



Policy Brief

Prayer Animal Release Can Embody Conservation Principles: A Call to Action

By

Stephen M. Awoyemi, Fred Kraus, Yiming Li, Kit Magellan & Jame Schaefer

Religion and Conservation Research Collaborative (RCRC)

of the

Religion and Conservation Biology Working Group (RCBWG)

Society for Conservation Biology (SCB)

June 16, 2016



Society for Conservation Biology

Description of the Problem

Biodiversity in different parts of the world faces enormous problems including biological invasions, habitat loss, fragmentation, overexploitation, pollution, and emerging diseases¹. These problems are complex, multifaceted, and exacerbated by climate change². Concomitant with these challenges is a changing society that is evolving a broader view of the consequences of human actions on the biosphere through scientific inquiry. This awareness is leading to an increasing sense of responsibility across all sectors of society, including religious groups. If they are committed to ensuring a sustainable future for planet Earth, the religious practice of prayer-animal release that widely prevails in Asia, North America, Australia and other parts of the world needs to be addressed. A new understanding of this practice and new methods needs to be adopted in contributing to ecological integrity.

Prayer-animal release (*fang sheng* in Chinese, *ho`jo`-e* in Japanese, and *tshe thar* in Tibetan) is a religious practice of Buddhists, Daoists, and other religious groups in which captive wildlife are released as a demonstration of compassion and kindness³ in order to receive merit or good karma. However, the manner in which animal release is currently performed raises environmental and ecological problems that are antithetical to the ritual's intended cultivation of compassion⁴. For example, Taiwanese spend nearly \$6 million annually to set free 200 million wild animals⁵. All kinds of animals – birds, fishes, snakes, frogs, turtles, insects, monkeys – that are captured in the wild by hunters or purchased from local pet markets are released around the island's rivers, mountains, forests, lakes, and reservoirs⁶. Large-scale animal releases may cause long-term damages to local ecosystems⁷. The Red-eared slider (locally named as the Brazil turtle) *Trachemys scripta* (Schoepf) is now the second-most-abundant turtle in all the rivers surveyed in Taiwan⁸.

Many releases of non-native species lead to biological invasions, and eradication of established invasive species is usually impossible and rarely tried^{5,6,9,10,11}. Invasions of alien species are estimated to cost the equivalent of 100 billion USD annually¹². Formosan termites, *Coptotermes formosanus*, introduced from South East Asia, cost an estimated USD 1 billion annually in property damage, repairs and control measures in the United States¹³.

Animal-release can also increase local competition or predation pressure, genetic swamping (which occurs when two genetically isolated populations come into contact and the genes from the larger population reduce the genetic diversity of the smaller population), and the spread of disease. Some of the diseases spread affect human health^{14,15}.

Even the use of native species in prayer-animal release requires caution. If natives are released, there are the predictable potential impacts well known from other situations in that these animals can introduce unwanted diseases into native populations or serve as a means of genetic contamination. These concerns have been addressed for years in the context of releasing rare animals back into the wild during species-recovery efforts, but they apply equally to any animal releases, whether native or not. This is especially true when natives are captured from the wild, held in pet stores for weeks in crowded conditions, and then released at random places in a country as is practiced in prayer-animal release. Under these circumstances, a few diseased animals readily infect large numbers of additional animals who then spread the disease into native populations once released. Any genetic distinction among populations in a country will soon be blurred or lost altogether as animals from any number of populations can be released at the same location.

Given the scale and frequency of prayer-animal release events held annually in different parts of the world and their adverse consequences to biodiversity, the Religion and Conservation Research Collaborative (RCRC) of the Religion and Conservation Biology Working Group (RCBWG), Society for Conservation Biology (SCB) recommends that governments in Asia, North America, Australia, and other countries (1) carefully design programs in collaboration with religious organisations to educate practitioners of prayer-animal release, (2) establish regulations that prohibit release of non-native wildlife for any purpose, including prayer-animal release, and (3) enforce these regulations¹⁶. Regulation of market trade is also an important aspect of a comprehensive management plan¹⁶. In the following policy brief, scientific evidence of the problem is presented, preferred policy options are suggested, and actions for governments and societies are recommended.

