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The Impacts of Public Engagement with Conservation and the Durrell Wildlife Park Demonstration Project

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engaging the public in nature conservation



**The Impacts of Public Engagement with Conservation and the Durrell Wildlife Park
Demonstration Project**

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Forward

The Durrell Wildlife Conservation Trust is an international conservation charity with the mission of *saving species from extinction*. Since its establishment in 1959 Durrell has saved numerous species from the brink of extinction and has restored the habitats on which they depend. We now run more than 50 conservation projects in 14 countries. This direct conservation work is complemented by a well-established training programme which, to date has trained more than 3000 conservationists from 128 countries. The third pillar of our conservation efforts is represented by our wildlife park at our headquarters in Jersey. Through captive breeding and applied research the park supports our programmes in the field. The park also plays a role in providing a shop window into our conservation work worldwide to a visiting public.

As a conservation organisation, Durrell seeks to engage visitors to the wildlife park with our work and inspire them to consider how they could change the world for the better. Up to this point we have probably adopted a similar approach to other zoos in trying to achieve this ideal by *telling* the visiting public what *we* think *they* should hear, in the way *we* think they should hear it, in order to *make them* change. Such a one-way process is unlikely to 'engage' or 'inspire' people to make a difference in wildlife conservation. Rather we need to open up our thinking to inviting publics into more of a two-way dialogue about how best we can engage and involve visitors on terms that make sense to them.

The Public Participation Meeting, held at the wildlife park in Jersey in October 2010, heralded a fundamental change for Durrell in how we engage and inspire our diverse public(s). The meeting provided us with an opportunity to bring together a cross-section of our visiting public to ask them what *they* think are the most important messages to be conveyed and how *they* think visitors should be engaged. By empowering this group to participate directly in decisions over the content, medium and location of Durrell Wildlife Park's engagement and communication activities and materials, we have been able to gain valuable insights into what different sections of the public are looking for and how best to engage them.

With more than 180,000 people passing through our gates each year we have a substantial opportunity to engage publics with the wildlife conservation. Globally more than a tenth of the world's population passes through zoos annually. Zoos therefore have a significant role to play in engaging and inspiring people to care for the world into which we have been born. The public participation meeting on which this report is based takes an important step towards changing the way we engage our public with this vital issue. After all, who better to determine how to engage our public most effectively than members of that public?

This report provides the final piece of the puzzle, identifying the impacts of the public-inspired changes on the experience and impacts of visits to our Wildlife Park. The results show the substantial value that this project has brought to our efforts to engage publics with conservation.

Jamieson A. Copsey
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The Impacts of Public Engagement with Conservation and the Durrell Wildlife Park Demonstration Project

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Executive Summary of Visitor Survey Results

This report describes key findings from an impact evaluation conducted at Durrell Wildlife Park with the aim of assessing the value of the Durrell Demonstration Project that involved the development of new educational and engagement activities and materials throughout the zoo based on public input at an event called a 'Public Participation Meeting' (PPM). This impact evaluation was conducted using mixed methods surveys distributed before and after randomly selected visitors' journey around Durrell Wildlife Park.

- When asked at the wildlife park exit, the most frequently remembered species categories were flamingos (100% of respondents), gorillas (96% of respondents), meerkats (95% of respondents), orang-utans (94% of respondents). A further 105 people indicated seeing a lemur (90%) and snakes (86%).
 - Given the pre-Demonstration Project issue of low attendance and impacts from the Reptile and Amphibian House, the appearance of snakes on this list of most remember animals could be considered a positive impact from the project.
- The species categories highlighted *least* often in visitors' responses include: the local sea crow species 'chough' (30.8% of respondents; n=36), tortoises (39.3%; n=46), any insect (51.3%; n=60), otters (53.8%; n=63), aye-aye (56.4%; n=66).
 - These low recall numbers are likely to reflect the placement of these species in the park and the tendency for these animal categories to be low in visibility for a variety of reasons. However, the appearance of a reptile species category (tortoise) on this list of least remembered animals signals there is more to be done to engage visitors with this animal category in the interests of promoting a biodiversity message.
- There was a shift from pre-visit plans regarding the duration of respondents' visits to the wildlife park and the post-visit data showing the actual visit duration. From the fact that actual visit duration exceeds expected visit duration, we can infer that the engagement opportunities within the site enticed visitors to stay longer than they were intending.
 - This could be viewed as one indicator of the wildlife park's success or failure in engaging its visitors at the basic level of holding onto their time and attention for longer than expected.
 - In this case, the results show an increase from an expected visit duration of 2.8 hours to an actual visit duration of 3.5 hours. This is a substantial shift, indicating the wildlife park successfully enticed individuals to stay longer than they planned to.
- The results of the evaluation show significant positive impacts on visitors' thinking and reported concern for the conservation of particular kinds of wild animal species.

- Specifically, animal species that visitors encountered in person within their visit to Durrell Wildlife Park evinced significant positive shifts in conservation concern, while the 'control' category of animal species that could not have been encountered at the wildlife park (as it is not in the collection) showed no significant gains in this regard.

Feedback on Reptile and Amphibian House

- 86% remembered visiting the main Demonstration Project, which was the refurbished Reptile and Amphibian House.
- Valuing Naturalness of Enclosure Interiors: • "Easy to see the animals. Informative texts." (Female, 61, A-level, First Visit) • "Very well constructed. Seemed as though that the environment was as near to the natural environment as possible." (Male, 60, GCSE, Repeat Visitor)
- Valuing Variety: "Good variety of different species of animal" (Male, 20, A-level, Repeat Visitor) Feeling Close to Animals: "...Liked being close to the chameleon; easily able to see frogs and snakes" (Female, 39, Postgraduate Degree, First Visit)

Responses to Conservation Messaging in Reptile and Amphibian House

- "I enjoyed the exhibit, although I tend to have a greater interest in some of the other animals." (Male, PG Degree, First Visit)
- "Interesting. Not cute but important." (Female, 56, Degree, First Visit)
- These are indicators of success from the Demonstration Project as engaging people with non-charismatic animals is the hallmark of successful conservation education.

Responses to Conservation Messaging in Reptile and Amphibian House (Demonstration Project)

- "It was interesting and the frogs in particular were well presented. I used to live on Montserrat when mountain chicken were numerous and a restaurant delicacy so it was sad to learn of their current plight." (Female, 57, Degree, First Visit)
- Perhaps indicative of need for more personal empowerment?

Visitor Dissatisfaction with Reptile & Amphibian House: Animal Visibility & Species Diversity

Need for guidance and expectation management in the 'Reptile and Amphibian House':

- "Good but difficult to see some of the animals. It would be helpful to have more information about the size of the animals you were looking for." (Male, 55, PG Degree, First Visit)
- "It was very good [but] we could not find any alligators or crocodiles so I was a bit disappointed. And it could have done with a few more snakes of different species." (Female, 41, A-level, First Visit)

Changes in thinking about 'Durrell'

- Positive change: add animals, functions, parts of world in which zoo operates, good comments about the zoo site.
- Only one really ambivalent experience at the zoo in the sample.
- Associations to 'Durrell' still very much connect up with the man, his life and positive ideas about his work.

Changes in thinking about 'Durrell': Naming Endangered Reptile and Amphibian Species

- 'Members' (likely to be frequent visitors) showed high levels of knowledge already in their 'pre-' answers
- Most frequently named 'endangered species' in open-ended item:

Frogs (specific species is also most often named—e.g. 'dart frog' or 'mountain chicken')
Komodo Dragons
Tortoises
Toads

Conservation Concern for Species Categories: Overview

- Respondents' pre- and post-visit levels of conservation concern for different categories of wildlife were investigated in this evaluation study using a Likert-type scale rating concern from 1 (not at all concerned) to 9 (very strongly concerned).
- Results show substantial impact on these ratings of conservation concern across all species categories measured, except tigers.

Conservation Concern for Species Categories: Frogs

- Concern for the conservation of frogs increased from pre-visit (M=6.55) to post-visit (M=7.52) increased at a statistically significant level ($p < .05$).
- This +.971 shift was by far the biggest mean increase in a species category
- Indicates that the educational impact of the wildlife park was most effective in shifting visitors' views on this species category. This is very strong evidence of the impact of the Demonstration Project given that reptiles and amphibians were the main focus of the project.

