

**Proposal for**  
**Consulting Services**  
**Post-Construction Siting Inspections**  
**PU-10-123**

**Prepared for:**  
**North Dakota Public Service Commission**

**May 26, 2010**

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## 1.0 Introduction

The North Dakota Energy Conversion and Transmission Facility Act (NDCC Chapter 49-22) authorizes the North Dakota Public Service Commission (Commission) to determine that the location, construction, and operation of jurisdictional energy conversion and transmission facilities will produce minimal adverse effects on the environment and the welfare of the citizens of North Dakota. It is the policy of the Commission to site energy conversion facilities and to route transmission facilities in an orderly manner compatible with environmental preservation and the efficient use of resources. Site and routes are chosen to minimize adverse human and environmental impact while ensuring continuing system reliability and integrity and ensuring that energy needs are met and fulfilled in an orderly and timely fashion.

McCain and Associates, Inc. (McCain) is submitting this proposal in response to the PSC Request for Proposal (RFP #PU-10-123) to acquire consulting services for post-construction inspections. McCain will comply with the provisions of the RFP. There is no apparent conflict of interest that would prevent McCain from completing the work as described.

Correspondence regarding this proposal shall be directed to:

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**Todd A. Hartleben, P.E.**  
Vice President/Principal Engineer

Date:     May 26, 2010

## **2.0 Understanding of the Project**

The Commission is statutorily charged with the siting of energy conversion and transmission facilities under the North Dakota Siting Act, which is codified in Chapter 49-22 of the North Dakota Century Code. The purpose of the Siting Act is to ensure that the location, construction, and operation of energy conversion facilities and transmission facilities will produce minimal adverse effects on the environment and upon the welfare of the citizens of this state by providing that no energy conversion facility or transmission facility shall be located, constructed, and operated within this state without a certificate of site compatibility or a route permit issued by the Commission.

A utility may not begin construction of an energy conversion facility or transmission without first having obtained a certificate of site compatibility or a route permit from the Commission. The facility must be constructed, operated, and maintained in conformity with the certificate or permit and any terms, conditions, or modifications of the certificate or permit.

The Commission is soliciting proposals for post-construction inspections to ensure that energy conversion and transmission facilities have been constructed in compliance with the siting laws and rules and the applicable Findings of Fact, Conclusions of Law, and Order. McCain staff has the technical skills, experience, and resources to complete the project(s) in a timely manner and in conformance with the requirements of the RFP.

### **2.1 Inspector Responsibilities**

McCain will provide personnel to complete the post-construction inspection process in accordance with the requirements of the Commission. The Commission will identify the projects for post-construction inspection and the relevant laws, rules, and commission precedent.

McCain will complete and submit documentation and reports to the Commission for each siting project and certify, on behalf of the Commission, that the project has been constructed in compliance with the siting laws and rules, and the applicable Findings of Fact, Conclusions of Law, and Order. McCain will provide prompt reporting to Commission of any suspected non-compliance conditions.

McCain will provide the equipment necessary to fulfill the requirements of the project. Essential, results-oriented tasks necessary to achieve the desired results include: a thorough investigation, well-coordinated communication with Commission staff, and well-written inspection reports.

### **2.2 Possible Inspection Items**

Construction of an energy conversion and transmission facility is a complex undertaking. Engineering and environmental considerations affect both design and location. Permits for construction need to be obtained from federal, state, and local governing units. Negotiations with private landowners are needed to secure easements for construction and operation.

The Findings of Fact, Conclusions of Law, and Order take these factors into account for the siting permit. The RFP does not list specific inspection items to be completed by the Consultant. Some of the pertinent issues that may be addressed in the permit and applicable to this contract are:

- Avoidance of environmentally sensitive areas.
- Setback requirements for schools, houses, and other public resources.
- Reclamation and revegetation success.
- Erosion in construction areas.
- Rocks along the right-of-way (ROW).
- Noxious weed growth.
- Tree and shrub replacement/mitigation.
- Wetland Impacts.

This list is not inclusive and/or conclusive for all of the projects as each permit is written specifically for the project, and is included only as items for discussion in this proposal.

