

STATE WILDLIFE GRANT  
State of Illinois

Grant Proposal

PROJECT NUMBER: T - 17 - P - (1&2)

PROPOSAL TITLE: Enhancement and Integration of Natural Resource Information Systems in Support of Illinois' Comprehensive Wildlife Conservation Plan

PROPOSAL:

The Illinois landscape has changed dramatically since the time of European settlement with natural lands being manipulated and developed. Illinois has lost over 90% of its original wetlands, 99.9% of its original prairie, and currently has 424 state and 24 federally listed threatened and endangered species within it's boundaries. The mission of the Illinois Department of Natural Resources (IDNR), Office of Resource Conservation, is to protect, conserve and manage these natural resources.

This proposal encompasses database and mapping projects which will allow the agency to monitor the status of natural resources under its charge and will also directly support Illinois' Comprehensive Wildlife Conservation Plan. Development and enhancement of key data sets is vital to efficiently direct funding and manpower to address agency priorities and to effectively evaluate the success of those efforts. Elements of this proposal build upon previous projects that were used to assist in the development of the CWCP. Further development and enhancement of basic data sets are needed to provide quality support mechanisms for the CWCP planning process, including its future revisions. Needs, objectives, expected results and benefits, approach, costs, and personnel information for enhancing each database will be addressed individually under their corresponding projects. The following datasets will be updated or enhanced:

1. Updating of Biotics 4 and the Natural Areas Tracking System (Project 1 below):

The Biological Tracking and Conservation System (Biotics 4) contains locational data and descriptive information on state and federally listed threatened and endangered species, natural areas, nature preserves and other significant natural resource features including high quality natural communities, rookeries, large forest blocks, etc. The Natural Areas Tracking System (NATS) houses additional descriptive information about natural areas and their associated natural communities.

2. Expansion of the Owned, Managed, and Leased Properties Data Set (Project 2 below):

The Owned, Managed, and Leased Properties (OMLP) data set contains locational data and descriptive information on conservation related properties owned, managed, or leased by the State of Illinois through the Illinois Department of Natural Resources.

3. Expansion of the Illinois Conservation Practices Mapping System (Project 3 below):

The Illinois Conservation Practices Mapping System (ICPTS) data set contains locational data and descriptive information on conservation easements within the state.

PROPOSAL OBJECTIVES:

The Illinois Department of Natural Resources will update and expand existing information systems as part of the CWCP planning process of identifying strategies for the conservation of species of greatest conservation need and their habitats. The objectives of this plan are to:

1. Develop and enhance spatial and tabular information on statewide endangered and threatened faunal species, natural areas, and natural communities in an information system.
2. Develop and maintain a statewide geographic distribution of conservation related properties owned, managed and leased by the State of Illinois in an information system.
3. Develop and maintain a statewide geographic distribution of conservation practices in an information system.

PROPOSAL DURATION:

Segment 1: September 30, 2005 - June 30, 2009

Segment 2: July 1, 2009 - June 30, 2012

EXPECTED RESULTS & BENEFITS:

The Illinois Department of Natural Resources expects to benefit from this plan by using the enhanced data to direct the focus of land and water conservation efforts in Illinois. The data will enable agency managers to target and prioritize conservation projects, coordinate efforts within the Office of Resource Conservation, assist in the acquisition and stewardship grant process, and improve coordination with cooperating partners in federal, local and not-for-profit conservation organizations.

This data will assist plan managers in establishing specific goals for the preservation, enhancement and protection of priority wildlife habitat areas identified by the plan. Moreover, the data will provide managers with some of the tools necessary to achieving both specific and broad conservation goals and will provide evidence on the ecological significance of conservation habitat areas in the state.

APPROACH, AND LOCATION:

The Illinois Department of Natural Resources requests \$3,219,495 to develop and enhance natural resource information systems in support of the Comprehensive Wildlife Conservation Plan in order to better focus conservation efforts and monitor their success.

The University of Illinois at Urbana-Champaign will be the subgrantee for all three of these Projects. Supervisory staff will provide direction and support and ensure that objectives are met. For Project 1, all work will be conducted at IDNR Headquarters in Springfield. Office housing will be provided by IDNR and immediate supervision will be provided by both Illinois Natural History Survey (INHS) and IDNR staff. Immediate supervisory staff will not be paid through the grant. For Project 2, the majority of the work will take place at INHS offices in Urbana, with frequent coordination trips to IDNR Headquarters in Springfield. Office housing and immediate supervision will be provided by INHS. Immediate supervisory staff will not be paid through the grant. For Project 3, all work will be conducted at IDNR Headquarters in Springfield. Office housing and immediate supervision will be provided by IDNR. Immediate supervisory staff will not be paid through the grant.

OVERALL PROPOSAL BUDGET:

Segment	Project	Federal	State	Total
1	1	\$230,639	\$76,880	\$307,519
	2	\$439,992	\$146,743	\$586,735
	3	\$201,546	\$67,182	\$268,728
	<b>Segment 1 Total</b>	<b>\$872,177</b>	<b>\$290,805</b>	<b>\$1,162,982</b>

Segment	Project	Federal	State	Total
2	1	\$575,542	\$191,847	\$767,389
	2	\$740,905	\$248,844	\$989,749
	3	\$224,531	\$74,844	\$299,375
	<b>Segment 2 Total</b>	<b>\$1,540,978</b>	<b>\$515,535</b>	<b>\$2,056,513</b>

Segment	Federal	State	Total
1	\$872,177	\$290,805	\$1,162,982
2	\$1,540,978	\$515,535	\$2,056,513
<b>1 &amp; 2 Combined</b>	<b>\$2,413,155</b>	<b>\$806,340</b>	<b>\$3,219,495</b>

COMPLIANCE:

IDNR staff will be available to the public to provide additional explanation to enhance the understanding of the data within these datasets.

