RESEARCH PROJECTS LISTS
for FY2007
INHS RESEARCH PROGRAMS

PROGRAM 1.–Science in Support of Ecosystem Management and Conservation ........................................ 4

Goal 1: Ecosystem Research ................................................................................................................... 4
Objective P1.1.1: Ecosystem Function and Community Ecology ................................................................. 4
Objective P1.1.2: Landscape Ecology ...................................................................................................... 5
Objective P1.1.3: Surveys and Monitoring ............................................................................................... 6
Objective P1.1.4: Restoration Ecology ..................................................................................................... 8
Objective P1.1.5: Biological Indicators .................................................................................................. 10
Objective P1.1.6: New Technology Development .................................................................................. 10
Objective P1.1.7: Illinois Wildlife Action Plan ...................................................................................... 10

PROGRAM 2.–Science in Support of Understanding Species-level Biodiversity and Systematics .................. 11

Goal 1: Biological Diversity ................................................................................................................... 11
Objective P2.1.1: Systematics .................................................................................................................. 11

PROGRAM 3.–Science in Support of Public and Environmental Health .................................................... 14

Goal 1: Research and Information Dissemination ..................................................................................... 14
Objective P3.1.1: Medical Entomology .................................................................................................. 14
Objective P3.1.2: Wildlife Diseases ........................................................................................................ 15
Objective P3.1.3: Effects of Environmental Degradation and Contaminants ........................................ 16

PROGRAM 4.–Science in Support of Threatened and Endangered Species ............................................... 17

Goal 1: Research and Information Dissemination ..................................................................................... 17

PROGRAM 5.–Science in Support of Invasive Species Prevention, Management and Control ...................... 19

Goal 1: Prevention (6) ............................................................................................................................. 19
Objective P5.1.1: Early Detection of Invasive Species ............................................................................. 19
Objective P5.1.2: Studies of Aquatic Barriers ....................................................................................... 19
Objective P5.1.3: Information Dissemination ....................................................................................... 20
Objective P5.1.4: Diagnostics and Prediction .......................................................................................... 20

Goal 2: Biology of Invasive Species ........................................................................................................ 20
Objective P5.2.1: Population Ecology of Invasive Species ...................................................................... 20
Objective P5.2.2: Ecological Interactions of Invasive Species .................................................................. 20
Objective P5.2.3: Risk Analysis of Exotic Species .................................................................................. 21

Goal 3: Managing Invasive Species ....................................................................................................... 21
Objective P5.3.1: Biological Control of Invasive Species ....................................................................... 21
Objective P5.3.2: Integrated Management .............................................................................................. 22

PROGRAM 6.–Science in Support of State Fish, Wildlife and Outdoor Recreational Programs .................... 22

Goal 1: Fish and Wildlife Conservation .................................................................................................. 22
Objective P6.1.1: Fisheries Science ........................................................................................................ 22
Objective P6.1.2: Wildlife Science .......................................................................................................... 22
Goal 2: Human Dimension Aspects of Fish and Wildlife Management ........................................... 23
Objective P6.2.1: Fisher and Hunter/Trapper Activities, Harvests, and Attitudes Toward
Fish and Wildlife Resources ........................................................................................................ 23
Objective P6.2.2: Creel Census of Fish ...................................................................................... 24
Objective P6.2.3: Fisheries Analysis System (FAS) .................................................................... 24

PROGRAM 7.–Science in Support of Agriculture ........................................................................ 24

Goal 1: Research and Information Dissemination .................................................................... 24
Objective P7.1.1: Agricultural Entomology ................................................................................ 24
Objective P7.1.2: Ecology and Biological Control .................................................................... 24
Objective P7.1.3: Integrated Pest Management and Insect Resistance Management .............. 25
Objective P7.1.4: Organic Farming ......................................................................................... 25
Objective P7.1.5: Pest Diagnostics and Prediction .................................................................. 25

PROGRAM 8.–Science in Support of Environmental Regulation .................................................. 25

Goal 1: Research and Monitoring ............................................................................................ 25
Objective P8.1.1: Surveys and Mitigation ................................................................................ 26

PROGRAM 9.–Science in Support of Understanding Ecology and Life Histories of
Organisms not associated with other Research Programs ....................................................... 26

Goal 1: Life History, Ecological and Behavioral Studies ........................................................... 26
Objective P9.1.1: Biological Studies .......................................................................................... 26

INHS Research Programs and Associated Number of FY08 Research Projects .................... 30
INHS Research Projects Ranked by Strategic Plan Categories FY08 ....................................... 31
INHS Research Projects Ranked by Taxa FY08 ........................................................................ 31
This document lists 452 research projects for the Survey’s FY08 Annual Report. As part of our annual evaluations, INHS scientists are asked to update their lists of current research projects. These are then categorized within the Survey’s strategic plan, i.e., under various research program areas and associated goals and objectives.

**PROGRAM 1—Science in Support of Ecosystem Management and Conservation**

Studies in this category include research projects undertaken by Survey scientists related to ecosystem effects of management strategies, restoration ecology, food web studies, development of habitat management plans, and natural resource database development. These studies help us understand the state’s natural resources and inform decisions about management strategies and the impacts of those strategies.

**Goal 1: Ecosystem Research**

Understand the roles of individual species, biotic communities, and habitats in critical ecosystem processes such as nutrient cycling and dynamics, energy flow, and other factors affecting the health and viability of complex, interconnected biological systems, and investigate how rehabilitation of degraded ecosystems can be attained to restore important functional services and wildlife habitat.

**Objective 1.1: Ecosystem Function and Community Ecology**—Conduct studies aimed at understanding how ecosystems are structured and function at broad spatial and temporal scales to provide information about the services provided by those ecosystems, and the roles of various species in those systems.

Factors Affecting Abundance and Nest Success of **Riparian Forest Songbirds** in Central Illinois

*S. Beyeler, E. Heske*

Exploring **Fish Community Dynamics** in Illinois Reservoirs

*M.P. Carey, D.H. Wahl*

Effects of **Fish Diversity** on Ecosystem Structure and Function

*M.P. Carey, D.H. Wahl*

Food Web Dynamics in **Sunfish Communities**

*M.P. Carey, K.O. Maloney, D.H. Wahl*

Status and Trends in **Illinois’ Wetlands**: An Evaluation of Wetland Resources, Wetland Change, and Selected Environmental Impacts in a Highly Agricultural Watershed

*L. Cordle, B. Wilm, J. Matthews, J. Kurylo, D. Phillip, J. Zylka*

Polyunsaturated Fatty Acids in **Aquatic Food Webs**: Their Role in Reproductive Success and Early Life History Traits of Top Predators in Lake Michigan and other Great Lakes

*S. Czesny, J. Rinchard, J. Dettmers, K. Dabrowski, D. Philipp*

Population Dynamics and Early Life History of **Several Important Fish Species** in Lake Michigan [P5.2.2]

*S. Czesny, J. Dettmers, S. Creque, M. Carter, M. Weber*

**Flats Ecosystem Ecology** and Conservation

*A. Danylchuk, S. Danylchuk, S. Cooke, T. Golberg, C. Suski, J. Koppelman, J. Claussen*

Developing a **Multi-taxon Terrestrial Index of Biological Integrity** for CSS

*J. Diffendorfer*

Effects of Fire Severity and Distance from Unburned Edge on **Mammalian Community Post-fire Recovery**

*J.E. Diffendorfer, S.R. Tremor, W.S. Spencer*

The Illinois Pilot Watershed Program: Effects of Best Management Practices on **Stream Quality**

*H.R. Dodd, J.W. Niesler, K.O. Maloney, D.H. Wahl*

Stable **Isotope Analysis** of Large River Food Webs

*B.R. Herwig, D.A. Soluk, D.H. Wahl, J.M. Dettmers*
Nutrient Recycling by the **Prosobranch Snail, Elimia clavaeformis**  
W. Hill, B. Roberts

Effects of **Phosphorus** Mediated Through **Algal Biomass** in Illinois Streams  
W. Hill, T. Smith, S. Fanta

Stable **Isotope Dynamics** in Stream Periphyton  
W. Hill, G. Middleton

**Ecological Stoichiometry in Streams**: Testing the Light Nutrient Hypothesis  
W. Hill, P. Mulholland

Evaluating Water Temperature, Habitat and Fish Communities in **Candidate Coolwater Streams in Illinois** [Programs 4, 6, 8]  
A. Holtrop, L. Hinz, J. Epifanio

Developing a Multi-metric Index for **Wadable Streams** in Illinois [Programs 4, 6, 8]  
A. Holtrop, L. Hinz, R. Fischer, J. Epifanio

Influence of Inshore Retention Habitats on Community Structure of **Zooplankton**  
A. Levcuk, J. Chick

**Objective 1.2: Landscape Ecology**—Conduct studies that relate ecological processes or functions with the shapes and spatial arrangement of habitat patches and the relative abundance of habitat types across large spatial scales.

Illinois **Gap Analysis Project**  
P. Brown, T. Tweeddale, B. Bahnsen, L. Chapa, D. Luman (Illinois State Geological Survey)

Wetland Occupancy and Connectivity Patterns of Blanding’s and Western Painted Turtles in the Green River Valley  
J. Cosentino, C. Phillips, R. Schooley

**Habitat Distribution Modeling of Mammals** Using Presence Only Data  
J. Diffendorfer

Collaborative Research: Testing for Cascading Effects of **Habitat Fragmentation**  
J.E. Diffendorfer, D.T. Bolger

**Natural Divisions of Illinois**: Enhancement of the Spatial Database  
D. Greer

Exploring **Plankton Dynamics** in Three Major Habitats of Large Floodplain Rivers  

Multiple Scales of Temporal Variability in **Ecosystem Metabolism Rates**  
B. Roberts, W. Hill, P. Mulholland

Analyses of Patterns of **Exotic and Native Plant Species** from the Critical Trends Assessment Program [P5.2.2]  
G. Spyreas, J. Diffendorfer, M. Ward

**Gerromorphan (Heteroptera) Species Assemblages Southern Illinois** [P1.1.3]  
S. Taylor, J. McPherson (Southern Illinois University, Carbondale)

Individual-based Modeling of Young-of-year **Walleye**  
D. Wahl, R. Herendeen, T. Galarowicz  
(Central Michigan University)

**Seed Rain and Seed Bank** under Isolated Trees in **Sand Prairie Grassland** [P5.2.1]  
D. Wenny

Height and Stopover Biology of **Migrating Birds**  
R. Larkin, in collaboration with Michigan chapter of The Nature Conservancy, Ohio Division of Wildlife, and The Ohio State University

Investigating Relationships between Landscape Variables and **Floodplain Forest Plant Species** Distribution along Beaucoup Creek  
J. Matthews, P. Tessene, S. Wiesbrook, B. Zercher

**Waterbirds** on Working Lands: Population Status, Trends and Landscape Correlates  
D.K. Niven, G.S. Butcher (Audobon Society) and J.R. Sauer (U.S. Geological Survey)

Influence of Larval Habitat Features in Rice Fields on **Anopheline Productivity**, Behavior, and Ecology  
R. Novak, E. Muturi, J. Shililu, J. Githure, W. Gu, B. Jacob
Estimation of Extent of Presettlement Wetlands in Illinois Based on Hydric Soil Acreage
A. Plocher

Landscape Influences on Songbird Nest Predation and Parasitism
S. Robinson (University of Florida), E. Heske, J. Brawn (UIUC)

Objective 1.3: Surveys and Monitoring—Conduct short-term and long-term enumeration of biotic communities (including representative species abundances, ecological relationships with habitats, spatial and temporal shifts, mapping, etc.) for assessing their status and trends.

