorilla and bonobo viewing areas. Two types of participants were sought—those who used the iSaveSpecies kiosks and those who did not—to complete a questionnaire or an interview.

The study found that visitors who engaged with the iSaveSpecies inquiry kiosks reported they used basic science inquiry skills during their zoo visit. Visitors who interacted with a kiosk were more likely to observe a single animal carefully, talk with others in their group about what they observed or did, and make a prediction about an animal's behavior.

However, an essential inquiry skill is the ability to ask questions that lead to investigations, and respondents were less likely to share a question about the gorillas in response to an open-ended follow-up question on the questionnaire. Additionally, when asked how they would investigate their question, those who responded favored finding the answer on the internet or asking a zoo employee, rather than observing the bonobo or gorilla. The low number of responses, the high number of simple/uninvestigable questions, and the visitors' passive investigation techniques may be due to several factors including a lack of time or an environment un conducive to writing a question and/or investigation.

Visitors who interacted with the iSaveSpecies kiosks reported they felt more knowledgeable about how to study gorillas, understood gorillas better, and were more aware that gorillas need to be protected than visitors who did not interact with the kiosks. Interviewed visitors who explored the Do All Day kiosk felt the kiosk provided opportunities to better understand the bonobos even when the animals were not present. Interviewees who completed the Which Are You kiosk shared an understanding of different bonobo personalities.

Columbus Zoo visitors who interacted with the iSaveSpecies poster kiosk were more likely to report they understood great ape conservation efforts than visitors who did not use the poster kiosk. However, the mean scores for specific conservation actions were fairly neutral; with the mean scores for the majority of statements rated below the midpoint. Additionally, research indicates visitors come to zoos and other informal learning spaces holding a set of prior knowledge, the conservation knowledge and beliefs regarding gorillas need to be protected and recycling cell phones shared by respondents may have been informed by their current zoo visit, a print source, website, or visit to their cell phone store.

Visitors who engaged with the iSaveSpecies interactive kiosks feel it added value to their zoo visit. Mean scores for those who used the iSaveSpecies kiosks were all well above the midpoint. Respondents indicated they had fun, and found a different way to engage with the animals. The kiosks provided visitors on opportunity to participate in an activity they could do with others in their group.

The key outcomes of this study include:

- Visitors who interacted with the iSaveSpecies kiosks felt it added value to their zoo visit.
- Visitors who interacted with the iSaveSpecies kiosks felt more knowledgeable about how to study gorillas, and felt they could help gorillas than visitors who did not interact with the kiosks.
- Visitors who engaged with the iSaveSpecies kiosks reported they used basic science inquiry skills during their zoo visit.
- Visitors who interacted with a kiosk reported they were more likely to observe a single animal carefully, talk with others in their group about what they observed or did, and make a prediction about an animal's behavior.

## Contents

Executive Summary .....	2
Contents .....	4
Introduction.....	5
Methods.....	6
Findings.....	6
Inquiry Skills.....	7
STEM Content.....	10
Conservation Efforts .....	11
Value Added.....	12
Conclusions .....	13
Appendix A: Data Collection Instrument.....	15
Appendix B: Demographic Tables .....	21

## Introduction

The iSaveSpecies project, created by Project Dragonfly at Miami University and a consortium of zoos and aquariums, designed and implemented a socially-networked exhibit system to engage family visitors to zoos and aquariums in inquiry and conservation. iSaveSpecies inquiry and action tools reside in an evolving library of exhibit interactives, modified by partner institutions to suit the particular needs of their visitors.

The first wave of the iSaveSpecies exhibit stations focused on *Great Apes*, allowing families to conduct research on captive ape populations and to help save wild apes by joining the work of experienced field conservationists. Six partner institutions — Cleveland Metroparks Zoo (Cleveland Zoo), Columbus Zoo & Aquarium (Columbus Zoo), Pittsburgh Zoo & PPG Aquarium (Pittsburgh Zoo), Riverbanks Zoo and Garden, The Santa Barbara Zoo, and Zoo Atlanta — have participated in this project, incorporating three touchscreen-based research and action kiosks in or near their ape/bonobo/orangutan exhibits. By building cross-institutional partnerships committed to sustaining life on our planet, the iSaveSpecies projects believes that the new tools for inquiry and public action will achieve broad national impact.

To support these efforts, a summative evaluation was conducted to determine the effectiveness of the iSaveSpecies electronic interactive kiosks at engaging families in inquiry, STEM, and conservation actions. This study built on a prior evaluation of the kiosks, the Great Apes Kiosk Evaluation, which focused on visitor interactions with the interactive kiosks. That study found that the level of engagement with the iSaveSpecies interactives was high at most sites and visitors who engaged with the interactives spent up to three minutes longer in a viewing area. Additionally, visitors who interacted with the kiosk were likely to understand the “what?” message, but they were less likely to understand the “why?” message.

While the prior evaluation provided insight into visitor interaction with the kiosks, this study focused on the efficacy of the iSaveSpecies interactive kiosks engaging visitors and delivering their messages, including encouraging visitors to develop inquiry skills, knowledge of pertinent STEM content, and engaging in specific conservation actions.