GRANT PROPOSAL SUPPORT DOCUMENTATION:

The following documents are attached in support of this grant proposal:

1. Application for Federal Assistance (Standard Form 424)
2. Grant Proposal - Budget Information
3. Federal Aid Section 7 Evaluation Form
4. Illinois Clearinghouse Response per Federal Executive Order 12372
5. NEPA Compliance Checklist
6. U. S. Department of Interior, Part E: Certification Regarding Lobbying

PROCEDURES:

**Project 1**      Updating the Biological Tracking and Conservation System (Biotics 4) and the Natural Areas Tracking System (NATS)

PURPOSE AND NEED:

Since the time of European settlement, Illinois' landscape has dramatically changed. Manipulation and development by humans has resulted in the loss of the majority of the state's forests, prairies, and wetlands. Because there are few natural lands remaining in the state, many of Illinois' native species have become endangered or threatened.

The Illinois Department of Natural Resources (IDNR) currently maintains and supports several key databases including the Biological Tracking and Conservation System (Biotics 4) and the Natural Areas Tracking System (NATS). Biotics 4, an Oracle-based relational database directly linked to a Geographic Information System (GIS), is used by the Illinois Natural Heritage Database (INHD) Program for monitoring detailed information about state and federally listed endangered and threatened (E&T) species and elements of occurrence for natural resources of special concern including heron rookeries, geological features, large forest blocks, and high quality natural communities. Both Biotics 4 and NATS are used to monitor information about sites on the Illinois Natural Areas Inventory (INAI), an inventory of all significant natural

resources or features remaining in Illinois since early settlement. The INAI is used by IDNR to guide acquisition, management, and protection of natural resources in the state. Both Biotics 4 and NATS are an integral part of IDNR's natural resources information base and play an important role in the planning, implementation, and monitoring of Illinois' CWCP as well as any of its future revisions.

Beginning in 1986, IDNR's Division of Natural Heritage, in conjunction with The Nature Conservancy (TNC), established the Illinois Natural Heritage Database to be a central location of information on significant natural features within the state. The Database Program utilized the Biological Conservation Database (BCD) software, developed by TNC, from its inception until 2002. During the latter part of this time period, a portion of TNC disbanded, formed a new organization which was eventually named NatureServe, and developed a new software tracking system. In February of 2002, Illinois' Database Program upgraded to NatureServe's Biotics 4 software, which provided a direct link between spatial and tabular data using a custom ArcView Geographic Information System (GIS) application coupled with a powerful Oracle database. Illinois' Heritage Database Program is currently a member of the Natural Heritage Network, an organization of member programs which include 76 independent natural heritage programs and conservation data centers in the United States, Canada, Latin America, and the Caribbean with the purpose of providing scientific information to guide local, national, and global conservation action.

Biotics 4 contains data that has been compiled from a broad range of sources including INDR staff, museum and herbarium collection records, publications, experts and researchers, and volunteers throughout the state. IDNR staff members, contractors, and volunteers perform field surveys to find and verify specific locations of the features of highest priority and collect information on the condition, quality, and management needs of those features. This process of compiling and verifying data is on-going; therefore, data is received by the Illinois Natural Heritage Database Program on a continual, but sporadic basis.

Over the years, the amount of data that has been submitted to the Database Program has grown substantially presumably due to an increase in field staff, expansion of the type of data that is tracked, and other unknown factors. At the same time, there has been a decrease in the number of data entry staff due to hiring freezes, loss of headcount, and temporary contractual staffing issues. As a result, current IDNR Database Program staff are unable to enter all of the data that is received. At present, there is no system in place to measure the amount of data that is received by the Database Program. A system to track the incoming data will be put into place by the end of 2005. Currently, there is a backlog of approximately 300-400 E&T animal records, 1,000+ E&T plant records, and 3-4 years field seasons worth of INAI site surveillance records. Current staff will be able to reduce this backlog prior to the start of the grant, but new data is arriving continually.

Because Biotics 4 was not designed to report detailed information about Illinois Natural Areas Inventory (INAI) sites, the Natural Areas Tracking System (NATS) was developed by IDNR in 2003. This Access database with custom fields and reports was designed specifically for use by IDNR's Natural Areas Program to provide in-depth monitoring of individual INAI sites and their significant features. At present, some of the historic INAI information has been entered/imported into NATS. Additional historic information for nearly 1,200+ sites and INAI changes from the last two years still need to be entered. Despite this need, there is no one

designated to enter this data with the current shortage of staff.

Although IDNR expends considerable resources in maintaining the Biotics 4 and NATS, current resources are insufficient to maintain a level of data entry commensurate with the data that is available. The activities under this project will allow the agency to avoid creating a large backlog of data needing to be entered, providing a more complete and accurate database for use in implementing and monitoring Illinois' CWCP.

Illinois' species in greatest need of conservation are defined as all wild animals, including vertebrates and invertebrates, aquatic or terrestrial. The tracking of information on INAI sites and their natural communities is vital because these areas serve as high quality habitat necessary for the survival of wildlife. The following CWCP elements pertain to species and their habitat, or natural communities:

- § Description of locations and relative condition of key habitats and community types essential to conservation of species in greatest need of conservation.
- § Descriptions of problems which may adversely affect species in greatest need of conservation or their habitats.

