

## “CHARTER”

For

### INDIANA STATE UNIVERSITY CENTER FOR NORTH AMERICAN BAT RESEARCH AND CONSERVATION

(Department of Ecology and Organismal Biology, Indiana State University)

#### ADVISORY BOARD

Charles Amlaner, Chairperson, Ecology and Organismal Biology, ISU

Thomas Cervone, Bernardin, Lochmueller & Associates. Evansville, IN.

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Thomas Kunz, Professor, Boston University, Boston MA

Allen Kurta, Professor, Eastern Michigan University, Ypsilanti, MI

Lori Pruitt, US Fish and Wildlife Service, Bloomington, IN

Merlin Tuttle, Executive Director, Bat Conservation International, Austin Texas

Robert Wolfe, Jimmie New Consulting, Walkerton, IN

#### PERSONNEL

##### Director

John O. Whitaker, Jr., Professor of Ecology and Organismal Biology, ISU

##### Assistant Directors

Dale W. Sparks. Department of Ecology and Organismal Biology, ISU.

Virgil Brack, Jr. Environmental Solutions and Innovations, 781 Neeb Road,  
Cincinnati, Ohio, and Senior Research Professor, ISU.

##### Affiliated Personnel

Brianne Walters. Research Biologist, ISU. Consulting projects.

#### GRADUATE STUDENTS

Ronny Eidels, DVM. Toxins. Hibernation. Post-doc.

Christina Booher. Outreach. Bat reproduction. Ph.D. candidate

Jake Burskey. Primary interests: Fish, Crayfish. MS candidate.

Justin Boyles. Winter behavior. Hibernation. Migration. Ph.D. candidate

Heather Brookhart. Outreach. MS Candidate

Amy Fairbairn. Winter behavior. PIT tag work. Outreach. MS candidate

Matt Griswold. Bat communities. Outreach. MS candidate

Daniel Judy. Migration. Winter behavior. MS candidate

Swapna Mohan, DVM. Bat reproduction. Ph.D. candidate

Jeremy Sheets, MS Candidate

Jon Storm. Food and feeding habits. Ph.D. candidate

#### UNDERGRADUATES

Eugene Booher

Jerrold Helms

Nicole Tuttle

#### RESEARCH ASSOCIATES

Tim Carter, Ball State University

Jerry Choat, Fort Hayes State University

William H. Clark, Albertson College of Idaho, and Orma J. Smith Museum  
of Natural History. Entomology

Carl Dick, Field Museum of Natural History. Parasites

Miranda B. Dunbar, University of Regina, Regina, Canada

Keith Dunlap, Indiana Karst Conservancy

George A. Feldhamer. Southern Illinois University

Mark Gumbert, Copperhead Consulting.

Joyce Hofmann, Illinois Natural History Survey  
Art Howard, Camp Atterbury, Edinburgh, IN  
Joe Kath, Illinois Department of Natural Resources  
James Kiser, Daniel Boone National Forest, KY.  
Mike Lacki, University of Kentucky  
Susan Loeb, Southern Research Station, Clemson  
Roberto Martinez-Gallardo, Baja California Autonomous University  
Chris Maser, Oregon  
Paul Moosman, Fitchburg State College, Fitchburg, Mass.  
Thomas E. Morrell, Imperial Valley College, CA  
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Dan Sparks, US Fish and Wildlife Service, Bloomington, In.  
Howard Thomas, Fitchburg State College, Fitchburg, Mass.  
Wade Ulrey, University of Kentucky  
Ernest Valdez, University of New Mexico  
Jacques Veilleux, Franklin Pierce College, Rindge, NH  
Maarten Vonhof, Western Michigan University, Kalamazoo, Mi.

#### FRIENDS OF BATS

James (Andy) Anderson, Oregon  
Andrea Bootman

Samantha Carpenter

Thomas K. Connerley, 812 Hiatt Ave. Greenwood, IN 46143-8983  
Joe Merritt

Terri Warne, Bloomington, Indiana

## AFFILIATED ORGANIZATIONS

Department of Biology, Universidad Autonoma de Baja California

Organization for Bat Conservation, Bloomfield Hills, MI 48303

Indiana Karst Conservancy, Bloomington, Indiana

## MISSION OF CENTER

Our mission is to conduct and encourage basic and applied research on North American bats, by collaborating with students and other scientists, and to make our findings available to the scientific community and the public through technical and popular publications, teaching, and outreach programs.

