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**An Annotated Bibliography of Research Relevant to
Attitudes Toward Wildlife and the Environment
2014-2015**

The Humane Society Institute for Science and Policy

**Compiled by Erich Yahner
(All Abstracts and Summaries from Authors or Publishers)**

JOURNAL ARTICLES

Almeida, A., Vasconcelos, C., & Strecht-Ribeiro, O. (2014). Attitudes toward animals: A study of Portuguese children. *Anthrozoös*, 27(2), 173-190.

In this study we analyzed the attitudes toward different animals in 210 Portuguese children: 107 boys and 103 girls, aged between 8 and 10 years, attending the 3rd and 4th years of primary school. We used a questionnaire with two distinct parts. In the first part, the children were asked about the degree to which they liked 25 different animals, using a scale ranging from -7 (strongly dislike) to 7 (like very much), and to give their reasons for the value attributed. In the second part, they were asked whether in the event of the animals being threatened with extinction, it would be important to save any of them. We also asked for the reasons for their opinion. The most popular animals were big mammals and also birds. Certain gender differences were present, with boys preferring predators and other animals with a traditionally bad image, like bats and sharks. The most disliked animals were insects, but also those that were thought of as a danger to humans. However, we found a moderate positive correlation between liking and saving an animal, although this was lower in the case of the girls toward several animals. This shows that a negative perception of an animal does not always mean a negative attitude toward it. In part, the reasons for liking an animal were different from the reasons for saving it. All the results are important for the design of primary school teaching activities involving animals, including the fact that some reasons that the children gave revealed a lack of knowledge about the meaning of certain behaviors of the animals and of their ecological role.

Binngießer, J., & Randler, C. (2015). Association of the environmental attitudes "preservation" and "utilization" with pro-animal attitudes. *International Journal of Environmental & Science Education*, 10(3).

The relevance of environmental attitudes is obvious and attitudes towards farm and companion animals and animal welfare in medical research are an important aspect of education. However, both have rarely been linked with each other, and animal attitudes are only sparsely represented within environmental education assessment instruments. Linking these two aspects was the main aim of the present study. The Animal Attitude Scale (AAS), the Intermediate Attitude Scale (IAS), and environmental attitudes based on the 2-MEV-model were used. The 2-MEV model is made of two distinct aspects: preservation and utilization of nature. This relationship between pro-animal attitudes and preservation and utilization has been assessed while controlling for pet ownership, meat consumption, gender and grade level. These covariates are necessary because they have been identified in previous research. Five hundred and forty-three pupils from two different schools in Leipzig, Germany participated in this study. There was a significant influence of gender and grade but not of pet ownership on environmental attitudes. Girls showed higher positive attitudes, and preservation decreased with an increasing grade. Animal attitudes (both AAS and IAS) correlated with $r = 0.4$ with the two environmental attitudes preservation and utilization. It is therefore concluded that environmental attitudes and animal attitudes are closely related constructs.

Borgi, M., & Cirulli, F. (2015). Attitudes toward animals among kindergarten children: Species preferences. *Anthrozoös*, 28(1), 45-59.

Attitudes toward animals are influenced by both animal traits (e.g., similarity to humans, aesthetic quality, size) and individual human attributes (e.g., gender, age, educational level, cultural factors). Although the examination of children's interest in animals, and their preference for different species, may evidence specific trends and help explain the development of attitudes, the vast majority of research has not considered children younger than 6 years. The present study was aimed at assessing preferences for a variety of animal species in a sample of 3–6 year-old Italian children, using a forced-choice task and visual aids (images of the animals). Pictures of 48 animal species, ranging from mammals to invertebrates, were presented to the children. Two photographic stimuli were simultaneously displayed and participants were asked to indicate their preference. Results show that the children preferred higher-order species, and domestic over wild animals. Apart from a few exceptions, invertebrates were the most disliked group of species among the children. Girls showed more negative and fear-related attitudes than the boys. Results are discussed taking into account different factors that may affect children's preferences for various animal species, that is, similarity to humans and aesthetical appeal. Greater knowledge on early attitudes toward animals has implications for promoting interest in animals and for building educational interventions for kindergarten children. This is particularly important in light of the growing use of different animals in educational and therapeutic contexts, as well as from an animal welfare perspective.