INAI data housed within Biotics 4 and NATS includes information on the location, quality, and condition of particular sites and their significant features including natural communities. Additional information including site descriptions, land use history, conservation intentions, threats, and management needs is also tracked.

Note: Endangered and threatened plant data will be handled by two Database Program staff: one permanent IDNR employee and one long-term contractual employee who is funded under another grant.

Some of the activities in this project were also conducted in Project 4, Job 2 of T-03-P (Re-evaluation of Historical Illinois Threatened and Endangered Faunal Species Occurrences and Illinois Natural Areas Inventory Habitat Sites - Data Entry and Product Development) as well as Project 2, Job 6 of T-02-P (Distribution and Abundance of Conservation Elements - Biotics 4 Updating). While the jobs in the previous agreements focused on updating Biotics 4 alone, this project is expanded to include the updating of NATS as well.

Data in the Biotics 4 and NATS databases are essential for satisfying several of the eight elements of the CWCP required by Congress, specifically describing the distribution and abundance of low and declining wildlife populations (Element 1), describing the location and relative condition of key habitats and community types (Element 2), and providing a "base condition" for future comparisons in monitoring the Plan's progress and success (Element 5).

#### OBJECTIVES:

1. Data pertaining to endangered and threatened (E&T) faunal species observations, will be entered and mapped into the Biotics 4. Existing E&T faunal point records will be remapped as polygons. An estimated 1,000-1,400 E&T records will be mapped or remapped and corresponding data entered into the database each year.
2. Data pertaining to Illinois Natural Areas Inventory (INAI) sites will be entered and

mapped in Biotics 4. Additional INAI data will be entered into NATS. An estimated 2,500-3,000 INAI site records will be mapped or remapped and corresponding data entered into the database each year of the grant.

3. Data pertaining to high quality natural communities will be entered and mapped in Biotics 4. Existing natural community point records will be remapped as polygons. An estimated 300-400 high quality natural community records will be mapped or remapped and corresponding data entered into the database each year.
4. Data specialists will assist field staff with sampling and transect surveys as well as GPS techniques on a limited basis in an effort to capture E&T and INAI data. Participation in field work is estimated at 24 total days per year.
5. Biotics 4 & NATS will be used to respond to requests for information, conduct data analysis, and generate reports pertaining to Illinois' Comprehensive Wildlife Conservation Plan. An estimated 20-30 information requests from internal and external sources will be handled each year.

#### EXPECTED RESULTS AND BENEFITS:

By updating the existing databases, we will be able to provide accurate, timely information to those involved in management planning, as well as to those charged with implementing Illinois' CWCP. The Biological Tracking and Conservation System (Biotics 4) and the Natural Areas Tracking System (NATS) were two of the core data systems used in the development of the Comprehensive Wildlife Conservation Plan. As such, they will be used by the conservation partners and agency staff in implementation and monitoring as well as review and future revision of the CWCP.

#### APPROACH:

Two to three contractual data specialists will be hired to log, enter, and map endangered and threatened (E&T) faunal species, Illinois Natural Areas Inventory (INAI), and high quality natural community data received by the Illinois Natural Heritage Database program as part of a multi-year effort to update information in Biotics 4 and the Natural Areas Tracking System (NATS) to assist in implementation and monitoring of Illinois' Comprehensive Wildlife Conservation Plan (CWCP). The data specialists will also assist with field work and the answering of information requests on a limited basis.

*1) Data pertaining to endangered and threatened (E&T) faunal species observations, will be entered and mapped into Biotics 4. Existing E&T faunal point records will be remapped as polygons.*

Tabular data pertaining to E&T faunal species observations, including reports of new observations and updates to known populations, will be entered and spatial locations will be mapped in Biotics 4. Existing E&T faunal species records, which were brought in as large

buffered points during the conversion to Biotics 4, will be remapped into more meaningful polygons based on the original data submitted. All E&T records will be mapped using the new polygon mapping methodology developed by NatureServe, available in part at <http://whiteoak.natureserve.org/eodraft/index.htm>. Every species record entered will undergo a Quality Assurance / Quality Control process to minimize data entry and mapping errors. An estimated 1,000-1,400 E&T records will be mapped or remapped and corresponding data entered into the database each year. Since work will not begin on this grant until summer of 2006, the Heritage Database team will process an estimated 5,000-7,000 E&T faunal records under the duration of this grant.

*2) Data pertaining to Illinois Natural Areas Inventory (INAI) sites will be entered and mapped in Biotics 4. Additional INAI data will be entered into NATS.*

Information on Illinois Natural Areas Inventory (INAI) sites received from various sources, including the Natural Areas Evaluation Committee, will be entered and spatial locations mapped in Biotics 4. This includes information on the status of the natural areas and their significant features, site descriptions, land use history, conservation intentions, threats, and management needs. Additional INAI data not tracked in Biotics 4 will be entered into the Natural Areas Tracking System (NATS). This additional data includes detailed acreage and grade information for natural communities, species lists, ownership, dominant species present, etc.

The Natural Areas Evaluation Committee (NAEC) is made up of members from IDNR (Natural Areas Program Manager, the District Restoration Ecologist, and the Regional Restoration Ecologist), the Endangered Species Protection Board (Board Member), and the Illinois Nature Preserves Commission (Deputy Director for Protection). Using criteria that they have established in past meetings, the NAEC determines which individual lands, nominated by IDNR field staff and other experts, qualify as Illinois Natural Areas Inventory (INAI) sites.

Every INAI record entered will undergo a Quality Assurance / Quality Control process to minimize data entry and mapping errors. An estimated 2,500-3,000 INAI site records will be mapped or remapped and corresponding data entered into the database each year of the grant. Since work will not begin on this grant until summer of 2006, the Heritage Database team will process an estimated 12,500-15,000 INAI-related records under the duration of this grant.

