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# Does Conservation Status Matter if You're Ugly? An Experimental Survey of Species Appeal and Public Support

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Does Conservation Status Matter if You're Ugly?

An Experimental Survey of Species Appeal and Public Support

Undergraduate Honors Thesis

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### **Abstract**

Wildlife conservation is of the utmost importance to the preservation of a healthy planet, with the extinction of wild animals increasing at previously unseen rates. However, conservation is also becoming increasingly difficult without strong public support, and this often varies in extent and success when it comes to different species and taxa. There is considerable research investigating how the physical characteristics of species affect public support of their conservation. Results suggest species seen as more charismatic, or even more likeable, are more likely to gain support for their conservation, regardless of conservation status. This study aimed to identify whether conservation status, and concern for it, is as important of a consideration for endangered species that are not seen as simply likeable or appealing, or whether this tends to be more ignored for such species. We found that for the treatments/species we chose in our experiment, and in the context we distributed the survey in, their conservation status was a more significant factor than their perceived appeal when it came to public support for their conservation. These results have implications for wildlife conservation efforts, as it shows that appeal is not always the most important factor when attempting to garner support, and that influencing the perception of concern for certain species may be a more effective avenue than relying on appeal for successful wildlife conservation.

### **Introduction**

Biodiversity loss is part of a suite of serious issues facing wildlife conservation today. Human-caused extinction has resulted in a high rate biodiversity loss, with human activities such as habitat loss, overexploitation, invasive species, pollution, toxification and other similar factors becoming some of the greatest threats to wildlife on both the population and species level (Ceballos, Ehrlich, & Dirzo, 2017). One of the most common avenues to combat biodiversity loss is through conservation action, which has seen evidence to be effective in protecting endangered species in many cases, and in some instances halting their decline altogether (Rodrigues, 2006). However, even with strong conservation actions in place, public support has been shown to be vital to conservation success (Bruskotter et al., 2017). Variance in public support can be rationalized when considering the idea that decisions for conservation, both in management and public support, can be based on a wide range of indicators (Fischer et al., 2011). Some of these indicators can include recent population change, perceived harmfulness or perceived value of a species (Fischer et al., 2011). Other methods of identifying avenues for public support of a species' survival can be evaluated by looking at the ways that the public may derive value from a species. Examples include commercial value (food, medicine, clothing, tourism), existence value (pleasure simply from knowing the animal exists), or contributory value (comes from the understanding humans have that if species go extinct, there will be further ecological problems) (Metrick & Weitzman, 1996). Metrick and Weitzman (1996) contend that existence value specifically is a function of the "likeability" and charisma of a species' visceral characteristics, and that this is one of the strongest considerations when determining whether a species' conservation will be funded or given legislative protection. Many studies in the field corroborate that "likeability" of a species is incredibly important to the public, informing their concerns, values and preferences when it comes to their support in conservation (Colléony, Clayton, Couvet, Saint Jalme, & Prévot, 2017; Tisdell, Wilson, & Nantha, 2015). The Similarity

Principle is one method for predicting human preference in supporting wildlife conservation: animals that are more physiologically similar to humans (forward facing eyes, human-esque hands and feet, etc.) are seen as more relatable and appealing, therefore worthier of empathy and support (Plous, 1993).

Studies conducted on this topic often result in answers to one or more of the following questions: *Does the public favor the survival of species that are similar to humans? What attributes of a species make them desirable for conservation? Are individuals more likely to pay for conservation of an endangered species or one that is aesthetically appealing?* Answers to these questions have filled in gaps of understanding regarding public preference for conservation. Despite a significant amount of existing research for public preference in wildlife conservation, there is little evidence on how people trade-off likeability with conservation status for the support of a species. The interaction between conservation status and appeal in public preference and support, as well as how this interaction changes with variation in the attributes or physical characteristics of the species considered, is still unknown. In other words, does conservation status matter to individuals when considering the conservation of unappealing or disliked species?