Analysis of Scientific Evidence, Policy Options and Justifications

Release of non-native species can lead to biological invasions^{10,11,17,18,19}. Invasive species are a major driver of global change^{20,21} and biodiversity loss^{20,22} and their impacts may be far reaching. They may change the community structure of native ecosystems or alter the evolutionary pathway of native species through predation, competition, niche displacement or hybridization; change species interactions, nutrient cycles and ecosystem functions; and ultimately lead to the extinction of native species^{23,20}. Invasive alien species means alien species whose introduction and/or spread threatens biological diversity. It refers to a species, subspecies, or lower taxon introduced outside its natural past or present distribution; it includes any part – gametes, seeds, eggs, or propagules – of such species that might survive and subsequently reproduce²⁴. These organisms are sometimes called exotic, non-native or non-indigenous species¹². Liu and colleagues provide the first quantitative evidence that religious-animal release is an important pathway for wildlife invasions and has implications for prevention and

management in China²⁵. The success of an invasive species is dependent upon a 'viable propagule', defined as the smallest number of individuals necessary to reproduce and colonize a new area. The systematic release of animals in large numbers, with a high frequency in a given area, therefore greatly increases the likelihood of an invasive species establishing itself^{3,26,27}. The organised Buddhist release of American bullfrogs (*Lithobates catesbeianus*) (native to eastern North America and listed among 100 of the World's Alien Invasive Species by the International Union for the Conservation of Nature) in water bodies in Yunnan Province, China, led to invasion of these waters, resulting in significantly higher populations of bullfrogs than water bodies where release events did not take place²⁵. The concomitant increased likelihood of bullfrog establishment was related to increased frequency of release events²⁵ which is one aspect of propagule pressure. In Taiwan, the exotic mouth-breeding fish (*Tilapia spp.*), sucker-mouth catfish (*Hypostomus punctatus*), and red-eared slider (*Trachemys scripta*), have already infested a diversity of aquatic ecosystems throughout the island through release as prayer animals⁶. The loss of genetic purity, partly as a result of prayer-animal release, is already evident in some Taiwanese species⁷. The endemic Styan's bulbul (*Pycnonotus taivanus*) is threatened with extinction because of widespread hybridization with Chinese bulbuls (*P. sinensis*)^{28, 29}.

More important in terms of number of species affected by prayer-animal release is that disease spread is a huge risk for wildlife. For example, bullfrogs are highly implicated in the introduction and/or spread of chytrid fungus around the world (which has exterminated many native frog species)³⁰, and these (and other) frogs are a popular prayer-release animal in Asia, making them likely vectors of the disease in that area²⁵. The contact between humans and animals through prayer-animal release poses a high risk of humans contracting diseases from these animals³. The potential role of the Eurasian Tree Sparrow (*Passer montanus*) has been investigated in the spread of Highly Pathogenic Avian Influenza (HPAI) H5N1 virus in Cambodia³¹. The findings from their experiment suggest that due to the presence of significant quantities of H5N1 virus in Eurasian Tree Sparrow feathers, the prayer-animal-release ritual represents a high risk for human contamination in countries where the avian influenza virus is spreading³¹.

The most appropriate policies to solve the problem of prayer-animal release have already been suggested in the scientific literature. First, the negative outcomes of releasing invasive species for Buddhist ceremonial purposes are largely unintentional and likely stem from a lack of ecological knowledge of the consequences of these releases¹⁶. Ecological knowledge of invasive species has been shown to reduce the probability of prayer-animal release¹⁶. Buddhists' desire to do no harm is very strong implying that dissemination of knowledge can be an effective strategy for preventing releases and may be crucial for future management efforts¹⁶. Education campaigns should be carried out by government agencies and conservation organisations in collaboration with release organisers and Buddhist leaders to influence

society away from these practices in the affected regions of the world¹⁶. Local newspaper, television, radio, and internet media are important means by which release organisers acquire knowledge¹⁶. Further, public-education programs targeted at people with primary or middle school education, especially women, has been suggested⁷.