### **2.2.1 Avoidance**

The permit may require avoidance of certain sensitive areas. These areas may include wetlands and other water bodies, cultural resource sites, native prairie, conservation easements, or residential/occupied buildings. McCain will review the applicable documents and field-verify that avoidance of these areas has been achieved.

### **2.2.2 Setbacks**

Various regulations prohibit the placement of facilities within a certain distance from residential and public buildings, and other sensitive areas. McCain will verify that facility construction will comply with setback requirements.

### **2.2.3 Reclamation and Revegetation**

Reclamation will take place throughout the project lifespan. Reclamation will be required after the initial construction and after any maintenance work or addition of auxiliary infrastructure. Construction areas should be restored as closely as possible to their original condition. Depending on the location and circumstances, this may involve smoothing the construction area, replacing topsoil, repairing irrigation systems, applying fertilizer and grass seed, or other actions that may be necessary.

Re-contouring and reclamation of disturbed areas should be accomplished as soon as possible after construction is completed, and no later than by the next appropriate planting season (fall or spring). Compacted areas should be scarified, ripped and re-contoured. Following inspection and approval of the contoured area, stockpiled topsoil should be re-distributed and seeded. The area should be seeded with certified, weed-free seed mix chosen for the specific site and goals. Seed mixtures must be pre-approved and specified in the permit.

The construction area will be inspected to identify areas of excessive erosion, subsidence, or invasion of noxious weeds. Site monitoring will be conducted to ensure cover is adequate to prevent erosion and that noxious weeds are controlled. Revegetation success will be evaluated to meet the conditions prescribed by the Commission to meet the goals for the specific site. Success may include vegetation measurements, an assessment of the site functions and/or aesthetic values.

### **2.2.4 Erosion**

Clearing and grading of the construction ROW will remove the vegetation from the work area. In addition, construction grading may change the land contours around the work area. These factors increase the potential for erosion around work areas. McCain will inspect the

construction areas and note areas of excess erosion. Recommendations for stabilizing the site and the use of Best Management Practices (BMP's) will be included in the inspection report.

### **2.2.5 Rocks**

Rocks are unearthed as part of construction. Permits and landowner lease agreements typically prohibit or limit the size and amount of rock; and the placement of rock on the ground surface after construction. This can be especially important on agricultural land. Rocks must be disposed of off the ROW or at a designated location. The size, density, and distribution of rocks over the working area following construction should be similar to adjacent areas not disturbed by construction.

### **2.2.6 Noxious Weeds**

Removal of existing soils and vegetation present opportunities for invasive species and threatens to reduce the quality or quantity of forage or crop production. The North Dakota Agriculture Commission (ND Department of Agriculture 2002) identifies twelve noxious weed plant species in the state. McCain staff has the expertise to identify noxious weeds and species that may interfere with successful reclamation of the desired vegetation. Site inspections will report the presence of noxious weeds and address control measures.

### **2.2.7 Trees and Shrubs**

Trees and shrubs are often removed as part of construction. Mitigation specifications must be approved by the Commission prior to construction. The specifications detail plans for tree and shrub inventories, clearing and grubbing, and mitigation/replacement. McCain has the expertise to evaluate tree and shrub mitigation plans and successful establishment.

### **2.2.8 Wetland Impacts**

Construction of the facilities may affect wetlands and their functions during and immediately following construction activities but permanent changes also are possible. Potential construction- and operations-related effects include:

- Modification in wetland productivity due to modification of surface and subsurface flow patterns;
- Temporary and permanent modification of wetland vegetation community composition and structure from clearing and operational maintenance (clearing temporarily affects the wetland's capacity to buffer flood flows and/or control erosion);
- Modification of the wetland function by modification of hydrologic characteristics resulting in a shift in vegetation composition and/or structure;
- Loss of wetlands due to backfilling or draining;
- Wetland soil disturbance (mixing of topsoil with subsoil with altered biological activities and chemical conditions that could affect reestablishment and natural recruitment of native wetland vegetation after restoration);
- Compaction and rutting of soils from movement of heavy machinery and transport of pipe sections, altering natural hydrologic patterns, inhibiting seed germination, or increasing siltation;
- Temporary increase in turbidity and changes in wetland hydrology and water quality; and
- Permanent alteration in water-holding capacity due to alteration or breaching of water-retaining substrates.