Aquatic Systems

US EPA Environmental Management Program
Great River EMAP—Laboratory and Statistical Long Term Resource Monitoring Program—
Upper Mississippi River Pool 26
J. Chick, E. Ratcliffe, L. Gittinger, E. Gittinger, B. Lubinski, R. Cosgriff

US EPA Environmental Management Program
Great Rivers EMAP Monitoring

Long-term Resource Monitoring of the La Grange Reach, Illinois River

Ten Mile Creek Watershed Assessment

Fishes

Long-term Electrofishing Survey of the Illinois River
M.A. McClelland, G.G. Sass, T.R. Cook

Long-term Monitoring of the Fish and Aquatic Vegetation Communities of the Emiquon Preserve
G.G. Sass, N.N. Michaels

Botany


Green Infrastructure in Illinois: A Landscape-level Analysis of Natural Resources
D. Szafoni

GIS Mapping of IDNR Owned, Managed, and Leased Properties (OMLP)
T. Tweddale, J. Jarvis, D. Greer, C. Hickman


Baseline Vegetation Study of a Prairie Grove in Champaign County
J. Ebinger, R. Larimore, J. Taft

Las Cruces Flora Project, San Vito, Costa Rica

Inventory of Prairie Plants on 325 Illinois Prairie Remnants
W. Handel

The Vascular Flora of Middle Fork Woods Nature Preserve, Vermilion County, Illinois*
R. Larimore, R. Phillippe, J. Ebinger

Floristic Inventory of Funks Grove Illinois Natural Inventory Sites including Funks Grove Nature Preserve, Thaddeus Stubblefield Grove Nature Preserve, and Stubblefield Woods Nature Preserve
P. Marcum, D. Busemeyer, R. Larimore, L. Phillippe

Vegetation of Natural Plant Communities of the Kankakee Sand Area, Illinois
P. Marcum, J. Ebinger, L.R. Phillippe, J. Wilder

Floristic Inventory of Forbes State Park, Illinois
P. Marcum, D. Ketzner, L.R. Phillippe

Vascular Flora and Plant Community Survey of Gooseberry Island Nature Preserve, Kankakee County, Illinois
P. Marcum, L.R. Phillippe, D.T. Busemeyer, J.E. Ebinger
Floristic inventory of The Tensleep Preserve, Ten Sleep Wyoming (TNC)
P.M. Marcum, L.R. Phillippe, R.L. Larimore

Vascular Flora of Bonnie’s Prairie Nature Preserve, Iroquois County, Illinois
M. Murphy, L.R. Phillippe, J. Ebinger

Vascular Flora of Spring Bay Fen Nature Preserve, Woodford County, Illinois
M. Murphy, L.R. Phillippe, J. Ebinger

Early stages of plant succession at the Green River State Wildlife Area
R. Phillippe, J. Ebinger

Botanical Survey of Sand Ridge State Forest, Mason County, IL
L.R. Phillippe, M.A. Feist, P.B. Marcum, D.T. Busemeyer

Vegetation Survey of the Emiquon National Wildlife Refuge, Fulton County, Illinois
R. Phillippe, D. Busemeyer, P. Marcum, J. Ellis, M.A. Feist

Floristic Inventory of Grant Creek Natural Area, Blodgett Road Dolomite Prairie, and the Midewin National Tallgrass Prairie South Patrol Road Restoration
L.R. Phillippe, B. Molano-Flores, C. Carroll-Cunningham, J. Ellis, D.T. Busemeyer, P.B. Marcum, J.E. Ebinger

Floristic Inventories and Vegetation Surveys at Midewin National Tallgrass Prairie
L. Phillippe, B. Molano-Flores, C. Carroll-Cunningham, J. Ellis, D. Busemeyer, P. Marcum, J. Ebinger

Vegetation of Isolated Sand Deposits along the Illinois River
L. Phillippe, B. Molano-Flores, M. Murphy, J. Ebinger

K. Robertson

Evaluation of Compositional Trends and Edge Effects on Vegetation in Small Prairie Preserves
J. Taft

Functional Group Density, a Proposed New Rapid Assessment Method for Vegetation Monitoring
J.B. Taft, C. Hauser (Kane County Forest Preserves District)

Evaluation of the Accuracy of National Wetlands Inventory Maps in the Upper Sangamon River Watershed
B. Wilm, J. Matthews, D. Szafoni, and L. Cordle

Seed Bank Composition of Different Habitat Types
J. Zylka, B. Molano-Flores, C. Whelan

Annelids

The Aquatic Oligochaetes (Annelida, Clitellata) of the Great Smoky Mountains National Park, North Carolina and Tennessee
M. Wetzel, P. Morgan (Florida Department of Environmental Protection)

The Aquatic Oligochaetes (Annelida, Clitellata) of the Colorado River and its Tributaries, Grand Canyon National Park, Arizona [P8.1.1]
M. Wetzel, J. Shannon (Northern Arizona University), P. Morgan (Florida Department of Environmental Protection)

Fungi

A Survey of Wood-inhabiting Pyrenomycetes of the Great Smoky Mountains National Park
A. Miller

A Survey of Coprophilous Fungi of the Great Smoky Mountains National Park
A. Miller, V. Hustad (Eastern Illinois University)

Mollusks

Freshwater Mussel (Bivalvia: Unionidae)
Survey of the Galena River Basin in Wisconsin and Illinois
J. Tiemann

Freshwater Mussel (Bivalvia: Unionidae)
Survey of the Kishwaukee River Basin in Illinois
J. Tiemann, K. Cummings

Freshwater Mussel (Bivalvia: Unionidae)
Survey of the Little Wabash River Basin in Illinois
J. Tiemann, K. Cummings, C. Mayer
**Entomology**

**Terrestrial Arthropod Survey of Fiji** [part of NSF Biodiversity Surveys & Inventories Program]

**Aquatic Invertebrates**

Biological Inventory and Monitoring Protocol for
**Caves in Great Basin National Park, Nevada**
S. Taylor, J. Krejca (Zara Environmental, Buda, TX)

A Biological Survey of **Caves** at Fort Leonard Wood, Missouri
S. Taylor, M. Slay (Ozark Highlands Office, The Nature Conservancy), S. Ahler (Univeristy of Kentucky)

**Springs of Illinois**: Their Biota, Water Quality, and Hydrology [P1.1.3]

**Birds**

**Breeding Bird Survey** of IDNR’s Newly Acquired Dynegy Midwest Generation Property in Vermilion County
S. Amundsen

Integrating the **Christmas Bird Count** into North American Bird Conservation: A Hierarchical Modeling Method for Regional Analysis of Population Change for Species and Groups of Species
D. Niven

**Fishes**

Effects of **Dam Removal** on Fish Passage, Movements, and Habitat Utilization
S.E. Butler, H.R. Dodd, V.J. Santucci, Jr., D.H. Wahl

Evaluation of a **Dam Removal** on the Fox River
K.O. Maloney, S.E. Butler, D.H. Wahl

Using **Continental Birds Survey Data** to Assess Changes in the Distribution of the Birds of North America over the Past 40 Years: the Possible Affects of Climate Change
D. Niven

The Effects of **Hydrologic Restoration** on a Bottomland Forest Bird Community
J. Hoover

**100-year Statewide Bird Survey**
M. Ward, J. Walk (TNC), S. Bailey, J. Brawn (UIUC)

Winter **Bald Eagle** Surveys in Northwestern Illinois, 1961–2007
D. Wenny, J. Bergstrom, L. O’Neal (volunteers)

**Other Vertebrates**

**Marsh Rice Rat Monitoring** at a Wetland Mitigation Site in Franklin County
J. Hofmann, J. Merritt, J. Mengelecho

**Bat Survey** of Northeastern Illinois
J. Hofmann, J. Merritt, J. Mengelecho, S. Carpenter

**Misc. Survey/Monitoring Projects**

Developing a Comprehensive Plan for Regional Monitoring in the **Chicago Wilderness Region**
G. Levin

Critical Trends Assessment Program (CTAP)
M. Ward, CTAP Staff

Biological Resources of **Lost Mound** and Adjacent Areas [P4.1.1]
D. Wenny, R. Nyboer, E. Anderson (IDNR)

Establishment of Historic Fish Communities to **Restored Illinois River Floodplain Lakes**
M. Retzer

**Backwater Lakes**

**Swan Lake** Habitat Rehabilitation and Enhancement Project Evaluation
J. Chick, C. Dolan, T. Timmerman, J. Lamer

Objective 1.4: **Restoration Ecology**—Conduct studies related to returning damaged ecosystems to conditions that are similar in content, structure, and function to their undamaged state.
Influence of Herbivores and Abiotic Conditions on Re-establishment of Aquatic Vegetation
C. Dolan, J. Lamer, J. Chick

Prescribed Fires

How Prescribed Fire and Mechanical Clearing Affect the Plants, Insects and Birds in Two Oak-hickory Forests in Central Illinois
C.H. Dietrich, R.L. Larimore, J.D. Brawn, J.E. Ebinger

Vegetational Changes in Dry-mesic Upland Forest after Controlled Burning in the Mississippi Palisades State Park, Carroll County, Illinois
W. Handel, S. Neuendorf

Response of Asimina triloba (L.) Dunal (Annonaceae) to Prescribed Fire in a Central Illinois Woodland
R.L. Larimore, J.E. Ebinger

Fire Effects in Oak Woodlands at Beaver Dam State Park
J. Taft

Fire Effects in a Stable, Low-diversity Flatwoods on the Illinoisan Till Plain
J. Taft

Effects of Fire and Leaf-litter Removal on a Population of Collinsia violacea (Scrophulariaceae)
J. Taft, E. Smith (IDNR)

How Prescribed Fire Affects Vascular Plants in a Central Illinois Prairie Grove, Royal, Illinois
J. Taft, R. Larimore, J. Ebinger

Effects of Prescribed Burns on Sand Prairie Seed Banks [P9.1.1]
D. Wenny

University), K. Robertson

The Effects of Soil Impoverishment on the Growth and Reproduction of an Annual Prairie Plant
H. Mlynarski (UIUC), B. Molano-Flores

