

# The Conservation Behaviorist



Animal Behavior Society

ABS Conservation Committee

The Conservation-Behaviorist, an electronic biannual news-update, informs ABS members about the Conservation Committee's activities, research trends in behavior and conservation, and relevant scientific news in conservation research where behavior plays an important role.

Vol. 1, No. 2, November 2003

## Edward O. Wilson ABS Student Research Grant for Conservation Award

*"...I would be delighted and feel doubly fulfilled to have my name associated with the ABS student research grant for conservation award, given that so much of my life as a scientist and writer has been devoted to animal behavior and conservation..."* wrote professor Edward O. Wilson in his letter to Jim Ha (past ABS Senior Program Officer) when accepting the Society's request to name the award after him.

E. O. Wilson, professor at Harvard University, who in 2002 received the ABS Distinguished Animal Behaviorist Award, is one of the world's most eminent scientists and pioneers in biodiversity conservation. He has received numerous awards (see Award page 2).

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## The ABS Conservation Committee

Created in 1997, the Conservation Committee aims to encourage ABS members to participate in research programs addressing the interface between animal behavior and conservation science. By identifying and evaluating the areas in which behavioral research has contributed to conservation, as well as the fields that need development, the Committee seeks to generate discussion and promote studies in behavior and conservation.

### Conservation Tips By Dan Blumstein

Is there anything a behaviorist can do to help conservation?

Study more than one species at a time. By studying several species simultaneously you will gain a much better understanding of how different species respond to the same ecological pressures. Whether they respond in the same way or differently will be good information for answering both conservation and behavioral questions. Managers and policy-makers often do not have the luxury of waiting for results. Studying more than one species at a time will generate more information more efficiently.

## Editorial

### Behavioral Unknowns: An Emerging Challenge for Conservation

By Guillermo Paz-y-Miño C.

In 1995, Norman Myers defined "Environmental Unknowns" as those problems we had not even identified as yet but for which we were all accountable<sup>1</sup>. Examples included climate change, mass extinctions, and ozone layer depletion. Society disregarded their existence until the early 1980s. These "surprise phenomena" have already disrupted ecological and evolutionary processes<sup>2-7</sup>.

As data become available and environmental public awareness grows, new "unknowns" are emerging. One such "surprise" is the impact of global disruptions on the behavior of animals. Scarce scientific information has limited our capacity to anticipate and prevent negative effects caused by global environmental problems on the physiological and sensory mechanisms that control behavior, its development, function and evolution.

By participating in seed dispersal, pollination, predation, competition, and parasitism, animals shape communities and ecosystems. Behaviors, however, can be easily disturbed directly through physiology (metabolic and reproductive processes)<sup>2,7</sup> or indirectly through the ecosystem, by changes in the abundance of resources, predators, parasites, and competitors<sup>2,5,6</sup>.

Large-scale patterns of climate variability, such as the ones generated by the North Atlantic Oscillation (NAO) or the El Niño-Southern Oscillation (ENSO), determine altitudinal, transcontinental and transoceanic migrations of animals<sup>2,6,7</sup>; NAO and ENSO influence recruitment synchrony between fish-predators and zooplankton, and facilitate species food-web assemblages in the sea and in land<sup>2,5</sup>. How are NAO and ENSO affecting animal dispersal and settlement, reproductive behavior and social organization, species interactions, foraging and feeding<sup>8</sup>? What will be the impact of global environmental problems on aspects of behavior that are still unknown to scientists, such as cognition, behavioral endocrinology and physiology, communication, behavioral diversity, or behavioral evolution<sup>9</sup>?

"Behavioral unknowns" are emerging at a time when ethological data are most needed for captive breeding of endangered species, reintroduction programs, and habitat restoration<sup>8,10</sup>. Yet, despite Myers' previous warnings, we have been taken by surprise. For too long, we have omitted behavior from the list of "things to be done" to keep our Planet running. Behaviorists have much to contribute to conservation.