Aligns with Endangered Species Naming Data

- For the sample as a whole, frogs were by far the largest category named in the open-ended item asking if visitors could name endangered reptile and amphibian species.
- Moreover, in the other question particular species of frog was given – for example, 'poisonous dart frog' and 'mountain chicken'.
- After the frogs on the naming item, the second most commonly named species was the 'komodo dragon' followed by 'tortoises' and 'toads'.

Conservation Concern for Species Categories: Tortoises, Gorillas & Bats

- Tortoises from pre-visit (M=7.52) to post-visit (M=7.89) was also significant ($p < .05$).
- Also for gorillas: Going from pre-visit (M=8.21) to post-visit concern (M=8.61)
- Also bats drew greater conservation concern from pre-visit (M=7.01) to post-visit (7.59).
 - At +.581, the bat evinced the second largest shift amongst the species categories tested.
- A category of bird species, the crane, also showed change from pre-visit (M=6.99, SD=2.862) to post-visit (M=7.37, SD=2.124), which was statistically significant ($p < .05$).

Control Group

- In marked contrast, the charismatic category of mammal species, the tiger, failed to engender greater concern from pre-visit (M=8.42) to post-visit (M=8.6) at a statistically significant level.
- Thus the 'tiger' served as a de facto 'control' to test effect of wildlife park as intervention.
- Notably, tigers are not in the zoo collection at Durrell Wildlife Park, thus indicating that the presence of the animal category at the zoo was the major factor in promoting an increase in conservation concern for that species category.

Conclusions

- Public engagement paradigm offers zoos the prospect of engaging ever more fully in promotion of pro-conservation social change for benefit of both wildlife and a more sustainability society.
- Requires commitment of not just education staff at zoos, but entire institution.
- In return for this broader commitment to their publics, zoos may gain greater visitor satisfaction, public interest and involvement and a much expanded role within the struggle for pro-conservation social change in the public sphere.
- The present evaluation research supports this pro-public engagement paradigm shift, showing its value for enhancing pro-conservation outcomes amongst visitors.
- But as always, it also highlights that there is more that can be done to engage visitors ever more effectively with animals and conservation.

Background: EU-Zoos Project and Upstream Public Engagement at Durrell Wildlife Park

This report, and the Demonstration Project of changes around the zoo that it evaluates, is part of the larger European Commission-funded project *EU-Zoos-XXI*, which has seen other upstream public engagement events taking place at zoos across Europe in Portugal, Sweden and Rome. The aim of these examples of upstream public engagement is to draw on the views of members of the zoo visiting public and understand the kinds of educational and engagement needs they would like to see addressed by zoos. This unique approach involves engaging publics upstream in the decision-making process, and empowering them to guide the development of the zoo's educational provision.

Although the PPM participants focused primarily on defining the development of the Durrell 'Demonstration Project', the PPM focus groups also offer important insights into visitor interests, priorities and engagement preferences. This report presents both specific educational interventions identified as desirable by participants and general principles of visitors' engagement interests and needs revealed through in-depth, systematic analysis. The results show that in terms of message content, participants advocated a focus on the interconnectivity of life on Earth, alongside the provision of details about the scope and details of Durrell Wildlife Conservation Trust's efforts to redress negative impacts on endangered wildlife. An unexpected rationale for the latter focus was to make Durrell Wildlife Park a 'see-through zoo' that is transparent in its goals, actions and impacts. This transparency was viewed as important for justifying admission costs, as well as demonstrating the legitimacy of the organization its requests for donation and further support from visitors in seeking to promote wildlife conservation.

The Durrell PPM had three constituent focus groups. Their suggestions for new engagement activities or materials in the wildlife park are summarized below.

A key principle advocated by participants was that unattractive or 'boring' surfaces should be covered with attractive visuals wherever possible around the zoo.

Group 1 advocated the following developments in the interests of enhancing the zoo's engagement:

- Providing more direction for visitors to the zoo, such as a suggested route and suggested activities, as well as generally enhancing signposting around the zoo.
- Introducing a full programme of animal keeper talks.
- Providing audio guides in different languages with the facility to provide information along certain routes through the zoo.
- Increasing the provision of 'all weather' areas to allow visitors to more fully engage in wet weather conditions.
- Enhancing the interactivity options in all areas.
- Making backstage areas open to view through windows so the public can see how things are done behind the scenes.
- Increasing transparency by making clear to visitors that the expense of feeding the animals and thereby promoting the zoo's 'animal adoptions'.
- Encouraging more volunteers especially in the education area.
- Providing workbooks for children as part of the entrance fee.

Group 2 main conclusions for the enhancement of the Reptile and Amphibian House can be summarised as follows:

- Make more information available to visitors.
- Provide opportunities to 'see behind the scenes'.
- Use communication technology such as podcasts and television to extend reach of conservation messaging by showing visitors important conservation work taking place off-site and animal behaviour that is unlikely to be displayed within the zoo.
- Enhance 'interactivity' through presentations by zoo staff or volunteers passionate about wildlife conservation, as well as allowing opportunities for getting 'closer' to the animals.

Thus, Group 3 also advocated the following developments:

- Make the zoo visiting experience multi-sensorial.
- Use Reptile and Amphibian House to tell a full story from behind the scenes to grow your own cockroaches, to dealing with the actual background information about Durrell's conservation work and so on.
- Use as many media processes as we could.
- Include as many interactive activities as possible.
- Use communication technology to show currently unseen aspects of Durrell's conservation work, for example, showing endangered animals being released into the wild after a successful breeding programme.
- Using audio guides to enhance the immersive experience as well as relating key information in particular zones of the wildlife park.
- Develop long-term feedback relationships with visitors using electronic evaluation methods (e.g. asking visitors questions by email or Twitter).
- Connect zoo engagement to the opportunities for visitors to get involved, including through donations, animal adoptions, etc.

Background: Upstream Public Engagement at the Zoo

The conclusions of the UN Intergovernmental Panel on Climate Change (2007) are clear: Global production of hydrocarbons must be curtailed to limit the dramatic loss of plant and animal life already underway. Human behaviour and unsustainable consumption patterns are playing a significant role in escalating both climate change and biodiversity loss. While new green technologies and EU and national government initiatives are making a difference, the socio-cultural dimensions of these ever intensifying problems must be effectively addressed as well. Given the myriad economic, social and political barriers, pro-conservation social change needed (cf., Fisher et al. 2007). One set of institutions seeking to engage EU publics about the panoply of dangers currently threatening biodiversity in general, and wildlife in particular, is Europe's zoos and aquaria. Zoos and aquaria direct funds gathered from the hundreds of millions of visitors who enter their gates every year to contribute to programmes designed to save endangered species. Moreover, zoos claim to serve a vital educational and engagement role in persuading publics of the importance of conservation and involving them in this cause. For example, the European Association of Zoos and Aquaria (EAZA) states that their membership "empowers European citizens to learn about and contribute to global biodiversity conservation goals. It is estimated that more than 140 million people visit EAZA members each year, equivalent to approximately one in five European citizens" (www.eaza.net). Thus, European zoos see themselves as being at the frontier of public

engagement with conservation and a drive for social change to help make the EU a more sustainable community of nations.

Yet, despite the scale of European zoos public engagement activities, it has remained largely unclear what pro-conservation messages visitors think zoos should be communicating to their visiting publics and how. This lacuna in knowledge about visitors' perspectives on zoo-based public engagement and education is the *raison d'être* of the Durrell Wildlife Conservation Trust PPM ('Durrell PPM' from here on). The Durrell PPM and the EU-Zoos-XXI project more generally aim to engage publics in dialogue to understand their perspectives on zoo-based education and engagement. In addressing this aim, the Durrell PPM was designed to take account of the latest theoretical and empirical literature on public engagement with science to ensure the highest quality public dialogue and participant satisfaction with the experience. This section of the report briefly outlines how science engagement is currently defined within European academic and policy literature, as well as the principles of good practice in public engagement that were adopted for the Durrell PPM.