Prairie Seed Banks at Midewin National Tallgrass Prairie: A Key to its Restoration
B. Molano-Flores, C. Whelan

What is the Impact of De-awning Aristida tuberculosa on Seed Burial and Germination?
K. Patel (UIUC), B. Molano-Flores

Prairie Restoration at Midewin: a Long-term, Multidisciplinary Study
C. Whelan, J. Brown (UC), E. Heske

Prairie Restoration as a Sink for Carbon Sequestration
C. Whelan, M. Gonzalez-Meler (UC), B. Molano-Flores (INHS)

Wetlands

Assessment of Restoration Success and Plant Community Development in Compensatory Mitigation Wetlands [P8.1.1]
J. Matthews

Soil Microbial Community Composition and Denitrification Rates in Restored and Created Wetlands
A. Kent (University of Illinois), A. Peralta (University of Illinois), D. Flanagan (University of Illinois), J. Matthews

Plant Community Development in Created Wetlands in Four Natural Divisions in Illinois
A. Plocher

Historical and Contemporary Characteristics of Illinois River Valley Wetlands: A Geospatial Database for Conservation Planning and Evaluation
J. Stafford, A. Yetter

Floodplain Forests

Regeneration of UMRS Floodplain Forests
R. Cosgriff, J. Chick

Botany

Illinois River Sediment Seed Bank Research and Potential Implications for Illinois River and Gulf Coast Restoration Projects
M. Murphy, J. Marlin (WMRC)

Prairies

J. Coons, N. Coutant, B. Todd (Eastern Illinois
Objective 1.5: Biological Indicators.—Conduct studies of the distributions and functions of species that are indicators for the condition of their ecosystems

Development of Zooplankton Indicators for Large-floodplain Rivers
J. Chick, L. Gittinger

R.E. DeWalt

Changes in Aquatic Insect Taxonomic Richness and Habitat Quality using the Critical Trends Assessment Program Protocols
R.E. DeWalt

The Development of Composite Indicators of Bird Population Status for North America Using Hierarchical Modeling Methods
D. Niven

Evaluation of Leafhoppers and Their Relatives (Hemiptera: Homoptera: Auchenorrhyncha) as Indicators of Habitat Quality in Midwestern Tallgrass Prairies
A.M. Wallner, B. Molano-Flores, C. Dietrich

Objective 1.6: New Technology Development.—Develop and apply the latest technology to wildlife and other natural resource conservation issues, including new technologies for gathering data, radar and radio tracking of animals, and remote sensing.

Development of an Automated Telemetry and Biocoustic System to Investigate the Movement and Behaviors of Wild Birds
D. Enstrom, M. Ward

Trap Monitor for Wildlife in Advanced Development
R. Larkin, R. Sabick (Innotect Communications), B. Kamen

Target Recognition on Radar by Wing Beats
R. Larkin, S. Franke (UIUC)


Historical Occurrence and Present Status of Illinois Insect Species in Greatest Need of Conservation
C. Dietrich [P1.1.3. P4.1]

Illinois Natural Areas Inventory Update
D. Thomas, G. Levin, R. Nybor, D. Szafoni, T. Tweddale

Development and Expansion of the Natural Resources Data and Information Systems in Support of the Illinois Comprehensive Wildlife Conservation Plan [Programs 1, 2, 4, 5, 6, 8, 9]

Interrelationships of Grassland Birds and Sand Prairie Plants and Insects [P1.1.1]
D. Wenny, D. Elbert (UIUC)
PROGRAM 2—Science in Support of Understanding Biodiversity and Systematics

Studies in this program are aimed at understanding biological diversity at the species level, including the evolutionary relationships, distribution, and identification of the full range of organisms that are relevant to Illinois biota and other areas.

Goal 1: Biological Diversity
Provide information on species-level diversity and evolutionary relationships of organisms.

Objective 1.1: Systematics—Conduct studies on the taxonomy, classification, distribution, and evolutionary biology of plants, animals, fungi, and microorganisms of relevance to Illinois and other geographical areas. Provide tools that facilitate the identification of species and access to information on species distributions and ecological associations. Provide revised classifications that reflect phylogenetic relationships among taxa and facilitate research on the historical processes that have driven species diversification.

Botany

Botanical Nomenclature—The Nomenclatural History of Sanctioned Names
L. Crane

Systematic Analysis of the Genera Oxypolis and Ptilimnium (Apiaceae) and Closely Related Genera
M.A. Feist

Phylogeographic Study of Oxypolis occidentalis (Western Cowbane) in the Pacific Northwest, USA and Western Canada
M.A. Feist

The Phylogeography of the Ephedra saxatilis Complex within the Qinghai-Tibetan Plateau in Southwest China
M.A. Feist, X. Wang, X. Wei (Institute of Botany in Beijing, China)

Studies on the Malvaceae [the Cotton Family] in Illinois—Species Status, Taxonomy, Distribution
S.R. Hill

Treatments for the Flora of North America Project of the Following Genera of Malvaceae: Alcea, Althaea, Malva, Malvastrum, Sidalcea, Urena
S.R. Hill

Studies on the Origin and Evolution of the Australian Species of Malvastrum
[S]Malvaceae
S.R. Hill, R. Small (Univ. Tennessee), L. Craven (CSIRO—Canberra)

Systematics of Putranjivaceae
G. Levin

Systematics and Phylogeny of Acalypha (Euphorbiaceae)
G. Levin, V. Steinmann (Instituto de Ecologia, Mexico), V. Sagun

Sanicula (Apiaceae) in Illinois
R. Phillippe, D.T. Busemeyer, JE. Ebinger

Amaranthaceae and Parts of Rosaceae for Flora of the San Juan River Basin (Four Corners Region)
K. Robertson

Phylogeny and classification of Rosaceae

x Rhaphiobotrya, A New Intergeneric Hybrid in Rosaceae and the Identity of Coppertone Loquat
A.J. Coombes, K. Robertson, D. Potter, S. Still

Systematic Studies of Jacquemontia (Convolvulaceae)
K. Robertson

Continued Development of “Digital Flowers,” Courseware for Plant Systematics Courses
K. Robertson

Systematics of Pseudocymopteris (Apiaceae)
F. Sun, G. Levin, S. Downie

Fungi

An Index to the Authors and Literature Cited by E.M. Fries in the Sanctioning Books for Fungi, Systema Mycologicum, Published 1821–1832, and Elenchus Fungorum, Published 1828
L. Crane
Phylogenetics and Systematics of the Sordariomycetes
A. Miller, S. Huhndorf (Field Museum, Chicago)

Mushrooms of Illinois
A. Miller, A. Methven (Eastern Illinois University), W. Sundburg (Southern Illinois University, Carbondale)

Phylogenetic Studies in the Chaetomiaceae
A. Miller, A. Stchigel (Universitat Rovira i Virgili, Reus, Spain)

Annelids
Taxonomy, Systematics, and Ecology of Aquatic Oligochaeta and Branchiobdellidae (Annelida, Clitellata) of North America
M. Wetzel, S. Fend (USGS), K. Coates (Department of Conservation Services, Bermuda), R. Kathman (Tennessee Department of Transportation), S. Gelder (University of Maine-Presque Isle)

Nomenclatura Oligochaetologica – Supplementum Quartum: A Catalogue of Names, Descriptions, and Type Specimens of the Oligochaeta
M. Wetzel, J. Reynolds (Oligochaetology Laboratory, Kitchener, Ontario)

Terrestrial Oligochaeta (Annelida, Clitellata) in North America, including Mexico, Puerto Rico, Hawaii, and Bermuda
M. Wetzel, J. Reynolds (Oligochaetology Laboratory, Kitchener, Ontario)

Mollusks
K. Cummings

Maintenance and Enhancement of the Illinois Mussel Database
R. DeWalt, K. Cummings

Systematic Revision of the Etherioidea, the Freshwater Mussels (Mollusca: Unionoida) of the Gondwanan Continents
D. Graf (Academy of Natural Sciences, Philadelphia), K. Cummings

Crustaceans
Development of an Alabama Crayfish Database
C. Taylor, G. Schuster (Eastern Kentucky University)

Entomology
Systematics, Bioacoustics and Ecology of Tettigoniidae from Ecuador
H. Braun, G.K. Morris (University of Toronto at Mississauga)

Key to Orthoptera of Illinois [P5.1.4]
H. Braun, L. Deem, D. Eades

A Taxonomic Revision and Phylogenetic Analysis of Tydides Stål (Hemiptera: Reduviidae: Peiratinae)
W. Cai (China Agricultural University, Beijing, China), S. Taylor

Lentireduvius, a New Genus of Peiratinae (Hemiptera: Reduviidae) from Brazil
W. Cai (China Agricultural University, Beijing, China), S. Taylor

Testing the Utility of Mitochondrial Genome Rearrangements as Phylogenetic Markers in Ischnocera (Insecta: Phthiraptera)
S. Cameron (Brigham Young University), K. Johnson, M. Whiting (Brigham Young University)

Stoneflies of Ohio
R.E. DeWalt, R.W. Baumann (Brigham Young University)

Building a North American Plecoptera Specimen Database

Conservation Status of Stoneflies (Plecoptera) in the Till and Drift Plains of the Middle Midwest, USA and Canada
R.E. DeWalt, D.W. Webb, S.A. Grubbs (Western Kentucky U)

Post-glacial Dispersion of Stoneflies from Appalachian Refuge to Midwest
R.E. DeWalt, Xin Zhou (U. Guelph, Ontario, Can.), J. Heilveil (SUNY-Oneida)

Phylogeny and Biogeography of the Leafhopper Subfamily Deltocephalinae (Insecta: Hemiptera) [P5.1.4, P7.1.5]
C. Dietrich, D. Dmitriev
Revisionary Synthesis of the Holarctic Leafhopper Genus *Erythroneura* Fitch (Insecta: Hemiptera: Cicadellidae) [P5.1.4, P7.1.5]
C. Dietrich, D. Dmitriev

Revisionary Synthesis of the Leafhopper Tribe *Empoascini* (Insecta: Hemiptera: Cicadellidae) [P5.1.4, P7.1.5]
C. Dietrich, D. Dmitriev

**Orthoptera Species File** (http://orthoptera.speciesfile.org)
D. Eades, H. Braun, L. Deem, M. Maehr, M. Beckman, R. Flood

**Phasmda Species File** (http://phasmida.speciesfile.org)
D. Eades, P. Brock (Natural History Museum, London)

**Blattodea Species File** (http://blattodea.speciesfile.org)
D. Eades, G. Beccaloni (Natural History Museum, London)

**Coreidae Species File** (http://coreidae.speciesfile.org)
D. Eades, M. Webb (Natural History Museum, London)

**Polyneoptera Species File** (http://polyneoptera.speciesfile.org)
D. Eades, M. Maehr

**Hymenopteran** Biodiversity Informatics
C. Favret

The Cinara Aphids of North America
C. Favret, D. Voegtlin

The Mindarus Aphids of North America
C. Favret, D. Voegtlin

**Therioidea** for the Manual of Central American Diptera
S. Gaimari (California Department of Food and Agriculture), D. Webb

