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The Role of a Flagship Species in the Formation of Conservation Intentions

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Environmental agencies increasingly use flagship species (those popular, relatively large, charismatic animals) as tools to trigger concern for the species and motivate community members to conserve the flagship species and its habitat. However, little research has considered the mechanisms behind which this strategy works. Using the platypus as a flagship species, this study aimed to (a) determine whether exposure to the platypus flagship and/or (b) a person's level of environmental concern influences intentions to conserve the platypus and its habitat. Logistic regression analyses of questionnaire responses showed that exposure to educational materials promoting the conservation of the platypus and its habitat was a strong and reliable predictor of feelings of concern specific to the welfare of the platypus and its habitat. This concern influenced intentions to conserve the platypus and its habitat. It is hoped that managers will use these findings to improve their uses of flagship species to motivate community-wide conservation efforts.

Keywords flagship species, conservation intentions, environmental concern, platypus, *Ornithorhynchus anatinus*

Introduction

Flagship species are increasingly used as a tool to motivate public involvement in conservation efforts. A flagship species is a popular, "cute," charismatic animal that is used as a symbol to arouse public interest in the animal and its habitat and promote broader ecological and economic values of conservation. An ideal flagship species: (1) is endemic to one area but known far beyond that region; (2) has economic importance within the culture; (3) can act as an umbrella species; and (4) has a declining population (Bowen-Jones & Entwistle, 2002; Caro & O'Doherty, 1999; Entwistle & Stephenson, 2000; Simberloff, 1998; Walpole & Leader-Williams, 2002). Conservation success stories like the giant panda in China (Zhi, Wenshi, Xiaojian, Dajun, & Hao, 2000) and tamarins in Brazil (Dietz, Dietz, & Nagagata, 1994) show that flagship species can contribute to raising local and

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international public support for species and habitat conservation (Dietz et al., 1994; Ginsberg, 2001; Zhi et al., 2000).

Flagship species provide individuals with exposure to the species and focus public attention on its conservation values. It is hypothesized that flagship exposure leads to the development of concern for the species (Caro & O'Doherty, 1999; Myers & Saunders, 2002), which ultimately motivates people to take actions (financial or otherwise) to conserve the flagship species, its habitat, and associated biodiversity (Bowen-Jones & Entwistle, 2002; Dietz et al., 1994; Entwistle & Stephenson, 2000; Leader-Williams & Dublin, 2000; Walpole & Leader-Williams, 2002; White, Gregory, Lindley, & Richards, 1997; Zhi et al., 2000).

Although the studies cited earlier suggest a link between flagship exposure and increased environmental concern and conservation actions, other findings suggest that flagship exposure alone is not enough to influence either a broader concern for the species' habitat (e.g., Vining, 2003) or conservation behaviors. Rather, effecting behavior change may require education that instills an understanding of the interconnectedness of the species, its habitat, and human well-being (Dietz et al., 1994) and also addresses barriers to actions (McKenzie-Mohr, 2000).

It is clear that exposure to a species can take many forms, ranging from simple exposure to flagship symbols and educational materials to direct experiences with the species and its habitat. It is not known, however, whether type of exposure to a species has an effect on an individual's level of concern or conservation intentions and behaviors regarding that species. This study explores the relationship between exposure type and conservation intentions using the platypus (*Ornithorhynchus anatinus*) as a case study.

Study Context

The platypus was chosen for this study because it meets all of the aforementioned criteria for an ideal flagship species (see Caro & O'Doherty, 1999; Entwistle & Stephenson, 2000), and because it has been used as a flagship species since 2000 by the Barron River Integrated Catchment Management Association (BRICMA) in north Queensland, Australia. BRICMA uses a variety of educational tools (e.g., information packets, public talks, displays, media events) featuring the platypus, its habitat requirements, and suggested conservation actions, in an effort to foster community-wide concern for the species and motivate people to take actions to help ensure that local waterways are suitable platypus habitat (see http://www.barronriver.com.au).

Theoretical Framework

This study tests whether different types of exposure to the flagship platypus influence intentions to conserve the platypus and its habitat (1) directly; or (2) indirectly as mediated by environmental concern and general ecological intentions. The model tested is outlined in Figure 1 and described in what follows.