(see Behavioral Unknowns for list of references, page 5)

### Behavior & Conservation at the 2003 ABS Meetings

Six interesting conservation-related papers were presented at this year's ABS meetings held in Boise, Idaho: Social influences on development of survival skills in Black-tailed prairie dogs (*Cynomys ludovicianus*) by **Debra Shier**. Breeding success of tufted puffins in British Columbia is dependent on ocean temperatures by **Colleen Cassidy St. Clair**. Social behavior explains microgeographic genetic structure in white-tailed deer by **Anna Bess Sorin**. Wolves improve pronghorn fawn survival in Yellowstone National Park by **John Byers**. Movement, mating-competition and the evolution of resistance to insecticides by **Mitchell Baker**. Movement, home range and core-area use patterns in two populations of North American river otters (*Lontra canadensis*) by **Debbie Boege**.

Abstracts of these presentations and information about authors/co-authors' affiliations or poster presentations can be found at <http://www.animalbehavior.org/ABS/Program/>

### Award

continued from page 1

and honors, including the National Medal of Science. Among his books are *The Insect Societies*, *Sociobiology: The New Synthesis*, *On human Nature*, which won the Pulitzer Prize, *Biophilia*, *The Ants*, *The Diversity of Life*, *Naturalist*, *In Search of Nature*, and *Consilience: The Unity of Knowledge*.

### The Award

The Edward O. Wilson ABS Student Research Grant for Conservation Award seeks to encourage graduate students of animal behavior to participate in meaningful conservation-related research. The award is part of the **ABS Student Research Grant Program** and it will support a **proposal** considered meritorious for its science and conservation component.

The **deadline** for receipt of completed applications is **January 22, 2004** and award decisions will be announced by April 1, 2004. The preferred method for receiving and submitting application materials is through the ABS website (<http://www.animalbehavior.org/ABS/Grants/>). For additional information contact the **Student Research Grant Committee** [pls@ou.edu](mailto:pls@ou.edu)

## Feature Article

### Kidnapping the Don Juans of Guantánamo

***Temporary removal of dominant males and careful manipulation of a population's social structure could help conservation behaviorists reduce the effects of inbreeding. The technique may be most effective for small genetically-compromised endangered species that show strong polygyny, with a few dominant males monopolizing territories and females. After the "Don Juans" are removed from their home ranges, new males take over their roles and females have access to a more diverse set of mates.***

By Allison C. Alberts\*

West Indian rock iguanas (genus *Cyclura*) are among the most endangered lizards in the world, with five of the eight species considered critically endangered by IUCN. Introduced mongooses, feral cats and dogs, and free-ranging hoofstock have decimated once teeming populations of iguanas by preying on young and degrading native vegetation. Rock iguanas, as herbivores, play a crucial role in Caribbean dry forest ecology: they promote foliage growth through cropping, provide nutrients to developing seedlings, and disperse seeds into new habitats.

In the mid-1990s, we spent a year documenting hormones and behavior in a group of iguanas inhabiting the U.S. Naval Base at Guantánamo Bay. Our behavioral observations revealed that 80% of adult males engaged in aggressive interactions with other males. We classified males winning more than 50% of encounters as high-ranking, and those winning less than 50% of encounters as low-ranking. The remaining 20% of males never participated in agonistic interactions (non-ranking).

High-ranking males exhibited higher testosterone levels and were significantly larger in body length, weight, head size, and scent gland diameter than low-ranking males. High-ranking males vigorously defended small but well-defined home ranges that overlapped the ranges of various females. Non-ranking males occupied peripheral home ranges with very limited access to females and tended to avoid movement to escape the notice of more aggressive individuals. Low-ranking males did not defend territories, instead they moved extensively throughout the study area while suffering constant chases by high-ranking males. Analysis of mean distances between pairs of individuals indicated that each of the resident females on the site was closer to a high-ranking male than to a low- or non-ranking male. Headbob displays, chases, and mouth gaping, behaviors usually performed in the context of territorial defense, were exhibited by high-ranking males significantly more often than by low-ranking males. There was also a trend for courtship to be performed more often by high-ranking males than by other males.

Although it is impossible to be certain in the absence of genetic studies, our results suggested that high-ranking males, through their more robust body morphology and behavioral dominance, had better access to mates than low and non-ranking males.