A summative design utilized questionnaires and interviews to gather data from zoo visitors. Questionnaire data were gathered from two types of zoo visitors: those who used an iSaveSpecies kiosk and those who did not. Interviews were conducted with adult visitors seen interacting with at least one of the iSaveSpecies kiosks.

The overarching evaluation question for this summative evaluation was: Do the iSaveSpecies kiosks achieve their desired (collective) outcomes? To address this larger question, five sub-questions were asked:

1. Did visitors who engaged with the iSaveSpecies inquiry kiosks report they have used basic science inquiry skills during their zoo visit?
2. Did visitors who engaged with the iSaveSpecies interactive kiosks have a better understanding of the STEM content related to the iSave Species kiosks?
3. Did visitors who engaged with the iSaveSpecies conservation poster kiosk understand great ape conservation efforts?
4. Did visitors who engaged with the iSaveSpecies conservation poster kiosks report involvement in specific conservation actions?
5. Did visitors who engaged with the iSaveSpecies interactive kiosks feel it added value to their zoo visit?

## Methods

The audience for this summative evaluation study was adult visitors to the Columbus Zoo gorilla area. Additionally, to better understand the impact of the iSaveSpecies interactives, two types of participants were sought; those who used the iSaveSpecies kiosk and those who did not.

To answer the evaluation questions, two different methods were used; a structured, intercept interview and a questionnaire. Using a continuous ask format, visitors who interacted with one of the iSaveSpecies kiosks were invited to participate in the interview as they completed the interactive. The interviews asked adults to describe what they did at the kiosk (s), and what they gained from the interaction in regards to scientific inquiry and environmental conservation.

The second method was a questionnaire. To better understand the impact of the kiosks, data were collected from those who did and those who did not engage with the kiosk. Additionally, visitors were asked to compare their interaction at the ape/bonobo area with another exhibition area of the zoo. Visitors were asked to complete the questionnaire after they had passed the iSaveSpecies kiosk. Interview scripts and questionnaires can be found in Appendix A.

All data for the two methods of the study were collected with different groups of visitors. Data gathering was impacted by the uniqueness of the zoo's animal viewing area, including the placement of the kiosks within the viewing area.

Data were analyzed collectively. Interview responses were entered into an Excel spreadsheet and coded based on the question and the objectives of the interactive kiosks. During analysis, categories of visitor responses about their knowledge were developed inductively through the coding process (i.e., they emerged from the data itself rather than being prescribed). No demographic information was collected for visitors interviewed.

All questionnaire data were entered into an Excel spreadsheet. Quantitative data were transferred into SPSS for analysis. Open-ended data were coded using coding rubrics developed for this study. Quantitative data were analyzed descriptively and, where appropriate, inferential statistics were used to test specific questions or hypotheses about the data.

## Findings

### Participants

Visitor participants in this study completed either an interview or a questionnaire. Those who completed interviews are referred to as "interviewees" throughout this report, those who completed questionnaires are referred to as "respondents." Table 1 illustrates the visitors in each category.

Table 1. Visitor participants by study method

Zoo	Number of Interviewees	Number of Respondents
Columbus	26	301

Every effort was made to gather data for each interactive kiosk. Table 2 itemizes the frequency of visitors interviewed per kiosk. Visitors were invited to comment on any of the kiosks they interacted with, and several individuals interacted with more than one kiosk. No demographic information was collected for visitors interviewed.

Table 2. Exit Interviews completed for each interactive kiosk (n=26)\*

Interactive Kiosks	Number of Interviewees
Which Gorilla Are You?	16
What Do Gorillas Do All Day?	16
Conservation Poster	8

\*Several interviewees discussed more than one exhibit

One questionnaire was designed and administered for all kiosks, with visitors indicating if they interacted or not with each kiosk. Table 3 has a breakdown of questionnaires completed by visitors who interacted with each kiosk. Data indicate that almost one third of the respondents (29%) were frequent visitors, visiting two or more times each year, one quarter were first time (24%) and almost half (46%) were infrequent zoo visitors, visiting once or less per year. Almost half of the respondents (49%) spent 5 – 15 minutes with the gorillas. The respondents were unlikely to be zoo members (74%). Appendix B contains tables for each of the demographic questions included in the questionnaire.

Table 3. Visitor interaction by kiosk (n=301)

Interactive Kiosks	Number of Respondents
Which Gorilla Are You?	121
What Do Gorillas Do All Day?	139
Conservation Poster	46

## Inquiry Skills

Overall, visitors interacting with the iSaveSpecies kiosks reported using inquiry skills more often than those who did not interact with the iSaveSpecies kiosk during their visit to the gorilla area at Columbus Zoo. The skills most often used by those who interacted with the kiosks were observing a single animal carefully, talking with others in their group about what they observed or did, and making a prediction about an animal’s behavior.