Although there have been a range of visitor studies conducted in zoos and aquaria, this project represents the first ever example of 'upstream public engagement' in zoos, wherein the results of a rigorous and systematic engagement exercise feed directly into specific and visible action in a way that fully empowers the publics engaged. The core principles of such upstream public engagement are to be transparent in the decision-making process, to be clear with participants about the scope of their input and how it will be taken forward, as well as ensuring that their views are fully analysed and included (not cherry picking feedback based on decisions already made about the form and content that developments will take prior to the public engagement activity). Prior research on public engagement with science has demonstrated that the crucial factors here are avoiding the appearance of institutional arrogance and demonstrating to participants that the engagement exercise will directly shape outcomes. Conversely, prior research clearly demonstrates that insincere public engagement in which all the decisions are predetermined can lead to greater frustration and more negative outcomes than no public engagement at all.

Public Engagement with Science

In the last two decades, discussions about 'scientific and environmental citizenship', and the need for 'engagement' between the sciences and the public have gained greater acceptance within government and institutional policy and practice in Europe (e.g. Irwin 1995; Irwin 2001; Wilsdon and Willis 2004). For many years the dominant approach to 'public understanding of science' has been the 'deficit model', in which greater 'scientific literacy' is viewed as the remedy for any public disinterest or distrust of scientific institutions or resistance to areas of scientific research and action. In recent years however, this 'deficit' model of public understanding has been eclipsed in social scientific and European policy discourse by calls for a two-way dialogue between sciences and publics. This new perspective posits that publics have a range of important forms of knowledge that they can contribute to enhancing decision-making (e.g. Wynne 1996)¹ on science-related issues (though not on the technical aspects of the science itself necessarily). Research Councils and professional organisations such as the Royal Society and British Science Association have joined high-level government officials in declaring a commitment to facilitating active public involvement in

¹ Wynne, B. (1996). May the sheep safely graze? A reflexive view of the expert-lay knowledge divide. In S. Lash, B. Szerszynski, & B. Wynne (Eds.), *Risk, environment and modernity: Towards a new ecology* (pp. 44–83). London: Sage.

² Wilsdon, J., and Willis, R. (2004). *See-through science: Why public engagement needs to move upstream*. London, Demos. Available from: <http://www.demos.co.uk/publications/paddlingupstream>.

science-related issues (Irwin 2006). Notable in this regard is the 2000 UK House of Lords report on *Science and Society*, which concluded that “direct dialogue with the public should move from being an optional add-on to [...] become a normal and integral part of the process” (House of Lords Select Committee on Science and Technology 2000: 43). A wide range of institutions are currently involved in delivering on this ambition for greater science engagement with publics. Amongst these, zoos are particularly well placed to engage publics with conservation biology and the pressing issue of wildlife conservation on a grand scale.

Science Engagement and European Zoos

Zoos’ engagement activities in Europe take place within the context of broader goals of engaging publics with science. Indeed, the European Commission (EC) supports ‘public engagement with science’ through its FP7 ‘Science and Society’ funding stream, including the *EU-Zoos-XXI* project.

The terms ‘science engagement’ or ‘public engagement with science’ are used in this report to refer to any communication about scientific or technical topics involving science-related experts, stakeholders and citizens. Within this field, well-established practices aimed at ‘public understanding of science’ (PUS) have long sought to ‘educate’, ‘inspire’ and ‘inform’ publics through, for example, zoos and museums. Within a PUS framework, communication is characterised as one-way; that is, from the sciences (‘experts’) to the public (‘non-experts’). In sociologist Alan Irwin’s (2008) taxonomy of public engagement approaches such a closed-ended framework is defined as ‘first order’.

Given the importance of scientific citizenship for European publics and the need to understand new scientific phenomena, it could be argued there is a strong social need for effective first order science engagement. Indeed, prior research in this domain at the Cambridge Science Festival and ZSL London Zoo (Jensen 2009; Jensen 2010) suggests that visitors can find a substantial level of value in first order engagement activities. However, there is also reason to suggest that greater dialogue with members of the publics being engaged would benefit the effectiveness of such practice for the benefit of both zoos and publics.

The particular argument informing the approach taken in the Durrell Wildlife Park Public Participation Meeting (PPM) has been articulated by policy analysts at the thinktank Demos and sociologist Brian Wynne, amongst others. Their contention is that public engagement should be ‘upstream’. The idea is that engagement can be used to directly shape and improve the decisions made by a scientific organisation.

From a substantive perspective, engagement processes aim to improve the quality of decision-making, to create more socially robust scientific and technological solutions. The goal is to improve social outcomes in a deeper sense than just improving the reputation of the technology, company or government involved. From this point of view, citizens are seen as subjects, not objects, of the process. They work actively to shape decisions, rather than having their views canvassed by other actors to inform the decisions that are then taken. (Wilsdon & Willis, 2004: 39).²

² Wilsdon, J., and Willis, R. (2004). *See-through science: Why public engagement needs to move upstream*. London, Demos. Available from: <http://www.demos.co.uk/publications/paddlingupstream>.

The argument is that “public engagement must be substantive. It must not just inform decisions – it must shape them” (*Ibid.*, p. 39). Such upstream public engagement requires institutions to open up decision-making to be led by public perspectives rather than by solely expert or practitioner perspectives. This approach was advocated in a *Nature* editorial as follows.

There are good reasons why scientists should ignore these fears and embrace upstream engagement [...]. Upstream engagement [...] is worth doing – provided that all involved consider two points before beginning. First the process must be long-term and properly funded. [...Second,] organisations must make a genuine commitment to react to the results of engagement processes. (*Nature* 2004)³

In seeking to expand the past paradigm for zoo-based public engagement to allow for a more visitor-centred and upstream approach, the Durrell PPM drew upon the accumulated knowledge and research literature on public engagement with science, as well as broader theoretical and empirical perspectives from the social sciences. The results of this formative public engagement informed numerous changes around Durrell Wildlife Park, the impacts of which were evaluated using a mixed methods repeated measures survey design. This evaluation addresses whether the changes that have been implemented across the wildlife park on the basis of the upstream public engagement processes were effective at achieving pro-conservation engagement goals set out by Durrell Wildlife Conservation Trust.

Methods

Overview

The purpose of this study is to collect and analyse evidence of the outcomes of the Durrell Wildlife Conservation Trust EU-Zoos-XXI public engagement demonstration project on the attitudes, perceptions and learning of visitors to Durrell Wildlife Park. In order to establish the effectiveness and impact of the demonstration project outcomes, formative and summative evaluation data were collected using a comprehensive, mixed-methods questionnaire. A mixture of quantitative and qualitative data were collected, with both quantitative and qualitative analyses conducted on this mix of data genres, which includes thought-listing, Likert scales and open ended questions designed to allow for the valid collection of relevant and reliable data, which can be robustly analysed to identify different possible forms of impact from zoo visitors.

This research is a part of a larger European Commission-funded project *EU-Zoos-XXI*, which has included the implementation of multiple public engagement demonstration projects at zoos and aquariums across Europe in Portugal, Sweden, Rome and the United Kingdom. The aim of these projects was to engage with members of the zoo visiting public and understand the kinds of educational and engagement needs they would like to see addressed by zoos. This unique approach involves engaging publics upstream and on an on-going basis in the decision-making process, and empowering them to guide the development of the zoo’s educational provision.

The resulting objective of Durrell Wildlife Park’s public engagement demonstration project advocated for enhancing current practices across the zoo. In particular publics advocated for improving the “Reptile and Amphibian House”, resulting in this project as the selected as the demonstration project for Durrell. Following the public engagement event and resulting

³ ‘Editorial: Going Public’, *Nature* 431, (7011) (21 Oct 2004)

project, it is important to evaluate the impacts of the 'Demonstration Project' of changes that have been made at Durrell Wildlife Park to reflect public input. The findings hold implications for other institutions considering using upstream public engagement techniques.

Sampling

Within an available timeframe for 2011 data collection of two months, 6 days were randomly selected by the researcher using an online random number generator. On those 6 days, a 'continual ask' sampling technique was employed in which the first person is initially selected to participate based on a random number between 1 and 10. Subsequently, once the survey interaction is completed with one respondent, the next person to cross an imaginary line is invited to participate, and so on. The 2012 data collection followed a similar procedure, with data collection taking place over 3 weekends and one full set of weekdays in the mid and late summer 2012.

The sample for this study was comprised of adults and children over 8, who attended the zoo, on self-guided visits (as of this reporting, $n = 252$ total respondents with 117 providing both pre- and post-visit responses). The age range for the self-guided respondents was 9-82, with a mean age of 45.3.

