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TRANSACTIONS
OF THE
NEBRASKA ACADEMY OF SCIENCES

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DIVISIONS OF THE NEBRASKA ACADEMY OF SCIENCES
Nebraska Association of Teachers of Science, NATS
Nebraska Junior Academy of Science, NJAS

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Nebraska Graduate Women in Science
Nebraska Ornithologist's Union
Nebraska Psychological Society
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Nebraska Space Grant Consortium

The Nebraska Academy of Sciences was founded 30 January 1880 and is affiliated with the American Association for the Advancement of Science and the National Association of Academies of Science.

All persons interested in science are welcome to become members of the Nebraska Academy of Sciences.

NAS – NEBRASKA ACADEMY OF SCIENCES, INC.

302 Morrill Hall, 14th and U Streets, Lincoln, Nebraska 68588-0339 Phone (402) 472-2644
nebacad@unl.edu *http://www.neacadsci.org*

The membership of the Academy consists of those individuals and institutions interested in science and those persons actively working and contributing to science in the State of Nebraska. It includes nonprofessional persons, as well as representatives from education, the professions, industry, and governmental agencies.

The Academy was organized in 1880 in Omaha with seventy-five charter members, and reorganized in 1891 in Lincoln. The Academy was incorporated in 1950 as a nonprofit educational institution, and it is neither a state agency nor does any particular university, college, or other Nebraska educational organization sponsor it. In 1963, the Internal Revenue Service established the Academy's rating as "Section 501(c) (3)" of the Internal Revenue Code. The Policy Committee of the Academy is made up of one representative from each of the colleges and universities in the State.

The objectives of the Academy are to further the work of scientists and to facilitate cooperation among them; to improve the effectiveness of science in the promotion of human welfare and environmental quality; to provide the opportunity for scientific research related to the problems of the ever-changing environment of the Great Plains; to increase public understanding and appreciation of the importance and promise of science in human progress; to stimulate science education, and to encourage young people to become involved in science, and to foster the interaction of business, industry, government, education, and the academic scientific community.

NATS – NEBRASKA ASSOCIATION OF TEACHERS OF SCIENCE

The purpose of the Nebraska Association of Teachers of Science is advancement, stimulation, extension, improvement, and coordination of science education in all fields of science at all levels. The Association is dedicated to the improvement of science education in Nebraska.

Membership is available to those engaged in the teaching of science and those interested in science education. Activities include: 1) *The Annual Fall Conference*, providing science educators with updates in content and strategies designed to enhance science education in Nebraska. Workshops, speakers, and concurrent sessions are available in each content area and at all levels from elementary to post-secondary. 2) *The NAS/NATS Newsletter*, a publication designed to provide a communication link among all NATS members. Each edition provides information on current research in science education, resources, opportunities for workshops and conferences, teaching tips, activities of affiliated groups, and recognition of outstanding educators in Nebraska. 3) *The Presidential Award for Excellence in Science Teaching*, coordinated and administered by NATS. 4) *The Outstanding Contributions to Science Education Award*, given annually to a Nebraskan who has made outstanding contributions to science education. 5) *The Nebraska Science Olympiad*, an annual competition for students sponsored by NATS to stimulate interest and provide recognition for achievement in science.

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Persons wishing to submit a manuscript for publication should consult guidelines available on the *NAS* website, *http://www.neacadsci.org* or at *http://digitalcommons.unl.edu/nebacadsci/*. Manuscripts are reviewed by at least two referees, including at least one from outside the author's institution. Following review by the referees and the editorial board, the author is notified whether or not the paper is accepted for publication and, if accepted, of necessary revisions.

I owe many thanks to those individuals who served as anonymous manuscript reviewers for the current volume. Their contributions are deeply appreciated.

Bruce Chase, Editor
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Volume 32 **November 2011**

EDITORIAL CONTENTS

Listing of Divisions and Affiliated Societies i
NAS Membership and Objectives ii
NATS Membership and Objectives ii
Nebraska Academy of Sciences Executive Committee ii
Nebraska Academy of Sciences Policy Committee iii
Friends of the Academy iii
2011 Donors of $100 or more iii
Editorial Board iv
State Board of Education iv
Editor's Corner iv

PAPERS

The Freshwater Mussels (*Mollusca: Bivalvia: Unionoida*) Of Nebraska 1
Ellet Hoke

Seed Production With Insect Herbivory and Fungal Occurrence for the Rare *Penstemon haydenii* 47
Kay Kottas, James Stubbendieck, Erin Blankenship, and Jay Fitzgerald

The Ringed Crayfish, *Orconectes neglectus neglectus*, in Nebraska with a Revision of Its Distributional Range 59
Steven C. Schainost

Assessment of Water Quality and Response Rate of Zooplankton in a Nebraska "Barrow Pit" After Rotenone Application 69
Brian C. Peterson, Byron W. Sellers, Nicolas J. Fryda, and Keith D. Koupal

A Report of Freshwater Sponge (Porifera: Spongillidae) In Central Nebraska 75
Todd S. Paulsen and W. Wyatt Hoback

Distribution of Zooplankton in Harlan County Reservoir, Nebraska 78
Kathy M. Maline, Keith D. Koupal, Brian C. Peterson, W. Wyatt Hoback

The Vascular Flora of Brown County, Nebraska 83
Megan K. Killion and Steven J. Rothenberger

A Comparison of the Clarendonian Equid Assemblages from the Mission Pit, South Dakota and Ashfall Fossil Beds, Nebraska 98
Nicholas A. Famoso and Darrin Pagnac