Exposure → Conservation Intentions

This study evaluated four ways in which a person could have been exposed to the platypus and its habitat: (1) exposure to BRICMA and its educational materials (including logo, newsletters, website, fact sheets, media events, etc.), (2) direct experience with the platypus in the wild or in captivity, (3) direct experience with the platypus' riparian habitat, and

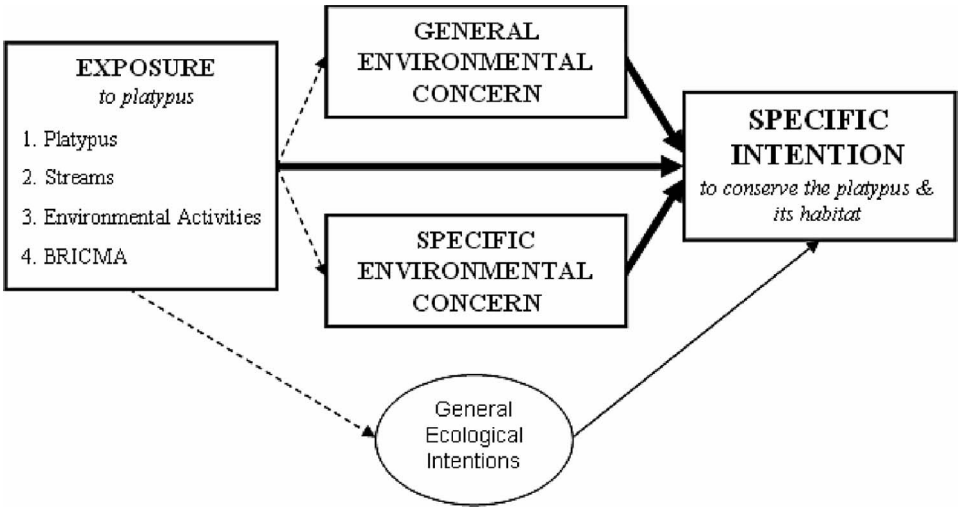

Figure 1. The proposed pathways of analysis for determining the relationships between exposure, environmental concern, and intention. The bold solid arrows represent the primary path of investigation; the dotted arrows are the secondary path of investigation, and the solid thinner arrow shows how to account for the effects of general ecological intentions.

(4) involvement in environmental organizations or activities. The first three exposure types are all related to the platypus and its conservation. Involvement in other environmental activities is a less specific level of exposure relating to conservation behaviors in general.

People are more likely to behave according to those attitudes formed by direct experience (Fazio & Zanna, 1978). Exposure to BRICMA should influence conservation intentions because BRICMA's educational materials are designed to promote the need to conserve the platypus and its habitat while addressing the barriers for action (Monroe, 2003). The types of educational tools used by BRICMA have been shown to raise environmental knowledge, attitudes, values, conservation intentions, and behavior (Dietz et al., 1994; Finger, 1994; Tung, Huang, & Kawata, 2002). Previous studies have also shown that prior direct experiences with nature and wildlife are among the best predictors of ecological behavior (Bogner, 1998; Finger, 1994; Kals, Schumacher, & Montada, 1999; Vaske & Kobrin, 2001), suggesting that exposure to the platypus and its stream habitat should also influence conservation intentions and behaviors relating to the platypus. Partaking in one type of ecological behavior (e.g., involvement in other environmental organizations or activities) has also been found to be a strong predictor of future ecological behaviors (Finger, 1994). This type of exposure may be limited, however, because it does not necessarily relate to the desired conservation actions relating to the platypus' habitat.

Environmental Concern → Conservation Intentions

Environmental concern is most commonly considered an attitude (i.e., a psychological tendency expressed by labeling degrees of positive or negative associations; Ajzen, 1991; Eagly & Chaiken, 1993) relating to how human behavior affects the environment. "Environmental concern" has been used to represent both specific attitudes (Fransson & Gärling, 1999) toward the conservation of a single species and more general attitudes or value orientations relating to the environment in general (Abdul-Muhmin, 2007; Bamberg, 2003;

Fransson & Gärling, 1999; Stern, 2000). Both the specific and general conceptualizations of environmental concern can influence behavioral intentions (Fransson & Gärling, 1999; Stern & Dietz, 1994).

