



# Measuring Biodiversity Literacy in World Zoo and Aquarium Visitors



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# UN Decade on Biodiversity

WAZA official partner of United Nations Convention on Biological Diversity (CBD) during Decade on Biodiversity 2011–2020.





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# Aichi Biodiversity Target 1

Target 1: “By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.”





## Why Zoos and Aquariums?

- Zoos and aquariums are truly global in their popularity.
- 700 million visits made to zoos and aquariums each year worldwide (Gusset and Dick, 2011).

**So, huge potential to influence large numbers of people.**



## Project time-frame

	Global zoo and aquarium survey	Educational and awareness tools
2012	First global survey conducted	Educational tools developed
2013		
	First survey analysis and report	Educational tools implemented in participating zoos
2014	Second global survey conducted	
2015	Second survey analysis and report	



# Global zoo and aquarium visitor survey:

Methods and key findings from first  
survey



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## Research Team

Andrew Moss (Chester Zoo), Eric Jensen (University of Warwick) and  
Markus Gusset (WAZA Executive Office)

International peer reviewers

30 WAZA member institutions across the globe



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# Biodiversity Literacy Research

## Research Questions

1. How well do world zoo and aquarium visitors understand the term 'Biodiversity'?
2. Do world zoo and aquarium visitors understand the actions they can take to help protect Biodiversity?
3. Can zoos and aquariums make a difference with regard to Target 1?



## Procedure outline

- Pre-/Post-visit survey (repeated-measures)
- Systematic random sampling employed. Goal was for n=300 matched pre-/post-visit surveys per zoo or aquarium
- Small incentives were offered to respondents by most zoos and aquariums to encourage post-visit survey completion



## Survey Design

Single-page design with three main components:

**1.** Basic demographic information.

**2.** Two main dependent variables, each measured by open-ended questions:

- Understanding of Biodiversity
- Knowledge of actions to protect Biodiversity

**3.** A number of potential independent variables also measured.



# Pre-visit Survey

## Visitor Survey

Institution

Date:

Visitor number:

<p>1. Time: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> AM / PM (circle)</p> <p>2. Is today your first visit to this zoo or aquarium?  <input type="checkbox"/> YES    <input type="checkbox"/> NO    <input type="checkbox"/> NOT SURE</p> <p>3. If this is your first visit, is this your first visit to any zoo or aquarium?  <input type="checkbox"/> YES    <input type="checkbox"/> NO    <input type="checkbox"/> NOT SURE</p> <p>4. How many times do you think you have visited any zoo or aquarium in the last 12 months?  _____ visits</p> <p>5. Are you a season ticket holder or member?  <input type="checkbox"/> YES    <input type="checkbox"/> NO    <input type="checkbox"/> NOT SURE</p> <p>6. What is your gender?  <input type="checkbox"/> MALE    <input type="checkbox"/> FEMALE</p> <p>7. What is your age?  _____ years</p> <p>8. How many years of formal education (in school, college and university) have you had?  _____ years</p> <p>9. Do you live locally or are you visiting?  <input type="checkbox"/> LOCAL    <input type="checkbox"/> VISITOR / TOURIST</p>	<p>10. Please list anything that comes to mind when you think of 'biodiversity':</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> <li>4.</li> <li>5.</li> </ol> <p>11. If you can think of an action that you could take to help save animal species, please list below: (Or if you cannot think of any actions, tick here <input type="checkbox"/>)</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> </ol> <p>If you listed an action above, have you done it in the last month?  <input type="checkbox"/> NO    <input type="checkbox"/> YES    <input type="checkbox"/> NOT SURE</p>	<p>12. What prompted your zoo or aquarium visit today (tick all that apply)?</p> <table border="0"> <tr> <td><input type="checkbox"/> Fun day out</td> <td><input type="checkbox"/> Learn about animals</td> </tr> <tr> <td><input type="checkbox"/> See animals</td> <td><input type="checkbox"/> Entertainment</td> </tr> <tr> <td><input type="checkbox"/> Family time</td> <td><input type="checkbox"/> Other</td> </tr> </table> <p>If other, please specify:</p>	<input type="checkbox"/> Fun day out	<input type="checkbox"/> Learn about animals	<input type="checkbox"/> See animals	<input type="checkbox"/> Entertainment	<input type="checkbox"/> Family time	<input type="checkbox"/> Other
<input type="checkbox"/> Fun day out	<input type="checkbox"/> Learn about animals							
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<input type="checkbox"/> Family time	<input type="checkbox"/> Other							
		<p><i>This survey is done under the auspices of the World Association of Zoos and Aquariums (WAZA). For more information, please click on 'Visitor Survey' on <a href="http://www.waza.org">www.waza.org</a>.</i></p> <p><i>Thank you very much for completing this survey!</i></p>						