We conducted an experiment to determine whether temporary alteration of local social structure could increase the probability that sexually mature but genetically under-represented male iguanas could improve chances to mate. During the 1994 breeding season, we temporarily removed the five highest-ranked males from the study site. Removal of these "Don Juans" produced immediate and dramatic changes in male social structure. Within a few days, the five largest previously low-ranking males began to win more than half of their encounters and could be classified as high-ranking. All of the previously non-ranking males began to move throughout the study site and fight extensively with other males, behaving like low-ranking individuals. The newly dominant males showed increased rates of headbob display and chases associated with territorial defense, as well as testosterone levels typical of high-ranking males during the breeding season. Active courtship of females was seen in both the newly dominant males as well as the low ranking males. Once the previously dominant males were removed from the site, the five males that achieved high-ranking status in their absence defended territories that were strikingly spatially similar to those vacated by the removed individuals.

At the close of the breeding season, we returned the Don Juans to the study site. Our behavioral observations and home range mapping for five weeks following the release of the dominant males indicated no long-term disruption of behavior or social relationships.

These findings suggest that temporary alteration of local social structure may represent a potential management tool for small or otherwise genetically-compromised populations by enhancing the chances that a greater percentage of males will have opportunity to mate. This strategy, however, may not be equally appropriate for all species of rock iguanas, and to be fully effective will need to be combined with other measures, such as predator control, that directly counter the factors responsible for population decline. Temporary removal of dominant males is likely to be most effective for species that show strong dominance polygyny, in populations for which inbreeding has become a serious threat to genetic integrity. Because of the possibility that high variance in male reproductive success is naturally maintained through genetic or age-dependent balanced polymorphism, it is important that this strategy only be considered as an emergency interim measure until the effective population size is large enough to insure genetic viability.

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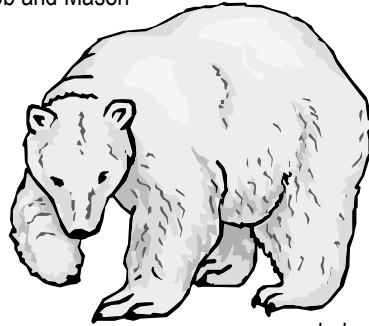
(see Alberts et al. 2003 in **Interesting Articles** page 4).



## Our Favorites

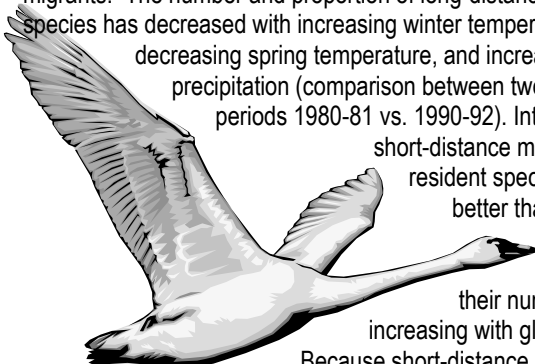
### Carnivores just don't like it in cages

According to Ross Clubb and Georgia Mason (*Nature* 425: 473-474, 2003), researchers at the University of Oxford, animals that roam over large territory in the wild do not take kindly to be confined. Polar bears and other carnivores are prone to problems when kept in cages or zoo enclosures. These sensitive species usually show poor health, repetitive stereotypic behaviors and breeding difficulties. Clubb and Mason recently investigated this phenomenon on caged carnivores and concluded that particular lifestyles in the wild confer vulnerability to welfare problems in captivity. Naturally wide-ranging species showed the most evidence of stress and/or psychological dysfunction in captivity, a finding that, according to the authors, is a cause for concern, given the difficulties of conserving some species *in situ*. Husbandry of these species in captivity is therefore in need of urgent improvement (a polar bear's typical enclosure size, for example, is about one-millionth of its minimum home-range size). "Zoos could stop housing wide-ranging carnivores and concentrate instead on species that respond better to being kept in captivity... such as snow leopards that usually thrive in enclosures", indicate Clubb and Mason.



### Long-distance migrants affected by global climate change

Nicole Lemoine and Katrin Böhning-Gaese (*Conservation Biology* 17: 577-586, 2003) suggest that increasingly warmer winters all over Europe are imposing severe threat to long-distance migrants. The number and proportion of long-distance migrant bird species has decreased with increasing winter temperature, decreasing spring temperature, and increasing spring precipitation (comparison between two census periods 1980-81 vs. 1990-92). Interestingly, short-distance migrants and resident species are doing better than long-distance migrants; their numbers are increasing with global warming. Because short-distance migrants appear to behave like residents, by having earlier access to resources ("early birds") in wintering lands than long-distance migrants, they benefit from the current trend in mild winter



conditions. Short-distance migrants and residents seem to be able to out-compete long-distance migrants. In addition to the ecological effect of global climate change on long-distance migrants, evolutionary changes in the migratory behavior of long- and short-distance migrant birds can also be expected.