Environmental concern has not been operationalized consistently in previous studies (Bamberg, 2003). In this study, environmental concern is operationalized as a three-dimensional construct (following Bentrupperbäumer, 1997): (1) *Saliency* represents beliefs about the urgency and importance of conserving the species (specific environmental concern) or the environment (general environmental concern; Stern, 2000; Stern & Dietz, 1994; Stern, Dietz, & Kalof, 1993); (2) *Empathy* is an emotional response characterized by feelings of compassion for the perceived welfare of the species or the environment (Davis, 1980, 1983; Eisenberg & Miller, 1987; Schultz, 2000); (3) *Responsibility* is a sense of obligation to act to conserve the species or the environment (Bentrupperbäumer, 1997; Gärling, Fujii, Gärling, & Jakobsson, 2003; Kaiser & Shimoda, 1999; Schwartz, 1970; Stern, 2000; Stern & Dietz, 1994; Stern et al., 1993).

The three components of environmental concern (saliency, empathy, and responsibility), have been shown to influence behavioral intentions. Empathy has a low to moderate relationship with prosocial behavior (Davis, 1983; Eisenberg & Miller, 1987; Mehrabian & Epstein, 1972), a category of behavior for which conservation actions belong. High levels of environmental saliency (Stern & Dietz, 1994; Stern et al., 1993) and responsibility (e.g. Hines, Hungerford, & Tomera, 1987; Kahn, 2003; Kaiser, Ranney, Hartig, & Bowler, 1999; Kaiser & Shimoda, 1999) have correlated with stronger ecological intentions. These findings suggest that when considered collectively as a measure of concern for the platypus and its habitat (or for the environment in general), environmental concern will influence intentions to conserve the platypus and its habitat.

Exposure → Environmental Concern

It is hypothesized that the various types of exposure to a flagship species can influence conservation intentions indirectly by influencing environmental concern. Dietz and colleagues (1994) showed that exposure through educational materials (like those used by BRICMA) influenced local residents to develop a greater sense of responsibility to care for their local environment in general. Previous literature has argued that exposures via direct interactions with animals (Myers & Saunders, 2002) and by viewing photographs of animals being harmed by nature (Schultz, 2000) can contribute to the formation of heightened concern for animals. Vaske and Kobrin (2001) found that repeated experiences with nature of personal importance or meaning can lead to a deeply felt emotional attachment to the place, leading to a level of concern for it, which can lead to actions to conserve that place. Previous positive experiences acting in an environmentally friendly manner (e.g., involvement in other environmental activities) have influenced general environmental concern (Abdul-Muhmin, 2007). These findings support the idea that exposure to a flagship species will influence both the specific and general levels of environmental concern and ultimately lead to intentions to conserve the platypus and its habitat.

General Ecological Intentions

An individual's propensity to engage in ecological behaviors in general (i.e., their general ecological intentions) will influence their intentions to engage in specific ecological behaviors (Abdul-Muhmin, 2007; Finger, 1994; Knussen, Yule, MacKenzie, & Wells, 2004). Variation in general ecological intentions is likely to account for a substantial

amount of the variation in specific intentions to engage in conservation actions related to the platypus and its habitat. A measure of general ecological intentions is included in the model to (1) allow the effects of exposure and environmental concern to be tested after accounting for any relationship between an individual's general ecological intentions and specific intentions to conserve the platypus, and (2) test whether general ecological intentions are influenced by exposure to the platypus and therefore act as a mediating variable between exposure and specific conservation intentions.

Methodology

Data Collection

A random sample of Barron River Catchment residents (aged 18 years and older) was surveyed in 2004 to collect data on their: (1) general predisposition toward the environment, (2) level of concern for the conservation of the platypus, its habitat, and the environment, (3) exposure to the platypus as a flagship species, and (4) intentions to conserve platypus habitat. Survey packets (including an introductory letter, a 20-minute self-administered questionnaire, and a reply-paid envelope) were mailed to post office boxes within the Catchment. Post office box selection involved a stratified random sampling procedure (de Vaus, 2002) that aimed to reach approximately 8% (n = 500) of the 6,221 privately owned P.O. Boxes within the Catchment. An additional 150 survey packets were personally delivered to randomly selected households using multistage cluster sampling (de Vaus, 2002).

One hundred and sixty-nine (26%) completed surveys were returned. This response rate is comparable with previously published studies on Australian wildlife using a similar methodology (Hill, Carbery, & Deane, 2007). No attempt was made to contact non-respondents to check for non-response bias; however, a comparison of the sample demographics with the Australian Bureau of Statistics 2001 Census statistics for the region indicates that the sample adequately represented the local population in terms of age and gender.