A refusals log was kept to track the externally available characteristics of all individuals who declined the invitation to participate in order to control for the risk of systematic sampling bias.

Data Collection Procedures

Questionnaires were administered both before, as visitors entered the park, and after the participant's visit, as they exited Durrell Wildlife Park. The purpose of these questionnaires was to capture any changes in the visitor's perceptions and knowledge of reptiles and amphibians as they engaged with the wildlife park. In particular, the use of pre- and post-visit questionnaires was intended to measure the cumulative impact of the reptile and amphibian components of the zoo visit on visitors' development of their understanding of reptiles and amphibians.

Survey Instrument

The methods for this study were tailored to explore the overall alterations of visitor knowledge and perceptions of Durrell Wildlife Trust and the "Reptile and Amphibian House" in the park. The methods employed to evaluate these impacts included open-ended survey items capable of identifying a broad range of potential unanticipated perceptions of general visiting publics exploring Durrell Wildlife Park. To elicit the change in visitor attitude and knowledge of Durrell and the "Reptile and Amphibian House" we asked visitors to answer a number of questions before and after their visit. Specifically, the survey included a number of open-ended questions and a thought listing task. These questions provide an opportunity for visitors for visitors to express their opinions and knowledge not confined by set perimeters, such as is the case of ordinal scales and polar questions.

Two survey instruments were developed for this study, a pre-visit and post-visit two-page questionnaire, consisting of quantitative and qualitative questions.

Pre-Visit Questionnaire

The pre-visit questionnaire consisted of the following elements:

- Demographic details: Name, email, highest level of education, residency, first-language, income, group composition (including, gender and age).
- Visit details: Date, arrival time, ticket purchased, predicted visit time and two questions regarding visitor motivation. Motivation questions included the question, “What prompted your visit to Durrell today?” and “What are you most looking forward to on this visit to Durrell Wildlife Park? (and why?)”.
- An item assessing whether the visitor was a first-time or repeat visitor to the zoo, with the question “Is this your first visit to Durrell Wildlife Park?”. This question was followed up by the question, “If no, when was your last visit (approximately)?”, in order to comprehend participants’ visiting behaviour.
- An items assessing how long visitors expected to spend at the zoo with the question, “About how long (to the nearest hour) do you expect to visit Durrell Wildlife Park today?”.
- Items assessing agreement with the following ideas (‘Please note whether you agree with these statements’): “I feel personally concerned about animals going extinct”, “It is ethically wrong for animals to be kept in captivity in zoos” and “Zoos play an important role in saving animal species from extinction”. (Response options: 1 ‘Strongly Disagree’ to 9 ‘Strongly Agree’)
- Space to complete a thought-listing task, with the instruction: “Please write down or draw any words or ideas that come to mind relating to the word below. (Durrell)
- An item assessing the visitor’s level of knowledge regarding actions for reptile and amphibian conservation, with the open-ended question, “Please write any actions you can think of to help save reptiles and amphibians.”.
- An item assessing the visitor’s level of concern about wildlife conservation, with the question “How concerned are you about the following animals [frogs, gorilla, cranes, bats, tiger, and tortoise] going extinct? (Response options: 1 ‘Not at All Concerned’ to 9 ‘Very Concerned’)
- An item assessing the visitor’s level of knowledge regarding the conservation status of reptile and amphibian conservation, with the open-ended question, “Please write the names of any endangered reptiles and amphibians you can think of.”.
- An item assessing the visitor’s level of interest regarding wildlife conservation, with the question “During your visit today, how interested are you in learning more about: ‘Animals’, ‘Wildlife Conservation’ and ‘Wildlife Research’.” (Response options: 1 ‘Least Interested’ to 9 ‘Most Interested’)

Post-Visit Questionnaire

The post-visit survey instrument maintained the following items:

- Demographic details’ (adding age and gender)
- Thought-listing
- ‘How concerned are you about the following animals going extinct’
- ‘Please note whether you agree with these statements’
- “Please write any actions you can think of to help save reptiles and amphibians.”
- “How concerned are you about the following animals [frogs, gorilla, cranes, bats, tiger, and tortoise] going extinct?”

However, the post-visit survey dropped the questions, “What prompted your visit to Durrell today?” and “What are you most looking forward to on this visit to Durrell Wildlife Park?”. The following items were added or adjusted in the post-visit survey:

- Visit details: Departure time, ticket purchased, predicted visit time and two questions regarding visitor motivation. Motivation questions included the question, and “What are you most looking forward to on this visit to Durrell Wildlife Park? (and why?)”.
- An item assessing satisfaction of the visit, with the question, “Overall, how satisfied are you with today's visit to Durrell Wildlife Park?” (Response options: 1 ‘Least Satisfied’ to 9 ‘Most Satisfied’)
- An item assessing the visitor’s self-reported visitor experience regarding their behaviour during their visit through the question, “Please tick all of the animals you remember seeing during your visit today.” (List of 20 species)
- An item assessing the visitor’s level of interest regarding wildlife conservation following their visit, with the question “During your visit today, how interesting did you find any information on the following topics? ‘Animals’, ‘Wildlife Conservation’ and ‘Wildlife Research’.” (Response options: 1 ‘Least Interested’ to 9 ‘Most Interested’)
- Item assessing visitor perception of the ‘Reptile and Amphibian House’ with question, “Do you remember visiting the ‘Reptile & Amphibian Area’?” (Response options: ‘yes’, ‘no’, ‘not sure’). A follow-up question, “If YES, what did you think of this area?”, elicited further feedback from the visitor regarding their perceptions of the ‘Reptile & Amphibian House’.

Data Analysis

Questionnaire data was entered into an Excel spreadsheet by research personnel. All data except for the annotated drawings and open-ended questions could be straightforwardly entered without any analytic judgment required.

A postgraduate research assistant on this project coded key qualitative responses to transform them into quantitative data that could be used in statistical analysis. Analysis of positive or negative changes in visitor responses from pre- to post-visit are described below:

- *For the concept map data:*
 - A positive change would include adding objective words (e.g. conservation, preservation, education, rehabilitation, specific animal names) **and/or** removing negative words (e.g. cage, bars, hunting, pollution) **and/or** being more specific (e.g. Rambo to Jambo)
 - A negative change would include removing objective words **and/or** adding negative words and/or being less specific.
- *For ‘conservation action’ data:*
 - A positive change includes adding tasks (e.g. donate, less pollution, preserve habitat) **and/or** an increase in the number of tasks listed and/or being more specific about a task (e.g. "preserve water" to "stop chemical runoff into water") **and/or** improved accuracy of the task (e.g. "don't allow people near wildlife" to "keep poachers away from wildlife")
 - A negative change includes a decrease in the tasks listed and/or a loss of specificity regarding the task **and/or** decreased accuracy regarding the task **and/or** listing an incorrect task (e.g. "continued awareness" {not an action, there is no benefit of just being aware of a dangerous situation})
- *For naming endangered species data:*
 - A positive change includes listing species when none were listed previously **and/or** an increase in number of correct species (actually endangered species) being listed **and/or** an improvement in accuracy of endangered species (e.g. frog to mountain chicken frog)

- A negative change includes listing a species which is not a reptile or amphibian (however if they also listed a reptile or amphibian this was excluded) **and/or** a decrease in the number of species listed and/or species listed is not endangered **and/or** loss of specificity regarding species.
- *For Comments about the Reptile and Amphibian House (Demonstration Project):*
 - A positive comment includes positive describing words (e.g. excellent, fun, great) **and/or** words that positively described the exhibit (e.g. "easy to see", "laid out nicely", "informative")
 - A negative response includes negative describing words (e.g. boring) **and/or** negative words to describe the exhibit (e.g. "too crowded", "too hot", "couldn't see anything")
 - A positive response was given if the positive words outnumbered the negative words. Oppositely, a negative response was given if the negative words outnumbered the positive words.
 - If a response had equally bad/good comments it was assigned a neutral standpoint. Additionally, phrases that were not easily categorised as positive/negative from the context of the description (e.g. species name, "warm", "busy") were categorised as neutral.

For all of these items, respondent data that was missing either their pre- or post- response was coded as incomplete ('4')⁴.