### How We Know

Table 4 contains a list of inquiry skills divided by those who interacted with a kiosk (either on this visit or a prior visit) and those who did not interact with any of the kiosks. Inquiry skills most often used by visitors include:

- Observing a single animal carefully for more than a few seconds
- Talking with others in my group about what I observed or did
- Making a prediction about an animal’s behavior
- Discovering that I am similar to an animal

Questionnaire respondents who interacted with the iSaveSpecies kiosks were more likely to report using inquiry skills than respondents who did not use the iSaveSpecies kiosks. Using a Mann-Whitney U test, a statistically significant positive difference at the .001 level was found with the following skills:

- Asking questions about what I observed
- Recorded information about an animal’s behavior (on a touch screen or on paper)
- Compared research results with others
- Made a prediction about an animal’s behavior
- Participated in research by answering questions

Table 4. Respondent's use of inquiry skills separated by interaction with kiosks

	Interact (Frequency/%)	No Interact (Frequency/%)	z	p
	n=170	n=131		
Observed a single animal carefully for more than a few seconds	158 (92%)	117 (89%)	-.725	.469
Talked with others in my group about what I observed or did	146 (86%)	100 (76%)	-2.121	.034*
Made a prediction about an animal's behavior	103 (61%)	54 (41%)	-3.329	.001***
Discovered that I am similar to an animal	102 (60%)	68 (52%)	.000	.161
Participated in research by answering questions	97 (57%)	31 (24%)	-5.801	.000***
Asked questions about what I observed	90 (53%)	44 (34%)	-3.344	.001***
Compared myself to an animal	90 (53%)	50 (38%)	-2.543	.011*
Recorded information about an animal's behavior (on a touchscreen or on paper)	55 (32%)	11 (8%)	-4.972	.000***
Compared research results with others	41 (24%)	12 (9%)	-3.372	.001***

N=301

\*\*\*statistically significant to .001

\*statistically significant to .05

Additionally, visitors were asked to compare their interaction at the ape/bonobo area with another exhibition area of the zoo. Visitors who interacted with iSaveSpecies kiosks typically reported using inquiry skills more often than those in the comparison group, with one exception, asking questions about what they observed. See Table 5. Using a Mann-Whitney U test, a statistically significant positive difference at the .001 level was found with the following skills:

- Made a prediction about an animal's behavior
- Compared research results with others

Conclusions from these data should be interpreted with caution, as there was wide variation among comparison animals and amount of time spent in the comparison animal exhibit area.

Table 5. Respondent's use of inquiry skills separated by iSaveSpecies and comparison

	iSS Interact (Frequency/%)	Comparison (Frequency/%)	z	p
	N=131	N=170		
Observed a single animal carefully for more than a few seconds	117 (89%)	128 (75%)	-2.236 <sup>b</sup>	.025*
Talked with others in my group about what I observed or did	100 (76%)	119 (70%)	-1.732 <sup>b</sup>	.083
Discovered that I am similar to an animal	68 (52%)	47 (28%)	-2.236 <sup>b</sup>	.025*
Made a prediction about an animal's behavior	54 (41%)	67 (39%)	-3.873 <sup>b</sup>	.000***
Compared myself to an animal	50 (38%)	47 (28%)	-3.464 <sup>b</sup>	.001***
Asked questions about what I observed	44 (34%)	77 (45%)	-4.000 <sup>b</sup>	.000***
Participated in research by answering questions	31 (24%)	19 (11%)	-2.000 <sup>b</sup>	.046*
Compared research results with others	12 (9%)	18 (11%)	-2.000 <sup>b</sup>	.046*
Recorded information about an animal's behavior (on a touchscreen or on paper)	11 (8%)	18 (11%)	-1.732 <sup>b</sup>	.083

N=301

\*\*\*statistically significant to .001

\*statistically significant to .05



Overall, the kiosks appear equally effective at encouraging the use of specific inquiry skills, additional analysis revealed that inquiry skills were reported consistently among the kiosks; however, a high percentage of visitors talked with others in their group about what they observed and observed a single animal carefully for more than a few seconds regardless of kiosk use. Table 6 includes the complete analysis.

Table 6. Respondent’s use of inquiry skills separated by interaction with each kiosk

Inquiry Skills	Poster		Do All Day		Which Are You	
	No Interact n=255	Interact n=46	No Interact n=162	Interact n=139	No Interact n=180	Interact n=121
Talked with others in my group about what I observed or did	205 (80%)	41 (89%)	128 (79%)	118 (85%)	140 (78%)	108 (88%)
Asked questions about what I observed	98 (38%)	36 (78%)	64 (40%)	70 (50%)	64 (36%)	70 (58%)
Compared research results with others	39 (15%)	14 (30%)	16 (10%)	37 (27%)	28 (16%)	25 (21%)
Observed a single animal carefully for more than a few seconds	229 (90%)	44 (96%)	145 (90%)	128 (92%)	162 (90%)	111 (92%)
Made a prediction about an animal’s behavior	130 (51%)	27 (59%)	70 (43%)	87 (63%)	88 (49%)	69 (57%)
Recorded information about an animal’s behavior (on a touchscreen or on paper)	58 (22%)	10 (22%)	17 (11%)	49 (35%)	35 (19%)	31 (26%)
Compared myself to an animal	109 (43%)	31 (67%)	64 (40%)	76 (55%)	67 (37%)	73 (60%)
Discovered that I am similar to an animal	138 (54%)	32 (70%)	88 (54%)	82 (59%)	87 (48%)	83 (69%)
Participated in research by answering questions	101 (40%)	27 (59%)	49 (30%)	79 (57%)	52 (29%)	76 (63%)

Regarding skills visitors felt they had not engaged in, the issue may be a matter of question semantics. Respondents may have not asked questions about what they observed or they may have felt that they needed to ask a question of a zookeeper or a docent. Those who did not indicate they recorded information about an animal’s behavior may not have realized that answering the questions while interacting with the kiosk was recording information.

