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Letter of recommendation for **Steve Bellan** to attend the AIMS/SACEMA Short Course

Dear Colleagues:

Steve Bellan entered the ESPM graduate program this past fall. He was ranked second out of 23 very fine students on the short list of those being considered for admission to work with faculty in our Division of Organisms and Environment: thus I felt privileged to have him join my group. His high rank on our short list was due to his excellent verbal and quantitative GRE scores (above 95 and 98 percentiles respectively) and graduating with high honors from Princeton (GPA in major 3.83/4.00). Beyond this, Steve had considerable undergraduate research experience in the behavioral ecology of male fiddler crab for his independently researched Senior Thesis, working on radio telemetry as a field research assistant to Professor Martin Wikelski, and carrying out pollen research under a field research internship mentored by Professor Claire Kremen. He also had international experience in spending a semester abroad at James Cook University in Queensland, Australia.

On arriving at Berkeley, Steve integrated very well into my group, which is not surprising for someone with his friendly, easy-going disposition. However, he also plunged right into his studies, taking a full course load and doing very well on an eclectic set of course that includes spatial data analysis, a conservation biology seminar, and a social science class on religion, science and the environment. I was pleasantly surprised by the initial ideas he had for carrying out research on the role scavengers play in the spread of anthrax spores in their feces after feeding on anthrax infected herbivore carcasses: these ideas reflected his ability to think broadly and innovatively, bringing concepts and methods together from several different subfields of population biology (population modeling, as well as spatial, community, wildlife and disease ecology). I was also impressed by his ability to respond to our discussions in making critical improvements to a revised version of his original proposal.

The research that Steve outlines in proposal gets at the heart of perhaps the most important conundrum regarding episodic outbreaks of anthrax in wildlife ecosystems throughout Africa. In ecosystems, such as Etosha National Park, anthrax outbreaks occur every year in the wet season in several herbivores (sprinbok, zebra, wildebeest) and in the dry season in elephants, but at varying intensities. In other parks, such as the Kruger National Park, outbreaks do not occur every year, and are more episodic than in Etosha. The question remains why anthrax affects different species in different seasons in Etosha and why outbreaks are more irregular in Kruger. What is it that causes spores to become sufficiently concentrated at various points in the environment for a dose-related threshold to be exceeded, as required for the anthrax infection of a susceptible individual? Steve's work will hopefully shed important insights into this question and provide a coherent view of how anthrax persists in environments in ways that results in annual outbreaks in some systems and much less frequent outbreaks in others. This knowledge will fill a gap in the natural history of anthrax that has now been outstanding since Glenn Van Ness's publication on the "Ecology of Anthrax" in **Science** in 1971. Besides filling this all-important lacuna, Steve's work will provide a much better understanding of why anthrax outbreaks occur in the animal husbandry industry, and insights into how such outbreaks can be managed; not to mention how best to clean up after a possible bio-terrorist anthrax attack.

From the brief amount of time I have had to interact with Steve over the past semester—by observing his participation at weekly lab meetings and his interaction with other students, from the intellectual and science related discussions I have had with him on his course work and projects—it is clear to me that he is one of the best students I have had an opportunity to interact with at Berkeley over the past 25 plus years. I have no doubt that he will flourish in has Ph.D. studies at Berkeley, execute a well-thought out research plan with regard to the field component of his proposed research in Etosha, and come with some innovative modeling studies that generalize theory and methods to systems beyond Etosha and beyond anthrax.

Steve has good modeling skills for someone who has graduated from a biology, rather than a more mathematically oriented, undergraduate program: in fact, he has the equivalent of a math minor from Princeton University (his formal courses include Honors Linear Algebra and Multivariable Calculus). He also has courses in Biological Dynamics and in the Ecology and Epidemiology of Parasites. Thus, in many ways, Steve is a perfect fit for the AIMS/SACEMA Epidemiology Short Course being able to cope readily with the mathematical level, benefit from being formally exposed to the theoretically underpinnings of epidemiological models, and being able to appreciate the applications of the methods because of his biological training.

Thus it is with great confidence and pleasure that I recommend Steve for a Fellowship to participate in the AIMS/SACEMA Epidemiology Short Course. I know that in his case the funds will be well spend in training someone who I believe is destined to become a leader in the area of the ecology of infectious diseases.

Sincerely,

Wayne M. Getz
Biomathematician and Professor of Environmental Sciences