Towards a World Monograph of the Therioidea (Insecta: Diptera) [part of NSF PEET project]
M. Irwin, B. Wiegmann (North Carolina State University), D. Yeates (CSIRO, Canberra), G. Kampmeier

Ectoparasites of Birds of Illinois
K. Johnson

The Evolution of Microhabitat Specialization in Avian Ischnocera
K. Johnson

Taxonomy and Systematics of Goniodidae
K. Johnson

The Population Genetics of Host Specificity: Waterfowl Lice
K. Johnson

Population Genetics of Sexual Populations of the Bark Louse, *Echmepteryx hageni* in Illinois
K. Johnson

Coevolutionary History of Pigeons and Doves and Their Lice
K. Johnson, D. Clayton (University of Utah)

Co-phylogeography of Ducks and Lice
K. Johnson, K. McCracken (University of Alaska, Fairbanks)

The Origin of Parasitism in Psocodea
K. Johnson, K. Yoshizawa (Hokkaido University)

Revision of New World Bee Genus *Evylaeus* (Apoidea: Halictidae)
R. McGinley

Evolution of Oviposition Behavior and Associated Structural and Physiological Traits in the Leafhopper Genus *Cuerna* [P5.1.4, P7.1.5]
R. Rakitov, C. Dietrich

Phylogeny of the Leafhopper Subfamily Cicadellinae (Insecta: Hemiptera: Cicadellidae) [P5.1.4, P7.1.5]
R. Rakitov, C. Dietrich

Supertrees and Low Taxon Overlap: Generation of a Stiletto Fly Phylogeny (Diptera: Therioidea)
C. Lambkin, J. Trueman, D. Yeates, H. Hill (all CSIRO, Australia); D. Webb, M. Metz, K. Holston (Swedish Museum of Natural History); M. Hauser (California Department of Food and Agriculture); L. Yang, B. Wiegmann (both North Carolina State University); M. Irwin (UIUC); J. Skevington (Canadian National Collection, Ontario)

State Records and Confirmations of Aradidae (Hemiptera: Heteroptera) from Louisiana, U.S.A
S. Taylor, S. Gil (Louisiana State University)
The **Gerromorpha (Heteroptera)** of Illinois: Distribution, Keys, and Species Accounts  
*S. Taylor, J. McPherson* (Southern Illinois University, Carbondale)

**Aquatic True Bugs** (Heteroptera: Nepomorpha) of Illinois  
*P.P. Tinerella, S. Taylor*

**Aquatic Beetles** (Coleoptera) of Illinois  
*P.P. Tinerella*

**Aquatic True Bugs** (Heteroptera: Gerromorpha, Nepomorpha, and Leptopodomorpha) of the Great Plains, North America  
*P.P. Tinerella*

Phylogenetics of the **Water Boatmen** (Heteroptera: Corixoidea): a Synthesis of Morphology and Molecules  

**Aquatic Beetles** (Coleoptera) of North Dakota  
*P.P. Tinerella, R.D. Gordon* (retired, USNM)

Systematics and Biogeography of the **Pygmy Backswimmers** (Heteroptera: Pleidae) and **Backswimmers** (Heteroptera: Notonectidae)  
*P.P. Tinerella, T. Weir* (Australian National Insect Collection, CSIRO, Canberra, AU)

The Water Bugs of Canada and Alaska  
(Heteroptera: Gerromorpha, Nepomorpha, and Leptopodomorpha)  
P.P. Tinerella, G.G.E. Scudder (U. of British Columbia, Vancouver, CA)

The **Chrysoptilus (Diptera: Rhagionidae)** of Fiji  
*D. Webb*

**Mecoptera** of Ontario  
*D. Webb, D. Cheung, S. Marshall* (both University of Guelph, Ontario)

Pupae and Adults of **Aquatic Diptera** for an Introduction to the Aquatic Insects of North America  
*D. Webb, R. Merritt* (Michigan State University)

Revisionary and Phylogenetic Studies of New World **Therevidae (Diptera)**  
*D. Webb, M. Metz*

**ATOL: Building the Dipteran Tree**: Cooperative Research in Phylogenetics and Bioinformatics of True Flies (Insecta: Diptera)  

**Vertebrates**

Taxonomy of the **Black Bass Genus Micropterus**  
*B. Barthel, J. Claussen, T. Kassler, T. Near, W. Porak, D. Philipp*

Phylogenetic Studies of **Pigeons and Doves** of the World  
*K. Johnson*

Taxonomy of **Leporinus** (Anostomidae)  
*M. Retzer*

Taxonomy of the **Auchenoglanidinae Catfishes**  
*M. Retzer*

Taxonomy of the **Farlowella Catfishes**  
*M. Retzer*

Development of a Distributed Information Network of **North American Herpetological Databases** (HerpNET)  
*L. Trueb* (University of Kansas), *D. Wake* (University of California), *C. Phillips*

**Misc.**

*S.R. Hill*

Exploiting Information Technology to Uncover **Patterns in Complex Systems**  
*G.E. Kampmeier, M.E Irwin*
PROGRAM 3.–Science in Support of Public and Environmental Health

Studies in this program include ecotoxicology studies, diseases of fish and wildlife, West Nile virus and other arthropod borne diseases, contaminant transfer through the food chain, and water and air quality impacts on ecosystems.

Goal P3.1: Research and Information Dissemination
Provide surveillance, intervention and management strategies, and information that support public and environmental health.

Objective P3.1.1: Medical Entomology
Conduct studies of the biology and management of insects, invertebrates, and associated pathogens that affect the health and well-being of humans, wildlife, and other animals in natural and urban ecosystems.

Patterns in the Landscape and Meteorological Conditions that Promote Pathogen Transmission by Mosquitoes [P1.1.2]
B. Jacob, J. Funes, E. Camaano, R. Lampman, R. Novak

Determination of Vector Feeding Patterns by Mosquito Bloodmeal Analysis and Seroprevalence
N. Krasavin, T. Beveroth, M. Ward, R. Lampman, O. Sanogo, R. Novak

West Nile Virus Diagnostics in Mosquitoes and Wild Birds in Illinois
N. Krasavin, R. Lampman, T. Beveroth, M. Ward, R. Novak

The Influence of Climate and Landscape on Transmission of West Nile Virus in Cook County [P1.1.2]
R. Lampman, K. Kunkel, R. Novak

Experimental Encephalitis Prevention in Champaign, Urbana, and Savoy by Source Reduction, Microbial Larvicides, and Surveillance
R. Lampman, N. Krasavin, J. Morris, G. Ballmes, R. Novak

Vector ecology of West Nile Virus and St Louis Encephalitis Virus in Illinois
R. Lampman, M. Ward, R. Novak

Objective P3.1.2: Wildlife Diseases
Conduct epidemiological studies of diseases in wildlife populations at the interface of human, livestock, and wildlife health. This includes studies of the frequency, distribution, mode of transmission, and maintenance of infectious organisms and determinants of health and disease.

A Cohort Field Study to Determine the Risk Factors Associated with the Natural Transmission Cycle of Ribeiroia ondatrae within Snail and Tadpole Populations
R. Cole (USGS Wildlife Health Center, WI), A. Schotthoefer, A. Plocher, N.E. Mateus-Pinilla

Objective P3.1.2: Wildlife Diseases
Conduct epidemiological studies of diseases in wildlife populations at the interface of human, livestock, and wildlife health. This includes studies of the frequency, distribution, mode of transmission, and maintenance of infectious organisms and determinants of health and disease.

Distribution of Tick Abundance and as a Risk Factor for Disease Transmission to Humans in Illinois
N. Mateus-Pinilla, R. Warner

Habitat Distribution of Ixodes scapularis and Assessment of the Presence or Absence of Borrelia burgdorferi in Robert Allerton Park [P3.1.2]
N. Mateus-Pinilla, R. Warner

Comparative Genomics of West Nile Virus Strains [P5.1.4]
O. Sanogo, C. Kim, R. Novak

Molecular Identification of Culex Species [P5.1.4]
O. Sanogo, C. Kim, N. Krasavin, R. Novak

Population Trends of Avian Species in Areas of West Nile Virus Transmission [P1.1.3]
M. Ward, D. Enstrom, T. Beveroth, R. Novak

The Roosting Behavior of Avian Reservoir and Amplification Hosts for West Nile Virus
M. Ward, R. Lampman, T. Beveroth, R. Novak

Contamination of Environmental Surfaces with West Nile Virus from Birds
M. Ward, R. Lampman, O. Sanogo, N. Krasavin, T. Beveroth, R. Novak

Incidence of Rabies in Illinois Bats
J. Hofmann, C. Austin (Illinois Department of Public Health)

Incidence of West Nile Virus in Gray Squirrels
R. Kunkel (UIUC), N.E. Mateus-Pinilla, E.J. Heske, R. Novak
Causes and Policy Implications of **Amphibian Declines** [P1.1.1]
K. Lips, J. Mendelson, J. Diffendorfer

Wildlife and **Chronic Wasting Disease** Surveillance
N.E. Mateus-Pinilla, J. Diffendorfer, J. Andrews, M. Kinsel, M. Pinkerton, J. Killefer and J. Novakofski (UIUC)

Distribution of **Chytrid Fungus Infections among Amphibian Species** in Illinois Wetlands
N. Mateus-Pinilla, A. Plocher, A. Schotthoefer

Prevalence and Distribution **Chronic Wasting Disease in Illinois White Tailed Deer**, between 2002 and 2005
N. Mateus-Pinilla, J. Novakofski, J. Diffendorfer, J. Killefer, P. Shelton, T. Beissel

**Patterns of CWD Prevalence** Based on Immunohistochemistry in Retropharyngeal Lymph Nodes and Obex
N. Mateus-Pinilla, J. Novakofski, J. Diffendorfer, J. Killefer, P. Shelton

**Vertical Transmission of CWD**
N. Mateus-Pinilla, J. Novakofski, J. Diffendorfer, J. Killefer, P. Shelton, T. Beissel

**White Tailed Deer as Biomonitors** in the Allerton Park Region
N. Mateus-Pinilla, R. Warner

Home Range, Microhabitat Use and Behavioral Patterns of **Free Ranging Cats in Illinois** [P1.1.5]
N. Mateus-Pinilla, R. Warner

**Toxoplasma gondii** Infection in **Medium Size Mammals** at Robert Allerton Park and Home Range of **Free Ranging Cats in Illinois** [P1.1.5]
N. Mateus-Pinilla, R. Warner

**West Nile Virus in Illinois Owls** between 2003 and 2006: Clinical, Diagnostic, and Necropsy Findings
N. Mateus-Pinilla, J. Whittington, M. Pinkerton

**Screening Prairie Birds for Blood Parasites Using PCR Amplification**
B. Swanson, J. Bouzat, J. Ross (BGSU), D. Wenny

---

**Objective**P3.1.3: **Effects of Environmental Degradation and Contaminants**.—Conduct studies on plants and wildlife in degraded and contaminated habitats (e.g., Lake Calumet) to assess the consequences of anthropogenic chemical and physical stressors on native aquatic and terrestrial organisms, communities, and ecosystems, including food-chain effects of various contaminants in the environment.