Bruskotter, J. T., Singh, A., Fulton, D. C., & Slagle, K. (2015). Assessing tolerance for wildlife: clarifying relations between concepts and measures. *Human Dimensions of Wildlife*, 20(3), 255-270.

Two parallel lines of inquiry, tolerance for and acceptance of wildlife populations, have arisen in the applied literature on wildlife conservation to assess probability of successfully establishing or increasing populations of controversial species. Neither of these lines is well grounded in social science theory, and diverse measures have been employed to assess tolerance, which inhibits comparability across studies. We empirically tested behavioral measures of tolerance against self-reports of previous policy-relevant behavior and behavioral intentions. Both composite behavioral measures were strongly correlated ($r > .70$) with two attitudinal measures of tolerance commonly employed in the literature. The strong correlation between attitudinal and behavioral measures suggests existing attitudinal measures represent valid, parsimonious measures of tolerance that may be useful when behavioral measures are too cumbersome or misreporting of behavior is anticipated. Our results demonstrate how behavioral measures of tolerance provide additional, useful information beyond general attitudinal measures.

Charles, K. E., & Linklater, W. L. (2015). The role of environmental engagement in tolerating urban bird problems. *Human Dimensions of Wildlife*, 20(2), 99-111.

Since negative attitudes toward wildlife reduce support for biodiversity conservation, understanding the relationship between urban residents' attitudes and their experience with wildlife problems is important. We surveyed households in Wellington City, New Zealand, and modeled the relationship between attitude toward birds, and biodiversity awareness and engagement. Planting trees to attract birds was the only predictor to provide substantial inference for attitude ($\omega_i = 0.873$). We then assessed how experiencing a problem with birds modified these relationships, finding that two models comprised the confidence model set ($\sum \omega_i \geq 0.95$); planting for birds combined with the additive ($\omega_i = 0.568$) and interactive ($\omega_i = 0.400$) effects of experiencing a problem. Experience of a bird problem on its own did not influence attitude ($\Delta AIC = 17.50$, $\omega_i < 0.001$). Attitude toward birds may be robust to experiencing minor problems, and may be related to a person's experience and engagement with birds rather than negative experiences.

Chowdhury, M. S. H., Gudmundsson, C., Izumiyama, S., Koike, M., Nazia, N., Rana, M. P., ... & Redowan, M. (2014). Community attitudes toward forest conservation programs through collaborative protected area management in Bangladesh. *Environment, Development and Sustainability*, 16(6), 1235-1252.

The formulation of conservation policies with options for creating protected areas is significantly influenced by the social factors of the surrounding communities. Therefore, indigenous knowledge, attitudes and perceptions of the local communities need to be explored during the planning and implementation stages of conservation projects.

A government-initiated experiment in co-management was conducted in the Rema-Kalenga Wildlife Sanctuary, Bangladesh. This paper analyzes the attitudes toward conservation by members of local communities living in and around the wildlife sanctuary. Training incentives on alternative income-generating (AIG) activities and allotment of agricultural lands were distributed among the Forest User Groups. It is of interest to policy makers and resource managers whether this technique leads to improved attitudes on the part of local people. Although there were different attitudes toward protected areas and conservation, overall, a favorable attitude of the respondents was observed. The opinions of respondents also varied based on factors such as village position, village dependency level on forest resources, ethnicity and gender. Increase in annual income resulting from the augmented skills by trainings on AIG activities and getting agricultural lands leased from the Forest Department contributed significantly to the variation in respondents' conservation attitudes. It is suggested that eliminating inequity and inequality in incentive distribution, discovering and launching training on more need-based livelihood activities, and liberalizing the restriction of resource extraction from the protected area by fixing the harvesting limit would encourage the community to be more cordially and actively involved in the conservation efforts of the sanctuary.

Cox, C., Morse, W., Anderson, C., & Marzen, L. (2014). Applying public participation geographic information systems to wildlife management. *Human Dimensions of Wildlife*, 19(2), 200-214.