Second, there is need for strict prohibition of live sale of certain high-risk species and the prohibition of non-indigenous wildlife release through enforced regulations and monitoring of aquaculture facilities²⁵. Information for Buddhist groups and individuals on which species should and should not be released needs to be disseminated at the local level⁴.

Third, promotion of responsible-religious release activities should be encouraged. For example, government or conservation NGOs could sponsor breeding programs for imperilled native species and coordinate with local temples to hold ceremonial release or re-introduction events at designated areas as a means of reducing species introductions and establishment²⁵. In the case of the Vajrayana Institute in Australia, they checked with their Ministry of Agriculture and Fisheries before performing prayer-animal release and used a local species caught in the nearby harbour³².

Recommendations

Contextually specific actions that form collaborative relationships between government, non-governmental organizations, civil society, and religious groups have the potential to engage all stakeholders thereby increasing the potential for success. Based on the foregoing analysis of scientific evidence and presentation of policy options, the RCRC recommends the following:

1. Widespread education and publicity campaign by government, civil society and religious groups about the harmful effect of prayer-animal-release practices.
2. Devise and enforce regulations that prohibit release of non-native species for any purpose, including prayer-animal release.
3. Develop and implement models of responsible prayer-animal-release activities working with religious groups and using native species.

Conclusion

Earth, the common home of all species and biological systems, faces daunting challenges which are mainly due to human modifications of the biosphere. Humanity faces an overwhelming responsibility for environmental protection in this era of the Anthropocene. This term is now used widely to refer to this period of time during which human activity has been the dominant influence on the environment.

Behavioural changes, adaptation of institutions, and adoption of new approaches and strategies are needed. Prayer-animal release, a practice rooted in religious compassion, should adapt to current ecological realities without losing its spiritual meaning, essence, and integrity. Government, civil society, and religious institutions should work together on a platform of common goals for conservation of life on Earth and compassion for all sentient beings as an expression of their sense of ethical responsibility for the planet and all life. Prayer-animal releases should no longer endanger the biological life of the Earth community.