*3) Data pertaining to high quality natural communities will be entered and mapped in Biotics 4. Existing natural community point records will be remapped as polygons.*

High quality natural community information associated with INAI sites will be entered and spatial locations mapped in Biotics 4. Existing high quality natural community records, represented by buffered points, will be remapped using the new polygon mapping methodology developed by NatureServe. Every community record entered will undergo a Quality Assurance / Quality Control process to minimize data entry and mapping errors. An estimated 300-400 high quality natural community records will be mapped or remapped and corresponding data entered into the database each year. Since work will not begin on this grant until summer of 2006, the Heritage Database team will process an estimated 1,500-2,000 natural community records under the duration of this grant.

4) *Data specialists will assist field staff with sampling and transect surveys as well as GPS techniques on a limited basis in an effort to assist in the collection of E&T and INAI data.*

On a limited basis, the data specialists will assist field staff with sampling and transect surveys as well as GPS techniques in an effort to ensure that E&T and INAI data is collected in a manner best suited for use in Biotics 4 and NATS. All field work, including that which involves the capture of live animals, especially those that are federally listed, proposed, or candidate species, will be conducted under the supervision of the IDNR District Restoration Ecologist, who will be responsible for designing the survey, providing all the necessary equipment, and securing pertinent approvals and/or permits. Participation in field work is estimated at 24 total days per year. Since work will not begin on this grant until summer of 2006, participation in field work is estimated at 120 days under the duration of this grant.

5) *Biotics 4 & NATS will be used to respond to requests for information, conduct data analysis, and generate reports pertaining to Illinois' Comprehensive Wildlife Conservation Plan.*

Both Biotics 4 and NATS will be used to respond to requests for information, conduct data analysis, and generate reports, particularly those related to Illinois' CWCP. The use of these systems will assist in determining the status of wildlife species and their habitats, guiding future management efforts, and monitoring the success of both. An estimated 20-30 information requests from internal and external sources will be handled each year. Since work will not begin on this grant until summer of 2006, the Heritage Database team will process an estimated 100-150 information requests under the duration of this grant.

ESTIMATED COST:

Segment 1:	\$ 307,519
Segment 2:	<u>\$ 767,389</u>
Segment 1 & 2 combined:	\$1,074,908

PERSONNEL:

The following personnel from the Department of Natural Resources  
Two Contractual Employees

KEY STAFF: T. Kieninger (IDNR) and C. Phillips (Illinois Natural History Survey)

SCHEDULE:

Data entry Segment 1: As completed through 06-30-09  
Segment 2: As completed through 06-30-12

**Project 2** Mapping of Illinois Department of Natural Resources' Owned, Managed, and

## Leased Properties

### PURPOSE AND NEED:

The Illinois landscape has undergone dramatic change since Euro-American settlement. For example, 99.9% of the original prairie (which covered approximately half the state in the early 1800s) and over 90% of the original wetlands (which accounted for about one-fourth of the land cover in the early 1800s) have been lost. In Illinois, where well over 90% of the land is privately owned, Illinois Department of Natural Resources (IDNR) lands provide a critical opportunity to directly protect, manage, sustain, and enhance the state's remaining natural lands and waters and the plants and animals they support. Many of the lands that IDNR owns, manages, or leases support important and unique natural resources including plant and animal species, habitats, and communities. The IDNR Land and Water Report for June 30, 2004 lists 315 conservation-related properties which the department owns, manages, or leases, including state parks (62), conservation areas (24), natural areas (97), fish and wildlife areas (38), trails and greenways (10), forests (7), pheasant and wildlife areas (27), and lands leased from or managed for federal agencies and cooperating companies (50).

Comprehensive, reliable, and accessible information regarding the land holdings of IDNR is critical for well-informed decisions regarding conservation planning, implementation, and assessment efforts in the state. GIS based methods are one of the most cost effective and efficient means for meeting the Comprehensive Wildlife Conservation Plan and Strategy (CWCP) requirements at small, regional, and statewide scales. The development and maintenance of an Owned, Managed, and Leased Properties (OMLP) database with detailed information on boundaries, ownership, funding source, management goals and activities, and restrictions on these lands is important to designing and implementing a successful conservation strategy for the state. Utilization of the OMLP database in a GIS environment allows access to descriptive tabular information in a single database, visual display of information on maps, and the capability to conduct spatial analyses with a variety of other databases (e.g. wildlife species distributions, areas of high biodiversity, land cover, surrounding land use, surrounding land ownership) and at a variety of scales, providing scientific and technological information to meet ecosystem based management and protection goals.

Data in the OMLP data set are essential for satisfying several of the eight elements of the CWCP required by Congress, specifically describing the location and relative condition of key habitats and community types (Element 2), describing conservation actions proposed to conserve species of concern and habitats as well as priorities for implementing such actions (Element 4), and monitoring the effectiveness of conservation actions (Element 5).

### *Background*

The OMLP project was initiated in the fall of 2003. Initially, the main tasks were to establish procedures and standards for data capture and management into a GIS framework, and to create a geospatial database for IDNR properties acquired with federal and dedicated funds (e.g. Habitat, Pheasant, Migratory Waterfowl Stamp and Furbearer funds). The first phase of the project was initiated under the State Wildlife Grant T-03-P1 agreement. The main tasks for

that phase were to establish procedures and standards for data capture and management into a GIS framework, and to create a geospatial database for IDNR properties acquired with federal and dedicated funds (e.g. Habitat, Pheasant, Migratory Waterfowl Stamp and Furbearer funds). Of the 311 sites controlled by IDNR, 65 have been mapped by the OMLP project to date. It is anticipated that this phase of the project will be able to complete approximately 167 total sites over the next six years. The site count is relatively low due to the complexity and size of some of the sites (some have hundreds of ownership parcels to be mapped) as well as due to the problematic nature of some of the legal descriptions and associated deeds for some of the older sites. These problem sites entail a great deal of additional research to resolve the issues of correct boundary placement.