---

**Aquatic Invertebrates**

Bioenergetic **Effects of Sodium Sulfate** on Freshwater Invertebrates
D. Soucek

Toxicological **Effects of Smokes and Obscurants** on Aquatic Threatened and Endangered Species.
D. Soucek

**Mollusks**

Patterns of Contaminant Exposure in **Unionid Mussels** from the Mississippi/Illionis Rivers Confluence Area [P1.1.5]
J. Levengood, D. Soucek

Effects of Water Quality on Acute and Chronic **Toxicity of Sulfate to Freshwater Bivalves**, Ceriodaphnia dubia, and *Hyalella azteca*
D. Soucek

**Amphibians and Reptiles**

Effects of Terrestrial Habitat Degradation on the Health and Conservation of the **Painted Turtle** (*Chrysemys picta*) and the **Slider** (*Trachemys scripta*)
A. Readel, C. Phillips

**Fishes**

A Comparative Investigation of Contaminants in **Fishes from the Calumet Region** of Chicago [P6.1.1]
J. Levengood, in collaboration with WMRC, City of Chicago, IDNR

**Birds**

**Risks to Insectivorous Birds** in the Calumet Region from Transfer of Contaminants from Sediments to Emergent Aquatic Insects [P1.1.5, P6.1.2]
D. Soucek, J. Levengood, W. Hill, S. Gallo, J. Talbott, G. Bordson
Population Dynamics of **Common Tern**: Investigating the Biological Pathway of PCBs from **Zebra Mussels** to Common Terns
*M. Ward, C. Jablonski (UIUC)*

---

**Misc.**

**Isoflavones** in the Environment
*J. Levengood, T. Chow (Waste Management Research Center WMRC)*

**Historic Trends in Mercury Deposition in Illinois** [P1.1.5]
*J. Levengood, D. Soucek, D. Thomas, M. Piwoni (WMRC), and in collaboration with ISWS*

---

**PROGRAM 4. – Science in Support of Threatened and Endangered Species**

This program includes studies on the basic biology and ecology of threatened or endangered species with the intent to provide data for proper conservation management.

**Goal 1: Research and Information Dissemination**

Conduct studies of species with official designation as threatened or endangered and their habitats, or species considered to be candidates for these designations.

**Botany**

Reproductive Biology and Genetic Diversity of **Rudbeckia sullivantii**
*L. Elrick (UIUC), B. Molano-Flores, J. Koontz*

Search for **New and Rare Vascular Plants and Lichens** for the All Taxa Biodiversity Inventory — Great Smoky Mountains National Park
*M.A. Feist, P. Marcum, R. Phillippe, D. Busemeyer, C. Carroll, D. Ketzner, G. Spyreas, R. Larimore*

**Sensitive Plant Species Conservation Reports** for the U.S.D.A. Forest Service
*S.R. Hill*

Population Dynamics in Relation to Artificial Site Disturbance in a Restored Population of the **Federally Threatened Boltonia decurrens** in Illinois
*D. Ketzner, P. Marcum, A. Plocher*

An Investigation of Hybridization between the **Threatened Solidago sciaphila** (Cliff Goldenrod) and the **Common Solidago hispida** (Hairy Goldenrod)
*J. Koontz, W. Handel*

---

**Treating Sewage**: Technology, Science, Labor, and Law in an Industrial Ecosystem
*D. Schneider*

Process Control as Ecosystem Management: Using the History of **Sewage Treatment Plants** to Analyze Ecosystem Management Practices
*D. Schneider*

**Seed Germination of Agalinis auriculata** (False-eared Foxglove (Orobanchaceae))
*B. Molano-Flores, J. Koontz, M.A. Feist*

**Database Development** of all Endangered, Threatened and Extirpated Vascular Plant Species of Illinois
*M. Murphy, L.R. Phillippe, J. Ebinger*

**Development of Endangered and Threatened Vascular Plant Species Herbarium Database** [P1.1.7]
*L. R. Phillippe, J. Ebinger, M. Murphy, B. Molano-Flores, C. Allsup*

Development of a Recovery Strategy for **Endangered Plant Species** through Habitat Recovery, Preservation, and Management
*L. Phillippe, B. Molano-Flores, M. Murphy, J. Ebinger*

Vegetation Assessment for **Endangered Species** and Natural Areas in IDOT Road Construction [P8.1.1]
*C. Phillips, J. Taft, Biotic Surveys Staff*
Genetic Diversity and Cross-compatibility in the Widespread *Amorpha fruticosa* and Its Rare Congener *Amorpha nitens*
J. Taft, A.L. Edwards

**Mollusks**

Distribution of *Pleurocerids in Illinois* [P1.1.3]
J. Tiemann, K. Cummings

Status of *Darters* in Two Wabash River Tributaries in Illinois, and its Implications on Three Listed Freshwater Mussels [P1.1.3]
J. Tiemann, R. Szafoni

**Crustaceans**

Conservation Status Review of *North American Crayfishes*
C. Taylor

**Entomology**

Conservation Genetics of *Acroneuria frisoni (Plecoptera: Perlidae)* of the Midwest, USA
R. DeWalt, J. Heilveil (North Dakota State University)

Extinctions, Range Losses, and Conservation Status of *Stonies* of the Till and Drift Plains of the Middle Midwest, USA
R. DeWalt, D. Webb, S. Grubbs (Western Kentucky University)

Conservation Status of *Acroneuria (Perlidae)* Stonies in Illinois
L. Fennema, R.E. DeWalt, T. Tweddale

Phylogeography of Cave Crickets (*Ceuthophilus spp.*) in Central Texas: A Keystone Taxon for the Conservation and Management of Federally Endangered Cave Arthropods
S. Taylor, J. Weckstein (The Field Museum, Chicago), J. Krejca (Zara Environmental, Buda, TX), G. Veni (George Veni & Associates, San Antonio, TX), K. Johnson, J. Reddell (Texas Natural Science Center, Austin, TX)

**Amphibians and Reptiles**

Hematology, Plasma Biochemistry, and Serology of Selected Viral Diseases in Wild-caught *Eastern Massasauga Rattlesnakes* (*Sistrurus catenatus catenatus*) from Illinois [P3.1.2]
M. Allender (University of Illinois), M. Mitchell

*Response of the Eastern Massasauga to Habitat Management*
S. Baker, C. Phillips

Ecology of the Freshwater Turtle Community at Lockport Prairie Nature Preserve with Special Emphasis on the *Blanding’s Turtle* (*Emys blandingii*)
W. Banning, M. Dreslik, C. Phillips

Ecology of the *Eastern Massasauga Rattlesnake* (*Sistrurus catenatus catenatus*) at Carlyle Lake, Clinton County, Illinois
M. Dreslik, C. Phillips

Field Surveys for the *Eastern Massasauga Rattlesnake* (*Sistrurus catenatus*) in Cook, Lake, and Will Counties [P1.1.3]
M. Dreslik, C. Phillips

Monitoring *Listed Species* in Association with the I-355 South Tollway Extension- Illinois Toll Highway Authority
M. Dreslik, C. Phillips, J. Taft

Inventory and Monitoring of Two State-listed Snakes (*Kirtland’s Water Snake* and the *Eastern Massasauga*) in Piatt County, Illinois
J. Griesbaum, C. Phillips [P1.1.3]

Status of *Blanding’s Turtles* in Lake County Forest Preserve District and Feasibility of Initiating a Head-starting Program at Rollins Savanna
A. Kuhns, C. Benda, C. Phillips

Habitat Mapping, Baseline Inventory, and Development of a Monitoring Protocol for the *Ozark Hellbender* (*Cryptobranchus alleganiensis bishopi*) within the Ozark National Scenic Riverways [P1.1.3]
C. Phillips

Status Assessment of the *Illinois Mud Turtle* (*Kinosternon flavescens spooneri*) in Illinois
A. Readel, C. Phillips

**Other Vertebrates**

Occuancy Modeling, Habitat Evaluation, and Status of *Franklin’s Ground Squirrel* in Illinois [P1.1.7]
PROGRAM 5.–Science in Support of Invasive Species Prevention, Management, and Control
This program is designed to elucidate the biology of invasive and potentially invasive species, explore various strategies to prevent invasions, and control and manage invasive species that have become established.

Goal P5.1: Prevention
Develop methods and projects to prevent establishment of invasive species.

Objective P5.1.1: Early Detection of Invasive Species.—Help develop and expand the program to conduct focused surveys to detect the early presence of new invasive species, allowing rapid response to prevent establishment or spread.


Coordinate and/or Assist with the State-wide Surveys for Emerald Ash Borer, Soybean Rust, Giant Hogweed, Sudden Oak Death, Sirex Wood Wasp, Asian Gypsy Moth, Old World Bollworm, Soybean Pod Borer, and Exotic Snails
K. Cook

Foraging Ecology and Mechanisms of Coexistence in Amani and Collared Sunbirds in Arabuko-Sokoke Forest, Kenya
A. Whelan, J.O. Oyugi, J.S. Brown (University of Illinois at Chicago)

Nationally Exotic Wood Borer/Bark Beetle Survey
K. Cook

Invasive Species Surveys Monitoring the Spread and Dispersal Soybean Aphid, Gypsy Moth, Pine Shoot Beetle, Asian Longhorned Beetle, Karnal Bunt, Kudzu, and Japanese Beetle
K. Cook

Monitoring Invasive Mosquito Species (Aedes albopitus and Aedes (Oc.) japonicus) in Illinois
R. Lampman, J. Morris, R. Novak
Objective P5.1.2: Studies of Aquatic Barriers.—Continue work on electric and other barriers to prevent Asian carp from reaching the Great Lakes.

Field Assessment and Monitoring of an Electric Dispersal Barrier to Protect Great Lakes from Invasive Exotic Fishes
S. Czesny, J. Dettmers, R. Sparks

Objective P5.1.3: Information Dissemination.—Produce fact sheets and other information designed to inform the public and prevent establishment and spread of invasive species.