Wildlife management increasingly incorporates public participation to be more inclusive and reduce tensions between management and the general public in the decision-making process. There is also a need, however, to include spatial data since most wildlife biological and biophysical data are stored spatially in geographic information systems (GIS). This article presents a method for integrating this information using public participation geographic information systems (PPGIS). We asked stakeholders to identify specific places on a map that they would like to see maintained for the conservation of particular threatened species. This information is useful for identifying public wildlife management preferences and for allowing comparisons between public and expert opinions. We found high levels of public accuracy in identifying suitable habitat for threatened species conservation. We also identified places of potential conflict due to incompatible stakeholder preferences, but found little conflict between public conservation and development preferences.

de Pinho, J. R., Grilo, C., Boone, R. B., Galvin, K. A., & Snodgrass, J. G. (2014). Influence of aesthetic appreciation of wildlife species on attitudes towards their conservation in Kenyan agropastoralist communities. *PloS one*, 9(2), e88842.

The influence of human aesthetic appreciation of animal species on public attitudes towards their conservation and related decision-making has been studied in industrialized countries but remains underexplored in developing countries. Working in three agropastoralist communities around Amboseli National Park, southern Kenya, we investigated the relative strength of human aesthetic appreciation on local attitudes towards the conservation of wildlife species. Using semi-structured interviewing and free listing (n=191) as part of a mixed methods approach, we first characterized local aesthetic judgments of wildlife species. With a Generalized Linear Mixed Models (GLMM) approach, we then determined the influence of perceiving four species as beautiful on local support for their protection ("rescuing them"), and of perceiving four other species as ugly on support for their removal from the area, while controlling for informant personal and household socioeconomic attributes. Perceiving giraffe, gazelles and eland as beautiful is the strongest variable explaining support for rescuing them. Ugliness is the strongest variable influencing support for the removal of buffalo, hyena, and elephant (but not lion). Both our qualitative and quantitative results suggest that perceptions of ugly species could become more positive through direct exposure to those species. We propose that protected areas in developing countries facilitate visitation by local residents to increase their familiarity with species they rarely see or most frequently see in conflict with human interests. Since valuing a species for its beauty requires seeing it, protected areas in developing countries should connect the people who live around them with the animals they protect. Our results also show that aesthetic appreciation of biodiversity is not restricted to the industrialized world.

Dressel, S., Sandström, C., & Ericsson, G. (2015). A meta-analysis of studies on attitudes toward bears and wolves across Europe 1976–2012. *Conservation Biology*, 29(2), 565-574.

The ranges of wolves (*Canis lupus*) and bears (*Ursus arctos*) across Europe have expanded recently, and it is important to assess public attitudes toward this expansion because responses toward these species vary widely. General attitudes toward an object are good predictors of broad behavioral patterns; thus, attitudes toward wolves and bears can be used as indicators to assess the social foundation for future conservation efforts. However, most attitude surveys toward bears and wolves are limited in scope, both temporally and spatially, and provide only a snapshot of attitudes. To extend the results of individual surveys over a much larger temporal and geographical range so as to identify transnational patterns and changes in attitudes toward bears and wolves over time, we conducted a meta-analysis. Our analysis included 105 quantitative surveys conducted in 24 countries from 1976 to 2012. Across Europe, people's attitudes were more positive toward bears than wolves. Attitudes toward bears became more positive over time, but attitudes toward wolves seemed to become less favorable the longer people coexisted with them. Younger and more educated people had more positive attitudes toward wolves and bears than people who had experienced damage from these species, and farmers and hunters had less positive attitudes toward wolves than the general public. For bears attitudes among social groups did not differ. To inform conservation of large carnivores, we recommend that standardized longitudinal surveys be established to monitor changes in attitudes over time relative to carnivore population development. Our results emphasize the need for interdisciplinary research in this field and more advanced explanatory models capable of capturing individual and societal responses to changes in large carnivore policy and management.

Farnworth, M. J., Watson, H., & Adams, N. J. (2014). Understanding attitudes toward the control of nonnative wild and feral mammals: similarities and differences in the opinions of the general public, animal protectionists, and conservationists in New Zealand (Aotearoa). *Journal of Applied Animal Welfare Science*, 17(1), 1-17.

