

# Science at Black Hills State University

Dr. Brian E. Smith

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# Centers of Excellence

- Black Hills Herpetological Center
- Physical Sciences
- BHSU Herbarium
- Center for the Conservation of Biological Resources

# Black Hills Herpetological Center

- Dr. Brian Smith, Director
- Dr. Hugh Quinn, Adjunct Professor
- Ms. Jodi Massie, Research Associate
- Mr. Ben Blake, Research Associate

# CESU Projects

- Surveys of the reptiles and amphibians of National Parks of the northern Great Plains
- Survey of reptiles and amphibians at Devil's Tower National Monument

# Current Projects

- Genetic variation in the smooth green snake
- Surveys of historical localities of short-horned lizards
- Natural history of the prairie rattlesnake

# Expertise

- Extensive experience in herpetofaunal surveys
- Basic applied natural history research
- Wildlife management
- Conservation genetics
- GIS applications and modeling

# Physical Sciences at BHSU

- Dr. John Dixon
  - Organic chemistry
- Dr. Dan Durben
  - Physical chemistry
- Dr. Abigail Semple
  - Geology and GIS specialist
- Dr. Michael Zehfus
  - Environmental chemistry

# Recent Projects

- Determination of thiamine levels in Lake Oahe salmon and walleye
- Effect of astaxanthin and yeast supplements on post-stocking survival in salmonid fishes
- GIS mapping and modeling of lava flows in Idaho associated with the Yellowstone Hotspot

# Equipment

- Atomic absorption spectrometer
  - Monitoring metal concentrations in water
- Gas chromatography system
  - Monitoring of pesticides and herbicides in the environment
- Fully equipped GIS laboratory
- Scanning electron microscope facility

# Physical Sciences: Expertise

- Environmental chemistry
- Herbicide and pesticide research
- Fisheries and aquaculture
- Water quality assessment
- Remote sensing and GIS applications
- Hydrology

# BHSU Herbarium

- Emphasis on the northern Great Plains
  - 40,000 extant plant specimens
  - 10,000 fossil plant specimens
  - 4,000 fungal specimens
- Largest existing database on flora of western South Dakota and eastern Wyoming
- Plant identification services
- Floristic inventories

# Herbarium personnel

- Dr. Mark Gabel, Curator
- Ms. Grace Kostel, Collections Manager
- Dr. Curtis Card, Database Manager
- Dr. Audrey Gabel, mycology

# Current projects

- A web-accessible database of all vascular plants of western South Dakota and eastern Wyoming
- Annotated checklist of vascular plants of Buffalo Gap and Oglala National Grasslands

# Recent Projects

- Occurrence and diet of flying squirrels in the northern Black Hills
- Book: Mushrooms and Other Fungi of the Black Hills and Surrounding Area (Gabel and Ebbert)

# Facilities

- Recent expansion of herbarium facilities with NSF funding
- Bioinformatics
- Scanning electron microscope facility

# Center for the Conservation of Biological Resources

- Dr. Shane Sarver, Director
- Dr. Cynthia Anderson,  
Associate Director
- Dr. Garth Spellman, Research  
Professor
- Dr. Andriy Maj, postdoctoral  
researcher

# Recent CCBR Projects

- Conservation genetics of threatened and endangered species
  - The American dipper
  - Fine-scaled dace
  - Topeka shiner
- Genetic variation and conservation genetics of the smooth green snake
- *PRNP* (prion) gene sequence variation in Black Hills mountain goats and Black Hills bison

# Current Projects

- Conservation genetics of a variety of threatened and endangered species
- Genetic characterization of Great Plains avian hybrid zones
- Epidemiology of malarial parasites in North American birds
- Population genetics of invasive plant species (knotweed)
- WestCore: Core facility for wildlife forensics and DNA services

# CCBR Equipment

- Two genetic analyzers for DNA sequencing and genotyping
- Digital imaging system for analyzing genetic data
- Array scanner for microarray analysis
- Real-time PCR systems for sequence detection and gene expression analysis

# CCBR Expertise

- Wildlife forensics
- Monitoring of prions and other wildlife diseases
- Bioinformatics
- DNA sequencing and genotyping
- Spatial analysis of genetics data using GIS
- Genomics, including microarray technology

# Expertise at BHSU

- Black Hills Herpetological Center
- Physical Sciences
- Black Hills State University Herbarium
- Center for the Conservation of Biological Resources and Westcore Core Facility

# Contact Information

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