When investigating public support for conservation and other similar issues, willingness-to-pay (WTP) is a commonly used parameter to measure support (Colléony et al., 2017). In previous research, testing similar concepts regarding the appeal of certain taxa and the support they respectively receive, the prominent measure of support is measured using a stated-preference survey often including a question about the respondents' willingness to pay and contribute to the conservation of a species. For example, in a paper measuring support for different animals located at a zoo in Paris, support was measured by a WTP experiment for participants of a conservation program at the zoo, testing individuals' commitment to the conservation of a species by asking how much they would donate or have donated to an adoption program of a specific animal at the zoo (Colléony et al., 2017). Here we conduct a similar experiment, with an emphasis on the appeal of the species. We chose 3 species within the same taxon, Mammalia, to minimize the variation that the public may have in support of different taxon (ex. mammals v. reptiles v. birds). This study ultimately tested factors of appeal, concern, and willingness to pay for the conservation of three endangered mammals in determining public support.

## Methods

### Survey Design and Collection

We conducted an experimental survey, which was distributed at several locations to any individuals present between February and March of 2018, including those at a fitness center, café, ski resort, and a local restaurant, all located in Vermont. The survey consisted of a photo and short section of information about the endangered status and conservation needs/issues of one of the three following species of New England mammals: Canadian lynx (*Lynx canadensis*), American marten (*Martes americana*), or northern long-eared bat (*Myotis septentrionalis*) (Appendix I). These species represented our three treatments, and each respondent got one of the three treatments randomly upon receiving the survey. Following the informational paragraph (pictures and paragraphs included below), relevant questions asked about the perceived appeal of

and concern for the species, as well as a question regarding willingness to pay. This question charted the individuals' willingness to pay for the species' conservation compared to their willingness to pay for a charity of their choice. Finally, six total questions asked about the demographics of the respondent.



The Canadian lynx, *Lynx canadensis*, is a medium-sized felid that is rare in New England and a threatened species within the United States. The species is trapped for its soft fur and is also threatened with habitat loss by urban expansion, as well as an increase in competition by bobcats (*L. rufus*) and coyotes (*Canis latrans*). A majority of what would be prime habitat for the lynx in the northeast is fragmented and lacking connectivity. Additionally, much of their potential habitat is privately owned by private commercial logging companies. This species would benefit from re-establishing well-connected and healthy habitat in the northeast.



The American marten, *Martes americana*, is considered rare; it is an endangered species in Vermont and has experienced significant decreases in historical numbers. This species relies on significant snow depth and landscapes with high forest cover for foraging and escape from predators. They are also trapped for their fur, additionally decreasing their numbers.



The northern long-eared bat, *Myotis septentrionalis*, is listed as threatened on the Endangered Species Act and is rare in New England. It has been most impacted by the spread of white-nose syndrome, a fungal disease known to affect bats. The species has drastically declined in the Northeast from pre-white nose syndrome levels. The species is also facing some threat from loss of habitat to highway construction, commercial development, and forestry practices.

The three treatment species were chosen to represent a spectrum of visual appeal. The Canadian lynx was assumed to rate as highly likeable, the American marten as moderately likeable or appealing, and the northern long-eared bat, as a species generally considered to be unattractive or unappealing. Determining the varied level of likeability was based upon aesthetic appeal and physical similarity to humans, and was preliminarily checked with a small pilot survey conducted prior to the experiment. This survey was piloted with 24 respondents, with about 8 respondents per species, and asked each respondent to rate a photo of one of the three animals based on level of appeal (1 – Very Unappealing to 9 – Very Appealing). The lynx received an average score of 9.4, the marten received an average score of 7.7, and the bat received an average score of 5.3, reinforcing the assumptions about their decreasing appeal, respectively. These three species were chosen because of their different levels of appeal, and also because of their similar conservation status/rarity in New England. All three species have experienced (or still are experiencing) serious declines in a few or all New England states, with one significant cause of their drop in numbers being human activity.

Surveys were distributed on a voluntary basis. Some survey respondents filled out the questions with me present; for others, I was not present.

The survey was comprised of two sections, with the questions seeking qualitative information at the beginning. The first question asked the respondent to identify a charity/cause they support, financially or otherwise, aiming to setup a later, follow-up question that tested for the respondent's willingness to pay, a common assessment of support. The second question had the respondent identify the appeal rating they would give the species, on a Likert scale from 1 – 9. The third question used the same Likert scale, but asked how concerned the respondent was about the species. Finally, the last question on the front page brought back the choice of charity the respondent selected at the beginning of the survey. The following question was used to determine the respondent's willingness to pay for a specific species' conservation, thereby showing support: *“if you had a total of \$100 to donate, and you could donate to the conservation of this species and the cause you previously identified, how much would you donate to the conservation of this species?”* Once the data were collected, the range of answers for preferred charity were individually put into one of three bins to simplify the analysis: Healthcare, Environment/Conservation, and Social/Welfare.