Lethal control is used extensively in New Zealand to control nonnative nonhuman mammals. Respondents were surveyed about 8 mammal groups considered pests and their attitudes toward their control and pest status. They also identified the most appropriate method of control for the 8 different mammals. Information was gathered from 3 groups of respondents: nonhuman animal protectionists, conservationists, and the general public. Conservationists routinely rated all animal groups as more severe pests than the general public or animal protectionists, who provided the lowest scores. Rats, stoats, brushtail possums, and rabbits were identified as the 4 most serious pests by all 3 groups. Conservationists were 5.7 and 2.6 times more likely to prefer a lethal method of control than protectionists and the general public, respectively. For all 3 groups an increase in pest score for a given animal saw a decline in importance placed upon the animal's welfare. This relationship was strong for the general public but weak for conservationists and animal protectionists. Understanding aspects of potentially opposing viewpoints may be invaluable in supporting the development of new welfare-focused control methods.

Gangaas, K. E., Kaltenborn, B. P., & Andreassen, H. P. (2015). Environmental attitudes associated with large-scale cultural differences, not local environmental conflicts. *Environmental Conservation*, 42(01), 41-50.

Species and ecosystems are under constant pressure from a rapidly-growing human population. Human tolerance of carnivores, including the willingness to live in areas with these predators, is key to the success of large carnivore conservation. In the Scandinavian Peninsula, large carnivore populations conflict with human activity; low tolerance among local people may lead to illegal hunting. A survey of 2521 Scandinavian respondents to measure environmental value orientation, using the new environmental paradigm (NEP) scale and attitudes toward large carnivores, revealed attitudes towards the presence of carnivores were not related to carnivore abundance. Nor was there a significant relationship between environmental value orientation and personal experiences with loss of domestic sheep or hunting dogs. Environmental values were mainly explained by country differences; Swedes had a more ecocentric value orientation than Norwegians. Significantly more Norwegians (45 %) than Swedes (19 %) responded that there were too many carnivores in their country. Historic differences in how government is perceived between Norway and Sweden may result in different attitudes

towards illegal hunting and towards carnivores. Specifically, Norwegians may hold a more anthropocentric view, based on a suspicion of central authorities, whereas Swedes may hold a more ecocentric view.

Gurusamy, V., Tribe, A., Toukhsati, S., & Phillips, C. J. (2015). Public attitudes in India and Australia toward elephants in zoos. *Anthrozoös*, 28(1), 87-100.

We surveyed the attitudes of people toward captive elephants in Australia, where importation into zoos has been controversial recently, compared with India, where elephants are indigenous. Both Australian (AR, $n = 101$) and Indian (IR, $n = 101$) respondents rated conservation as the most important reason for the role of zoos and sanctuaries. Australian respondents were more concerned about the husbandry conditions for keeping wild animals in zoos and sanctuaries than Indian respondents ($p = 0.02$). This concern for captive animals increased with the higher educational level of the respondents. Female Australian respondents were more concerned about the practice of keeping elephants in captivity than Australian men. More Australian respondents were prepared to pay extra to visit a zoo with elephants (AR 42.6%, IR 7.9%, $p < 0.001$). Indian respondents believed more than their Australian counterparts that it was important for any zoo to display elephants, and wanted to interact with elephants by feeding, touching, and riding on them. While Australian respondents' perceptions of captive elephants acknowledged their scientific value, Indian respondents viewed elephants primarily of religious, cultural, and historical significance. We conclude that Australians and Indians have different requirements for keeping elephants in zoos, which should inform zoo directors about the best way to present them to the public.

Huang, H. J., & Lin, Y. T. K. (2014). Undergraduate students' attitudes toward biodiversity. *Universal Journal of Educational Research*, 2(4), 379-386.

The study investigated American and Taiwan undergraduate students' attitudes toward biodiversity. The survey questionnaire consisted of statements prompted by the question "To what extent do you agree with the following statements about problems with the biodiversity issues." Students indicated strongly disagree, disagree, agree, strongly agree, or no opinion. The questionnaire inquired students' awareness of biodiversity and the impact of human activity on biodiversity. The students' attitudes were analyzed by frequency of response and average value of response. The t-test was conducted to examine the difference among students of different backgrounds. The results showed that both American and Taiwan undergraduate students had consensus that they expressed lower level of confidence in the ability of science and technology to solve biodiversity problems, and they did not agree that people worry too much about the problem of biodiversity issue. There were also significant differences between different groups (gender, with or without experience of conservation activities). Understanding students' attitudes is important for educators to plan curriculum and instruction.