Qualitative Analysis

The in-depth qualitative data collected during the focus groups were also rigorously analysed to identify patterns and themes (for full discussion of data analysis methods used, see Jensen & Holliman 2009). The results of this thematic analysis are presented in the Results section below.

Qualitative results extracts from the focus groups are appended with a respondent's: gender (Male='M' or Female='F'), education level (e.g. 'PG' = postgraduate degree as highest qualification) and whether they are a repeat or first time visitor to Durrell Wildlife Park.

Results

The results show statistically significant pro-conservation impacts stemming from visits to Durrell Wildlife Park.

Visitor Profile: Demographic, Geographic and Attendance

This representative survey of the Durrell Wildlife Park visitor population offers an opportunity to gain insights into the overall characteristics of visitors.

Prior Experience

While a large proportion of visitors were attending Durrell Wildlife Park for the first time (55.6%, n=140) there was a substantial percent of participants who have previously visited Durrell Wildlife Park. Indeed, the majority of respondents had visited more than five years ago (60.2%; n=68), whilst 58.4% (n=66) had visited Durrell in the last year. Only 18.6% (n=21) of respondents had visited between one and five years ago. Overall 44.8% (n=113) of respondents had previously visited Durrell Wildlife Park.

⁴ This exclusion of data from this analysis if either a pre- or post-visit form was missing could be considered a limitation, as a lack of pre-visit response to these items may indicate a lack of opinion/knowledge or it may indicate a lack of willingness to participate. However, this analysis followed the most conservative approach of excluding these cases altogether, given the inherent uncertainty that surrounds their analysis and interpretation.

Ticket Type

Members of Durrell Wildlife Park comprised 25% ($n=63$) of the surveyed visitors. The majority of visitors were individual ticket holders (63.1%, $n=159$). Whereas, the least purchased ticket option was the family or group ticket option (10.3%, $n=26$). Four of the groups surveyed (1.6%) purchased more than one ticket option.

Gender Distribution of Visitors

Respondents reported on their own gender and on the gender of individuals in their visiting group (or just for themselves if they were visiting alone). The gender breakdown of survey participants was 62.1% ($n=133$) female, and 37.9% ($n=81$) male.

The overall gender breakdown within these visiting groups was 53.3% ($n=349$) female and 46.7% ($n=306$) male. Thus, the overall gender distribution for this sample of survey participants was skewed towards women and girls, but nearly uniform distribution between males and females overall.

Geographic Distribution of Visitors

A significant proportion of visitors lived relatively near to Durrell Wildlife Park living on Jersey (28.2%, $n=68$). For those visitors not from Jersey, a few of the respondents travelled from the nearby island of Guernsey (3.27%, $n=5$) and a majority of visitors reside in the rest of the United Kingdom (86.3%, $n=132$). Other visitors are from further abroad with 3.27% ($n=5$) travelling from the Netherlands, 1.96% ($n=3$) of respondents traveling from both the United States and Germany, 1.31% ($n=2$) traveling from both France and Slovakia, and similar numbers coming from Australia, Canada, Ireland, Tanzania, South Africa, and Switzerland (each at 0.65%, $n=1$). These results indicate that the profile of visitors to the Durrell Wildlife Park is predominately of national origin (83.0%, $n=200$ of visitors from the United Kingdom).

Language

Of the visitors surveyed, a majority of participants indicated English as their first language (88.1%, $n=222$). 2.0%, of the visitors who indicated another language as their native language, identified French as their first language. 1.2% ($n=3$) of the participants identified German as their first language. Dutch, Chinese and Slovakian each were represented with 0.8% ($n=2$) of participants. Malayalam and Swedish were only represented by 0.4% ($n=1$) of the participants.

Education

Most of the respondents were obtained secondary education, with 26.6% ($n=67$) stating that they had a degree, and 23.8% ($n=60$) stating that they had an A-level or equivalent. Similar proportions of respondents indicated that they had a GCSE or equivalent level (19.8%, $n=50$) or postgraduate degree (19.4%, $n=49$). Only 10.3% ($n=26$) indicated no degree or chose not to respond.

Annual Income

Visitors reported whether or not their annual household income met or exceeded the national poverty level of £22,000. Most of the respondents responded that their annual income is higher or above the poverty level (67.1%, $n=169$). Whereas 14.3% ($n=35$) of the respondents reported their annual income fell below the poverty level and 19.1% ($n=38$) chose not to respond to the question.

Group Size

A majority of respondents reported attending in small groups of two (42.5%, $n=107$). Whilst, 13.9% ($n=35$), 16.7% ($n=42$), 17.1% ($n=43$) indicated that they visited in groups of one, three and four persons respectively. In comparison, larger groups were not well represented with 4.4% ($n=11$), 2.4% ($n=6$), 0.8% ($n=2$) and 0.4% ($n=1$) were comprised of five, six, seven and eight persons respectively. Only one group surveyed attended in a significantly larger group of 32 (0.4%).

Age Distribution

Respondents were asked to report the age distribution of their visiting group. This section reports in turn how many respondents indicated the presence of individuals of different ages in their visiting party. Only a small minority of respondents had children aged 0-2 years in their group, with only 8.3% ($n=21$) stating that they had 1 person this age, and none of the groups surveyed indicated having more than 2 or more persons in this age group. 14.3% ($n=36$) of respondents reported that there was one 3-5 year old child in their visiting group. Moreover, only 0.8% ($n=2$) and 0.4% ($n=1$) of respondents stated that they had two and three 3-5 year olds in their groups respectively. 10.7% ($n=27$) of respondents indicated that there was one 6-12 year old in their group, 3.2% ($n=8$) of respondents stated that there were two 6-12 year olds, whilst only 0.8% ($n=2$) stated that there were three 6-12 year old children in their group.

Thus, from 0-14 years of age, there is a steady increase in participation by age. This pattern changes sharply at the age category of 13-17, which was not well represented in respondents' reports of group characteristics. In comparison to the 30% ($n=75$) of groups containing children 0-14, only 7.1% ($n=18$) of respondents had one 13-17 year old in their group, whilst 4.0% ($n=10$) and 0.4% ($n=1$) had two and thirty 13-17 year olds respectively. The outlying 0.4%, with thirty 13-17 year olds represents an adolescent organisation.

A similar pattern of relatively limited representation was evident for the 18-24 year old age category. Only 4.8% ($n=12$) of respondents had one 18-24 year old in their group, whilst 1.2% ($n=3$), 0.8% ($n=2$) and 0.4% ($n=1$) had two, three and four 18-24 year olds respectively in their group. There is a notable increase in participation was evident for the 24-49 year old age category. 30.6% ($n=77$) of respondents had one 24-49 year old in their group, whilst 27.0% ($n=68$), 1.6% ($n=4$) and 0.4% ($n=1$) had two, three and four 24-49 year olds respectively in their group.

A smaller number of respondents (20.2%, $n=51$) stated that there was a 50-69 year old in their group, with 22.6% ($n=57$) indicating that there were two 50-69 year olds in their group. Only 1.6% ($n=4$), 2.8% ($n=7$) and 0.4% ($n=1$) stated that there were three, four and five 50-69 year olds respectively in their group. Finally, the number of respondents from the 70 and above age group also had less representation in the visitor profile. 10.3% ($n=26$) and 2.8% ($n=7$) stated that there were one and two people this age in their group respectively.

Visitor Satisfaction and Feedback

Overall Visitor Satisfaction

The overall impression of respondents was generally very positive, with 53.2% ($n=59$) saying that their overall impression was "most satisfied" (a 9 on the satisfaction scale), and 27.0% ($n=30$) and 16.2% ($n=18$) saying it was "8" and "7" respectively. Only 2.7% ($n=3$) said their impression was a "6" and only 0.9% ($n=1$) satisfaction was a "6" and "4" respectively.

Therefore, 99.1% of respondents had an “overall impression” of Durrell Wildlife Park that was above average, while just 0.9% had a below average impression of the wildlife park.