The end of the survey contained 6 questions to ascertain certain demographic statistics about the respondents – gender, age, state of residence, political party affiliation, income, and level of education (Appendix I).

### **Statistical Analysis**

To test for significance among factors and how they impacted the WTP response, a few different statistical tests were run. An ANOVA and a Tukey's HSD were run to test for significant differences between the appeal, concern and WTP responses, and a t-test was run to test for any difference between the appeal and concern rating of each individual species. We used an ANOVA to test for significant differences between the WTP responses by species. Finally, OLS regression was used to examine how the concern and WTP for a species were a function of a suite of potentially associated variables.

## Results

### Participants

Table 1 is a summary of the respondents who successfully filled out and returned completed surveys, and had their answers recorded (n=136). The table includes the makeup of the demographic variables requested at the end of the survey.

*Table 1. Demographic Statistics of Survey Respondents (n=136)*

	Percentage of respondents
<b>Gender</b>	
Male	44.12%
Female	55.88%
<b>Age</b>	
<20	11.03%
21-30	31.62%
31-40	13.97%
41-50	14.71%
51-60	21.32%
61-70	6.62%
71+	0.74%
<b>Political Party</b>	
Democrat	41.18%
Republican	7.35%
Independent	31.62%
Other	19.85%
<b>Income</b>	
N/A	11.03%
Student	19.12%
<\$20,000	6.62%
\$20,000 - \$50,000	20.59%
\$50,000-\$75,000	10.29%
\$75,000+	32.35%
<b>Education</b>	
Less than Bachelor's	34.56%
Bachelor's	49.26%
More than Bachelor's	13.97%

Table 2. Summary of range, standard deviation, mean, and Tukey's HSD test across appeal, concern, and WTP survey responses. Differing letters in the last column indicate statistically significant differences at the  $p < 0.05$  level.

	Range	Mean	SD	Tukey's HSD
<b>Appeal</b>				
Lynx	6 - 9	8.38	0.85	a
Marten	3 - 9	7.00	1.72	b
Bat	1 - 9	5.96	2.32	c
<b>Concern</b>				
Lynx	4 - 9	7.38	1.51	a
Marten	2 - 9	6.93	1.85	a
Bat	1 - 9	7.08	2.11	a
<b>WTP</b>				
Lynx	0 - 100	51.09	33.76	a
Marten	0 - 100	29.67	24.60	b
Bat	0 - 100	44.89	33.57	a , b

Respondents gave the three treatments mean  $\pm$  SD appeal results (Table 2) of  $8.38 \pm 0.85$ ,  $7 \pm 1.72$ , and  $5.96 \pm 2.32$  for the lynx, marten, and bat respectively, based on a 1-9 Likert scale system for rating. An ANOVA showed a statistically significant difference between the appeal of all three species ( $F_{2,135} = 23.04$ ,  $p < 0.001$ ). A subsequent Tukey's HSD test showed there was a significant difference in appeal between each of the three species (lynx – bat,  $p < 0.0001$ ; lynx – marten,  $p = 0.0009$ , and marten – bat,  $p = 0.0158$ ).