Kansky, R., & Knight, A. T. (2014). Key factors driving attitudes towards large mammals in conflict with humans. *Biological Conservation*, 179, 93-105.

Biodiversity conflicts, and human-wildlife conflicts (HWC) in particular, are predicted to increase. Understanding drivers of these conflicts is a prerequisite for developing strategies to achieve conservation goals. People are a part of all HWC problems meaning social research methods are essential for finding solutions. We conducted a meta-analysis of the variables predicted to drive attitudes of people living in areas with damage causing carnivores, ungulates, elephants and primates so as to determine if common patterns of variables are present across a wide range of contexts. We categorized variables reported in publications into main and sub-categories and developed three indexes to describe relative frequency of category use, relative significance of categories and degree of accuracy between use and significance. From 45 suitable publications, 16 main categories and 17 sub-categories were identified. The majority of publications measured variables with a low likelihood of explaining drivers of HWC, or did not quantify variables of generally high utility. For example, only four categories (25%) were applied in over 50% of publications, and two thirds were mostly not significant in explaining attitudes. *Tangible costs* and *tangible benefits* thought to be the main drivers of attitudes were respectively, two and three times more non-significant than significant. *Intangible costs* however were the most important category to explain attitudes but was under represented in publications. *Intangible benefits* were mostly not important in explaining attitudes. *Costs* were more significant than *benefits* suggesting negative perceptions more strongly determine attitudes. Other important categories were exposure and experience with a species, stakeholder types and legal status of land. Socio-demographic variables commonly used in published studies such as gender,

education and wealth, poorly explained attitudes. We conclude that greater conceptual clarity is urgently required to guide future attitude studies so that research can reliably inform the development of species management plans and policies.

McCagh, C., Sneddon, J., & Blache, D. (2015). Killing sharks: The media's role in public and political response to fatal human–shark interactions. *Marine Policy*, 62, 271-278.

In 2013–14 the Western Australian Government deployed drum lines to catch and kill sharks perceived to be a threat to public safety. This policy decision sparked considerable controversy and debate which played out in the media. There have been limited studies examining the role of media discourses in the development of shark management policies. This study shows that media reporting reflected the unidirectional correlation between the public and policy makers; while there appeared to be a correlation between public pressure and the decision to deploy drum lines, there was no association between the culling program and public support. The reflective role the media played in the drum line debate was evident in their use of prescriptive and emotive language about human–shark incidents, and the use of two opposing frames; anthropocentric and conservation. Combined, these results suggest that the public policy makers need to rethink their approach to developing shark hazard mitigation programs through ongoing, meaningful engagement with the general public, scientists and stake holders, if they wish to garner public support.

Mueller, M. K. (2014). The relationship between types of human–animal interaction and attitudes about animals: An Exploratory Study. *Anthrozoös*, 27(2), 295-308.

Existing theory and research suggests that understanding the nuances of particular instantiations of human–animal relationships is important in promoting positive, mutually beneficial relationships between people and animals. One such aspect of human–animal interaction (HAI) involves species of animal involved in the relationship, and how various types of HAI may impact individuals' attitudes about animals. Therefore, the purpose of this study was to explore if species and/or types of animal ownership were associated with feelings of emotional attachment, commitment, and moral orientation toward animals. A sample of young adults ($n = 567$) from the 4-H Study of Positive Youth Development completed a survey which included questions about animal ownership and attitudes about animals. Regression analyses demonstrated that the species of animal(s) a person owned significantly predicted all three dimensions of attitudes about animals. In addition, latent class analyses identified three prevalent types of animal interaction (no/few animals, small animals only, large and small animals), and multinomial logistic regression within the mixture model indicated that individuals in these subgroups significantly differed in moral orientation scores. Overall, the analyses strengthen support for the notion that species of animal involved in the interaction matters, and that relationships with various species of animals may differ qualitatively. These findings have implications for understanding the role of the relationship between types of animal ownership and attitudes about animals. Exploring the multifaceted nature of human–animal relationships is important in understanding how to optimize the person and animal characteristics that are associated with adaptive, mutually beneficial human–animal relationships.