# Post-visit Survey

## Visitor Survey

Institution

Date:

Visitor number:

<p>1. Time: <input type="text"/> <input type="text"/> AM / PM (circle)</p> <p>2. How many people are in your group today (including you): _____ people</p> <p>3. During your visit today, did you see or hear any information about 'biodiversity'?</p> <p><input type="checkbox"/> YES   <input type="checkbox"/> NO   <input type="checkbox"/> NOT SURE</p> <p>4. During your visit today, did you attend any informational animal talk or show?</p> <p><input type="checkbox"/> YES   <input type="checkbox"/> NO   <input type="checkbox"/> NOT SURE</p> <p>5. During your visit today, did you talk to any zoo or aquarium staff or volunteers?</p> <p><input type="checkbox"/> YES   <input type="checkbox"/> NO   <input type="checkbox"/> NOT SURE</p> <p>6. During your visit today, did you watch any videos or films?</p> <p><input type="checkbox"/> YES   <input type="checkbox"/> NO   <input type="checkbox"/> NOT SURE</p> <p>7. During your visit today, did you use a smartphone application to enhance your visiting experience?</p> <p><input type="checkbox"/> YES   <input type="checkbox"/> NO   <input type="checkbox"/> NOT SURE</p> <p>If YES, please specify the 'app':</p> <p>8. Have you watched any nature shows on television in the last 12 months?</p> <p><input type="checkbox"/> YES   <input type="checkbox"/> NO   <input type="checkbox"/> NOT SURE</p>	<p>9. Please list anything that comes to mind when you think of 'biodiversity':</p> <p>1.</p> <p>2.</p> <p>3.</p> <p>4.</p> <p>5.</p> <p>10. If you can think of an action that you could take to help save animal species, please list below: (Or if you cannot think of any actions, tick here <input type="checkbox"/>)</p> <p>1.</p> <p>2.</p> <p>If you listed an action above, have you done it in the last month?</p> <p><input type="checkbox"/> NO   <input type="checkbox"/> YES   <input type="checkbox"/> NOT SURE</p> <p>11. Which of these describe your experience at the zoo or aquarium today (tick all that apply)?</p> <p><input type="checkbox"/> Had fun day out   <input type="checkbox"/> Learned about animals</p> <p><input type="checkbox"/> Saw many animals   <input type="checkbox"/> Was entertained</p> <p><input type="checkbox"/> Had good family time   <input type="checkbox"/> Other</p> <p>If other, please specify:</p>	<p>12. Are you part of a conservation, nature or environmental group of any kind?</p> <p><input type="checkbox"/> YES   <input type="checkbox"/> NO   <input type="checkbox"/> NOT SURE</p> <p>13. 'I would be willing to participate in further research on this topic':</p> <p><input type="checkbox"/> YES   <input type="checkbox"/> NO</p> <p>If YES, please provide e-mail address:</p>
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## Data processing and Analysis

- Dependent variables were content analysed to produce quantitative data:
  - Biodiversity understanding/literacy - scored along an 11-point continuous scale of understanding\*
  - Knowledge of actions to protect biodiversity – two methods of content analysis. Basic categorisation of reported actions, plus data were scored along 5-point continuous scale of personal action<sup>^</sup> (scored for both responses).