Development of an Illinois CAPS Web Site (http://www.inhs.uiuc.edu/research/CAPS/) with Current Pest Alerts and Invasive Species Fact Sheets
K. Cook

Objective P5.1.4: Diagnostics and Prediction.—Develop tools for accurately identifying invasive species and distinguishing them from their native relatives. Develop revised phylogenetically based classifications that facilitate identification of species and lineages likely to become invasive and aid identifying and assessing the efficacy of potential biological control agents.

On-line Identification Keys for Leafhoppers (Insecta: Hemiptera) [P2.1.1, P7.1.5]
D. Dmitriev, C. Dietrich

Goal 2: Biology of Invasive Species
Conduct theoretical and empirical research on the biological basis of invasiveness of indigenous and exotic species to inform management of these species.

Objective P5.2.1: Population Ecology of Invasive Species.—Study the demography of invasive plants to identify key life history characteristics that permit invasiveness.

Hybridization of Asian Carp in the Mississippi and Illinois Rivers
C. Dolan, J. Lamer, J. Chick, J. Epifanio

Information Management for Wildlife Habitat Enhancement—Illinois Invasive Weed Monitoring
B. Dolbeare, J. Epifanio

Germination Requirements of Rhamnus cathartica
J. Kurylo, A. Endress (UIUC)

Demographic Variation in Alliaria petiolata (Garlic Mustard)
S. Raghu, S. Post, A.S. Davis (USDA)

Invasion Dynamics of Alliaria petiolata (Garlic Mustard) in Eastern Deciduous Forests
S. Raghu, S.L. Post

Demography of Dipsacus laciniatus (Cutleaf Teasel) in Relation to Soil Disturbance and Competition
S. Raghu, S.L. Post

Correlations between Plant Nutrients and Insect Herbivore Community Composition: Implications for Biological Control of Leafy Spurge (Euphorbia esula)
L.K. Schwab (UIUC), S. Raghu

Resource Overlap as a Displacement Mechanism in Native and Exotic Crayfishes in Illinois
C. Taylor, D. Soucek
Objective P5.2.2: Ecological Interactions of Invasive Species—Investigate the interactions of invasive species with the biotic and abiotic components of invaded habitats.

Botany

Influence of Invasive Shrubs on Nesting Success of Riparian Forest Songbirds
S. Beyeler, E. Heske

Response of Ornithogalum umbellatum L. to Herbicides in Relation to Associated Native Herbaceous Plants in a Central Illinois Oak-hickory Forest
B.M. Flores, R.L. Larimore, J.E. Ebinger

Growth of Rhamnus cathartica under Four Moisture Regimes
J. Kurylo, B. Molano-Flores, S. Raghu

Response and Recovery of Rhamnus cathartica to Flooding
J. Kurylo, B. Molano-Flores, S. Raghu

Effects of the Invasive Plant Phalaris arundinacea on the Diversity and Composition of Plants, Insects, Birds and Small Mammals in Wetlands
G. Spyreas, B. Wilm, E. Heske, A. Plocher, J. Ellis, J. Matthews, D. Ketzner

Woody Plant Invasion of Grasslands: Interaction between Seed Dispersal and Microhabitat Characteristics [P1.1.1]
C. Whelan, D.G. Wenny, N.J. Cordeiro (Field Museum and UIC)

Mollusks

Impact of Zebra Mussels on Bass Recruitment
J. Claussen, D. Philipp

Evaluating the Interactions between Two Non-native Species in Lake Michigan: Round Goby and Zebra Mussel
S. Creque, S. Czesny

Population Dynamics of the Zebra Mussel (Dreissena polymorpha) in Large Rivers
D. Schneider, H. Bustamante

Fishes

Effects of Asian Carp on Zooplankton
Abundance and Composition
J. Chick, C. Dolan, G. Sass

Evaluating Asian Carp Colonization Potential and Impact in the Great Lakes
W. Hill, R. Herendeen, M. Pegg, S. Cooke, K. Meyer

A Preliminary Ecotoxicological Assessment of Asian Carp Species in the Chicago Waterway and Illinois River
D. Rogowski, D. Soucek, J. Detmers, M. Pegg, J. Chick, J. Epifanio

A Mark-Recapture Population Estimate for Asian Carps in the La Grange Reach, Illinois River

The Effect of Common Carp on Aquatic Ecosystems
M.D. Wolfe, J.J. Parkos, V.J. Santucci, Jr., D.H. Wahl

Birds

Ecological Effects of Mute Swans (Cygnus olor) Foraging and Nesting Behavior
J. Stafford, M. Eichholz (SIUC)

Objective P5.2.3: Risk Analysis of Exotic Species—Conduct studies to evaluate the ecological risks of exotic species that may become established in Illinois.

Ecology and Invasiveness Risk of Miscanthus x giganteus
S. Raghu, R.C. Anderson (IL State Univ)

Evaluating the Transfer, Dynamics, and Risk of Spread of Aquatic Nuisance Species by Watercraft in the Chicago Sanitary and Ship Canal
D. Schneider
Goal P5.3: Managing Invasive Species
Develop methods of management for key invasive species.

Objective P5.3.1: Biological Control of Invasive Species.–Develop appropriate methods of controlling invasive species using biological control agents.

Microorganisms

**Microsporidia** of the Black Vine Weevil [P2.1.1]
D. Bruck (USDA-ARS, OR), L. Solter

Biology and Taxonomy and Inoculative Release of **Microsporidian Pathogens of the Gypsy Moth** [P2.1.1, P5.2.2]
L. Solter, M. McManus and V. D’Amico (USDA Forest Service, CT), D. Pilarska (Bulgarian Acad Sciences), G. Hoch and D. Goertz (Univ. Applied Sciences, Vienna), J. Novotny and M. Zubrik (Forestry Research Inst., Slovakia), A. Linde (Fachhochschule Eberswalde, Germany), J. Vavra, M. Hylis, and J. Weiser (Charles Univ., Czech Republic), P. Solter (Univ. of IL), C. Vossbrinck (CT Agric. Expt. Stn.)

**Microsporidia** Infecting Coleopteran Predators of the Hemlock Woolly Adelgid [P2.1.1, P5.3.1]
L. Solter, B. Onken and R. Reardon (USDA Forest Service), D. Palmer (NJ Dept. of Agric.), M. Baker (Iowa State Univ.)

Botany

Biological Control of *Lythrum salicaria* (Purple Loosestrife)
S.L. Post, S. Raghu

Invasion Biology and Biological Control of *Euphorbia esula* (Leafy Spurge) in Illinois
S. Raghu

Chemical Ecology of *Galarucella calamariensis* and *Galarucella pusilla*, Biological Control Agents of *Lythrum salicaria*
S. Raghu, S.L. Post, R. Bartelt (USDA)

Objective 3.2: Integrated Management.–Identify and evaluate methods to integrate strategies to control and manage invasive species.

PROGRAM 6.–Science in Support of State Fish, Wildlife, and Outdoor Recreational Programs
Studies in this program include investigations of sport fish and game animals, habitat management of game animals, human dimensions research, creel surveys, and database development for sport fish and wildlife. These studies directly support Illinois Department of Natural Resources fish, wildlife, and land managers.

Goal P6.1: Fish and Wildlife Conservation
Provide information from studies of fish and wildlife game populations, communities, and environments with a focus on providing scientific input to inform management decisions.

Objective P6.1.1: Fisheries Science.–Conduct studies of fisheries and aquatic populations with exploited, recreational, aesthetic, or aquacultural value.

Factors Controlling Smallmouth Bass Recruitment
B. Barthel, D.P. Philipp

Outbreeding Depression–The Impacts of Stocking Fish
J. Claussen, M. Jennings, D. Philipp

Factors Affecting Bluegill Population Size Structure

Evaluation of Largemouth Bass Stocking Program
M.J. Diana, D.H. Wahl
Alternative Scoring for **Tournament Bass Fishing** [Program 6]
*S. Landsman, D. Philipp, J. Epifanio*

**Largemouth Bass** Recruitment in Illinois
*J.J. Parkos, M.J. Diana, D.H. Wahl, D.P. Philipp*

Impacts of Catch-and-Release Angling on **Largemouth Bass Recruitment**
*J. Stein, D.P. Philipp, D. Wahl*

Evaluation of Growth and Survival of Various Stocks of **Muskellunge**
*C.P. Wagner, D.H. Wahl, M.J. Diana*

Impact of Catch-and-Release Angling on the Physiological Status of **Sportfish**
*D. Philipp, S. Cooke, C. Suski, A. Danylchuk*

Aquatic Resource **Conservation Electronic Library**—Outreach for the Fisheries Conservation Foundation
*J. Claussen, J. Koppelman, J. Sobel, S. Burns*

---

**Objective P6.1.2**: **Wildlife Science**—Conduct studies of terrestrial wildlife populations with exploited, recreational, aesthetic, or agricultural value.

Nesting Biology of **Heron**s and **Egret**s at Clear and Pekin Lakes and Emiquon NWR, Illinois [P1.1.3, P1.1.5]

*R. Bjorklund, M. Horath, M. Bowyer, C. Hine, J. Stafford, A. Yetter, A. Bartlett, A. Burgett*

Ecology of **Spring-migrating Waterfowl** in Illinois
*M. Eichholz (SIUC), J. Stafford, A. Yetter, C. Hine, R. Smith*

Modeling **Waterfowl** Migration using NEXRAD Radar
*R. Larkin, J. Stafford, B. O’Neal (UIUC), A. Yetter, D. Warner*

Genetic Relatedness and Gene Flow of **White Tailed Deer** (*Odocoileus virginianus*) in the **Chronic Wasting Disease Prevalent Region of Illinois** [P3.1.2]
*N. Mateus-Pinilla, J. Novakofski, J. Diffendorfer, J. Killefer, P. Shelton, T. Beissel*

Fetal Development, Sex Ratio, and Pregnancy Rates of **White-tailed Deer** in Relation to Deer Population Control
*N. Mateus-Pinilla, J. Novakofski, J. Diffendorfer, P. Shelton, T. Beissel*

Changes in Adult Age and Sex Structure of **White tailed Deer** in Response to Intense Deer Population Control
*N. Mateus-Pinilla, J. Novakofski, J. Diffendorfer, P. Shelton, T. Beissel*

Changes in the Proportion of Pregnant Does before and after **Intense Deer Population Control**
*N. Mateus-Pinilla, J. Novakofski, J. Diffendorfer, P. Shelton, T. Beissel*

Recruitment, Mortality, and Site Occupancy of **Riparian Muskrats**: Effects of Flow Regime and Landscape Context [P6.1.2, P1.1.7]
*B. Schooley (UIUC), J. Levengood, J. Diffendorfer, E. Heske*

**Aerial Inventories of Waterfowl** on the Illinois and Mississippi Rivers
*J. Stafford, M. Horath, C. Hine, A. Yetter, R. Smith, A. Burgett*

Foraging Ecology of **Fall-migrating Shorebirds** in the Illinois River Valley
*J. Stafford, A. Yetter, R. Smith, C. Hine, M. Horath*

Do **Breeding Waterfowl** Use Proximate Cues to Evaluate Predator Sensitivity?
*J. Stafford, M. Eichholz (SIUS), P. Weatherhead (UIUC), A. Yetter, C. Hine, R. Smith*

Estimation of Moist-soil Plant Seed Production for **Waterfowl on IDNR-managed Lands**
*J. Stafford, A. Yetter, M. Horath, C. Hine, R. Smith, A. Burgett*
Goal P6.2: **Human Dimension Aspects of Fish and Wildlife Management**

Provide human dimensions information with emphasis on improving management decisions for fish and wildlife resources, their environments, and their stakeholders.