Several species of partial and short-distance migrants do not migrate any longer and have become "more resident". Thus the phenomenon of long-distance migration may be influenced by changes in the number and proportion of long-distance migratory species and by changes in the behavior of these species.



## Interesting Articles

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- Cale, P. G. 2003. The influence of social behaviour, dispersal and landscape fragmentation on population structure in a sedentary bird. *Biological Conservation*, 109, 237-248.
- Cotton, P. A. 2003. Avian migration phenology and global climate change. *Proceedings of the National Academy of Sciences*, 100, 12219-12222.
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- Joron, M. & Brakefield, P. M. 2003. Captivity masks inbreeding effects on male mating success in butterflies. *Nature*, 424, 191-194.
- Lacy, K. E. & Martins, E.P. 2003. The effect of anthropogenic habitat usage on the social behaviour of a vulnerable species, *Cyclura nubila*. *Animal Conservation*, 6, 3-9.
- Lemoine, N. & Böhning-Gaese, K. 2003. Potential impact of global climate change on species richness of long-distance migrants. *Conservation Biology*, 17, 577-586.
- Slabbekoorn, H. & Peet, M. 2003. Birds sing at a higher pitch in urban noise. *Nature*, 424, 267.
- Thomas, K., Kviteck, R. G. & Bretz, C. 2003. Effects of human activity on the foraging behavior of sanderlings *Calidris alba*. *Biological Conservation*, 109, 67-71.

## Did you know that

(1) Behavioral diversity is one of the least known aspects of animal behavior. (2) Extinction of biodiversity includes the extinction of behavioral diversity. (3) Different populations of the same species can have different behavioral repertoires; in consequence, every time a population becomes extinct a unique set of culturally-transmitted behavioral adaptations is also lost. (4) Extinction of behavioral diversity can affect essential biological processes in communities and ecosystems: seed dispersal, pollination, predation, competition, and parasitism. (5) During the past three years 121 more species have become threatened with extinction (total 11,167), which implies a threat to behavioral diversity.

Find more about threatened species of animals in the updated IUCN Red List of Threatened Species: <http://www.redlist.org>



## Interact with the Conservation Committee

Send letters, comments and contributions to  
**The Conservation Behaviorist**

[pazymino@unlserve.unl.edu](mailto:pazymino@unlserve.unl.edu)

Deadlines for articles are the 15<sup>th</sup> of the month preceding the next news update. The next deadline is **April 15<sup>th</sup>**. Contributions submitted by members of the Animal Behavior Society and judged by the Conservation Committee to be appropriate will be published in **The Conservation Behaviorist**. The publication of such material does not imply ABS or Conservation Committee endorsement of the opinions expressed by contributors.

Editor Guillermo Paz-y-Miño C.  
Associate Editor Allison C. Alberts

## ABS Conservation Committee Members

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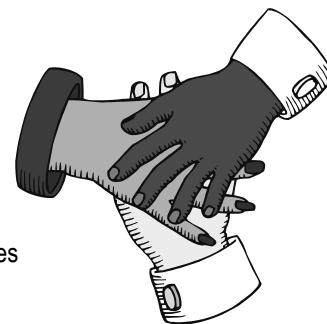
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## Behavioral Unknowns