Perceptions of the ‘Reptile and Amphibian House’

Positive Visitor Perception. A high percentage of visitors recalled visiting the ‘Reptile and Amphibian House’ (86%, n=98). Of the participants who recalled visiting the area 58.6% (n=68) wrote positive comments about the area. These results indicate that visitors hold a relatively positive perception of the ‘Reptile and Amphibian House’. The majority of these comments could be categorised as “interest”, “animal species”, or “exhibit design”. The “interest” category includes responses focused on the range of comments respondents made in relation to appearance and perception:

- “Excellent, one of the best I have seen” (Male, 62, PG Degree, First Visit)
- “Great, Very Busy. Lots of children enjoying the area.” (Female, 41, PG Degree, Return Visitor)
- “I enjoyed the exhibit, although I tend to have a greater interest in some of the other animals.” (Male, PG Degree, First Visit)
- “Interesting. Not cute but important.” (Female, 56, Degree, First Visit)

These extracts do not provide a great deal of information on visitor attitudes or recommendations but do indicate that the reception of the area is positive. The “animal species” category is defined as those extracts that referred to positive accounts of the reptiles and amphibian species in the area. In these extracts, a wide range of comments referring to the variety of animal species were provided:

- “I think this area was interesting because of the large snakes and iguanas. Also, they have to breed so many insects.” (Female, 9, No Degree, First Visit)
- “It was interesting and the frogs in particular were well presented. I used to live on Montserrat when mountain chicken were numerous and a restaurant delicacy so it was sad to learn of their current plight.” (Female, 57, Degree, First Visit)
- “Good variety of different species of animal” (Male, 20, A-level or Equivalent, Repeat Visitor)
- “[Did] not [visit] today as too hot but normally enjoy it - especially when the snake is awake” (Female, 37, Degree, Repeat Visitor)
- “...Practically liked being close to the chameleon; easily able to see frogs and snakes” (Female, 39, PG Degree, First Visit)

Finally, the third category, “exhibit design”, is defined as that aspect of visitor comments that refer to the layout and design of the ‘Reptile and Amphibian House’:

- “Nice. Tidy, lots of benches to sit.” (Female, 25, Degree, First Visit)
- “Very good, Could see more than at a lot of places.” (Female, 36, PG Degree, Repeat Visitor)
- “Easy to see the animals. Informative texts.” (Female, 61, A-level, First Visit)
- “Very well constructed. Seemed as though that the environment was as near to the natural environment as possible.” (Male, 60, GCSE, Repeat Visitor)

These responses indicate that visitors to Durrell Wildlife Park were generally very positive about the ‘Reptile and Amphibian House’. These positive comments illustrate visitor’s

positive attitudes not only in terms of the species on exhibit, but also in terms of the design and layout of the exhibit.

Negative and Neutral Visitor Perceptions. In contrast to the positive responses, 6.9%(n=8) and 9.5% (n=11) of visitors provided negative and neutral comments, respectively. Negative comments were defined as those comments that consisted largely of negative terminology. Whereas neutral excerpts were comprised of a mix of positive and negative phrases or did not provide terminology that was easily distinguishable as positive or negative. Similarly to the positive visitor comment categorisation comments have been sectioned into three categories: “comfort/atmosphere”, “animal species”, or “exhibit design”. The “comfort/atmosphere” category includes responses focused on the range of comments respondents made in relation to the visitor’s comfort within the space:

- “Very warm.” (Female, 24, A-level, First Visit)
- “Very hot.” (Male, 40, Degree, First Visit)

In these extracts, there are few negative or neutral comments referring to the animal species in the ‘Reptile and Amphibian House’:

- “Good but difficult to see some of the animals. It would be helpful to have more information about the size of the animals you were looking for.” (Male, 55, PG Degree, First Visit)
- “It was very good we could not find any alligators or crocodiles so I was a bit disappointed and it could have done with a few more snakes of different species.” (Female, 41, A-level, First Visit)

Finally, the third category, “exhibit design”:

- “Smelly, less and less busy. Good information.”(Female, PG Degree, Repeat Visitor)
- “Small exhibit compared to other zoos I have visited.”(Female, PG Degree, First Visit)

Demonstration Project and Visitors’ Public Engagement Experiences at the Zoo

Positive Impacts: Extending the Visit Duration

One measure of the effect of the demonstration project on visitors’ experience is a comparison of responses to the pre-visit survey question asking about the expected visit duration with the post-visit survey asking about actual duration. If actual visit duration exceeds expected visit duration, we can infer that the engagement opportunities within the site enticed visitors to stay longer than they were intending. This could be viewed as one indicator of the wildlife park’s success or failure in engaging its visitors at the basic level of holding onto their time and attention for longer than expected. In this case, the results show an increase from an expected visit duration of 2.8 hours to an actual visit duration of 3.5 hours. This is a substantial shift, indicating the wildlife park successfully enticed individuals to stay longer than they planned to.

Remembering Animals

One goal of the demonstration project was to make it easier for visitors to see as many of the animals at Durrell Wildlife Park as possible through improved navigational signage and expectation management in the form of photos of the animals in upcoming spaces. Therefore another measure of Demonstration Project success in this case is the set of questions about which animals visitors saw. In the post-visit survey form, respondents were asked to recall

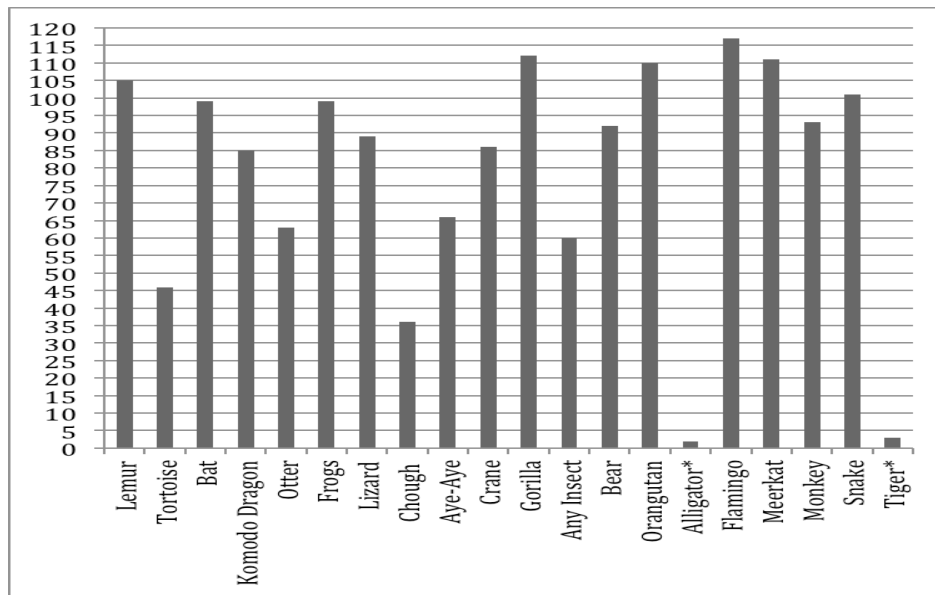
the animals they saw during their visit. A list of 20 species categories was provided and respondents were asked to tick all of the animals they remembered seeing during their visit. To verify that respondents had carefully considered their answers on this item, two species categories were included on the list that were not a part of Durrell Wildlife Park’s live animal collection (and so we would expect them not to be ticked for the entire sample if respondents were providing valid responses to this item). The results from this animal recall item (n=117) are listed in the table below and are also illustrated in a graph.

117 respondents completed the post-visit item asking visitors to select the animals they remembered seeing. The most remembered species categories were flamingos (100% of respondents; n=117), gorillas (96% of respondents; n=112), meerkats (95% of respondents; n=111), orang-utans (94% of respondents; n=110). A further 105 people indicated seeing a lemur, 86% of respondents (n=101) recalled seeing a snake and 99 indicated they had seen the bats and 85 said they remembered seeing Komodo dragons. The others are summarised below:

Animal	Number of Times Recalled	Percent of Participants
Lemur	105	89.7%
Tortoise	46	39.3%
Bat	99	84.6%
Komodo Dragon	85	72.6%
Otter	63	53.8%
Frogs	99	84.6%
Lizard	89	76.1%
Chough	36	30.8%
Aye-Aye	66	56.4%
Crane	86	73.5%
Gorilla	112	95.7%
Any Insect	60	51.3%
Bear	92	78.6%
Orangutan	110	94.0%
Alligator*	2	1.7%
Flamingo	117	100.0%
Meerkat	111	94.9%
Monkey	93	79.5%
Snake	101	86.3%
Tiger*	3	2.6%
*Animal is not a part of the Durrell Collection Number of Participants Responding = 117		

These results indicate both the memorability of the species categories that were selected most frequently, but they also reflect the structure of the wildlife park, which highlights the most remembered species categories and places them in the main pathways for visitors (also see Moss & Esson 2010). In the case of lemurs, there is the added advantage of having them

placed in at least two major spaces in the wildlife park (thereby at least doubling the chances that a visitor will see one).