The geodatabase created for the mapping project contains property boundaries at the parcel level and has been designed with the capability of mapping outer extent property boundaries, corner monument markers, interior parcel lines, right-of-way and easement extents, and historical boundary change. Each property requires thoroughly researching files with extensive amounts of paper records for relevant information concerning parcel boundaries and conservation practices. Most properties consist of multiple parcels; some of the more complex properties have hundreds of parcels.

A procedure for accurately and consistently digitizing each property has been developed using ESRI Arc software. Metadata is being created for the GIS data layers using Federal Geographic Data Committee compliance standards as a guide. A quality assurance/quality control (QA/QC) methodology has been put into place to insure the data created meets the accuracy standards defined in the OMLP project data input methodology.

To maximize its usefulness as an information and planning tool, the OMLP database has been designed for integration with other agency databases. This will facilitate coordinated conservation management activity efforts within IDNR in support of the CWCPs.

#### OBJECTIVES:

1. Record, update, and maintain IDNR owned, managed, and leased properties in a GIS database. During the six year duration of this grant project, the OMLP team will be able to map somewhere in the order of 167 of the 311 total sites controlled in some way by IDNR.
2. Develop and implement ways to make the data available and accessible to users.

#### EXPECTED RESULTS AND BENEFITS:

The products of this project are:

- § A geodatabase of IDNR owned, managed, and leased properties that can be used for

mapping and analysis. Spatial boundaries and data fields with descriptive narrative information will be included in the database.

- § User interfaces developed with ArcIMS addressing the needs of the Office of Resource Conservation and the CWCPS.
- § Metadata included in the final database.
- § Annual and final reports including documentation of the methodology used.

## APPROACH:

### *Objectives*

*1) Record, update, and maintain IDNR owned, managed, and leased properties within the existing OMLP GIS database.*

The proposed project will expand on previous work by adding properties to the database. Ultimately the aim is to include all conservation related properties which IDNR owns, manages, or leases. This would create a comprehensive source of information on property boundaries and descriptive information related to each property (e.g. size, land use, management practices, etc.) in a digital geospatial format.

The project will finish the top priority of mapping all Federal and other special interest-funded sites. Sixty-five of the seventy some top priority sites have been completed, with quality control needed on all sites mapped to date. The Quality Assurance / Quality Control process will be completed on the top priority sites before beginning work on a second priority list that is being determined by IDNR staff in response to CWCP monitoring needs. Because of the widely varying sizes of the sites as well as because of the problematic nature of some of the legal descriptions and deed information, it is likely that no more than 14 sites can be done in a year. Therefore, during the six year duration of this grant project, the OMLP team will be able to map somewhere in the order of 167 of the 311 total sites controlled in some way by IDNR.

*2) Develop and implement ways to make the data available and accessible to users.*

The data will be available to users as an Arc geodatabase to be used in GIS applications; it is anticipated that most users will utilize the data in ArcGIS. Customized user interfaces will be developed to facilitate access to the data by IDNR staff, especially those staff charged with the mission of implementing, monitoring, and evaluating conservation efforts set forth in the CWCPS. Database integration efforts will focus on compatibility with the Office of Resource Conservation Federal Aid program database (to track and manage the use of properties with federal interest) and the Office of Realty and Environmental Planning IDNR property database. Integration with these two existing databases will provide critical information to IDNR staff regarding funding restriction compliance on new and existing USFWS grants as well as funding compliance on grants from other agencies and organizations. The OMLP database will also be

combined with other conservation activity management tracking systems as they are developed. Demonstrations and training of IDNR staff and other interested parties will be conducted.

### *Specific Tasks Needed to Complete the Project*

The specific tasks for the proposed project are the following:

- 1) Research property boundaries and related information. Research is conducted in Springfield where paper records of boundaries and related data are housed.
- 2) Digitize boundaries and add descriptive information to the database.
- 3) Conduct quality assessment and quality control on each property in the database. This step is important for meeting accuracy and reliability standards. Most of the properties currently in the database and each new property will need to have QA/QC.
- 4) Develop customized user interfaces with ArcIMS in collaboration with IDNR staff.
- 5) Conduct demonstrations and training for IDNR and other user groups.
- 6) Prepare written documentation and metadata.
- 7) Prepare reports.

Properties will be added based on a prioritized list developed in consultation with the Project Manager. Sites with federal interest have been assigned first priority. Types of properties to be included in the database are State Parks, Conservation Areas, Natural Areas, Fish and Wildlife Areas, Forests, and Land and Water Reserves. Properties with insufficient information regarding parcel boundaries (generally some of the early acquisitions) will be mapped based on best available information. It is difficult to estimate the number of properties that can be added during the project period because properties vary from a few to hundreds of parcels and the amount of time individual properties may take is not known until the paper files have been researched. Based on progress so far, it takes a person approximately one month to research and digitize a property. The GIS specialists will also need to conduct quality assessment/quality control (QA/QC) for each property in the database (this will need to be done on most properties currently in the database as well as the new ones added). Therefore, it is anticipated that a staff of two full-time GIS specialists and one technician could complete (i.e. research, digitize, and QA/QC) 14 properties per year and 3 full-time GIS specialists and one technician could complete 21 properties per year. The estimated schedule of completion for properties is as follows (the estimated number of properties that should be researched and digitized by 9/30/05 under previous agreements is 65; periods are 12 months except Period 3 which is 9 months):

Period	# of Properties	Total
-	65	65
1	14	79
2	14	93
3	11	104
4	21	125
5	21	146
6	21	167

The OMLP project will continue to be a joint effort between the Project Manager in the Springfield office and personnel at the Illinois Natural History Survey (INHS) in Champaign. The Project Manager, who designed the database and developed the methodology, will determine if the objectives have been met and the product meets quality standards. INHS personnel will continue to stay in regular contact with the Project Manager.