REFERENCES

1. *Millennium Ecosystem Assessment* 2005. Ecosystems and human well-being : synthesis. Washington, DC: Island Press.
2. Dudgeon, D., Arthington, A.H., Gessner, M.O. et al. 2006. Freshwater biodiversity: importance, threats, status and conservation challenges. *Biol. Rev.* 81: 163-182.
3. Awoyemi, S.M. et al. 2012. Society for Conservation Biology, "Religion and Conservation Research Collaborative (RCRC) of the Religion and Conservation Biology Working Group (RCBWG) Society for Conservation Biology (SCB) Position on the Religious Practice of Releasing Captive Wildlife for Merit". www.conbio.org/policy/religion-and-conservation-biology-working-group-policy-position-on-the-rele.
4. Shiu, H., & Stokes, L. 2008. Buddhist animal release practices: historic, environmental, public health and economic concerns. *Contemporary Buddhism* 9: 181-196.
5. Agoramoorthy, G., and M.J. Hsu. 2005. Religious freeing of wildlife promotes alien species invasion. *BioScience* 55: 5-6.
6. Agoramoorthy, G., and M.J. Hsu. 2007. Ritual releasing of wild animals threatens island ecology. *Human Ecology* 35: 251-254.
7. Severinghaus, L.L., and L. Chi. 1999. Prayer animal release in Taiwan. *Biological Conservation* 89: 301-304.
8. Lue, K.Y., and Chen, T.H. 1996. The distribution and conservation of freshwater turtles in Taiwan. Council of Agriculture. (Published report in Chinese). (as cited in Severinghaus and Chi (1999))
9. Sherwood, P. 2001. Buddhist contribution to social welfare in Australia. *Journal of Buddhist Ethics* 8: 61-74.
10. Corlett, R.T. 2010. Invasive aliens on tropical East Asian islands. *Biodiversity Conservation* 19: 411-423.
11. Pimentel, D., R. Zuniga, and D. Morrison. 2005. Update on the environmental and economic costs associated with alien-invasive species in the United States. *Ecological Economics* 52: 273-288.
12. Pimentel, D., Loch, L., Zuniga, R., and Morrison, D. 2000. Environmental and economic costs of non-indigenous species in the United States. *BioScience* 50: 53-65.
13. Suszkiw, A.R.S. 1998. The Formosan termite, a formidable foe. *Agricultural Research Magazine USDA* (October 1-9).
14. Gutierrez R.A., Sorn, S., Nicholls, J.M., Buchy, P. 2011 Eurasian Tree Sparrows, Risk for H5N1 Virus Spread and Human Contamination through Buddhist Ritual: An Experimental Approach. *PLoS ONE* 6(12): e28609. doi:10.1371/journal.pone.0028609
15. Gilbert, M. Sokha, C., Joyner, P.H., Thomson, R.I., and Poole, C. 2012. Characterizing the Trade of Wild Birds for Merit Release in Phnom Penh, Cambodia and Associated Risks to Health and Ecology. *Biological Conservation* 153:10-16.
16. Liu et al. 2013. Ecological knowledge reduces religious release of invasive species. *Ecosphere* 4(2): 21.
17. Mack, R. N., D. Simberloff, W. M. Lonsdale, H. Evans, M. Clout, and F. Bazzaz. 2000. Biotic invasions: causes, epidemiology, global consequences and control. *Issues in Ecology* 5: 1-20.
18. Henderson, R. W. 1992. Consequences of predator introductions and habitat destruction on amphibians and reptiles in the post-Columbus West Indies. *Caribbean Journal of Science* 28: 1-10.
19. Case, T.J., and D.T. Bolger. 1991. The role of introduced species in shaping the distribution and abundance of island reptiles. *Evolutionary Ecology* 5: 272-290.
20. Lockwood, J.L., Hoopes, M.F., Marchetti, M.P. 2007 *Invasion Ecology*. Blackwell Publishing, Massachusetts.
21. Ricciardi, A. 2007. Are Modern Biological Invasions an Unprecedented Form of Global Change? *Conservation Biology* 21: 329-336.
22. Brook, B.W., Sodhi, N.S. and Bradshaw, C.J.A. 2008. Synergies among extinction drivers under global change. *Trends in Ecology and Evolution* 23:453-460.

23. Mooney, H. A. and Cleland, E. E. 2001. The Evolutionary Impact of Invasive Species. *Proceedings of the National Academy of Sciences of the United States of America* 98: 5446-5451.
24. Convention on Biological Diversity. 2002. Decision VI/23: Alien Species that Threaten Ecosystems, Habitats or Species. <http://www.biodiv.org/decisions/default.asp>
25. Liu, X., McGarrity, M.E. & Li, Y. (2012). The influence of traditional Buddhist wildlife release on biological invasions. *Conservation Letters* 5: 107-114.
26. Hayes, K.R., and S.C. Barry. 2008. Are there any consistent predictors of invasion success? *Biological Invasions* 10: 483–506.
27. Lockwood, J.L., P. Cassey, and T. Blackburn. 2005. The role of propagule pressure in explaining species invasions. *Trends in Ecology and Evolution* 20: 223–228.
28. Severinghaus, L.L. 1990. Distribution of Chinese and Styan's bulbuls in Taroko National Park. *Taroko National Park*, p. 27 (published report in Chinese). (as cited in Severinghaus and Chi (1999)).
29. Severinghaus, L.L. 1991. The behaviours and ecology of Chinese and Styan's bulbuls in Taroko National Park. *Taroko National Park*, p. 27 (published report in Chinese). (as cited in Severinghaus and Chi (1999)).
30. Fisher, M.C. & Garner, T.W.J. 2007. The relationship between the introduction of *Batrachochytrium dendrobatidis*, the international trade in amphibians and introduced amphibian species. *Fungal Biology Reviews* 21: 2–9
31. Gutiérrez, R.A. and Buchy, P. *BMC Proceedings* 2011, 5(Suppl 1):P64 <http://www.biomedcentral.com/1753-6561/5/S1/P64>
32. De Bien, N. 2005. Animal liberation Buddhist style. *The Religion Report*. Sydney: Australian Broadcasting Corporation.