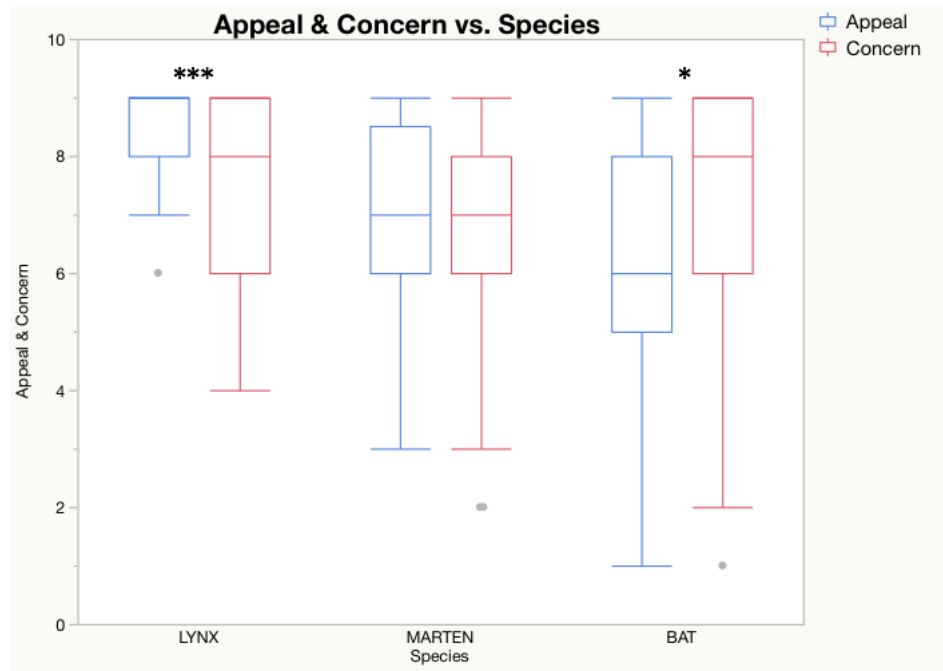
The mean  $\pm$  SD results of the respondents' concern ratings (Table 2) were  $7.38 \pm 1.51$ ,  $6.93 \pm 1.85$ , and  $7.08 \pm 2.11$  for the lynx, marten, and bat respectively, again based on a 1-9 Likert scale system for rating. An ANOVA showed no statistical difference in the respondents' stated concern measurements for the three species ( $F_{2, 135} = 0.71$ ,  $p < 0.4956$ ).

A t-test also indicated that for the first treatment, the lynx, there was a statistically significant difference between the appeal and concern measurements ( $t = 3.956$ ,  $p < 0.0002$ ). For the second treatment, the marten, a t-test indicated no significant difference between the appeal and concern measurements ( $t = 0.186$ ,  $p = 0.853$ ). For the third treatment, the bat, a t-test indicated a statistically significant difference between the appeal and concern measurements ( $t = 2.482$ ,  $p = 0.0148$ ).

Figure 1 shows the range of data for the Likert scores for appeal and concern across treatments. The box represents the 1<sup>st</sup> and 3<sup>rd</sup> quartile with the median shown as a line through the box, and with the top and bottom lines representing the maximum and minimum values, excepting outliers (black points beyond the max/min). Testing for difference in means between the appeal and concern of each respective treatment, was completed by the t-test mentioned above.



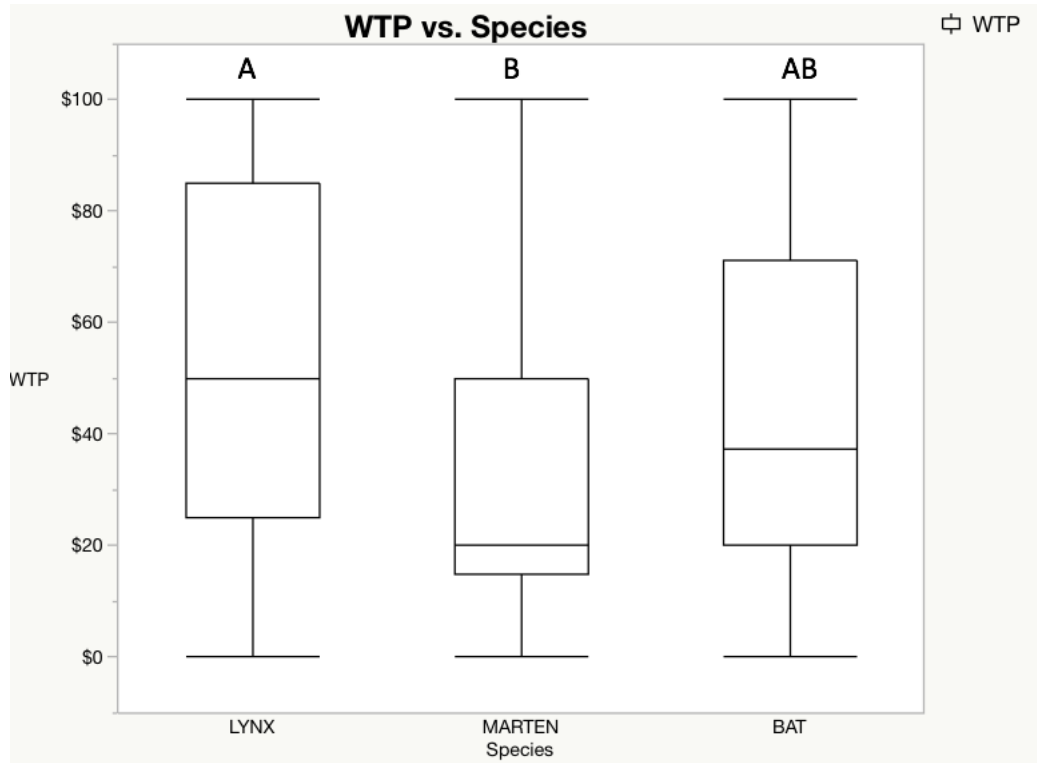
Figure 1. This graph depicts boxplots for the distribution of data regarding measured appeal and concern for each of the three treatments (species). The levels of significant difference between appeal and concern for each species at  $p < 0.05$  level are indicated within Figure 1 with the following guide:  $p < 0.05$  - \* /  $p < 0.01$  - \*\* /  $p < 0.001$  - \*\*\*.