The OMLP database is currently stored and maintained on a server at IDNR in Springfield and is managed by the Project Manager. The initial user interface will be developed for the Federal Aid Division in the Office of Resource Conservation. It is anticipated that OMLP data would be available to other offices at IDNR with an interest in IDNR properties (e.g. Office of Realty and Environmental Planning), the US Fish and Wildlife Service, and other users.

Costs:

Segment 1:	\$ 586,735
Segment 2:	<u>\$ 989,749</u>
Segment 1 & 2 combined:	\$1,576,484

KEY STAFF: T. Tweddale (Illinois Natural History Survey), C. Foor (IDNR)

SCHEDULE:

Work will take place throughout Segment 1 and Segment 2 (September 30, 2005 through June 30, 2012).

PROJECT PERIOD						
	Segment 1			Segment 2		
TASK	Period 1 9/30/05- 9/30/06	Period 2 10/1/06- 9/30/07	Period 3 10/1/07- 6/30/09	Period 4 7/1/09- 6/30/10	Period 5 7/1/10- 6/30/11	Period 6 7/1/11- 6/30/12
Research and digitize properties *	X	X	X	X	X	X
Conduct quality assessment/ quality control of digitized properties	X	X	X	X	X	X
Develop user interfaces and availability of data	X **	X	X	X	X	X
Conduct demonstrations and training	X	X	X	X	X	X
Develop metadata for database	X	X				
Prepare report for project period	X	X	X	X	X	X
Prepare final report						X

\* The number of properties that can be completed is estimated at 14 in Periods 1 and 2 (12 months with 2 full-time staff), 11 in Period 3 (21 months with 2 full-time staff), and 21 in each of Periods 4, 5, and 6 (12 months with 3 full-time staff). The estimate is based on current progress on the OMLP project.

\*\* Development of user interface for Office of Resource Conservation (ORC) Federal Aid program will be accomplished in Period 1.

**Project 3** Mapping in Support of the Comprehensive Wildlife Conservation Plan and Wildlife Conservation Strategies.

PURPOSE AND NEED:

Conservation Practices mapping began in 2000. Currently, eight (8) counties out of 102 have been mapped by IDNR for Federal Conservation Reserve Program (CRP) and Federal and State Conservation Reserve Enhancement Program (CREP), Illinois' Conservation 2000 Program, Environmental Quality Incentive Program (EQIP) and the Wetland Reserve Program (WRP). Other Counties have had mapping done by other parties (approx. 26 counties), but will need to have Quality Assurance / Quality Control conducted and updates performed before being fully incorporated.

Georeferencing of practices, type, size, and longevity of practice are but a few of the specific reference points that will be available to users. Users will include all parties contributing to, and implementing the CWCP.

The attached map (icpts\_mapping\_project1) identifies the counties where mapping has or has not occurred. The counties of Cass, Christian, Fulton, Knox, Menard, Morgan, Sangamon, and Schuyler have been mapped to the ICPTS. Other mapping work will have to be verified, updated, and rectified to the ICPTS. The data being collected is included at the end of the proposal and is entitled, "Conservation Practices Tracking System (CPTS) database structure" (Appendix 1). This information will be expanded as information becomes available, but all counties will have this minimum level of data.

Conservation mapping is a valuable and necessary component to natural resources planning by displaying the distribution of conservation practices and data on practice type and size. This job will build upon past mapping within the Illinois River Basin to identify conservation easements and the associated practice information in counties not mapped to date. Mapping will be consistent with past protocols, and compliment efforts of federal agencies such as USDA - NRCS and FSA in their mapping efforts on conservation practices. This will allow for data sharing and expansion of the Illinois Conservation Practices Tracking System (ICPTS).

Data in the ICPTS data set are essential for satisfying one of the eight elements of the CWCP required by Congress, specifically monitoring the effectiveness of the conservation actions (Element 5).

This project was initiated in Project 1, Job 1 in T-03-P (Expand the Illinois Conservation Practices Mapping System (ICPTS) to Selected Illinois Counties) for which tasks and expenditures will be completed prior to initiating tasks identified in this Project. This project expands the Illinois Conservation Practices Mapping System (ICPTS) to all of Illinois. As a fundamental component of any natural resources planning, the ICPTS will provide field managers, administrators, and planners with critical information on current conservation easements.

#### OBJECTIVES:

1. Update and expand the Illinois Conservation Practices Mapping System (ICPTS) to cover the entire State of Illinois. This will include assessment of current mapping, initiating mapping in sequential order based on a prioritized listing, and working with individual counties to implement standard mapping protocols as defined in ICPTS. Fifteen (15) counties will be mapped on an annual basis as prioritized by staff utilizing the CWCP within the IDNR Regional Offices.
2. Map all State Conservation Reserve Enhancement Program sites and include all federal CRP and CREP sites, other Federal farm program sites as made available, Federal Corps of Engineers Habitat Rehabilitation and Enhancement Project sites and other Corps sites as available, and projects sites available through cooperative agreements with state natural resource agencies. Initial activities will be within the 8 counties completed by IDNR, and updating of the 26 additional counties with some level of mapping completed.