An essential inquiry skill is the ability to ask questions that lead to investigations. To get a sense of a visitor’s ability to do this, questionnaire respondents and interviewees were asked “Based on your viewing in the primate area, what questions do you have about the gorillas?” and “How could someone investigate this?” about a third of visitors completing questionnaires (110 of 301) and interviews (12 of 26) shared a question and only 77 visitors who completed questionnaires and 10 visitors interviewed shared how they would investigate this question. These low numbers may be due to the visitor’s inability to articulate a question or formulate an investigation about gorillas when they are focused on closed-ended questions or lack time because other members of their party desire to move to another exhibit. Additionally, respondents might not have found the environment conducive to writing a question and/or investigation scenario.

To determine if a question was investigable, responses to the question and investigation were examined collectively. In addition to the original categories of simple/uninvestigable and investigable; two additional question themes emerged, animal contentment and conservation. A question was considered investigable if the visitor proposed to investigate their question by observing the gorillas. For example, two respondents may both have written “What do the gorillas eat?” as their question. If the respondent followed up with an investigation that included watching the gorilla eat, the question was classified as investigable. If the visitor shared they would investigate by asking someone, the question was classified as simple/uninvestigable.

The majority of the questions were considered simple or uninvestigable (76 or 62%). To better understand visitor’s interest, the simple questions were further coded into four categories: behavior, age, environment, and personal. Although the majority of those who answered this question (both questionnaire and interview) shared only one question, a few guests wrote several. Simple/uninvestigable questions were most likely about the gorilla’s age (14) behavior patterns (23), personal information (25), and their environment (20). Personal questions included those

that asked questions about specific gorillas and family relationships, such as “When will you find out who Elma’s father is?”, “What are their personalities and interpersonal dynamics like?”, and “How many families of gorillas or bonobos does the zoo support?” Behavior-related questions, including: “Why do gorillas imitate what we do?” “What are the specific ways they communicate with one another?”, and “How often do they sleep in a day?” Questions about their environment mostly dealt to the whereabouts of the bonobos, who were not always on view during data collection due to maintenance of one of their enclosures.

One quarter of the questions (32) were investigable questions, including: “When is their most active time of day?” which would be investigated by “Watch them over a week and observe,” “Are they lethargic because they are in captivity or normally lethargic?” which would be investigated by “Observation in the wild and in captivity and compare results,” and “What sorts of schedules have to be made based on the social hierarchies of these animals?”, which would be investigated by “Observational, non-obtrusive study.” Additionally, there were seven questions that focused on the gorilla’s contentment, including “How do you know that they enjoy being in the zoo?” and “Do the gorillas always hate being looked at?” There were seven conservation-related questions, including, “What more can I do-in my limited way-to help conserve these animals?”

## STEM Content

Visitors who interacted with the iSaveSpecies kiosks reported they felt more knowledgeable about how to study gorillas, understood gorillas better, and were more aware that gorillas need to be protected than visitors who did not interact with the kiosks. Interviewed visitors who explored the Do All Day kiosk felt the kiosk provided opportunities to better understand the bonobos even when the animals were not present. Interviewees who completed the Which Are You kiosk understood that bonobos had different personalities.

### How We Know

On a scale where 1 represents Strongly Disagree and 7 represents Strongly Agree, questionnaire respondents who interacted with an iSaveSpecies kiosk were more likely to agree with statements that they were more knowledgeable about how to study gorillas, understand gorillas better, and were more aware that gorillas need to be protected. Analyzing the data with an independent samples t-test, statistically significant differences were found with the following statements:

- I am more knowledgeable about how to study gorillas
- I understand gorillas better
- I am more aware that gorillas need to be protected.

The statement with the highest mean score for both groups was “I am more aware that gorillas need to be protected,” indicating the majority of the visitors had an understanding that the gorillas need to be protected that they gained from their zoo visit or other sources. See Table 7.

Interviewed visitors who explored the Do All Day kiosk watched the videos of bonobos when they weren’t present, learning something about what the bonobos did even when they weren’t present. One of these visitors shared, “That bonobos like to walk around and play and get their food and walk somewhere else and eat it.” Interviewees who completed the activity with bonobos present shared, “Doesn't surprise me, it was kind of hot, I don't feel like doing anything. Surprised that others said the bonobos were walking/climbing. I never see them active and I’m here every Saturday morning,” and “these 2 are active and apparently like each other's company.” Those that completed the Which Are You kiosk shared they learned that “A bunch of different bonobos live here, bonobos are not all alike, they are different,” and a seven year old boy shared, “I was like Mary Rose, I'd be scared if a gorilla walked in.” One adult interviewee who completed the Poster kiosk learned the “male is called a silverback.”