**Objective P6.2.1: Fisher and Hunter/Trapper Activities, Harvests, and Attitudes Toward Fish and Wildlife Resources.** – Conduct studies of fish and wildlife harvests; fisher/hunter/trapper activities; and characteristics, attitudes, and opinions of stakeholder groups.

- **Non-resident Deer Hunter Survey**
  S.A. Lischka, W.L. Anderson

- **Annual Hunter Harvest Survey**
  S.A. Lischka, W.L. Anderson

- **Non-resident Hunter Harvest Survey**
  S.A. Lischka, W.L. Anderson

- **Annual Furbearer Trapping Survey**
  S.A. Lischka, W.L. Anderson

- **Annual Waterfowl Hunter Survey**
  S.A. Lischka, W.L. Anderson

- **Annual Light Goose Conservation Order Season Survey**
  S.A. Lischka, W.L. Anderson

- **Explorations of Acceptance Capacity to Guide Integration of Human Dimensions and Biological Information in White-tailed Deer Management [P6.1.2]**
  S.A. Lischka, S.J. Riley (Michigan State University), B. Rudolph (Michigan Department of Natural Resources)

- **A Comparative Study of Bird Populations in Illinois: Human Dimensions Insights to Further Understanding and Effectiveness of Management Interventions [P1.1.3, P1.1.7, P6.1.2]**
  S.A. Lischka, J. Walk (The Nature Conservancy), M. Ward

**Objective P6.2.2: Creel Census of Fish Populations.** – Conduct studies to monitor fish populations that support sustainable recreational fisheries, and provide resulting information to resource managers.

- **Sport Fishing Creel Survey on the Illinois Portion of Lake Michigan [Program 6]**
  S. Czesny, D. Philipp, J. Epifanio

- **Illinois Sportfish Creels [Program 6]**
  J. Stein, R. Illyes, T. McNamara, B. Carroll, L. Miller-Ishmail, J. Epifanio, D. Philipp

**Objective 2.3: Fisheries Analysis System (FAS).** – Manage, maintain, and disseminate historical and current fish population sampling data for Illinois lakes and streams.

- **Fisheries Analysis System—Management of Illinois Fisheries Data [Programs 1, 4, 6, 8]**
  J. Stein, R. Illyes, T. McNamara, J. Epifanio, D. Philipp
PROGRAM 7. Science in Support of Agriculture
Projects in this program include organic farming research, the biology and management of crop pests, inventories and monitoring of crop pests, and other research related to protecting farmlands and agricultural production.

Goal P7.1: Research and Information Dissemination
Conduct research and provide biological and ecosystem information aimed at developing effective management strategies for insect and other pest species in agricultural systems.

Objective P7.1.1: Agricultural Entomology. Conduct studies of the relationships among agricultural systems, insect pests, other plant and animal species, and natural ecosystems.

Seasonal Patterns of Western Corn Rootworm Abundance and Movement between Adjacent Corn, Soybeans and Other Crops
J. Spencer, E. Levine

Trap then Manage: Using Corn Rootworm Behavior to Reduce Producer Inputs and Optimize Resistance Management for Transgenic Corn
J. Spencer, K.L. Steffey (UIUC), M.E. Gray (UIUC)

Objective 1.2: Ecology and Biological Control. Conduct studies of the natural history of pest species, their relationships to their natural enemies, and experimental manipulation of natural enemies to limit the ecological and economic impacts of pest species.

Efficacy of Nematodes against Western Flower Thrips [P7.1.2]
E. Caamano and R. Cloyd (UIUC), L. Solter, D. Warnock

Maternal Influence on Prolonged Diapause in Illinois Northern Corn Rootworms
E. Levine

Use of Transgenic Crops to Measure Insect Herbivore Movement
J. Spencer

Herbivore Ecology in Miscanthus x giganteus and Agricultural Crops
J. Spencer, S. Raghu

Natural History and Biological Control of the Soybean Aphid [P5.3.1, P5.3.2, P7.1.1, P7.1.2]
D. Voegtlin, R. O’Neil (Purdue Univ), M. Oneal (Iowa St. Univ.), C. Gratton (Univ. Wisconsin).

Monitoring Soybean Aphid and other Aphids of Economic Interest Using a Suction Trap Network [P5.1.1, P5.3.2, P7.1.1, P7.1.5]
D. Voegtlin, R. O’Neil (Purdue Univ.), C. DiFonzo (Michigan St. Univ.), E. Cullen (Univ. Wisconsin), D. Ragsdale (Univ. Minn.), M. Oneal (Iowa St. Univ.), D. Johnson (Univ. Kentucky), K. Tillmon (S. Dakota St. Univ.), W. Bailey (Univ. Missouri), M. Smith (Kansas St. Univ.)
Objective P7.1.3: Integrated Pest Management and Insect Resistance Management. – Conduct research that measures the effects of conventional and alternative pest management practices on crop protection and susceptibility of pest species.

Dispersal of Western Corn Rootworm Adults from Cornfields into Soybean Fields at Sites in Illinois Where Crop Rotation is Still Effective and Where it Has Failed
E. Levine, J. Spencer

Intrafield Movement Adult Western Corn Rootworms in a Structured Refuge vs. a Seed Blend Field
J. Spencer

Movement of Rotation-resistant Western Corn Rootworm Beetles from Soybean Fields to Cornfields (Intensive Local Field Study)
J. Spencer, D. Onstad (UIUC), E. Levine

Survey of Rotation-Resistant Western Corn Rootworm Activity near Illinois Corn and Soybean Fields (Statewide Survey Component)
J. Spencer, D. Onstad (UIUC), E. Levine, S.A. Isard (Penn State Univ.)

Objective P7.1.4: Organic Farming. – Work in partnership with University of Illinois researchers and organic growers to develop an interdisciplinary, cross-institutional organic farming systems research and education program that seeks to elucidate and provide sound scientific information on fundamental ecological and agronomic mechanisms for productivity and long-term sustainability of organic farming systems; improve the performance of these systems; and enhance the ability of midwestern producers to meet the growing demand for organic produce.

Effects of Transition from Conventional to Organic Farming Practices on Soil Fertility, Soil Biota, Crop Productivity, and Pest Management Aspects

Objective P7.1.5: Pest Diagnostics and Prediction. – Develop tools for accurately identifying noxious and beneficial insects and other species of agricultural importance. Develop revised phylogenetically based classifications that facilitate prediction of the emergence of new pests/invasive species and aid identifying and assessing the efficacy of potential biological control agents.

Northern Corn Rootworm Genetic Studies
R. Roehrdanz (USDA), E. Levine

PROGRAM 8.–Science in Support of Environmental Regulation
Studies in this program address issues related to the environmental impacts of transportation projects (e.g., roads and barges), energy production facilities, and fish and wildlife harvesting. They, therefore, provide the science needed to develop and enforce environmental regulations.

Goal P8.1: Research and Monitoring
Provide research, surveys, and monitoring to enhance assessment and mitigation of impacts of infrastructure development or improvement projects, to guide future growth and development in environmentally friendly directions.

Objective P8.1.1: Surveys and Mitigation. – Conduct surveys for threatened or endangered species, as well as other species or habitats of conservation concern (e.g., wetlands), that might be affected by infrastructure development or improvement, and investigate methods for and the effectiveness of mitigation procedures.
Biotic Surveys in Illinois **Toll Highway Study Corridors**

Monitoring Listed Species in Association with the I-355 South Tollway Extension
M. Dreslik, C. Phillips

Biotic Surveys in **Illinois Toll Highway Study Corridors**
A. Kuhns, C. Phillips

Vegetation and Soils Assessments of Illinois Wetlands in Relation to Road Construction
A. Plocher, IDOT Wetlands Staff

**PROGRAM 9.–Science in Support of Understanding Ecology and Life Histories of Organisms not associated with other Research Projects.**
This program includes projects on the life history, ecology, and behavior of organisms not obviously associated with other research programs, e.g., invasive species, insects associated with health issues, etc.

**Goal P9.1: Life History, Ecological, and Behavioral Studies**
Provide information on the natural history of plants, animals, and other organisms, thus providing for improved conservation and management.

**Objective P9.1.1: Biological Studies.–Conduct studies on the behavior, population biology, ecology, and life histories of organisms not obviously associated with other research programs.**

**Microorganisms**
Intra-guild Predation and Phenotypic Switching in *Tetrahymena*, a Ciliate Protist
J.S. Brown, H.E. Buhse, Jr., (UIC), C. Whelan

An *Encephalitozoon* Microsporidium of a Vertebrate Genus Isolated from Grasshoppers [P2.1.1]
C. Lange (La Plata National University, Argentina), L. Solter, D. Whitman (IL State Univ.), M. Baker (Iowa State Univ.), S. Johny (Laboratory of Molecular. Genetics, Hyderabad, India)

**Botany**
Effects of Awn Length and Soil Type on Self-Planting and Germination in *Stipa spartea* and *Aristida tuberculosa*
B. Molano-Flores

Tree Regeneration and Herbaceous **Understory Dynamics in an Illinois River Floodplain**

**Forest** following Stand Mortality after the Flood of 1993
A. Plocher

Investigating Relationships between Basal Area, Species Richness, and the Distribution of Herbaceous Plants in Forests
G. Spyreas, J. Mathews

Viability of **Warm-season Grass Seed** from Grazed and Ungrazed Prairies
D. Wenny, R. Nyboer

**Fungi**
**Illinois Fungi – Ascomycetes and their Anamorphs** with Relative Abundance and Distribution on Natural Substrates
L. Crane

**Macrofungi** Associated with Tree Windfall in Old Growth Prairie Groves
K. Vernier (Eastern Illinois University), A. Methven (Eastern Illinois University), A. Miller

The Relationship between Science and **Habitat Conservation Plans**
M. Rahn, H. Doremus, J. Diffendorfer

**Arkansas Troglobites: Status Assessment and Monitoring of Species of Concern [P1.1.3]**
M. Slay (Ozark Highlands Office, The Nature Conservancy), S. Taylor

**IDOT FY2005 Statewide Biological Survey and Assessment Program**
J. Taft, Biotic Surveys Staff

Assessment of Mitigation Projects for **Illinois Chorus Frog Habitat**
John Tucker
Mollusks