Variables

Specific conservation intentions. Individuals' intentions to conserve platypus and/or platypus habitat were collected by asking them to rank their level of agreement with five behavioral intentions statements on a 5-point Likert scale ranging from "1, strongly disagree," to "3, neutral," to "5, strongly agree." The statements were designed to address a variety of actions people could take to conserve the platypus and its habitat (cf. Kaiser & Wilson, 2000). After reverse-coding the negatively worded item, the five items were averaged to create an ordinal index of conservation intentions (M index score = 3.89; SD = .58). Because of the relatively small number of items in the scale (i.e., less than 10; Cortina, 1993; Pallant, 2007), the unidimensionality and internal consistency reliability of the scales were confirmed using inter-item correlations; inter-item correlations were within the recommended range of .15–.50 (Clark & Watson, 1995). The average inter-item correlation of .37 indicates an acceptable level of reliability for the specific conservation intentions scale (Table 1).

Exposure variables. The four exposure variables were divided into specific and general levels. At the specific level, respondents were asked to indicate whether they had been exposed to the platypus or platypus habitat by: (1) visiting streams near their homes; (2) seeing a platypus in the wild or in captivity; and/or (3) through exposure to BRICMA

Table 1
Descriptive statistics for the scaled dependent variable: Intentions to conserve the platypus and its habitat (Cronbach's $\alpha = 0.76$, Average inter-item correlation = 0.37)

Items in scale	*n*	Mean[a]	SD	Median[a]
I would be willing to spend some of my money/time to help keep our local waterways as undisturbed as possible.	168	3.49	.83	3.0
I would be willing to help plant trees along our local rivers.	169	3.75	.85	4.0
If I saw an injured platypus, I would do whatever I could to help it.	169	4.33	.74	4.0
I *would not* protect platypus habitat if it interfered with my ability to make money.	169	3.85[a]	.80	4.0[a]
During periods of low rainfall, I would be willing to reduce my water intake to help ensure there is sufficient platypus habitat.	169	4.01	.80	4.0

[a]All responses have been coded such that 5 is the most environmentally oriented response. Accordingly, this item was reverse coded.

materials. At the general level, respondents were asked whether they have exposure through (4) involvement or membership in an environmental activity. Each exposure type was measured as a dichotomous variable (exposure/no exposure).

Environmental concern variables. Environmental concern was operationalized at the general and specific levels separately. For each, respondents were asked to rate their level of agreement (on a 5-point agreement scale) with two *Saliency*, three *Empathy*, and three *Responsibility* statements. When possible, the questions were worded after previously published studies (Davis, 1980; Mehrabian & Epstein, 1972). After reverse-coding negatively worded items, the items in each scale were averaged to provide separate ordinal measures of general (*M* index score = 4.05; *SD* = .52) and specific (*M* index score = 3.98; *SD* = .60) environmental concern. Inter-item correlations identified one specific saliency item that was not significantly correlated with the others. This item was dropped; the specific environmental concern scale has seven items. The subsequent internal consistency for both the general (average inter-item correlation = .29) and specific (average inter-item correlation = .36) levels of environmental concern are acceptable (Table 2).

General ecological intentions variable. Respondents' general intentions to engage in ecological behaviors were measured by asking them to rate their level of agreement (on the 5-point scale) with six statements about their general ecological behaviors and intentions to engage in environmental activities (cf. Kaiser & Wilson, 2000). The six items were averaged to create an index of general ecological intentions (*M* index score = 3.85; *SD* = .52). The average inter-item correlation value of .22 shows that the internal consistency of this scale is acceptable (Table 3).

Analysis

Prior to analysis, the ordinal measures of general and specific intentions and environmental concern were transformed into dichotomous variables. These transformations were