Russell, J. C. (2014). A comparison of attitudes towards introduced wildlife in New Zealand in 1994 and 2012. *Journal of the Royal Society of New Zealand*, 44(4), 136-151.

Attitudes play an important role in introduced wildlife management. The attitudes of New Zealanders to introduced wildlife and their control were surveyed in 2012, and compared with attitudes in 1994. Attitudes to widely established introduced herbivores such as deer, possums and rabbits have remained consistent, whereas those for goats, pigs and uncommon species such as thar, chamois and wallabies are changing. New Zealanders generally accept that large mammals are both a resource and a pest requiring management and control. Attitudes to small herbivores such as possums and rabbits, and predators such as mustelids and rodents, are negative and focused on control or extermination using multiple methods. Less than 1% of respondents felt doing nothing was acceptable, but acceptability of poisons has declined. Future management of introduced animals in New Zealand will need to be situational and utilise mixed management methods appropriate to different demographics and stakeholders, while appropriately resolving conflict.

Seabrook-Davidson, M. N., & Brunton, D. H. (2014). Public attitude towards conservation in New Zealand and awareness of threatened species. *Pacific Conservation Biology*, 20(3), 286-295.

A survey was conducted amongst a sample ($n = 3\ 000$) of the New Zealand public to gauge their perception of government spending on conservation. The survey also obtained an understanding of the level of awareness the public has of New Zealand threatened species. Respondents ranked eight areas of government spending, namely health, education, superannuation, law and order, defence, conservation of native species, primary industry research & development and tourism. From a response rate of $n = 131$ (4.5%), health and education were ranked the highest, followed by law and order with conservation in fourth position. Except for conservation of native species, these rankings by respondents closely aligned with priorities of average annual government spending. Awareness was the highest for endemic species such as kiwi *Apteryx* spp, Hector's dolphin *Cephalorhynchus hectori*, kokako *Callaeas cinerea cinerea*, kakapo *Strigops habroptilus*, takahe *Porphyrio mantelli*, Maui's dolphin *Cephalorhynchus hectori maui* and tuatara *Sphenodon punctatus*. The awareness for these prominent species may suggest that the Department of Conservation is achieving some success in its advocacy role to increase the public's awareness of species threatened with extinction. With awareness of threatened species and the moderate ranking given to conservation expenditure, it is evident there is a level of public support for expenditure on protection of biodiversity and natural heritage.

Smith, J. B., Nielsen, C. K., & Hellgren, E. C. (2014). Illinois resident attitudes toward recolonizing large carnivores. *The Journal of Wildlife Management*, 78(5), 930-943.

Large carnivores are recolonizing portions of midwestern North America given harvest protection and the presence of suitable habitat in the region. Perhaps more so than other species, the successful management and viability of large carnivore populations is as dependent on social acceptance as on biological factors. However, knowledge of human attitudes and perceptions toward large carnivores in much of the Midwest remains unknown. We assessed attitudes and perceptions of Illinois citizens about black bears (*Ursus americanus*), cougars (*Puma concolor*), and gray wolves (*Canis lupus*) via a mail survey to provide wildlife managers with an understanding of residents' views prior to formulating carnivore management plans. The survey instrument consisted of questions about large carnivores regarding knowledge and beliefs, experiences and encounters, attitudes toward carnivores and management, and demographic questions and behavioral characteristics. We surveyed residents statewide; the sample drawn was stratified by geographic region (northern, central, and southern) and urban or rural county designation within regions. Because we observed differences in demographic variables between respondents (by mail) and non-respondents (telephone interviewees), we did not pool responses from the 2 groups for analysis; the final response rate for the survey was 13%. More than 70% of survey respondents ($n=791$) were male and their average age was 60; 55% were hunters. Approximately 40% were unsure about the population status of large carnivores in Illinois; of the remaining respondents, most (ranging from 20% for black bears to 41% for cougars) believed the presence of all 3 focal species had increased over the past decade. More residents supported protection (43%) and increasing numbers of large carnivores (39%) than opposed them (26%); however, support for black bears was slightly higher than for cougars and wolves. Rural residents and livestock owners were the most likely to want carnivore numbers to decrease and least likely to support their protection; higher levels of education corresponded to positive attitudes toward large carnivores. Our research provides the foundation for well-informed management plans, policy decisions, and educational initiatives for large carnivores in midwestern states where these species appear to be recolonizing following decades of absence.