Freshwater Mussel Assemblage Dynamics of Three Adventitious Streams in the Wisconsin Driftless Division
J. Tiemann, K. Cummings

Timed Search Technique Used to Evaluate Freshwater Mussel (Mollusca: Bivalvia: Unionidae) Abundance and Species Richness
J. Tiemann, K. Cummings, C. Mayer

Entomology

Current Status and Potential Causes of Population Decline in Wild Bumble Bee Pollinators
S. Cameron (University of Illinois), L. Solter, J. Strange and T. Griswold (USDA-ARS, Logan, Utah)

The Impact of Ultraviolet Radiation on Anopheline Survivorship
J. Kane, R. Novak

Larval Habitats for Culex and Aedes Species in Kenyan Rice Schemes [P1.1.3]
E. Muturi, J. Githure, J. Shililu, B. Jacob, R. Novak

Life Histories of Waterstriders of the Sangamon River, Champaign County, Illinois
S. Taylor

Examining Possible Foraging Differences in Urban and Rural Cave Cricket Populations: Preliminary Study of Carbon and Nitrogen Isotope Ratios (δ13C, δ15N) as Indicators of Trophic Level
S. Taylor, J. Krejca (Zara Environmental, Buda, TX), K. Hackley (Illinois State Geological Survey)

Bioacoustics, Stridulatory Mechanisms, and Acoustic Behavior of Aquatic True Bugs (Heteroptera: Nepomorpha)
P. P. Tinerella, M. Bulbert (The Australian Museum)

Amphibians and Reptiles

Life History and Reproductive Biology of the Southern Two-lined Salamander (Eurycea cirrigera) in Vermilion County, Illinois
J. Jakubanis, M. Dreslik, C. Phillips

Factors Influencing Anuran Breeding and Recruitment success
A. Maley, C. Phillips

Population Estimates and Age Class Structure of the Salamander Plethodon albagula (Plethodontidae) at Fort Hood, Texas
S. Taylor, C. Phillips, J. Krejca (Zara Environmental, Buda, TX)

Influence of Climate Change on the Demography and Life History of Red-eared Sliders
J. Tucker

Fishes

Reproductive Ecology of Smallmouth and Largemouth Bass [P6.1.1]

Population Genetic Analysis of Florida Bass and Suwannee Bass [P6.1.1]
B. Barthel, W. Porak, D. Philipp

Systems Ecology and Conservation of Tidal Salt Flats—The Role of Bonefish and Anglers [P6.1.1]
S. Danylchuk, A. Danylchuk, S. Cooke, J. Koppelman, T. Goldberg, D. Philipp

Effects of Predator Size and Prey Characteristics on Piscivory of Juvenile Largemouth Bass [P6.1.1]
L.M. Einfalt, J.J. Parkos, D.H. Wahl

Causes and Consequences of Hybridization in Sunfishes [P6.1.1]
J. Epifanio, D. Philipp

Using a Whole-lake Acoustic Observatory to Study the Detailed Behavior of Largemouth Bass [P6.1.1]
K. Hanson, C. Hasler, S. Cooke, B. Tufts, D. Philipp

Assessment of the Relationships between Size-specific Growth Rates of Fish and Physical Habitat and Biotic Community Variables in Illinois Streams
J.W. Neisler, H.R. Dodd, D.H. Wahl

Largemouth Bass Diet and Growth in Bluegill- and Gizzard Shad -dominated Reservoirs [P6.1.1]
J.J. Parkos, D.H. Wahl
Nesting Site Fidelity and Kinship Relationships in Colonially Spawning Bluegill [P6.1.1]
T. Silich, J. Claussen, D. Philipp, J. Epifanio

Effect of Temperature and Food Availability on Overwinter Survival in Age-0 Bluegill [P6.1.1]
D.E. Shoup, D.H. Wahl

Effect of Turbidity on Prey Selection in Largemouth Bass [P6.1.1]
D.E. Shoup, D.H. Wahl

Evaluation of Fish Diversity and Reproduction in Seven Oxbow Lakes of the Lower Kaskaskia River, Illinois [P6.1.1]
D.E. Shoup, D.H. Wahl

Birds

G.S. Butcher (Audubon Society), D.K. Niven

Comparison of Male and Female Song in Orchard and Baltimore Orioles
D. Enstrom, M. Ward

Seasonal Song Development in Male and Female Northern Cardinals (Using Spatial, Audio, and Physiological Transmitters) [P1.1.6]
D. Enstrom, M. Ward, M. Wilkelski (Princeton University), M. Gahr (Max Plank Institute, Germany)

Population and Evolutionary Dynamics of a Parasitic Cowbird and a Common Host: Mafia, Farming, and Overlapping Generations
Jeff Hoover

Monitoring the Long-term Nesting Success, Site Fidelity, and Population Dynamics of Neotropical Migratory Bird (Prothonotary Warbler): Implications for Floodplain Restoration [P1.1.1, P1.1.3, P1.1.4]
J. Hoover

The Importance of Floodplain and Upland Forest Habitat for Wintering Birds [P1.1.1, P1.1.2, P1.1.3, P1.1.4]
J. Hoover

The Influence of Agricultural In-holding on the Nesting Success of Forest Songbirds [P1.1.1, P1.1.2, P1.1.3, P1.1.4]
J. Hoover

Using Stable Isotope Analysis of Tail Feathers to Determine Natal Dispersal in a Migratory Songbird
J. Hoover, K. Hobson, S. Robinson

Links Among Vegetation Height, Arthropods and Grassland Bird Species
L. Nakamoto (UIUC), C. Whelan, D. Wenny

Identifying Important Bird Areas (IBAs) in the U.S. Global and Continental Criteria and Their Application
D.K. Niven

Combining Breeding Bird Survey and Christmas Bird Count Data to Evaluate Seasonal Components of Population Change: An Example Using the Northern Bobwhite
D.K. Niven

Blackbird Population Trends as Inferred from Christmas Bird Count Data
D.K. Niven

The Role of Extra-pair Fertilizations (EPFs) in Breeding Decisions and Dispersal in a Socially Monogamous Migratory Songbird
W. Schelsky, J. Hoover, S. Robinson

Reproduction, Survival and Habitat Use of Grassland Birds in Agricultural Landscapes
J. Walk, E. Kershner (Institute for Wildlife Studies), R. Warner

J. Walk, M. Ward, S. Bailey, D. Thomas, J. Diffendorfer, L. Cordle, J. Brawn

How Do Birds Select Breeding Habitats
M. Ward, Mark Alessi (UIUC)

Site Fidelity and Return Rates of Grasshopper Sparrows
D. Wenny

Winter diet of Long-eared Owls
D. Wenny, Volunteers

Short-term Response of Grassland Birds to Cessation of Grazing
D. Wenny, J. Herkert (TNC), R. Nyboer, E. Anderson (IDNR)
INHS RESEARCH PROGRAMS AND ASSOCIATED NUMBER OF FY08 RESEARCH PROJECTS (445 total projects)

PROGRAM 1.–Science in Support of Ecosystem Management and Conservation (125)

PROGRAM 2.– Science in Support of Understanding Species-level Biodiversity and Systematics (76)

PROGRAM 3.–Science in Support of Public and Environmental Health (40)

PROGRAM 4.–Science in Support of Threatened and Endangered Species (37)

PROGRAM 5.–Science in Support of Invasive Species Prevention, Management and Control (57)

PROGRAM 6.–Science in Support of State Fish, Wildlife and Outdoor Recreational Programs (33)

PROGRAM 7.–Science in Support of Agriculture (14)

PROGRAM 8.–Science in Support of Environmental Regulation (8)

PROGRAM 9.–Science in Support of Understanding Organismal Ecology and Life Histories of Organisms not associated with other Research Programs (55)

Using Loggerhead Shrike Habitat Use as a Guide to Controlling Woody Invasion of Sand Prairie
D. Wenny, R. Nyboer

Foraging and Habitat Selection of Crested Guineafowl, Lajuma, South Africa
C. Whelan, A. Hank (UIC)

Other Vertebrates

Small Mammal Population and Community Ecology
J. Diffendorfer

Energetics and Thermoregulation of Least Shrews (Cryptotis parva) and Eastern Moles (Scalopus aquaticus) Residing in Successional Habitats of Allerton Park, Piatt County, Illinois
J. Merritt

Miscellaneous

History of Biological Research at Lost Mound
D. Wenny
INHS RESEARCH PROJECTS RANKED
BY STRATEGIC PLAN CATEGORIES
FY08

Systematics (76) [Entomology (41), Botany (16),
Vertebrates (6), Fungi (4), Mollusks (3); Annelids
(3); Crayfish (1)]

Invasive Species (57) [Botany (21); Entomology
(13); Fishes (7); Mollusks (5); Misc./general
issues (4); (Microsporidia (3); Crayfish, Birds (1
each)]

Ecological Studies (not associated with other
programs, e.g., invasive species, agriculture,
etc.) (55) [Birds (21); Fishes (12); Entomology
(5); Amphibians & Reptiles (4); Botany (4);
Microorganisms, Mollusks, Fungi, other
Vertebrates (2 each)]

Surveys and Monitoring (51) [Botany (23); Birds
(6); Aquatic Systems (4); Aquatic Invertebrates,
Mollusks, Misc./General Surveys (3 each);
Annelids, Fishes, Fungi, other Vertebrates (2
each); Entomology (1)]

Threatened and Endangered Species (37)
[Botany (12); Amphibians & Reptiles (10); other
Vertebrates (6); Entomology (4); Mollusks, Misc.
issues (2 each); Crayfish (1)]

Restoration Ecology (25) [Prescribed fires (8);
Prairies (6); Wetlands (4); Fishes (3); Backwater
lakes (2); Botany, Floodplain forests (1 each)]

Ecosystem Function and Community Ecology
(25)

Fish and Wildlife Conservation (22) [Fishes
(10); Waterfowl (7); Deer (4); Muskrats (1)]

Science in Support of Agriculture (14)
Wildlife Diseases (14)
Medical Entomology (14)
Landscape Ecology (13)
Effects of Environmental Degradation and
Contaminants (12)
Human Dimension Aspects of Fish and Wildlife
Management (11)
Science In Support of Environmental Regulation
(8)
Biological Indicators (5)
Illinois Wildlife Action Plan (3)
New Technology Development (3)

INHS RESEARCH PROJECTS RANKED
BY TAXA
FY08

Botany (106)
Entomology (97)
Birds (64)
Fishes (52)
Other Vertebrates (23)
Microorganisms (23) [viruses, protozoans, etc.]
Amphibians & Reptiles (21)
Mollusks (20)
Fungi (12)
Aquatic Invertebrates (6)
Annelids (5)
Microsporidia (4)
Zooplankton (4)
Crayfish (3)
Nematodes (1)

51 projects are not related to specific taxa