We also tested to see if there was a difference in the respondents' WTP for each of the three treatments. The mean  $\pm$  SD results of the respondents' WTP (Table 2) were  $\$51.09 \pm \$33.76$ ,  $\$29.67 \pm \$24.60$ , and  $\$44.89 \pm \$33.57$ , for the lynx, marten, and bat respectively, based on an open response question asking the respondent to decide how much of \$100 they would like to give to the conservation of the species they were considering, and how much they would give to a charity they support (decided at the beginning of the survey). Their response was the amount given to the species.

Figure 2 shows the range of data for the response of WTP from the survey. The box represents the 1<sup>st</sup> and 3<sup>rd</sup> quartile with the median shown as a line through the box, and with the top and bottom lines representing the maximum and minimum values.

Figure 2. This graph depicts boxplots for the data distribution of WTP responses for all three treatments (species). The significant differences at  $p < 0.05$  level between treatments are shown with different letters.



An ANOVA indicated that there was a statistically significant difference in WTP across treatments ( $F_{2,130} = 5.16$ ,  $p = 0.007$ ) and a Tukey's HSD clarified that at the 0.05 level, there was a significant difference in the WTP between the lynx and marten ( $p = 0.0057$ ), but not between the bat and either of the other species.

### Model Results for Concern and WTP

We ran an OLS to model our concern results as a function of the following variables: appeal, gender, age, political party, income and degree of education (Table 3). Appeal, age and income were statistically significant at the  $p < 0.05$  level for having an effect on the measurements for concern.

Next, we ran another OLS to model the respondent's willingness-to-pay, as a function of the same variables as the previous, with one additional variable: category of charity. Thus, the variables tested were: appeal, gender, age, political party, income, degree of education, and the additional variable of the category of charity they chose for the first half of the question testing willingness to pay (Table 4). Charity choice, education, and concern were statistically significant variables at the  $p < 0.05$  level for having an effect of the measurements for WTP.

Table 3. Parameter estimates of the variables tested by the survey, with the last nine rows indicating estimates of the strength of movement from one ordinal category of political affiliation/income/education to the subsequent category. Significant results in bold and italicized.

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	3.888	0.777	5.000	<b>&lt;0.0001*</b>
Appeal	0.337	0.079	4.260	<b>&lt;0.0001*</b>
Gender (toward female)	0.245	0.164	1.500	0.138
Age	0.049	0.015	3.340	<b>0.0011*</b>
Toward Democrat	0.009	0.260	0.040	0.971
Toward Independent	0.031	0.271	0.120	0.908
Toward Other	-0.286	0.329	-0.870	0.386
Student to <\$20,000	-1.81	0.653	-2.78	<b>0.0065*</b>
<\$20,000 to \$20-\$50,000	0.313	0.646	0.480	0.629
\$20-\$50,000 to \$50-\$75,000	-0.118	0.561	-0.21	0.833
\$50-\$75,000 to \$75,000+	-0.322	0.556	-0.58	0.564
Less than Bachelor's to Bachelor's	0.464	0.461	1.010	0.317
Bachelor's to More than Bachelor's	0.368	0.380	0.970	0.335

*Table 4. Parameter estimates of the same eight variables as Table 3, but with rows 2-3 and 8-16 indicating estimates of the strength of movement from one ordinal category of political affiliation/income/education to the subsequent category. Significant results in bold and italicized.*