Inter-coder reliability (Cohen's Kappa): \*= 0.82; ^=0.84



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# Preliminary research findings



## Response

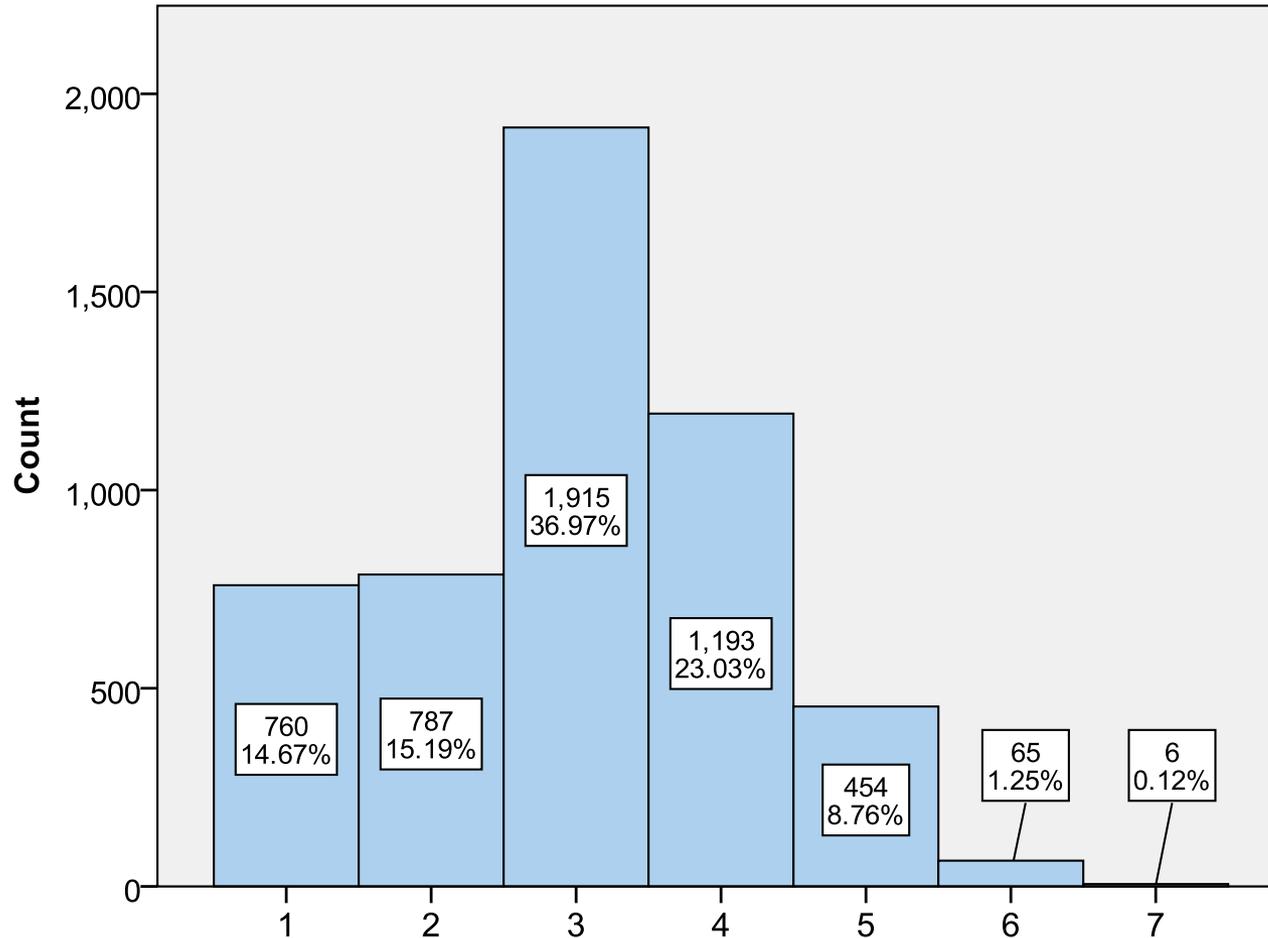
World region	Number of participants	Number of valid surveys
Africa	3	408
Asia	5	984
Central and South America	5	1,598
North America	8	1,563
Europe and the Middle East	7	1,260
Oceania	2	544
<b>Total</b>	<b>30</b>	<b>6,357</b>

Global refusal rate = 46.21%



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## Biodiversity understanding



**Biodiversity understanding - cross sectional (pre-visit)**

70% of visitors have at least a 'reasonable' understanding of biodiversity (3-7)

10% of visitors have an excellent understanding of biodiversity (5-7)

30% of visitors have poor to no understanding of biodiversity (1-2)



# Actions to help protect biodiversity

## Personal Action Scale

**0** Behaviour identified is not relevant to conservation.

**1** Vague platitudes about need for change (no specific action/behaviour mentioned) – e.g. ‘save ecosystems’.

**2** Specific identification of pro-conservation action/behaviour, but is at general level (not feasible to address as an individual) – e.g. ‘stop hunting’.