Table 2
Descriptive statistics for the environmental concern scales

Type	Component	Items in scale	*n*	Mean[a]	SD	Median[a]
General (Cronbach's α = 0.76, Average inter-item correlation = 0.29)						
	Saliency	Taking actions to protect the environment is among my top priorities.	169	3.64	.88	4.0
		The state of the environment is *not* bad enough to need to take actions now.	167	4.35[a]	.81	4.0[a]
	Empathy	I feel compassion for people less fortunate than myself.	169	4.08	.72	4.0
		People make too much of an issue about the sensitivity and vulnerability of nature.	166	3.91[a]	1.07	4.0[a]
		I would get very upset if I saw an injured animal.	169	3.92	.91	4.0
	Responsibility	Since future generations will be better able to deal with environmental problems, we *do not* need to worry about these problems right now.	167	4.38[a]	.99	5.0[a]
		I feel personally obligated to help care for the environment.	169	3.91	.82	4.0
		I feel that I am doing the right thing if I help care for the environment.	169	4.22	.65	4.0
Specific (Cronbach's α = 0.85, Average inter-item correlation = 0.36)						
	Saliency	I am concerned about the health of the platypus and its habitat.	169	3.82	.85	4.0
	Empathy	When I see pollution in the local streams and rivers, I feel kind of protective towards these waterways.	169	4.00	.78	4.0
		People make too much of an issue about the feelings and needs of the platypus.	169	3.73[a]	.91	4.0[a]
		I would get very upset if I saw an injured platypus.	169	4.02	.93	4.0
	Responsibility	Everyone should share in keeping local streams and rivers healthy.	169	4.27	.72	4.0
		I am doing the right thing if I took actions to protect the platypus.	169	4.14	.76	4.0
		Protecting platypus habitat is *not* my responsibility.	168	3.86[a]	.84	4.0[a]

[a]All responses have been coded such that 5 is the most environmentally oriented response. Accordingly, these items were reverse coded.

Table 3
Descriptive statistics for general ecological intentions (Cronbach's $\alpha = 0.58$, Average inter-item correlation = 0.22)

Items in scale	*n*	Mean[a]	SD	Median[a]
I often talk with friends/family about problems/issues related to the environment.	168	3.77	.85	4.0
When I am in nature, I try to leave it as undisturbed as possible.	168	4.61	.67	5.0
I always pick up rubbish I see in nature and put it in the bin.	169	3.98	.85	4.0
If a forest impacted on by ability to earn a living, I would be prepared to cut it down.	168	3.85[a]	.92	4.0[a]
I would be willing to spend some of my money/time to help improve river and stream habitats in other parts of the world.	167	3.04	.96	3.0
I usually leave the tap running while I am brushing my teeth.	169	3.86[a]	1.13	4.0[a]

[a]All responses have been coded such that 5 is the most environmentally oriented response. Accordingly, these items were reverse coded.

done because each variable had a skewed distribution; there were fewer responses in the lower categories. For each variable, a score of 3 or less (i.e., a stated neutrality or lack of intention or concern) was recoded to represent "no intention" (for specific and general intentions), or "not environmentally concerned" (for specific and general environmental concern). Scores of 4 or 5 (i.e., stated intention or concern) were recoded to represent "intention," or "environmentally concerned."

A series of logistic regression analyses were used to test the effects of exposure and environmental concern variables on the probability of having intentions to conserve the platypus and its habitat. Logistic regression analysis was chosen (a) for its flexibility to better handle categorical data that does not have to be normally distributed or of equal variance within each group and (b) because the distribution of responses for the dependent variable was expected to be nonlinear with one or more of the independent variables (Tabachnick & Fidell, 1996).

The logistic regression analyses to determine the best statistically significant ($\alpha = 0.05$) predictive model for the direct determinants of the dependent variable, intentions to conserve the platypus and its habitat (Figure 1), occurred in two stages. While controlling for the effects of general ecological intentions, the first stage of analysis considered the effects of the four exposure types and the general and specific levels of environmental concern on specific conservation intentions. The secondary path of analysis (testing for indirect effects of exposure on conservation intentions) considered the effects of each of the four exposure types on general ecological intentions and general and specific environmental concern.

Results

Seventy-five percent ($n = 126$) of respondents were classified as having intentions to conserve the platypus and its habitat, and 79% ($n = 133$) were classified as having a general propensity to engage in ecological behaviors. Eighty-three percent ($n = 140$) of

Table 4
Results of the logistic regression analysis testing for significant effects of exposure types and environmental concern variables on intentions to conserve the platypus and its habitat

Parameter	*df*	β	SE	χ^2	*p*-value	θ
General ecological intentions	1	2.047	0.580	12.444	<0.0005	7.74
Streams	1	0.852	0.992	0.738	0.390	2.34
Platypus	1	0.307	0.720	0.182	0.670	1.36
Environmental activities	1	1.249	0.767	2.650	0.104	3.49
BRICMA	1	0.181	0.653	0.077	0.782	1.20
Specific environmental concern	1	0.756	0.174	18.836	<0.0005	2.13
General environmental concern	1	1.071	0.717	2.232	0.135	2.92