<b>Term</b>	<b>Estimate</b>	<b>Std Error</b>	<b>t Ratio</b>	<b>Prob&gt; t </b>
Intercept	17.630	17.402	1.010	0.314
Environment/Conservation to Social/Welfare	-16.245	6.210	-2.62	<b><i>0.0104*</i></b>
Social/Welfare to Healthcare	-2.312	6.834	-0.34	0.736
Appeal	1.827	1.624	1.120	0.264
Concern	4.825	1.746	2.760	<b><i>0.0069*</i></b>
Gender (toward female)	3.965	2.882	1.380	0.172
Age	0.003	0.259	0.010	0.990
Toward Democrat	-1.042	4.388	-0.24	0.813
Toward Independent	-1.982	4.635	-0.43	0.670
Toward Other	-1.779	5.541	-0.32	0.749
Student to <\$20,000	10.639	12.172	0.870	0.384
<\$20,000 to \$20-\$50,000	-3.587	11.706	-0.31	0.760
\$20-\$50,000 to \$50-\$75,000	1.082	9.323	0.120	0.908
\$50-\$75,000 to \$75,000+	-6.817	9.237	-0.74	0.462
Less than Bachelor's to Bachelor's	-17.481	7.985	-2.19	<b><i>0.0311*</i></b>
Bachelor's to More than Bachelor's	-4.333	6.349	-0.68	0.497

## Discussion

### Appeal and Concern by Species

Previous literature strongly suggests that public perception of the appeal of animals is based on a few varying factors, such as characteristics physiologically similar to humans (Plous, 1993), features considered aesthetically attractive (Liordos, Kontsiotis, Anastasiadou, & Karavasias, 2017), and even perception of cognition (Eddy, Gallup, & Povinelli, 1993).

To test appeal for this experiment, we aimed to create an extrapolation of past research which implemented assessments similar to those in existing literature, with some adjustments to answer a different question. The main change in terms of our experimental survey was to make the treatments involved in this experiment slightly different: only mammals, as opposed to

mammal/bird/reptile, for example, to isolate the issue of taxonomy with the question of appeal. Additionally, all three of the treatments (species) are experiencing similar conservation scenarios, to eliminate the variable of varied endangerment within the geographic context of our study. Ultimately, despite these changes, our results for rating of appeal largely aligned with expectations formed by the literature on the subject.

In testing for the respondents' perception of the species' appeal, the results for each species were significantly different, following the trend produced by existing literature. The lynx is perhaps the most physiologically similar to humans, in size and theoretically in facial features as well. The bat, on the other end of the spectrum, exhibits features typically seen as unappealing, such as their disproportionately large ears, and features very dissimilar to humans (wings and claws, among other anatomy). The marten sits somewhere in a neutral space between the lynx and bat, as a smaller creature without some of the pleasing anthropomorphic features the lynx has, but also lacking some of the distinctly unattractive physicalities of the bat. The discontinuity between these species in terms of certain physical factors would be expected to result in decreasing appeal to the average person, descending from the lynx to the marten to the bat, and our results reflected this expectation.

Existing research in this field, including the examples I mentioned above, often tests appeal and concern in tandem as this experiment does. One specific example (Tisdell et al., 2015) tested public perception of appeal and the group's resulting concern for the species in question, finding largely that the public would permit ignorance of the decrease or even extinction of the species that did not meet the common characteristics for appeal. Our results for concern, however, did not follow the trend that appeal did (the reduction in rating by each subsequent treatment, lynx → marten → bat, as was experienced for appeal). The results of the respondents' concern in this experiment contradict the expectation created by existing research and the results of similar experiments. We found that despite a significant difference in perceived appeal of the three treatments, the resulting concern measurements were not significantly different between the treatments. This was an unexpected result, given the existing results on similar topics. We speculate that this may be a result of all three species being mammals, or perhaps that our respondents happened to be a group of individuals who care about wildlife conservation, regardless of appeal. Additionally, analyzing the relationship between the appeal and concern result achieved by each treatment individually showed a significant difference between these parameters for the lynx treatment (with appeal significantly higher than concern) and for the bat treatment (with concern significantly higher than appeal). This continues to contradict existing research in which experiments conclude with a positive correlating relationship between concern and appeal (Colléony et al., 2017; Gunnthorsdottir, 2015; Tisdell et al., 2015).