Table 7. Respondents feelings regarding STEM content separated by interaction with kiosks

I feel . . .	No Interaction Mean	Interaction Mean	Mean Difference	T	df	p
I understand gorillas better	4.26	4.75	0.493	2.851	287	.005
I am more knowledgeable about how to study gorillas	3.87	4.33	0.462	2.592	287	.010
I am more aware that gorillas need to be protected	4.73	5.15	0.422	2.395	284	.017
I might like to study gorillas (behavior, personality, etc.)	3.65	4.05	0.404	1.958	286	.051
I would like to work to help save gorillas in the wild	4.03	4.34	0.311	1.534	288	.126
I can investigate gorilla behavior through careful observation	4.40	4.70	0.296	1.727	288	.085
I can help gorillas	4.27	4.52	0.241	1.344	283	.180

N=301

n for No Interaction ranges from 123-124

n for Interaction ranges from 161-166

\*\*statistically significant to .01

\*statistically significant to .05

## Conservation Efforts

Columbus Zoo visitors interacting with the iSaveSpecies poster kiosk were more likely to report they understood general great ape conservation efforts than visitors who did not use the iSaveSpecies poster kiosk. Visitors who engaged with the iSaveSpecies conservation poster kiosks were more likely to report they created a conservation poster and e-mailed it to someone than those who did not engage.

### How We Know

Statistically significant differences were found between respondents who interacted with the iSaveSpecies poster kiosk and those who did not, using a Mann-Whitney U test, for the following statements:

- Learned about an animal or conservation issue
- Shared what I learned with others

The poster kiosk appeared to raise visitor awareness of gorilla behavior and habitat. Table 8 illustrates visitors' knowledge of conservation issues divided by interaction with the poster kiosk. A school-aged boy interacting with the poster stated "Gorillas are endangered, we are chopping down their homes" another school-aged boy shared, "Gorillas are important to environment; we shouldn't get rid of their homes. We don't want them angry at us."

Table 8. Visitors' knowledge of conservation issues separated by interaction with kiosks

	No Poster Frequency (%) N=255	Poster Frequency (%) N=46	Z	P
Learned about an animal or conservation issue	132 (52%)	36 (78%)	-3.434	.001***
Shared what I learned with others	74 (29%)	30 (65%)	-4.747	.000***

N=301

\*\*\*statistically significant to .001

Respondents were asked to rate their level of agreement with a set of conservation-themed statements, where 1 represents Strongly Disagree and 7 represents Strongly Agree. (See table 9.) Data were analyzed for two groups, those who interacted with the Poster kiosk on this visit or a prior visit and those who did not interact with the Poster kiosk. Questionnaire respondents interacting with the iSaveSpecies poster kiosk were more likely to agree with statements that they might like to study gorillas, help save gorillas in the wild, that they can help gorillas.

The statement with the highest mean score for both groups was “I am more aware that gorillas need to be protected,” indicating visitors understand that the gorillas need to be protected, either from this or prior zoo visits, or from messages received outside the zoo.

Table 9. Respondents feelings regarding conservation measures separated by interaction with the poster kiosk

I feel . . .	No Poster Mean	Poster Mean	Mean Difference	t	df	P
I might like to study gorillas (behavior, personality, etc.)	3.69	4.91	1.22	4.417	286	.000***
I would like to work to help save gorillas in the wild	4.08	4.91	0.83	3.027	288	.003**
I can help gorillas.	4.3	5.02	0.72	2.975	283	.003**
I am more aware that gorillas need to be protected.	4.89	5.43	0.54	2.246	284	.025*
I understand gorillas better	4.4	5.29	0.89	3.795	287	.000***

N=301

n for No Poster ranges from 241-245

n for Poster ranges from 44-45

\*\*\*statistically significant to .001

\*\*statistically significant to .01

\*statistically significant to .05

Specific conservation action statement means were found to be closer to the midpoint (4) than the general conservation statements. See Table 10. While a statistically significant difference was found between visitors who engaged with the iSaveSpecies conservation poster kiosk and those who did not create a conservation poster and e-mail it to someone, the overall means for both groups were below the midpoint. Cell phone recycling was the highest rated specific conservation measure among all visitors: those who interacted with the poster kiosk and those who did not— possibly because visitors receive this message multiple times from multiple sources or the zoo directed visitors to this action.

Table 10. Visitors likelihood of completing specific conservation actions

	No Poster Mean	Poster Mean	Mean Difference	t	df	p
Create a conservation poster and e-mail it to someone.	2.08	2.98	0.90	3.364	293	.001***
Recycle my cellphone or tell friends or family they should recycle.	5.04	5.51	0.47	1.539	293	.125
Donate to organizations that support gorilla conservation or ask others to do so.	3.74	4.22	0.48	1.659	293	.098
Donate to this zoo for gorilla conservation or ask others to do so.	3.81	4.38	0.57	1.937	294	.054

N=301

n for No Poster ranges from 250-251

n for Poster ranges from 44-45

## Value Added

Visitors who used the iSaveSpecies kiosks found that the kiosks added value to their visit.