The species categories highlighted *least* often in visitors’ responses include: the local sea crow species ‘chough’ (30.8% of respondents; n=36), tortoises (39.3%; n=46), any insect (51.3%; n=60), otters (53.8%; n=63), aye-aye (56.4%; n=66). These low recall numbers are likely to reflect the placement of these species in the park and the tendency for these animal categories to be low in visibility for a variety of reasons. In the case of the chough bird species, these are often position towards the back of their enclosures behind tree branches. In the case of aye-ayes, this nocturnal species is kept in very low lighting conditions in two separate indoor enclosures within the wildlife park and one heavily overgrown outdoor enclosure. Insects are not featured in any of the main visitor areas within the wildlife park and the otters- while centrally located- are off the main track of visitor foot traffic and the directional signage to them seems not to be sufficient based on these evaluation results.

Impact on Generalised Personal Concern for Wildlife Conservation and Perceptions of Zoos’ Conservation Role

There was a small but statistically significant increase in respondents’ agreement with the statement ‘I feel personally concerned about animals going extinct’ from pre-visit (M=7.82) to post-visit (M=8.06). This indicates that the zoo is increasing visitors’ generalised sense of personal concern about species extinction.

Interestingly, despite this finding of positive impact, respondents showed no statistically significant increase from their relatively high pre-visit (M=7.66) to their post-visit (M=7.74) level of agreement with the statement ‘Zoos play an important role in saving animal species from extinction’. Meanwhile, respondents’ level of agreement with the statement ‘It is ethically wrong for animals to be kept in captivity in zoos’ increased from a slight disagreement on average pre-visit (M=4.72) to slight agreement with this ethical concern about zoos post-visit (M=5.11). These results suggest that the positive impacts of visiting Durrell Wildlife Park are not translating into any broader positive perspective on zoos’ conservation role. Given the highly positive associations people tend to have with Durrell Wildlife Park, these data support the conclusion that Durrell Wildlife Park is not being perceived as a zoo per se by most visitors. However, the experience of visiting the wildlife park also boosted ratings of ethical concern about holding animals in captivity, suggesting that concerns about the persistence of

small cage-like enclosures in some parts of the wildlife park expressed by members of the visiting public in the public participation workshops may not have been fully addressed yet.

Impact on Pro-Conservation Concern for Particular Wildlife Species Categories

Respondents' pre- and post-visit levels of conservation concern for different categories of wildlife were investigated in this evaluation study using a Likert-type scale, rating concern from 1 (not at all concerned) to 9 (very strongly concerned). The results show substantial impact on these ratings of conservation concern across *all* species categories measured, *except* tigers. Notably, tigers are not in the zoo collection at Durrell Wildlife Park, thus indicating that the presence of the animal category at the zoo was the major factor in promoting an increase in conservation concern for that species category.

Concern for the conservation of frogs increased from pre-visit (M=6.55) to post-visit (M=7.52) increased at a statistically significant level ($p<.05$). This +.971 shift was by far the biggest mean increase in a species category, indicating that the educational impact of the wildlife park was most effective in shifting visitors' views on this species category.

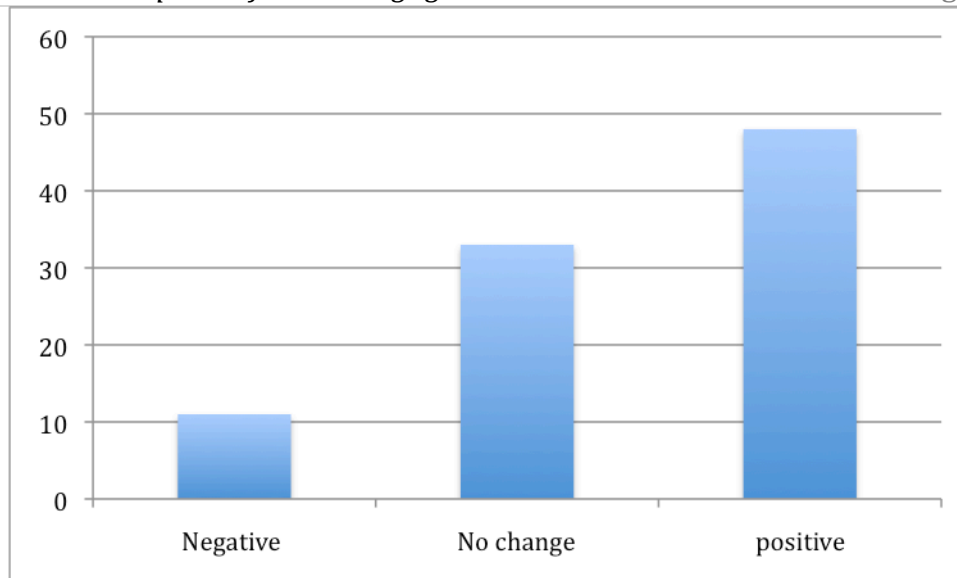
The increase in conservation concern for tortoises from pre-visit (M=7.52) to post-visit (M=7.89) was also significant ($p<.05$). For gorillas, pre-visit concern (M=8.21) was exceeded by post-visit concern (M=8.61) at a significant level as well ($p<.05$). Another category of mammal species, the bat, drew greater conservation concern from pre-visit (M=7.01) to post-visit (7.59) at a significant level ($p<.05$). At +.581, the bat evinced the second largest shift from pre- to post-visit conservation concern amongst the species categories tested.

A category of bird species, the crane, also showed change from pre-visit (M=6.99, SD=2.862) to post-visit (M=7.37, SD=2.124), which was statistically significant ($p<.05$).

In marked contrast, the charismatic category of mammal species, the tiger, failed to engender significantly greater concern from pre-visit (M=8.42) to post-visit (M=8.6). The most obvious reason for this one species category bucking the larger trend described above is that there are no tigers at Durrell Wildlife Park, while the other species categories are represented in the zoo collection.

Thought-Listing and Concept Map Results

Responses were coded for positive change, negative change, no change and incomplete pre- and post- forms. Positive change was coded when there was an increase of positive ideas about the zoo, whether that is zoo functions (such as conservation), ecosystem types or kinds of species. Conversely, if less information was given negative change was coded and no change was coded if the amount of information did not change between pre and post surveys. 48 participants showed positive change, 33 no change and 11 negative change (see the graph below). That means that just over half of the participants showed positive change.



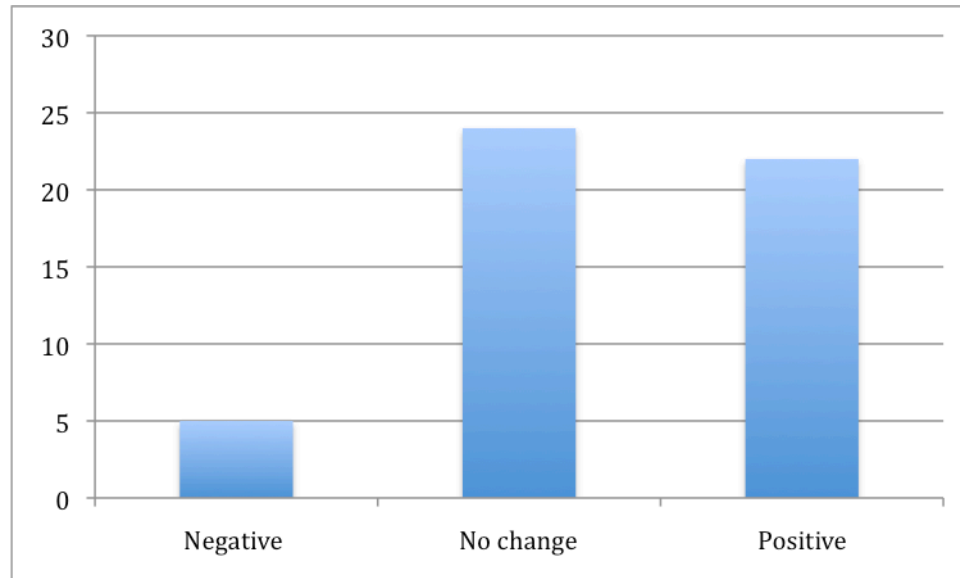
Positive change involved a number of factors. First, it was frequent to see more species named post visit than pre visit. For example, “dodo; endangered; primates; gorilla; lemurs; conservation; Jersey” (pre) becomes “verdant; space; flamingos; reptiles; orangutans; lush; tamarins; Komodo dragons; lemurs; Gerald; conservation; Jersey; gorillas; primates”. Second, new zoo functions were often added. For example, “reputation; conservation icon” (pre) becomes “reputation; concern for animals; research; conservation icon; access to see and learn about animals”; and “conservation” (pre) becomes “breeding programmes; conservation; protection; gene pool dilution” (post). Third, parts of the world that Durrell has conservation programmes in are added. For example, “Madagascar” was frequently mentioned post visit. Finally, there were several positive associations to the space of the zoo were given post-visit. The zoo was described as “huge place; lots of animals”; “big”; “impressive areas”; “well designed animal enclosures”; “beautiful gardens; lovely day out”. Though we did not code them for positive change, some participants also mentioned positive experiences such as “safe for children; great food in new cafe; fun”, “fun; exciting; colourful”.