These results paint a relatively optimistic outlook on the relationship between appeal and concern for endangered wildlife. We hypothesized that concern would decrease as appeal did, but that was not the case for this experiment. In the case of these three species, their differing levels of appeal ultimately did not affect the respondents' concern for their conservation, with the relationship between the appeal and concern of each treatment resulting in the opposite of what was hypothesized. Beyond our previous speculation about the taxonomy of our species treatments or any bias of our group of respondents, this result could be due to other factors; perhaps the specific conservation circumstances our chosen species are involved in resonated with our respondents for reasons that had nothing to do with what the animals looked like. For example, the northern long-eared bat's main setback has been their inability to defend

themselves against white-nose disease, and this may have elicited other feelings from the respondents and caused more concern for the species. The Canadian lynx and American marten's conservation circumstances were both primarily due to the actions of humans, perhaps eliciting some guilt or feelings of obligation on behalf of the respondents. However, we have not found literature examining this relationship (situations that provoke guilt and how this may affect concern), and this relationship would need to be researched further.

### **Willingness to Pay by Species**

Statistical analysis of the willingness to pay survey question results showed the WTP across the three species to be significantly different, with the difference occurring between the lynx and the marten, but not between the bat and either of the other two species, placing the bat in between the lynx and marten by the measurement of WTP. This result was somewhat unexpected, based on existing literature for support of species conservation, and that in previous experiments, support is usually predicted by appeal and therefore differs when considering different species or taxon (Colléony et al., 2017; Tisdell et al., 2015; Tisdell, Wilson, & Swarna Nantha, 2006). For this trend to have been followed, the WTP results should have decreased from the lynx to the marten, and the marten to the bat. Instead, the marten received significantly less support than the lynx and the bat sat somewhere between the two, not being statistically different than either of the other species. This could be a result of many different factors, and is an area that will require more research. Some options explaining the results could include differences in the causes of endangerment of the species (disease vs. human-induced issues, as is mentioned above), or perhaps how recognizable the species is, regardless of whether it is appealing.

This unexpected result could mean many things for wildlife conservation. Conservation programs are often held back by funding, and increased monetary support can mean better, and more, protection for endangered species. The goal of using a WTP question in the survey for this experiment was to look for any trends within the monetary response from respondents, and confirmed trends in this area could help conservation programs adjust their campaigns for additional support of an endangered species by catering to whatever variables elicit more support. We hypothesize one (or both) of two factors within the three treatments of this experiment may have caused the unexpected results in terms of WTP: the slight differences in endangerment situation, and/or how recognizable the species was to the respondent. We speculate that much of the monetary support received by the bat was because it is suffering from a disease, and this elicited more willingness to support their conservation. Similarly, we speculate that respondents were more able to recognize the lynx as a large cat of some kind (bobcat, lynx, etc.), and the northern long-eared bat definitively as a bat, but perhaps the marten was less identifiable. Whereas the lynx and bat were largely identifiable enough to narrow down to a few possible species, the marten looks much like the rest of its mustelidae family, and respondents may have had a hard time relating to the species because of its ambiguity in their view. If either of these two variables (scenario or distinguishability) had any effect on the results, this information can be utilized by a conservation organization to alter their campaigns.

### Concern Model

In looking at the models that were run, despite the fact that they seem to contradict the initial results of the present experiment, I found appeal to be a significant factor in measuring concern in a general situation from the regression model. This aligns more with existing literature on the subject, affirming conclusions from other papers that claimed concern was innately tied to appeal (Tisdell et al., 2015). Age and a certain level of income were also found to be significant, with an increase in age and a transition from the student income level to the income level of <\$20,000 causing a decrease in concern as appeal increased.

Despite the results for the present experiment seeming to say that appeal and concern are not connected, the models I ran say the opposite, and mean something different for wildlife conservation. This does make appeal an important factor to consider when working for wildlife conservation and attempting to garner simple *concern*, even when it seems to be a superficial consideration. Extrapolating this model to conservation campaigns would look like a prioritization of species considered appealing, simply because this model predicts they will receive the most concern. For species considered less appealing, manipulation of their presence in a campaign may be necessary, in order to make them more pleasing and successful in garnering concern about their endangered status. However, there may be exceptions; when taking my experiment into account, this theory of appeal impacting concern may not be guaranteed.