## PURPOSES OF CENTER

1. Promote and carry out research on any or all areas of bat biology in North America, with an emphasis on ecology, conservation, and management. Diverse and interdisciplinary collaborative efforts will be encouraged.
2. Develop and carry out means of bat conservation
  - a. Design research to develop and implement strategies that aid conservation of bats facing pressure from human populations
    - Manipulative management studies of traditional resources such as woodlands (incorporating harvest and other human uses) and caves
    - Determine how non-traditional resources, such as bridges, bat houses and mines, can benefit bats
  - b. Teaching/training of academic, regulatory, and private communities. Provide conservation training to traditional academic students and to special groups such as school teachers, private consultants, conservation organizations, and local/community chapters of organizations such boy and girl scouts and 4H.
3. Train personnel (undergraduate, graduate, post-doc) in the study of various phases of bat biology and conservation through coursework and experiential or hands-on learning. This training will allow them to better serve in education, community and public service, industry, and particularly biological consulting and management.

4. Conduct hands-on training in various areas of basic field biology for bats
  - a. Mist-netting, harp-trapping, radio-tracking, food habits analysis, ectoparasite studies, reproduction and population studies, habitat analysis, light tracking, ultrasonic surveys, etc.
  - b. Winter intra cave surveys and habitat use studies
  - c. Assessment of man-made structures, such as buildings, bridges, and mines, for their value to bat conservation.
  
5. Train students for careers in regulatory compliance, as a representative of a federal or state agency or as a private consultant. Topics/courses that are not regularly taught, that should be, include:
  - a. Regulatory compliance
    - Governmental regulations
    - The role of science/biology in compliance – asking and answering the right questions
    - The role and impact of the public
  - b. Business acumen for biologists
    - Financial, managerial, and project accounting for biologists
    - Project management
    - Writing technical and cost proposals
    - Legal considerations in the business environment
    - Expert witness testimony
    - Economics of contract biology
    - Documentation - regulatory requirements and public need
    - Human resources and business etiquette
    - Eco-business ethics
    - Types of business organizations
  
6. Help the public solve bat-related problems through education (out-reach programs), information dissemination, and as a contact source.
  
7. Publish information that can be used by the public. For example, two such publications are already being developed:
  - a. Bats of Indiana, Biology and Conservation
  - b. Harmful Insects Eaten by North American Bats
  
8. Establish collaborations with other organizations

## FINANCIAL SUPPORT

Financial support is an essential element of any successful program. Support is available from three sources: ISU, public agencies, and private entities.

1. ISU is providing the infrastructure, support services, and faculty upon which to build a program.
  
2. Public entities of two general types may provide funding to support students and the program
  - a. Regulatory agencies. Agencies such as the US Forest Service, U.S. Fish and Wildlife Service, Natural Resources Conservation

Services, Bureau of Land Management (in western states), US Geological Survey, and state resource agencies all require information to make policy and management decisions and to implement regulatory oversight. Fundamental applied research in ecology, conservation, and management will benefit these agencies and help them make informed, biologically accurate decisions.

Examples of areas that require a better understanding include:

- Pesticides and their effects on bats
- Effect of forest harvest, treatment, and regeneration methods on bats
- Landscape-scale assessment of habitat
- Habitat enhancement and management techniques
- Resource use and distances traveled by reproductive and non-reproductive individuals/colonies of bats
- Natural and man-made landscape features and their affect on local movements and long-distance migration
- Development of a protocol for assessment of bat populations
- Affect of habitat quality on reproduction and productivity
- Affect of weather, latitude, and elevation on reproduction and productivity
- Winter habitat use
- Effects of wind turbines on bats

b. Non-regulatory agencies. Many public entities, nearly all federal agencies and some state agencies, and also landowners, must comply with environmental regulations. Thus, departments of transportation, the Corps of Engineers, Department of Defense, Department of Energy, Environmental Protection Agency, Federal Aviation Administration (and local airport authorities), National Park Service, Federal Communication Commission, National Science Foundation, and the Office of Surface Mining all have requirements for compliance. Meeting the needs of individual projects, and addressing those needs on a programmatic scale presents a tremendous opportunity for both research in applied biology and issues of regulatory compliance. Issues include:

- Summer and hibernacula presence/absence surveys
- Habitat assessment and habitat use determinations
- Impact assessment
- Conservation/mitigation planning, implementation (enhancement, restoration, and creation), monitoring, and efficacy (success) determinations

3. Many private companies also must comply with environmental regulations as a consequence of their actions, typically because of federal funding or a federal action (permit). For example, many energy-related projects require a permit from the Federal Energy Regulatory Commission, coal mining can require permits under the Office of Surface Mines, Abandoned Mine Lands, and Surface Mining Control and Reclamation Act, and many types of land disturbance require permitting from the Corps of Engineers for wetland and streams. Often private companies hire consultants to assist with these issues. This may present an opportunity to fund students either directly through the company or through the consultant. The power industry may provide a particularly important opportunity. Current demand for energy is high, and after many years of limited infrastructure

developments, it is anticipated that new coal-fired power plants will be built, electric and gas transmission lines will be placed in service, and wind-power is quickly becoming a reality.

Other items under consideration

1. Web site
2. Bat banding registry for Midwest
3. Certificated program
4. Monitoring guidelines
5. Bat tissue depository
6. Working on grant proposals for study of
  - a.. toxicants and their effects on bats
  - b. bat population studies
  - c. studies on hibernation, particularly the periodic awakenings
  - d. migration patterns
7. We welcome other bat researchers that wish to become associated with the center as Research Associates.
8. Coordinator for research efforts on Indiana myotis (*Myotis sodalis*)

The following idea is currently under discussion also.

An idea raised at a recent meeting of Indiana bat (*Myotis sodalis*) workers was to develop a central location to help coordinate research efforts on this species. We hereby offer the services of the Indiana State University Bat Research and Conservation Center for this effort. Our intention is not to replace the efforts of other researchers, but to coordinate these efforts. Specifically we hope to stimulate research on the Indiana myotis (and other species), and to collect and dispense information. We also hope that a consortium approach will allow researchers to pursue larger funding efforts

We think our new center is ideally located for this purpose. Indiana currently has the largest wintering populations of the species, and the USFWS national lead office for the recovery effort is located in Bloomington, Indiana. Both current and historical research programs into the species have been based in Indiana. Currently biologists working with Indiana bats in the state include John O. Whitaker, Jr., Dale W. Sparks, Virgil Brack, Jr., Scott Johnson, Scott Pruitt, Lori

Pruitt, and Andrew King. Additionally Several members of the Indiana bat recovery team are already associated with the Indiana State University Bat Research and Conservation Center, including Al Hicks, Allen Kurta, and Merlin Tuttle.

One of the major purposes of the center would be to collect information on the Indiana bat, to determine questions that might be asked about it, and to apply for grants on the species, especially large grants which could involve many of the workers on the species throughout much of its range.

#### 9. Newsletter.

We could produce a newsletter which could come out periodically or as needed to keep us up to date on developments.

### NEW COURSES ASSOCIATED WITH BAT CENTER

Courses already in place that would support the bat center are

Vertebrate Zoology  
Mammalogy  
Mammalian Ectoparasites  
Food habits analysis  
Entomology

Two new courses should probably be introduced:

#### 1. BAT BIOLOGY AND CONSERVATION.

This course would consist of lectures, laboratories, and field work and would include topics listed below. The intent would be to get students involved in the subject matter with emphasis on techniques of study.

- a. Classification
- b. Evolution
- c. Morphology
- d. Flight
- e. Echolocation
- f. Migration and Navigation
- g. Hibernation

- h. Food and Feeding
- i. Roosts
- j. Behavior
- k. Reproduction
- l. Populations
- m. Predation and mortality
- n. Parasites and Diseases
- o. Conservation

2. REGULATORY COMPLIANCE. This course will consist primarily of lectures and written exercises and will introduce students to the world of consulting and regulatory compliance.

#### A. REGULATORY COMPLIANCE

- a. Governmental regulations
- b. The role of science/biology in compliance – asking and answering the right questions
- c. The role and impact of the public

#### B. BUSINESS ACUMEN FOR BIOLOGISTS

- d. Financial, managerial, and project accounting for biologists
- e. Project management
- f. Writing technical and cost proposals
- g. Legal considerations in the business environment
- h. Expert witness testimony
- i. Economics of contract biology

- j. Documentation - regulatory requirements and public need
- k. Human resources and business etiquette
- l. Eco-business ethics
- m. Types of business organizations