Of the 11 cases of ‘negative change’ only one actually seems to have not had an ambivalent experience at the zoo. His pre-visit thought list runs “safety; conservation; species; natural; habitat; Gerald Durrell; animals” and post-visit it changed to “nature; zoo; conservation; animals; bored; small enclosure”. The participant was a tourist in Jersey whose reasons for visiting was “have looked at various things to do in Jersey and this seemed a lot different; could use the Jersey Pass”. He showed generally high concern for animal extinction but this decreased somewhat pre- to post- visit.

The name ‘Durrell’ also still evokes associations to Gerald Durrell, the man, and his project in a significant number of visitors both pre- and post-visit. Here are some examples: “his sense of adventure and enthusiasm for conservation, to fulfill his”; “My Family and Other Animals”; “author; zoo; gerald; 1800’s”; “fantastic man who loved and cared much for the animal world; need all kind of support; concerned organisation; seeing him playing with gorillas on his front lawn; carrying on the good work; playing”; “Gerald; conservation; legacy; south America; Madagascar; deforestation; habitat; education; orangutans”; and “his sense of adventure and enthusiasm for conservation, to fulfill his dreams of restoring animals to their natural countries and surroundings”. Thus, Gerald Durrell’s name very effectively functions to connect the zoo to a long history of conservation work. It often triggers a chain of positive thoughts concerning conservation.

Action Words

There was less evidence of positive change for the question asking visitors' to identify an action they could take to save wildlife species from extinction when compared to the previous question. Yet, still well over a third showed positive changed (see graph below).



Responses to the question were typically quite general. The most common action was to promote habitat conservation. In a few cases, specific actions were mentioned, such as “don't eat palm oil”. Participants also frequently mentioned promoting awareness and education of conservation issues as well as stopping the ‘trade’ of animals and animal parts. Generally, participants already had ideas about actions in their pre-visit answers.

Endangered Species Names

It was not possible to directly compare pre and post answers to the ‘endangered species names’ question, because many participants did not fill in either the pre or the post form. Thus, the analysis grouped them together and counted every animal listed by each participant (but not counting an animal twice if it showed up in both pre- and post- answers). It should be noted though that wildlife park members could already name several endangered species. For the sample as a whole, frogs were by far the most commonly named in this item (aligning with the quantitative finding that this category of animals showed the greatest increase in conservation concern). Moreover, a particular species of frog was given – for example, ‘poisonous dart frog’ and ‘mountain chicken’. The second most commonly named species was the ‘Komodo dragon’ followed by ‘tortoises’ and ‘toads’.

Conclusion: Towards Visitor-Centred Public Engagement in Zoos and Aquaria

Although there has been a range of visitor studies conducted in zoos and aquaria, the Durrell Demonstration Project represents the first ever full-scale example of ‘upstream public engagement’ in zoos, wherein the results of a rigorous and systematic engagement exercise feeds directly into action in a way that fully empowers participants. Following on from this ground-breaking project, the present evaluation assesses the degree to which the changes implemented as a result of the upstream public engagement exercise yielded positive impacts for visitors.

Impact evaluation results show that the Demonstration Project yielded a number of gains in visitor learning, conservation concern for animals represented in the wildlife park and its educational engagement and in positive associations with the conservation oriented institution behind Durrell Wildlife Park. The fact that there were particularly strong impacts for reptiles and amphibian species concern (e.g. frogs) supports the conclusion that the Demonstration Project (which centred on the Reptile and Amphibian House) was successful.

The carefully designed approach to Durrell Wildlife Park's public engagement activity resulted in positive experiences for participants, as well as clear and usable public input on zoo education, which will be fed directly into the forthcoming 'Demonstration Project' for the EU Zoos project. The core principle of this exercise in upstream public engagement was to be transparent in the decision-making process by being clear with participants about the scope of their input and how it will be taken forward. Moreover, as this lengthy report shows, participants' views have been recorded and fully analysed. Future development at Durrell Wildlife Park will be able to draw direct inspiration from these results to enhance the experience for the visiting public.

Participants in this unique public engagement project identified a number of directions for future development. In some cases, participants views support larger historical shifts in zoo design towards more naturalistic and immersive enclosures. One point worth noting here though is the value of having plants and other naturalistic features on the visitor side of enclosures. This could foster a greater sense of connectedness to the animal through the shared natural environment, which is a broader conservation idea that zoos would like to encourage (i.e. recognition of the interdependence of all life on Earth). In a similar vein, participants valued the provision of a multi-sensory experience (e.g. the sounds of rainforest animals playing and the smell of rainforest flowers). This was viewed as facilitating learning about the connection between animals living in captivity in the zoo and their wild counterparts' natural habitat. In order to further enhance and connect this kind of learning about animals and their habitats to specific pro-conservation ideas, it was suggested that the zoo's educational messaging should be organised around a central theme or a minimum around zone specific themes. Any information communicated through signs should be kept as short and focused as possible, with large vibrant images of animals or habitats accompanying it. Where it is desirable to provide visitors the opportunity to go deeper and learn more about a conservation topic, handouts can be provided, with additional potential for a 'drive to web' approach to delivering follow-up information.

Ultimately, participants saw great value in Durrell Wildlife Conservation Trust engaging visitors with wildlife conservation. They advocated stepping up and enhancing current practices across the zoo, but especial in the Reptile and Amphibian House, which was selected as the site for the EU Zoos Demonstration Project at Durrell. Participants sought from the wildlife park greater transparency about its many conservation activities and greater opportunities to becoming involved in promoting wildlife conservation both individually and collectively. As this public engagement event shows, involving publics can be very fruitful, but it requires institutions giving up a degree of control to allow for direct and meaningful involvement.

A key finding from this engagement event is that visitors consider the zoo in its entirety, rather than in the segmented functions that zoos frequently self-identify (viz. Conservation, Research, Entertainment and Education).

The Durrell Demonstration project marked a shift from the conventional 'conservation education' model to one favouring the broader idea of 'public engagement' as an endeavour that cuts across these functions. Indeed, like other scientific institutions, zoos (and the science and conservation they practice) may benefit from a full commitment to the principle of public engagement, with upstream engagement activities shaping new developments across their portfolio of activities. The reasons for such a shift align well with the basis for the broader change in the sciences' approach to publics in Europe (see Jensen & Wagoner, 2010), which was reviewed at the outset of this report. The public engagement paradigm offers zoos the prospect of engaging ever more fully in the promotion of pro-conservation social change for the benefit of both wildlife and the development of a more sustainability society. This effort requires the commitment of not just the education staff at zoos, but the entire institution. In return for this broader commitment to their publics, zoos may gain greater visitor satisfaction, public interest and involvement and a much expanded role within the struggle for pro-conservation social change in the public sphere. The present evaluation research supports this pro-public engagement paradigm shift, showing its value for enhancing pro-conservation outcomes amongst visitors.

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