3. The IDNR Habitat Team has been establishing habitats on private lands and public sites since 1998. Operating from 4 locations, the Habitat Team Program offers assistance in establishing and managing optimum wildlife habitat. Assistance includes providing seed and/or equipment, planting, spraying herbicides, site preparation, mowing and prescribed burning. When fully staffed for the entire planting season, approximately 350 cooperators are assisted covering 3,500 - 4,000 acres in 40 or more counties. These sites have never been geo-referenced or mapped on a statewide basis. We will initiate development of a complete, accurate, and fully metadata-attributed GIS data set of all historical and current properties having wildlife habitat created or enhanced by the IDNR Habitat Team including the GPS siting and recording of practice locations and relevant data. It is estimated that 7 counties per year will be completed within the grant period.

EXPECTED RESULTS AND BENEFITS:

Mapping will show conservation practices and their spatial relationships between various programs. Data on the sites will document habitat availability for wildlife, as well as potential water quality management capabilities. Information gathered from this mapping will assist in targeting critical habitat needs for future program initiatives.

APPROACH:

The Department will work with all counties in a sequential, prioritized manner to implement ICPTS. Currently, all conservation mapping work through the ICPTS initiative is being accomplished in the Illinois River basin. This expansion will begin to incorporate other critical areas of the state such as the Kaskaskia River and the Upper Little Wabash basin where significant conservation planning and/or activities are taking place, as well as additional key areas in the Illinois River basin in a prioritized manner, into ICPTS. Given that USDA-funded conservation easement data are maintained in paper format by county USDA Service Center offices, generally without a delineation by watershed, and that ICPTS is being developed incrementally as a statewide database, the data gathering activities under this job are planned as countywide efforts. However, where particular basins are of special interest, such as the Kaskaskia or Illinois, and where feasible, the gathering and entry of new and historical data records into ICPTS for a given county will be prioritized by watershed.

ESTIMATED COST:

Segment 1:	\$268,728
<u>Segment 2:</u>	<u>\$299,375</u>
Segment 1 & 2 combined:	\$568,103

KEY STAFF: D. Bruce (IDNR), G. Schnitkey and L. Demeule (University of Illinois)

SCHEDULE: Work will take place throughout Segment 1 and Segment 2 (September 30, 2005 through June 30, 2012).

Award Contract                      Segment 1:10-01-05

Segment 2: 07-01-08

Maps and data                      Segment 1: As completed through 06-30-09

Segment 2: As completed through 06-30-12

APPENDIX 1:

**Conservation Practices Tracking System (CPTS) database structure**

Table: **CONTRACT.DB** - Data table where each record corresponds to a single contract under which property is enrolled in one of any number of government sponsored conservation programs. As of January 2001, these include the federal and state portions of the Illinois Conservation Reserve Enhancement Program (CREP) and other USDA Farm Bill conservation programs such as EQIP, CRP, WHIP, AND WRP. Information taken from the contracts include the agency and program funding the enrollment, the general location (county, NRCS HUC watershed, FSA county farm number) of the property enrolled, the county where the contract is held, date and duration of the enrollment, and the total acreage enrolled (as determined by the program administrators) under the contract.

Field Name	Type	Size	Key	Field Description
ContractID	A	12		Contract number assigned to enrollment.
MatchingEnrollID	A	12		Corresponding Federal/State CREP contract number if applicable.
ContractCountyName	A	10		Name of Illinois county where enrolled property is located.
ContractCountyNum	A	3		IDNR code for Illinois county where enrolled property is located.
OfficeCountyNum	A	3		IDNR code for Illinois county office where contract information is held.
OfficeCountyName	A	10		Name of Illinois county office where contract information is held.
Year	A	4		Fiscal year of enrollment.
Agency	A	4		Government agency managing conservation program under which the property was enrolled.
Program	A	6		Conservation program under which the property was enrolled.
FarmNum	I			Farm number, assigned by USDA-FSA county office, of the property enrolled.
SignUpNum	I			Program sign-up number, if applicable
EnrollMonth	A	2		Month of enrollment
EnrollDay	A	2		Day of enrollment.
EnrollYear	A	4		Year of enrollment.
Duration	A	4		Duration (years) of enrollment.
TotalAcres	N			Total acres enrolled in program, as noted in the contract.
CropHist	A	16		5 year cropping history of property prior to enrollment.

HUA	A	20		NRCS Hydrologic Unit Code for watershed where property is located.
Comments	A	255		Comments regarding the contract or how the contract information has been entered/revised.
Comments	+			Autoincrement number, which preserves the order in which records are entered into the Contract data table.

Table: **LEGAL.DB** - Data table which documents the general location, by Public Land Survey System (PLSS) Section, of property enrolled in conservation programs as described in table CONTRACT.DB. A single record is added for each PLSS section in which the enrolled property lies. Quarter section description can be specific (ex.: "SW") or general if the property covers several quarter sections within a section (ex: "S" where a property spans the SW and SE quarter sections). Records link to the CONTRACT.DB table through field [ContractID].

Field Name	Type	Size	Key	Field Description
ContractID	A	12	*	Contract number corresponding to conservation practice enrollment. Link to table CONTRACT.DB.
Meridian	A	1	*	Meridian of property enrolled in conservation program.
TWP	A	3	*	Public Land Survey System Township of property enrolled in conservation program.
RNG	A	3	*	Public Land Survey System Range of property enrolled in conservation program.
Sec	A	2	*	Public Land Survey System Section of property enrolled in conservation program.
QuartSec	A	2	*	Public Land Survey System Quarter Section of property enrolled in conservation program.