McCain has extensive wetland delineation experience. McCain will evaluate wetland areas to ensure that they are avoided or mitigated as specified in the permit. Pre-construction vs. post-construction acreage will be evaluated.

## **2.3 Schedule**

McCain is available to start immediately upon receiving a notice to proceed. The term of this contract is from June 17, 2010, through June 30, 2011. The Commission reserves the right to extend the contract period for additional period of time beyond the normal expiration date. McCain staff will be available to fulfill the requirements of this contract for the duration of that time.

## **2.4 Inspection Plan**

McCain will coordinate with the Commission to obtain the information necessary to perform the post-construction inspections and compile a list of priorities. McCain will develop a work plan that details specific work tasks, logical interactions, milestones, staff assignments, schedule, and deliverables. A timeline for completing the work tasks will be developed in coordination with the Commission.

Siting inspection projects included as part of this contract are listed in Attachment 6 of the RFP. Additional projects may be added or deleted, as necessary. McCain will make on-site inspections of the site(s) and determine if construction was completed in accordance with the relevant laws and rules. Historical aerial photography may be reviewed to identify changes in land use or patterns resulting from construction of facilities.

The findings collected during the field inspection will be compiled into an inspection report. The inspection report will document and summarize the field findings and methodologies used to collect the field data. McCain will work with the Commission to develop a report format suitable for each type of project (i.e. pipeline, transmission line, wind farm, etc).

McCain will submit reports promptly and report suspected non-compliance conditions. McCain may make recommendations to correct non-compliance conditions. If no non-compliance conditions are found, McCain will certify that the project was constructed in compliance with the permit.

Spatial data will be collected in the field using a Trimble GeoXH GPS. ArcGIS 9.2 will be used to create GIS maps illustrating locations, boundaries, and orientation. GPS Analyst will be used to post-process the spatial data. The post-process data will have sub-meter accuracy. AutoCAD and/or Microstation drafting software are available to be used for engineered drawings. Digital cameras will be used to collect field photographs of the mitigation sites.

McCain will utilize the most qualified personnel, depending on the nature of the inspection items, to perform the post-construction inspections. Personnel with expertise in a specified field will work on projects of that nature. A team approach will be utilized to complete fast-tracked or emergency projects. In this case a team will perform the site inspection and work together to compose and complete the report in an efficient manner. Separate personnel will be sent to work on multiple project sites simultaneously. All personnel are based in Bismarck, ND, and will travel to and work on the projects.

McCain personnel are equipped with laptop computers, cell phones, and digital cameras. Laptop computers will have wireless internet and e-mail capabilities so reports and photos can be submitted as quickly as possible. McCain will allocate space on our internal network server for storage of files generated for this project. McCain also has an <http://> protocol web site where files can be accessed by the Commission.

### 3.0 Experience and Qualifications

McCain and Associates is a civil and environmental consulting firm specializing in general civil engineering; environmental review, permitting, investigation, and remediation; ecological services; wetland delineation and mitigation; and construction management. Our office locations are in Bismarck, North Dakota, and Maple Plain, Minnesota. We are uniquely qualified for this project as all services required for this contract will be performed by McCain staff located in the Bismarck office.

McCain has the experience and expertise to fulfill the requirements of this RFP. McCain staff has previously worked on large pipeline, transmission line, coal mine reclamation, and industrial facility construction projects.

Staff members include civil and geological engineers, biologists/ecologists, environmental scientists, geologists and hydrogeologists, and CADD and GIS technicians with experience ranging from four to over 33 years. In-house staff resources that are particularly relevant to this project include:

- Expertise in inspecting pipeline construction, performing environmental inspections, grading and site design, erosion control, and preparing and reviewing specifications and construction drawings.
- Engineers and biologists with expertise in route investigations, soil classification, and wetland delineations, mitigation, and restoration.
- Biologists with expertise performing surveys for threatened and endangered species, performing tree counts, and monitoring revegetation and restoration success.

Additional staff experience includes regulatory permitting and compliance; surveying; and groundwater and soil remediation.

Staff assigned to this project includes Todd Hartleben, Kathie Kjar, Greg Meyer, and Ryan Krapp. Brief profiles of individual qualifications are provided below. Individual resumes are included in Appendix A.