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5. Gjerdrum, C. et al. Tufted puffin reproduction reveals ocean climate variability. *Proc. Natl. Acad. Sci.* 100, 9377-9382 (2003).
6. Lemoine, N. & Böhning-Gaese, K. Potential impact of global climate change on species richness of long-distance migrants. *Cons. Biol.* 17, 577-586 (2003).
7. Inouye, D. W. et al. Climate change is affecting altitudinal migrants and hibernating species. *Proc. Natl. Acad. Sci.* 97, 1630-1633 (2000).
8. Paz-y-Miño C., G. Contribution of animal behavior research to conservation biology. *Anim. Behav. Soc. Newslet.* 48, 1-2 (2003). Four main areas of behavioral research are addressed in most environmental-related studies (N=277): dispersal and settlement (includes home range, habitat selection), reproductive behavior and social organization (mating systems, mate choice, parental care, kinship, cooperation and helping), species interactions (predation, competition, pathogen-induced behavior, brood parasitism), and foraging (pollination) and feeding.
9. Source ref. 8. Cognition (includes perception, learning, decision making, information processing), behavioral endocrinology and physiology (hormonal and physiological traits and behavior), communication (information sharing, vocalization, signaling), behavioral diversity (genetic variability and behavior, population genetics and behavior), behavioral evolution (speciation, reproductive isolation, tradition/culture, and behavioral phylogenies).
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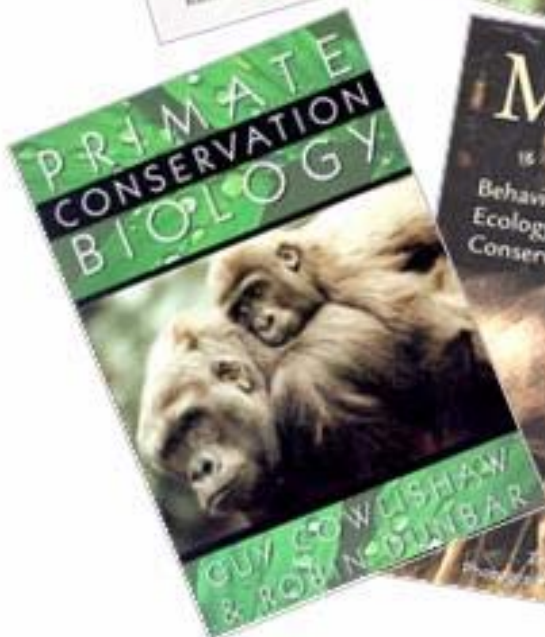
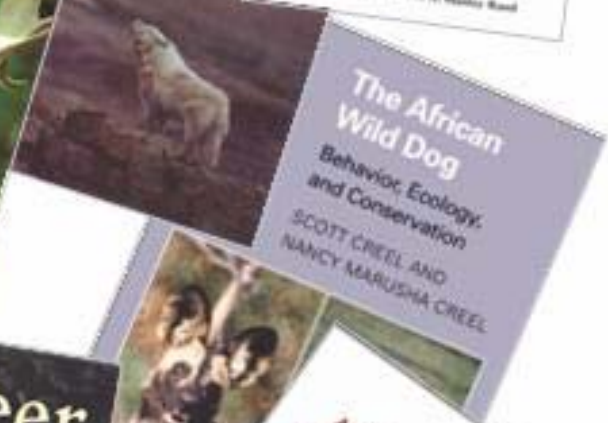
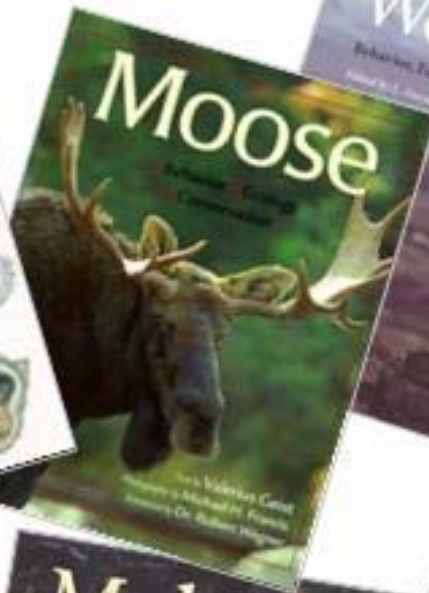
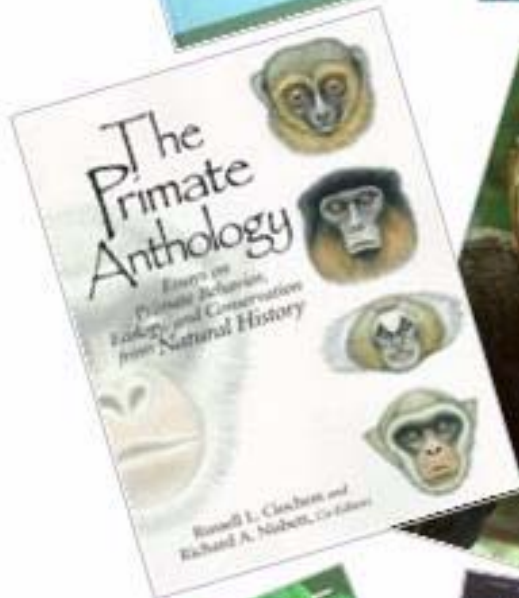
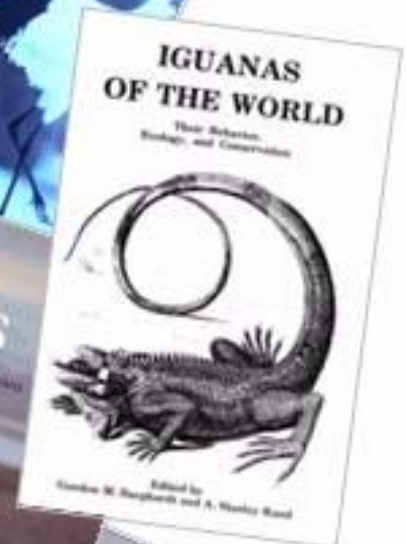
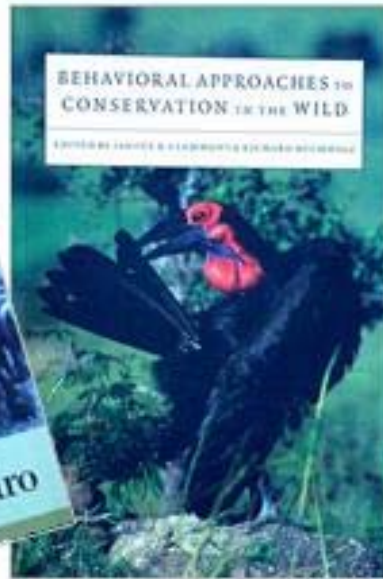
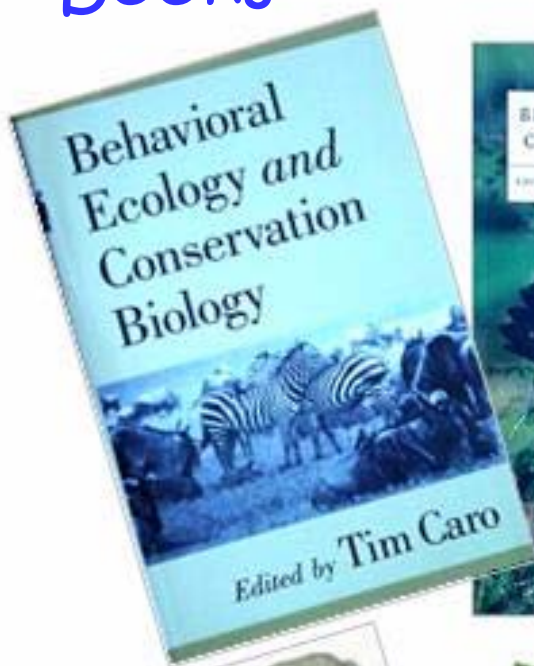
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# Books