Table **CPTS.DBF** - General name given for a group of ArcView GIS shape file attribute tables which document the precise location of property enrolled in to conservation programs. A record exists for each polygon digitized. Each polygon defines the boundary of a parcel of land in a conservation practice (filter strip, wetland restoration, wildlife habitat, etc.). Attributes of these polygons include the contract number under which the land was enrolled, the conservation practice applied, cropping history of the parcel, the identify of the person who digitized the contract, the basemap used in digitizing the property boundaries, and the listed and calculated acreage of the polygon. Records link to contract-specific information in the Paradox CREP.DB table through field [ContractID] in CREP.DB related with [STATEID] or [FEDID] in CPTS.DBF.

Field Name	Type	Size	Key	Field Description
ID	N	8	0	ArcView GIS internal ID for polygon.
STATEID	C	12		Corresponding State CREP contract number of enrollment, if applicable.

FEDID	C	12		Corresponding Federal Contract number assigned by county FSA office.
PRACTICE	C	6		USDA-FSA code for conservation practice implemented.
SUBPRACT	C	10		USDA code for subcategory of conservation practice, if applicable.
QUALIFY	C	8		General category of conservation enrollment (ADD=Additional acreage into State CREP, RBA=Riparian Buffer Area, HEL=Highly erodible)
COMMENTS	C	100		Comments related to the digitizing of the contract information.
AREA	N	16	4	Area (acres) of the enrolled property as calculated by ArcView GIS.
BASEMAP	C	6		Scale and source of basemap used in digitizing the boundary of the enrolled property.
DIGITIZER	C	6		Name of person digitizing the enrolled property boundaries.
LISTEDAREA	C	6		Area (acres) of property enrolled in conservation practice.
AREAOFF	C	6		Difference in area estimates between that on file for the contract and that calculated by ArcView GIS.
SUBCOMMENT	C	100		Secondary comment field.
CROPHIS	C	16		Five year cropping history of property enrolled in conservation practice.

Table: **TRACT.DB** - Data table which documents the general location, by FSA County Farm Tract number, of property enrolled in the State portion of conservation programs as described in table CONTRACT.DB. A single record is added for each tract in which the enrolled property lies. Records link to the CREP.DB table through field [ContractID].

Field Name	Type	Size	Key	Field Description
ContractID	A	12	*	Contract number assigned to enrollment. Link to table CONTRACT.DB.
TracNum	I		*	USDA-Farm Service Agency county Tract number assigned to the enrolled property

Table: **PRACTICE.DB** - Data table which documents the various conservation practices implemented under the conservation enrollment as described in table CONTRACT.DB. Each contract will have one record in PRACTICE.DB for each type of conservation practice planned or implemented under that contract as well as the total acreage converted to that conservation practice. Records link to the CREP.DB table through field [ContractID].

Field Name	Type	Size	Key	Field Description
ContractID	A	12	*	Contract number assigned to enrollment. Link to table CONTRACT.DB.
Practice	A	6	*	USDA Farm Service Agency Code for Conservation Practice (ex.: 'CP23').
TotalAcres	N			Total area (acres) covered by the specific conservation practice.
Comments	A	50		Comments related to the nature or implementation of the conservation practice.

Table: **AGENCY\_LOOKUP.DB** - Lookup table listing agency acronyms and full names. Each record corresponds to a different agency.

Field Name	Type	Size	Key	Field Description
Agency	A	4	*	Acronym for Federal or State Agency
Agency_FullName	A	50		Full Name of Agency

Table: **COUNTY\_LOOKUP.DB** - Lookup table which interprets IDNR integer codes for Illinois counties. Counties in this scheme are assigned an integer value based on the alphabetic order of the county name (ex.: 1=Adams County,....., 102=Woodford County). Each record corresponds to a single Illinois County.

Field Name	Type	Size	Key	Field Description
CountyName	A	10	*	Name of Illinois county
CountyNum	A	3		Corresponding IDNR code for Illinois county

Table: **CROPPING\_LOOKUP.DB** - Lookup table listing the codes for various types of cropping and their corresponding description.

Field Name	Type	Size	Key	Field Description
CroppingCode	A	5	*	Alpha code for type of cropping practice
Description	A	75		Description of cropping practice

Table: **DURATION\_LOOKUP.DB** - Lookup table listing the codes for various terms (years) of conservation enrollment contracts and their corresponding description.

Field Name	Type	Size	Key	Field Description
Duration	A	4	*	Length of enrollment (10 years, 15 years, 35 years, P=perpetuity)
Duration_long	A	25		Text explanation of duration of contract

Table: **PRACTICE\_LOOKUP.DB** - Lookup table listing the USDA Farm Service Agency (FSA) codes for various conservation practices, their corresponding description, and corresponding NRCS code for that practice.

Field Name	Type	Size	Key	Field Description
Practice	A	6	*	USDA Farm Service Agency Code for Conservation Practice (ex.: 'CP23')
PracticeName	A	50		Name of corresponding Conservation Practice (ex.: 'Wetland Restoration')
PracticeNRCS	A	5		Corresponding USDA Natural Resources Conservation Service Conservation Practice code

Table: **PROGRAM\_LOOKUP.DB** - Lookup table listing acronyms for various conservation programs and their corresponding description.

Field Name	Type	Size	Key	Field Description
Program	A	6	*	Acronym of agency Conservation Program
FullProgName	A	50		Full name of agency Conservation Program