$n = 156$.
Model $\chi^2 = 74.865$; $df = 7$; $p < .0005$.
Overall concordance = 86.5%.

respondents were classified as being specifically concerned about the welfare of the platypus and its habitat, compared to 85% ($n = 144$) of respondents who were concerned about the environment in general. Most respondents had been exposed to the platypus (85%; $n = 144$) and its habitat (95%; $n = 161$); however, only a minority of respondents were involved in other environmental activities (26%; $n = 41$) or had been exposed to BRICMA and their educational materials (30%; $n = 48$).

Results of the logistic regression analysis testing the effects of exposure, environmental concern, and general ecological intentions on intentions to conserve the platypus and its habitat are presented in Table 4. The only variables found to influence intentions to conserve the platypus were specific environmental concern and general ecological intentions. After accounting for individuals' general ecological intentions (which increased the odds of an individual having an intention to conserve the platypus and its habitat by 7.74 times), the odds of an individual having intentions to conserve the platypus and its habitat are 2.13 times higher for those who are specifically concerned about the platypus and its habitat than those who were not. There was no significant effect of any of the four exposure types on intentions to conserve the platypus and its habitat. This model successfully predicted 86.5% of the cases.

Results of the logistic regression analysis testing the effects of each of the four exposure types on general ecological intentions and general and specific environmental concern are presented in Table 5. Out of all of the possible effects tested, only one was significant. The odds of an individual being specifically concerned about the platypus and its habitat increased 5.51 times with exposure to BRICMA.

Discussion

Through an investigation of the effects of exposure to the platypus and its habitat, environmental concern, and general ecological intentions on intentions to engage in conservation-oriented behavior toward the platypus, this study identified empirical support for the hypothesis posed by the flagship species literature that exposure to a flagship species heightens concern and ultimately leads to conservation actions (Bowen-Jones & Entwistle, 2002; Dietz et al., 1994; Leader-Williams & Dublin, 2000; Myers & Saunders,

Table 5
Results of the logistic regression analysis testing for the effects of exposure types on environmental concern variables and general ecological intentions

		Dependent variable				
Independent variable	*df*	β	SE	χ^2	*p*-value	θ
General Environmental Concern[1]						
Streams	1	–19.778	14185.548	0.000	0.999	0.000
Platypus	1	–0.082	0.684	0.014	0.905	0.921
Environmental activities	1	1.308	0.785	2.780	0.095	3.701
BRICMA	1	0.516	0.606	0.726	0.394	1.676
Specific Environmental Concern[2]						
Streams	1	–0.752	1.107	0.461	0.497	0.472
Platypus	1	–0.340	0.682	0.248	0.619	0.712
Environmental activities	1	0.749	0.669	1.252	0.263	2.114
BRICMA	1	1.707	0.774	4.869	0.027	5.513
General Ecological Intentions[3]						
Streams	1	0.499	0.773	0.417	0.518	1.647
Platypus	1	–0.238	0.605	0.154	0.694	0.789
Environmental activities	1	0.633	0.547	1.340	0.247	1.884
BRICMA	1	0.728	0.508	2.052	0.152	2.071

[1]$n = 156$; Model $\chi^2 = 8.327$; $df = 4$; $p = .080$; Overall concordance = 85.9%.
[2]$n = 156$; Model $\chi^2 = 11.136$; $df = 4$; $p < .05$; Overall concordance = 83.3%.
[3]$n = 156$; Model $\chi^2 = 6.224$; $df = 4$; $p = .183$; Overall concordance = 77.6%.

2002; Walpole & Leader-Williams, 2002; Zhi et al., 2000). After accounting for individuals' general ecological intentions, specific concern for the platypus and its habitat was the only significant predictor of intentions to conserve the platypus and its habitat. However, specific concern for the platypus and its habitat was significantly increased with exposure to BRICMA materials. This indirect effect of exposure to BRICMA materials is consistent with the findings of previous studies examining the effects of educational tools focusing on a flagship species (e.g., Dietz et al., 1994). These findings suggest that further research is needed to identify (1) those specific educational tools that are effective in influencing heightened concern for the behavioral intention target and (2) the most effective means of distributing these tools to the broader public.