## How We Know

Respondents who indicated they interacted with a kiosk were asked to rate their level of agreement with a set of value-added statements, where 1 represents Strongly Disagree and 7 represents Strongly Agree. See Table 11. All statements were found to be above the midpoint, indicating visitors were generally pleased with the kiosks. Respondents appeared to appreciate that the kiosk was an activity they could do with others in their group; and they had fun and that the interactive provided them with new information and a different way to engage with the animals.

Table 11. Respondents who interacted with a kiosk feelings regarding value added statements

	Mean	Std. Deviation
<b>I had fun with the touchscreen interactive activity.</b>	5.31	1.511
<b>The touchscreen interactive provided an activity I could do with others in my group</b>	5.18	1.584
<b>The touchscreen interactive provided me with new information</b>	5.16	1.666
<b>The touchscreen interactive activity provided me a different way to engage with the animals</b>	5.13	1.537
<b>The touchscreen interactive was appealing</b>	5.04	1.478
<b>Stopping at the touchscreen interactive was worth my time</b>	4.98	1.535
<b>I will look at gorillas differently because of the touchscreen interactive activity</b>	4.86	1.774

n ranges from 121-124

### Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Worth_My_Time	124	1	7	4.98	1.535
Appealing	124	1	7	5.04	1.478
Do_W_Others	123	1	7	5.18	1.584
Fun	121	1	7	5.31	1.511
Different_Way	122	1	7	5.13	1.537
New_Information	123	1	7	5.16	1.666
Look_Animals_Differently	122	1	7	4.86	1.774
Valid N (listwise)	121				

## Conclusions

The overarching question for this summative evaluation was:

Do the iSaveSpecies kiosks achieve their desired (collective) outcomes?

To answer this question, five sub-questions were asked to allow for analysis of the impact of iSaveSpecies interactive kiosks on the different outcomes.

- Did visitors who engaged with the iSaveSpecies inquiry kiosks report they have used basic science inquiry skills during their zoo visit?

To some degree. Closed-ended questions indicate the kiosks appear to be effective in promoting basic inquiry skills and increasing visitors' knowledge of gorillas. Visitors who interacted with a kiosk were more likely to observe a single animal carefully, talk with others in their group about what they observed or did, and make a prediction about an animal's behavior.

However, an essential inquiry skill is the ability to ask questions that lead to investigations. While responses to a close-ended question indicated respondents asked questions about what they observed, they were less likely to share a question they had about the gorillas in response to an open-ended follow-up question on the questionnaire. Additionally, when asked how they would investigate their question, those who responded favored finding the answer on the internet or asking a zoo employee, rather than observing the gorilla.

- Did visitors who engaged with the iSaveSpecies interactive kiosks have a better understanding of the STEM content related to the iSave Species kiosks?

Yes, visitors who interacted with the iSaveSpecies kiosks reported they felt more knowledgeable about how to study gorillas, understood gorillas better, and were more aware that gorillas need to be protected than visitors who did not interact with the kiosks. Interviewed visitors who explored the Do All Day kiosk felt the kiosk provided opportunities to better understand the bonobos even when the animals were not present. Interviewees who completed the Which Are You kiosk understood that bonobos had different personalities.

- Did visitors who engaged with the iSaveSpecies conservation poster kiosk understand great ape conservation efforts?
- Did visitors who engaged with the iSaveSpecies conservation poster kiosks report involvement in specific conservation actions?

To some extent. Columbus Zoo visitors who interacted with the iSaveSpecies poster kiosk were more likely to report they understood general great ape conservation efforts than visitors who did not use the poster kiosk. However, the mean scores for three of four specific conservation actions were fairly neutral; with the mean score for the fourth, cell phone recycling above the mean for both groups.

- Did visitors who engaged with the iSaveSpecies interactive kiosks feel it added value to their zoo visit?

Yes, mean scores for those who used the iSaveSpecies kiosks were all well above the midpoint. Respondents indicated they had fun and found a different way to engage with the animals. The kiosks provided visitors on opportunity to participate in an activity they could do with others in their group.

## Appendix A: Data Collection Instruments

Date:  
Number:

### Columbus Zoo and Aquarium Interview

This zoo has recently installed some new interactive kiosks in this area and we are trying to better understand who uses these and what visitors might gain from these experiences. May I ask you a few questions about your experience in the bonobo/gorilla area. It will take about ten minutes and your participation is voluntary and your responses are completely confidential.

Begin by showing visitor screen shot cards and asking the following questions for each of the 3 kiosks. . .

<b>A</b>	<p>1. During your visit today, do you remember seeing this exhibit? Y            N</p> <p>2. Did you, or anyone in your group, interact with the exhibit (push buttons, read information, etc)? Y</p> <p>If yes, what did you do?</p> <p>3. If yes to question 2, who in your group interacted with the exhibit.</p> <p>4. What did you learn, if anything, from this exhibit?</p>
<b>B</b>	<p>1. During your visit today, do you remember seeing this exhibit? Y            N</p> <p>2. Did you, or anyone in your group, interact with the exhibit (push buttons, read information, etc)? Y</p> <p>If yes, what did you do?</p> <p>3. If yes to question 2, who in your group interacted with the exhibit.</p> <p>4. What did you learn, if anything, from this exhibit?</p>
<b>C</b>	<p>1. During your visit today, do you remember seeing this exhibit? Y            N</p> <p>2. Did you, or anyone in your group, interact with the exhibit (push buttons, read information, etc)? Y</p> <p>If yes, what did you do?</p> <p>3. If yes to question 2, who in your group interacted with the exhibit.</p> <p>4. What did you learn, if anything, from this exhibit?</p>

Talk to me about how this/these experiences [with the kiosks] relate to investigating bonobos/gorillas or how to understand them better?