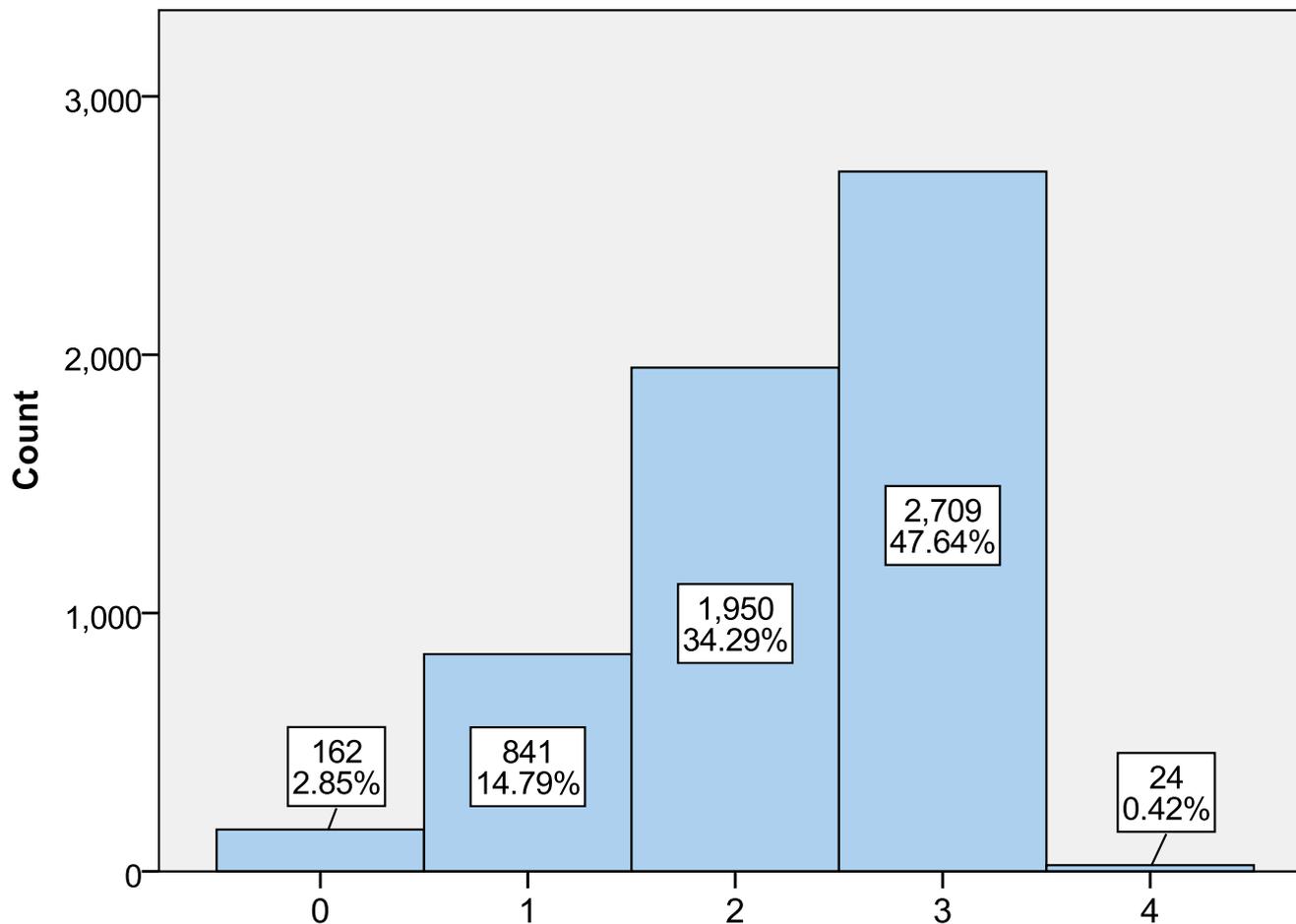
**3** Very specific identification of pro-conservation action/behaviour that can be done at the individual level – e.g. ‘hanging bird houses, feeding birds in winter time’.

**4** Very specific identification of pro-conservation action/behaviour that the respondent clearly states is a personal action/behaviour – e.g. ‘I recycle my mobile phone for gorillas’.