The lack of predictive capabilities for exposure to the platypus and its stream habitat counter previous studies that have shown that exposure to wildlife and nature increase concern (Myers & Saunders; Schultz, 2000; Vaske & Kobrin, 2001) and ecological intentions (Bogner, 1998; Dietz et al., 1994; Kals et al., 1999; Vaske & Kobrin, 2001). However, the literature also suggests that it is the *quality* of these experiences, as measured by (1) direct experiences (Myers & Saunders, 2002), (2) what a person currently values (Schultz, 2000), and (3) the sense of emotional connection with the particular natural element (Kals et al., 1999; Vaske & Kobrin, 2001), that effect behavioral intentions. Future research aimed at understanding the efficacy of flagship species in the formation of conservation intentions should endeavor to include a measure of the personal meaning behind the exposure to the species and its habitat.

The lack of predictive abilities for the general exposure type (involvement in environmental activities) and general environmental concern provide further support for the importance of conceptualizing the predictors of a specific behavioral intention at the same level of specificity (Ajzen & Fishbein, 1980, 2000, 2005; Bamberg, 2003). This study found that exposure specific to the platypus or its habitat were not significant predictors of specific concern or intentions. Rather, this study showed that only the most specific exposure type tested, BRICMA's educational materials, heightened concern for the conservation of the species and ultimately led to intentions to conserve the platypus and its habitat.

A number of methodological issues must be considered when interpreting the results of this study. First, the survey's low response rate raises the question of how representative the respondents are of the target population. Although comparisons with census data indicate the sample is representative in terms of age and gender, it is not known how the sample compares to the target population in terms of the variables of interest in this study (i.e., intentions, exposure to platypus, environmental concern, etc.). Responses for the intention and environmental concern components had an environmentally oriented skew, suggesting that individuals who volunteered to complete this survey were either already environmentally conscientious, or that their responses may have been subject to demand characteristics (Bordens & Abbott, 1999) or social desirability bias (King & Bruner, 2000). Such biases would make it more difficult to detect a relationship between intentions and the predictor variables and reduce the likelihood that reported intentions will translate into actual behavior in all cases (Ajzen & Fishbein, 2005). Second, to adjust for the environmentally oriented skewed responses, the ordinal variables were dichotomized prior to analysis. This resulted in some loss of information about the strength of individuals' environmental concern and intentions, which may have reduced the power of the analysis to detect smaller effects. Collectively, these issues of a low response rate, a skewed number of environmental responses, and a decrease in power, show that caution should be exercised in generalizing these results to other flagship species and contexts beyond this study.

After accounting for the effects of general ecological intentions, this study found support for the theoretical framework adopted by the flagship species literature; exposure to educational materials promoting the platypus as a flagship species heightened concern specific to the species, and ultimately led to conservation intentions. There are, however, many other theories on ecological behavior formation, such as the Theory of Planned Behavior (Ajzen, 1991), Rational-Economic Models, and Social-Dilemmas Models (Kurz, 2002; see also Vining & Ebreo, 2002), which collectively suggest that there are many other factors that can play a role in the formation of ecological intentions and behavior. Other commonly hypothesized determinants of ecological intentions not studied here are economic cost-benefits (Kurz, 2002), knowledge (Kaiser & Fuhrer, 2003; Kaiser, Ranney, et al., 1999; Kaiser, Wolfing, & Fuhrer, 1999), subjective norms (Ajzen & Fishbein, 1980, 2005; Zinn, Manfredo, Vaske, & Wittmann, 1998), and moral norms (Ajzen, 1991; Opotow & Weiss, 2000; Schwartz, 1970). Future research on the influence of flagship species on conservation intentions and behavior would benefit from considering some of these other potential determinants of ecological intention and behavior.

This study provided empirical support and further explanation for the hypothesis that exposure to a flagship species heightens concern and ultimately leads to conservation intentions. These results provide researchers with a baseline understanding of the mechanisms behind which a flagship species is capable of motivating conservation intentions and behaviors, and has hopefully stimulated further research in this area. It is hoped that

these findings will encourage managers using flagship motivational tools to continue to: (1) find ways to improve their educational materials promoting the conservation of a flagship species and (2) identify other methods to evoke feelings of concern specific to the flagship species.

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