Based on your viewing in the primate area, what questions do you have about the bonobos and/or gorillas?

How could someone investigate this?

This zoo is committed to conserving animals in the wild. Did these experiences introduce you to or remind you of things you might do to help the primates?



## Columbus Zoo and Aquarium

This zoo has recently installed some new interactive kiosks in this area and we are trying to better understand who uses these kiosks and what visitors might gain from these experiences. The survey will take you about ten minutes to complete. Your participation is voluntary and your responses are completely confidential.

During your visit today, about how much time did you spend with the gorillas and bonobos?

- Less than 3 minutes
- 3 – 5 minutes
- 5 – 10 minutes
- 10 – 15minutes
- 15 + minutes

Several questions will ask you to compare your visit with the gorillas and bonobos to another animal you visited today. For comparison purposes, which other animal did you visit today for about the same amount of time as the gorilla and bonobo?   (use this animal area to answer the comparison animal questions below)

During your visit today, about how much time did you spend with that animal?

- Less than 3 minutes
- 3 – 5 minutes
- 5 – 10 minutes
- 10 – 15minutes
- 15 + minutes



During your visit today, do you remember seeing this touch screen interactive?

- Yes       No

If you checked no, please go to

Did you, or anyone in your group, interact with the exhibit (push buttons, read information, etc.)?

- Yes       No

Who in your group interacted with the exhibit?

#Adult \_\_\_\_\_

#Youth \_\_\_\_\_

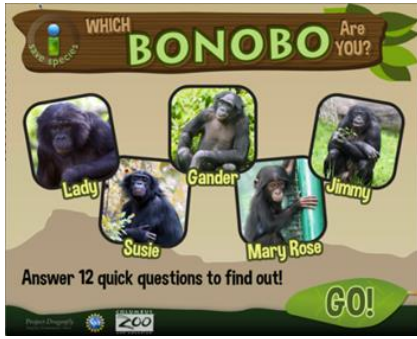
Please circle the best answer if you did any of the following during your visit at the bonobo area or at the comparison animal area.

- Observed a single animal carefully for more than a few seconds
- Made a prediction about an animal's behavior
- Recorded information about an animal's behavior (on a touchscreen or on paper)
- Compared research results with others
- Asked questions about what I observed
- Talked with others in my group about what I observed or did

Bonobo Area		Comparison Animal Area	
Yes	No	Yes	No
Yes	No	Yes	No
Yes	No	Yes	No
Yes	No	Yes	No
Yes	No	Yes	No
Yes	No	Yes	No

Did you or anyone from your group already interact with this touchscreen on an earlier visit to the zoo?

- Yes       No



During your visit today, do you remember seeing this touch screen interactive?

- Yes       No

**If you checked no, please go to**

Did you, or anyone in your group, interact with the exhibit (push buttons, read information, etc.)?

- Yes       No

Who in your group interacted with the exhibit?

#Adult \_\_\_\_\_

#Youth \_\_\_\_\_

Please circle the best answer if you did any of the following during your visit at the bonobo area or at the comparison animal area.

- Participated in research by answering questions
- Compared myself to an animal
- Discovered that I am similar/dissimilar to an animal
- Asked questions about what I observed or did
- Talked with others in my group about what I observed or did

Bonobo Area		Comparison Animal Area	
Yes	No	Yes	No
Yes	No	Yes	No
Yes	No	Yes	No
Yes	No	Yes	No
Yes	No	Yes	No

Did you or anyone from your group already interact with this touchscreen on an earlier visit to the zoo?

- Yes       No



During your visit today, do you remember seeing this touch screen interactive?

- Yes       No

**If you checked no, please go to**

Did you, or anyone in your group, interact with the exhibit (push buttons, read information, etc.)?

- Yes       No

Who in your group interacted with the exhibit?

#Adult \_\_\_\_\_

#Youth \_\_\_\_\_

Please circle the best answer if you did any of the following during your visit at the gorilla area or at the comparison animal area.

- Learned about an animal or conservation issue
- Shared what I learned with others
- Asked questions about what I observed
- Talked with others in my group about what I observed or did

Gorilla Area		Comparison Animal Area	
Yes	No	Yes	No
Yes	No	Yes	No
Yes	No	Yes	No
Yes	No	Yes	No

Did you or anyone from your group already interact with this touchscreen on an earlier visit to the zoo?

- Yes       No

Based on your viewing in the primate area, what is a question you would like to ask about the gorillas or bonobos?

---



---

How could someone investigate your question?

---



---

How likely are you to participate in these conservation actions, where 1 represents very unlikely and 7 represents very likely.