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# Actions to help protect biodiversity



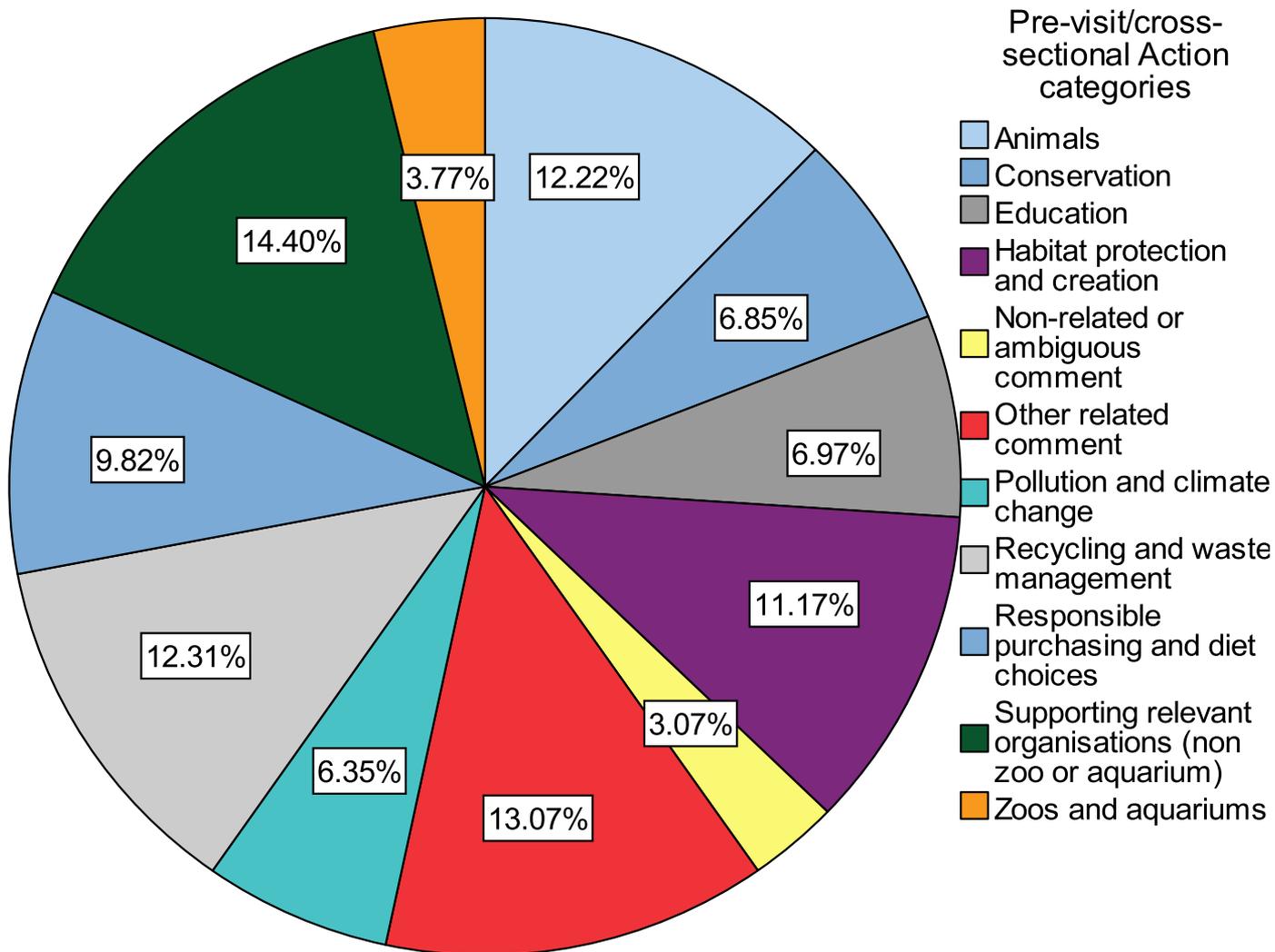
**Biodiversity action scale (both responses combined) -  
Cross sectional/Pre-visit**

Only around 50% of reported actions could be achieved at the individual level (3 and 4 on scale)