Vincenot, C. E., Collazo, A. M., Wallmo, K., & Koyama, L. (2015). Public awareness and perceptual factors in the conservation of elusive species: The case of the endangered Ryukyu flying fox. *Global Ecology and Conservation*, 3, 526-540.

The success of biological conservation initiatives is not solely reliant on the collection of ecological information, but equally on public adherence to protection programs. Awareness and perception of target species condition the intensity and orientation of public involvement in conservation initiatives. Their evaluation is critical in the case of elusive animals, for which uncertainty surrounding public attitude is maximized. This study featured the first assessment of public awareness and perceptual factors of a megabat (*Pteropodidae*). We investigated inhabitants' feelings, knowledge, and frequency of sightings related to the solitary Ryukyu flying fox (*Pteropus*

dasymallus) on Ishigaki island, Japan. The willingness to protect this species and mitigate its impact on agriculture was evaluated through contingent valuation. This fruit bat was not credited with aesthetic or scientific values, yet atypically did not trigger negativistic attitude. While respondents were reasonably aware of its existence, they were largely ignorant of its ecological importance. An overall lack of interest for this species was revealed by a low willingness-to-pay for its protection. The rejection of lethal control as means to protect orchards was, however, unequivocal. The success of *P. dasymallus* preservation may depend on the prior implementation of education programs focusing on aesthetic, ecological and utilitarian values.

Weber, S. R., Hayes, M. P., Webb, T., & LeRoy, C. J. (2015). Environmental education in prison: a comparison of teaching methods and their influence on inmate attitudes and knowledge of environmental topics. *Interdisciplinary Environmental Review*, 16(2-4), 267-284.

This study evaluated whether lecture- or workshop-style presentations were more effective for teaching environmental education (EE) to both male and female inmate students. To compare these styles, we designed pre- and post-engagement surveys quantified on a five-point Likert scale, and open-ended questions to capture qualitative nuances. Our findings revealed significantly improved inmate attitudes after receiving the educational opportunity, and the lecture-style presentations appeared more effective for male students, whereas workshop-style presentations appeared more effective for female students in improving inmate knowledge and attitudes on environmental topics. Overall, we found no significant differences in knowledge or attitudes among participants prior to the presentations or between male and female inmates, which provides evidence for learning independent of prior conditions or gender.

Willcox, A. S., & Giuliano, W. M. (2014). Explaining cattle rancher participation in wildlife conservation technical assistance programs in the Southeastern United States. *Rangeland Ecology & Management*, 67(6), 629-635.

US natural resources and wildlife agencies have been increasing their efforts to involve cattle ranchers in wildlife conservation through technical assistance programs that provide for wildlife conservation activities. Understanding why ranchers choose to be involved in these programs is fundamental to increasing participation and ensuring their success. Using the theory of planned behavior as a theoretical model, we surveyed 1093 ranchers in Alabama, Florida, Georgia, and Mississippi to explain and predict intention to participate in technical assistance programs, specifically, wildlife workshops and field days. All three theory components—attitude, subjective norm, and perceived behavioral control—were important to intent to participate and explained 41% of the variance, with perceived behavioral control and subjective norm having the greatest standardized effects ($\beta=0.329$ and $\beta=0.316$, respectively). Investigation of the construct components yielded insight into how agencies could increase participation. Ranchers generally held positive attitudes toward wildlife workshops, perceiving them to be a good way to learn about wildlife management and perceiving that most ranches were suitable for wildlife, an instance of perceived behavioral control. However, ranchers did not perceive that workshops and field days were widely advertised or promoted, limiting the amount of perceived control they had over their participation. Additionally, ranchers identified normative groups whose opinions were important to them, namely their families, friends and neighbors, fellow ranchers, and agency staff. However, these same groups were not seen to actively encourage ranchers to participate in technical field days and workshops. Using key members of these normative groups to advertise and promote workshops and field days among their peers should increase rancher behavioral control and attitudes associated with technical workshops and field days. Employing strategies from this research to increase attendance at technical workshops and field days should improve wildlife conservation technical assistance program effects.