	Very Unlikely							Very Likely						
Create a conservation poster and e-mail it to someone.	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Recycle my cellphone or tell friends or family they should recycle.	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Donate to this zoo for gorilla/bonobo conservation or ask others to do so.	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Donate to organizations that support gorilla and/or bonobo conservation or ask others to do so.	1	2	3	4	5	6	7	1	2	3	4	5	6	7

We would like to know if that interaction changed the way you feel about science and conservation. Please rate the extent to which you agree with the following statements using a scale from 1 (strongly disagree) to 7 (strongly agree).

I feel . . .	Strongly Disagree							Strongly Agree						
I am more knowledgeable about how to study gorillas and bonobos.	1	2	3	4	5	6	7	1	2	3	4	5	6	7
I can investigate gorilla and bonobo behavior through careful observation.	1	2	3	4	5	6	7	1	2	3	4	5	6	7
I am more aware that gorillas and bonobos need to be protected.	1	2	3	4	5	6	7	1	2	3	4	5	6	7
I can help gorillas and bonobos.	1	2	3	4	5	6	7	1	2	3	4	5	6	7
I might like to study gorillas and bonobos (behavior, personality, etc.)	1	2	3	4	5	6	7	1	2	3	4	5	6	7
I understand gorillas and bonobos better	1	2	3	4	5	6	7	1	2	3	4	5	6	7
I would like to work to help save gorillas and bonobos in the wild	1	2	3	4	5	6	7	1	2	3	4	5	6	7

If you used any of the touchscreen interactives today, please answer the question below. **If not, please skip to the last page to tell us a little bit about yourself.**



We would like to know if they **added value** to your experience with the gorilla and bonobos. Please rate the extent to which you agree with the following statements using a scale from 1 (strongly disagree) to 7 (strongly agree).

	Strongly Disagree							Strongly Agree						
Stopping at the touchscreen interactive(s) was worth my time.	1	2	3	4	5	6	7	1	2	3	4	5	6	7
The touchscreen interactives were appealing.	1	2	3	4	5	6	7	1	2	3	4	5	6	7
The touchscreen interactives provided an activity I could do with others in my group.	1	2	3	4	5	6	7	1	2	3	4	5	6	7
I had fun with the touchscreen interactive activities.	1	2	3	4	5	6	7	1	2	3	4	5	6	7
The touchscreen interactive activity provided me a different way to engage with the animals.	1	2	3	4	5	6	7	1	2	3	4	5	6	7
The touchscreen interactive provided me with new information	1	2	3	4	5	6	7	1	2	3	4	5	6	7
I will look at gorillas and bonobos differently because of one of the touchscreen interactive activities.	1	2	3	4	5	6	7	1	2	3	4	5	6	7

**Please tell me a little about yourself. Including you, how many people are in your group today?**

# adults \_\_\_\_\_ # children \_\_\_\_\_

**Are you a member of the Columbus Zoo and Aquarium?**

- Yes
- No

**About how often do you visit the Columbus Zoo and Aquarium?**

- Today is my first visit
- I haven't visited for many years
- Once every few years
- About once a year
- 2-4 times per year
- 5+ times per year

**What are the ages of the adults in your group? [check all that apply]:**

- 19-29
- 30-39
- 40-49
- 50-59
- 60+

**What are the ages of the children in your group (if any)? [check all that apply]:**

- Infant – less than 2 years old
- 2 – 4 years old
- 5 – 7 years old
- 8 – 12 years old
- 13 – 17 years old

***Thank you for taking the time to help us today!***

## Appendix B: Demographic Tables

Table 11. Amount of time spent with gorillas

	Number	%
Less than 3 minutes	1	1%
3 – 5 minutes	26	9%
5 – 10 minutes	67	22%
10 – 15 minutes	82	27%
15 + minutes	123	41%

N = 299

Table 12. Amount of time spent with comparison animal

	Number	%
Less than 3 minutes	15	5%
3 – 5 minutes	49	17%
5 – 10 minutes	71	25%
10 – 15 minutes	79	29%
15 + minutes	70	25%

N = 284

Table 13. Zoo membership

	Number	%
Yes	77	26%
No	216	74%

N = 293

Table 14. Visit frequency

	Number	%
Today is my first visit	72	24%
I haven't visited for many years	37	12%
Once every few years	40	13%
About once a year	62	21%
2-4 times per year	56	19%
5+ times per year	29	10%

N = 296

Table 15. Number of Adults in Respondent's Group

	Number	%
1	31	11%
2	158	54%
3	55	19%
4	37	13%
5	5	2%
6	4	1%
7	2	1%
8	0	
9+	3	1%

N = 293

Table 16. Number of Children in Respondent's Group

	<b>Number</b>	<b>%</b>
0	27	17%
1	44	28%
2	48	31%
3	19	12%
4	9	6%
5	5	3%
6		
7	2	1%
8	1	1%
59		
10+	2	1%

N = 163

Table 17. Ages of adults in respondent's group

	<b>Number</b>	<b>%</b>
19-29	141	48%
30-39	88	30%
40-49	82	28%
50-59	80	27%
60+	67	23%

N = 297

Table 18. Ages of children in respondent's group

	<b>Number</b>	<b>%</b>
Infant – less than 2 years old	38	13%
2 – 4 years old	39	13%
5 – 7 years old	31	11%
8 – 12 years old	50	17%
13 – 17 years old	59	20%

N = 297