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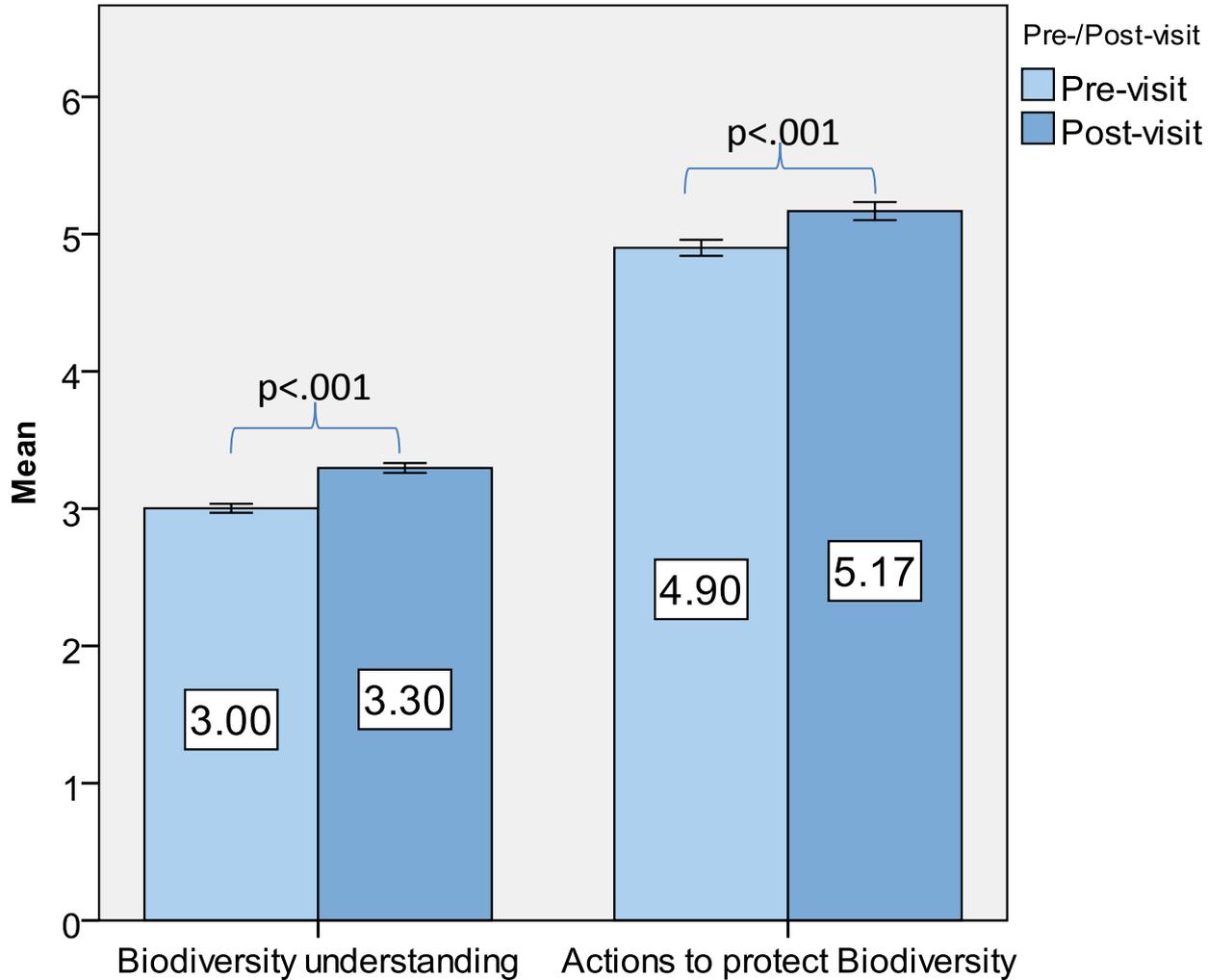
# Actions to help protect biodiversity





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# Pre-/Post-visit comparison



Error Bars: 95% CI



## Limitations and challenges faced

- Paper survey created issues with translation, legibility and missing data.
- Benefits and drawbacks of open-ended questions.
- The challenges of multiple study locations.



## Research Summary

- Biodiversity understanding/literacy was better than expected in zoo and aquarium visitors.
- Knowledge of personal actions/behaviours to help protect biodiversity not as strong.
- Visitors did not appear to relate visiting zoos and aquariums as an action to help protect biodiversity.
- Significant increases in both biodiversity understanding and knowledge of actions between pre- and post-visit, in zoo and aquarium visitors.



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