Zhang, L., & Yin, F. (2014). Wildlife consumption and conservation awareness in China: a long way to go. *Biodiversity and conservation*, 23(9), 2371-2381.

An attitudinal survey on wildlife consumption and conservation awareness was conducted in Beijing, Shanghai, Guangzhou, Kunming and Nanning of China recently. Comparison with the results from a similar survey we did in 2004, after 8 years, the proportion of respondents who had consumed wildlife was dropped slightly from 31.3 % down to 29.6 %. It showed that the rates of wildlife consumed as food and as ingredients for traditional medicines in Guangzhou and Nanning ranked in the top. The consumptions in these two cities were mostly

driven by utilitarian motivation, and mainly for food. Meanwhile, the rate of consumers taking wildlife as food was declining significantly in Beijing after 8 years. The results also showed that 52.7 % agreed that wildlife should not be consumed, which was significantly increased comparison with the survey result of 42.7 % in 2004. In addition, respondents agreed that wildlife could be used significantly decline from 42.8 to 34.8 %. It's indicated that wildlife conservation awareness was raised in China in the past years. We also founded that consumers with higher income and higher educational background were having higher wildlife consumption rate. It suggested that to strengthen the law enforcement and to promote the public awareness were keys to reduce wildlife consumption in China.

BOOK CHAPTERS

Adams, L. W. (2014). History of urban wildlife conservation. In *Urban Wildlife conservation* (pp. 11-31). Springer US.

Urban wildlife management is rooted in game management. According to Leopold, game management was first practiced in Asia by Kublai Khan during the latter half of the thirteenth century. At that time, game animals could not be taken between March and October. Such practice found its way to Europe where a long history developed of setting hunting seasons and bag limits to manage game species. *The Master of Game* is considered the oldest English book on hunting, written by Edward of Norwich, Second Duke of York, between 1406 and 1413. The practice of setting hunting seasons and bag limits to manage game species was transferred to North America with European settlement of the continent. For example, Rhode Island closed the hunting season for white-tailed deer (*Odocoileus virginianus*) from May to November in 1639 and Iowa established a bag limit of 25 greater prairie chickens (*Tympanuchus cupido*) per day in 1878.

Jacobson, S. K., Wald, D. M., Haynes, N., & Sakurai, R. (2014). Urban wildlife communication and negotiation. In *Urban Wildlife conservation* (pp. 217-238). Springer US.

Effective communication shapes how urban audiences affect and are affected by wildlife, ranging from policy making and management to citizen science and conflict resolution. This chapter reviews the elements of communication: Sources, Encoding, Messages and Media, Decoding, Receivers, and Feedback. We describe the process for identifying communication objectives, targeting audiences, using mass media and social dialogues, and evaluating results. We present strategies for wildlife conflict negotiation among diverse urban audiences as an example of communications that impact the fate of our urban ecosystems.

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Some of the most high-profile wildlife conservation cases in the world have been addressed within the emerging field of human-wildlife conflict (HWC). Although HWC is often defined as any situation where wildlife comes into conflict with humans over common resources, the term HWC has been applied almost exclusively to cases involving charismatic mega-fauna, such as large-bodied herbivores and top predators. What these animals have in common is not the magnitude of the damage they cause or their conservation status, but their power to elicit strong mixed opinions among broad sectors of society, which often results in clashes between groups of people who hold differing values toward these animals and their management. As society becomes more diversified and people hold more varied views on human domination over nature, conflicts involving wildlife will grow in intensity and frequency. In this chapter, I discuss the importance of the human dimensions perspective for effectively understanding and resolving HWC; an approach that goes beyond the traditional ecological and economic considerations about reciprocal negative impacts, by addressing also the complexity of the causal relationship between wildlife damage and human thoughts and actions toward wildlife, and the disagreements between people over wildlife values and management objectives.

Williams, G. H. (2015). *Christian attitudes toward nature*. Wipf and Stock Publishers.

In this essay the author, George Huntston Williams, explores the views of nature which have been held through the history of the Christian Church.

BOOKS

Nash, R., & Miller, C. (2014). *Wilderness and the American mind*. ISBN: 9780300190380.

A study of America's changing attitude toward wilderness, discussing efforts to protect the Alaskan wilderness, trends in wilderness management, and the international perspective