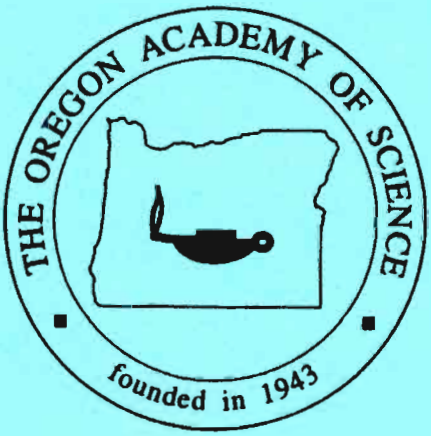
PROCEEDINGS

OF THE

OREGON ACADEMY OF SCIENCE



VOLUME XLIII

2007

Proceedings

of the

Oregon Academy of Science

VOLUME XLIII

Published by the Western Oregon University

2007

CONSERVATION IMPLICATIONS OF CONSERVATION: HEALTHY ECOSYSTEMS ARE GOOD FOR YOUR HEALTH. [1]Laurie J. Dizney, [1]Philip D. Jones, [1,2]Luis A. Ruedas, [1]Portland State University, Dept. Biology, Portland, OR 97207-0751, 2Museum of Vertebrate Biology, Portland State University, Portland, OR, 97207-0751.

In recent years, there has been a surge of newly emerging infectious diseases affecting humans, such as Ebola, West Nile Virus, SARS, Avian Influenza, and Hantavirus. These are all zoonotic diseases—diseases carried by wildlife—that periodically spill over and spread in human populations. As human populations expand and come into more frequent contact with wildlife, these spillovers will inevitably increase in number. Can such events be predicted or prevented? This research investigated the inverse relationship between natural biodiversity and the incidence of zoonotic disease, specifically *Hantavirus*. The three–year study was conducted in five natural areas around Portland, OR that varied in size and vegetation. Small mammals were live—trapped using a web sampling grid, in order to achieve accurate density measurements, as well as consistency with other studies. Blood samples were tested for hantaviral antibodies using ELISA. Population density was calculated using the program DISTANCE. Statistical analyses were undertaken using SAS and SPSS. We sampled 5052 specimens and found *Hantavirus*–positive deer mice (*Peromyscus maniculatus*), the natural host, in all parks. Using non—linear regression, we have found a strong significant negative relationship between site biodiversity and percent infection rate: that is to say, as biodiversity decreases, the prevalence of Hantavirus in the ecosystem increases, and exponentially so when diversity becomes very low. This result has clear implications for both human health and conservation efforts: by managing natural areas to maximize biodiversity, zoonotic diseases and their associated risks to humans can be minimized.

AN INVESTIGATIVE LABORATORY FOR INTEGRATED PLANT AND ANIMAL PHYSIOLOGY AT THE SOPHOMORE LEVEL. Scott Hawke, Stasinos Stavrianeas, and Gary Tallman, Willamette University, Salem, OR

Physiological Dynamics in Animals and Plants is an integrated, sophomore-level course required of all biology majors at Willamette University. Early course lectures emphasize differences in macro-physiological mechanisms used by plants and animals for internal transport and gas exchange, energy transduction, and nutrient and food processing. Subsequent lectures emphasize commonalities in cellular physiological mechanisms such as regulation of membrane electric potential and signal transduction. The laboratory for the course begins with six weeks of standard exercises that introduce students to basic techniques of plant and animal physiology. Over the final eight weeks, teams of students carry out research investigations of their own design. Each team must develop a testable hypothesis; design experiments to test the hypothesis; collect

and analyze data; present the results of the project in a symposium at the end of the course; and write a paper summarizing the study. The assessment plan for the laboratory includes pre- and post-course student self-assessment, student assessment of lab team members, and assessment of students by professors. Desired student learning outcomes are development of an ability to acquire data with a computer; overcome technical problems in the lab; correct flawed experimental designs; solve scientific problems; recognize and analyze patterns among data; critically evaluate experiments; draw reasoned conclusions from data; interpret physiological studies; and draw appropriate parallels between plant and animal physiology. As of December 2006, nearly 140 students have completed the assessment program; preliminary results of the assessment will be presented. The use of course equipment in a variety of other courses and various K-12 outreach programs will also be discussed. The laboratory is funded by grant 0309545 from the Course, Curriculum and Laboratory Improvement Program of the National Science Foundation.