This interpretation, however, is simply regarding measurements of concern, not willingness to support conservation, which tells a different story through this experiment.

### WTP Model

When considering appeal and concern and how they affect support (presented as willingness to pay), previous literature creates an expectation that as appeal increased and concern did as well, support for conservation would follow the same trend (Colléony et al., 2017). The present experiment did not create clear evidence of this, and the model that was run showed that appeal was not a significant factor in determining support. Instead, the category of charity chosen for the respective survey question, their level of income (for one specific income transition) as well as their measured concern were the only significant indicators of the respondents' willingness to pay for a species' conservation. Finding significance in the category of charity chosen (Social/Welfare, Environment/Conservation, or Healthcare) opens up an interpretation of the respondents' other concerns extraneous to the survey, and how their choice of charity may predict their concern for an endangered species. In the present experiment, a respondent's choice of charity fitting within the Environment/Conservation category significantly predicted a higher WTP, and this prediction is the same for respondents in the student income category, as compared to the next income level. These two factors are not commonly tested in terms of assessing willingness to support conservation, and this opens up an area for further research to find more significant details of these variables and how they affect support.

This conclusion seems to be an indistinct result for conservation. On one hand, this regression model shows us that appeal is not a significant factor in determining support, and that perhaps conservation status *does* in fact matter, even if you're ugly. That doesn't mean, however, that all species will receive the same support in terms of willingness to pay. Other variables play a role in determining the amount of support a species will receive, with the largest and arguably

most understandable variable being the concern an individual has for a species. This information, while relatively intuitive, can be a good guide for conservation organizations to run with. The more an individual is concerned about the endangerment of a species, the more they will be willing to pay for that species' conservation.

Other variables were found to be significant when determining WTP, including a certain income bracket and an individual's extraneous priorities, shown by their choice of charity in the survey. As I stated above, to avoid making too many assumptions, more research may be required on the effect of these variables on WTP, beyond just the conclusion that they are significant. Research in this area could be of immense use to conservation organizations, as it would create another avenue for organizations to reach individuals who are going to be more willing to support wildlife conservation by donating funds to the conservation of a species.

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## Appendix I

### Canadian Lynx Survey

*This survey is being conducted by an Environmental Studies student at the University of Vermont for her senior thesis.*

*Thank you for participating in this survey. All answers are completely anonymous and will be kept confidential. You are not required to participate in this survey and can opt out at any time.*

- 1. Please identify a charity or cause you support (financially or otherwise).**



The Canadian lynx, *Lynx canadensis*, is a medium-sized felid that is rare in New England and a threatened species within the United States. The species is trapped for its soft fur and is also threatened with habitat loss by urban expansion, as well as an increase in competition by bobcats (*L. rufus*) and coyotes (*Canis latrans*). A majority of what would be prime habitat for the lynx in the northeast is fragmented and lacking connectivity. Additionally, much of their potential habitat is privately owned by private commercial logging companies. This species would benefit from re-establishing well-connected and healthy habitat in the northeast.

- 2. How appealing is this animal to you? Rate on a scale of 1 (Very Unappealing) to 9 (Very Appealing)**

Very Unappealing					Very Appealing				
1	2	3	4	5	6	7	8	9	

3. How would you rate your own concern for this animal's conservation? Rate on a scale of 1 (Not at All Concerned) to 9 (Very Concerned)

Not at All Concerned					Very Concerned			
1	2	3	4	5	6	7	8	9

4. If you had a total of \$100 to donate, and you could donate to the conservation of this species and the cause you previously identified, how much would you donate to the conservation of this species?

\_\_\_\_\_

**Gender (check one):**

Male  Female  Other

**Age (write in):** \_\_\_\_\_

**State of Residence (write in):** \_\_\_\_\_

**Political Party affiliation (check one):**

Democrat  Republican  Independent Other: \_\_\_\_\_

**Income (check one):**

student  less than \$20,000  \$20,000-\$50,000  \$50,000-\$75,000  \$75,000+

prefer not to answer

**Level of Education in Progress (Completed Education if not currently in school) (check one below):**

High School  Associate  Bachelors  Masters  Professional Degree  PhD, MD, JD, etc.

*Thank you very much for your time. If you would like to get a copy of the results from this study, you can write your email address below or contact me at [ntredmon@uvm.edu](mailto:ntredmon@uvm.edu)*