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Poster presented at the ABS 2003 meetings, Boise, Idaho

# Animal Behavior & Conservation Science: The Mission of the ABS Conservation Committee



## Animal Behavior Society Conservation Committee

The Animal Behavior Society Conservation Committee was created in 1997. One of its goals is to encourage ABS members to participate in research programs addressing the interface between animal behavior and conservation science. By identifying and evaluating the areas in which behavioral research has contributed to conservation, as well as the fields that need development, the Committee aims to generate discussion and promote studies in behavior and conservation. The Committee sponsors the **Student Research Grant for Conservation Award**. ABS members are invited to interact closely with the Committee and participate in all aspects of its activities.

Contact: Guillermo Paz-y-Miño C.  
Chair, ABS Conservation Committee  
[pazymino@unhcr.org](mailto:pazymino@unhcr.org)

## The Conservation-Behaviorist

is an electronic biannual news-update which informs Society members about the Committee's activities, research trends in behavior and conservation, and related scientific news.

<http://pazymino.freeyellow.com/TheConservationBehaviorist.html>

Take a look at **Vol.1 No. 1** May 2003 sample below:



Article from ABS Newsletter - The Conservation-Behaviorist

## Contribution of Animal Behavior Research to Conservation Biology\*

By Guillermo Paz-y-Miño C.

Behavioral research encompasses the study of the physiological and sensory mechanisms that control behavior, the development or ontogeny of behavior, and the function and evolution of behavior. Conservation biologists have debated about these paradigms for decades, at times not realizing that their discussions have contributed directly or indirectly to the area of animal behavior and conservation. To assess the contribution of behavioral paradigms in conservation studies, I identified and evaluated 277 articles (N=1631) published in Conservation Biology between 1987 and 2002 that were directly related to animal behavior and conservation. Four main areas of behavioral research were commonly addressed in these studies (Figure 1): dispersal and settlement, reproductive behavior and social organization, species interactions, and foraging/feeding and pollination. These areas have helped biologists to understand and alleviate conservation problems such as extinction of endangered species and biodiversity loss, habitat destruction and ecosystem management and restoration (Figure 2).

\*From ABS Newsletter 4(1) 1-2 & The Conservation-Behaviorist. With permission from the editors. For a complete version of this article, visit ABS or ABS-Conservation Committee websites.

Figure 1 Areas of animal behavior most commonly discussed in conservation biology studies\*

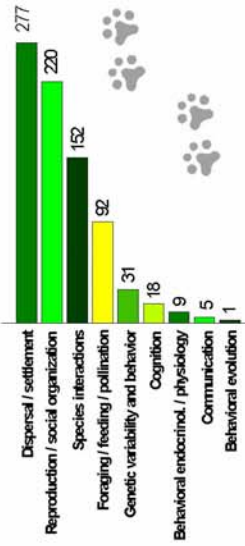
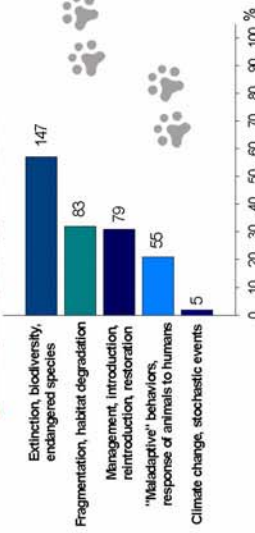


Figure 2 Conservation problems most commonly discussed in Conservation-and-behavior studies\*



\* Based on articles published in Conservation Biology 1987-2002 (N = 277). Number of articles per category is indicated next to each bar. Percentages were calculated for each category in respect to the total number of articles in this survey. Most studies included more than one behavioral or conservation category.

## Conservation Tips By Dan Blumstein

Is there anything a behaviorist can do to help conservation?

Study an endangered species. Much of endangered species management is a quest for knowledge about the behavior and ecology of rare species. Decisions are routinely made with remarkably limited data, and not always by those trained in the scientific method. By studying endangered species you can contribute to this needed dataset. More importantly, as a scientist, you should bring needed rigor to your studies and conclusions.

## Interact with the Conservation Committee and The Conservation-Behaviorist

Send letters & comments to  
[pazymino@unhcr.org](mailto:pazymino@unhcr.org)

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Contributions submitted by members of the Animal Behavior Society and judged by the Conservation Committee to be appropriate will be published in The Conservation-Behaviorist.

Editor: Guillermo Paz-y-Miño C.  
Associate Editor: Allison C. Alberts

## Interesting Review Articles On Animal Behavior & Conservation

Anthony, L.L. & Blumstein, D.T. 2000. Integrating behaviour into wildlife conservation: the multiple ways that behaviour can reduce Ne. *Biological Conservation*, 95, 303-315.  
Caro, T.M. 1998. The behaviour-conservation interface. *Trends in Ecology and Evolution*, 14, 366-369.  
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Rubenstein, D.I. 2001. Social behavior. *Encyclopedia of biodiversity*, 5, 295-303.  
Sutherland, W.J. 1998. The importance of behavioral studies in conservation biology. *Animal Behaviour*, 56, 801-809.

For many more references visit <http://pazymino.freeyellow.com/TheConservationBehaviorist.html>