#### **Todd Hartleben, P.E.** *Principal Engineer*

Todd is a licensed engineer in the State of North Dakota with over 15 years of professional experience. Todd's experience relevant to this project includes:

- Inspecting large pipeline and facility construction projects to ensure environmental and other permit compliance.
- Researching, preparing, and submitting environmental reports satisfying NEPA and FERC requirements for construction of interstate pipelines.
- Producing, reviewing, and editing contract documents, construction specifications, and construction drawings for pipeline and fiber optic cable projects.
- Consulting with federal, state, and local agencies regarding permit requirements for facility construction.
- Preparing and submitting permit applications to federal, state, and local agencies pertaining to wetlands, rivers, threatened and endangered species, NDPES, cultural resources, air quality, and land use.
- Preparing and administering environmental training programs.

Todd will be the primary contact for this project and will provide overall project management. He will be responsible for ensuring satisfaction with McCain's performance of the work and will ultimately be responsible for completion of the work in accordance with the contract.

**Kathie Kjar, PhD** Senior *Ecologist/Botanist*

Kathie has over thirty-three years experience in vegetation and wildlife research and reporting. Kathie has conducted biological evaluations and assessments and collected quantitative data for land grant colleges, federal offices, and coal companies. Kathie was instrumental in writing the Public Service Commission surface coal mine evaluations of vegetation in North Dakota. She has also delineated wetlands and has experience with GPS and GIS data acquisition and preparation.

- Tree counts and surveys
- Wetland delineation.
- Inspection and monitoring of surface coal mining operations and reclamation projects.
- GPS and GIS data acquisition and preparation.
- Background research and reporting.
- Field mapping and delineation of land uses and habitat types.
- Research and data compilation of land owners, mineral rights, structures, soils and waterways.
- Systematic annual vegetation monitoring of yield, cover and other parameters
- Erosion control monitoring
- Noxious and invasive weed surveys.
- Data collection on cropland, native grassland, hay land, tame pastureland, shelterbelts, woodlands, wetlands, and industrial areas.
- Coordination of input with State and Federal Agencies including ND Game and Fish, ND Soil Conservation Committee, ND Heritage Center, US Fish and Wildlife Service US Natural Resources Conservation Service, US Corp of Engineers, and US Bureau of Land Management.

**Greg Meyer, MS** Wildlife *Biologist/Ecologist*

Greg is McCain's wetland expert and will be called upon for issues involving wetland construction and restoration. Greg's wetland experience includes delineations, classification, vegetation mapping, mitigation, and restoration. At a previous employer, he led a study to determine carbon sequestration in wetlands in the upper Midwest. He has also conducted numerous floral inventories across North Dakota ranging from wetland to badland areas, including tree identification and tree counts. He currently specializes in conducting surveys for endangered, threatened, and rare plant and animal species, mapping habitats and plant communities, and delineating wetlands.

**Ryan Krapp, MS** Wildlife *and Fisheries Biologist/GIS Specialist*

Ryan provides GPS and GIS support, management, and analysis and map production. Ryan will assist in producing maps for reporting and reviewing as-built construction drawings for accuracy. He has extensive experience in creating GIS databases, managing large volumes of spatial and temporal data, and producing GIS maps that aid in habitat management, monitoring, and analysis. Ryan will also assist in reviewing river and stream crossing techniques.

## 4.0 Cost Proposal

McCain's fee schedule for this project is included in the table below. Invoices will be accrued on a time and materials basis, with a *not to exceed* cost based on the facility siting fee. As stated in Section 2.4, McCain will assign staff to perform the inspections depending on the nature of the inspection items and desired results.

<b>Item</b>	<b>Rate</b>
Principal Engineer (Todd Hartleben)	\$100/hr
Senior Ecologist/Botanist (Kathie Kjar)	\$85/hr
Biologist/GIS Specialist (Greg Meyer, Ryan Krapp)	\$65/hr
Mileage	\$0.60/mile
Lodging	Billed at cost
Per Diem	\$40/day

The following assumptions apply to this cost estimate:

- Expenses for travel will not be charged for work in Bismarck (meetings)
- Services to provide expert testimony are not included in this contract.
- Work not included within this general scope of work will be addressed via amendment to the original contract.

McCain is willing to discuss our cost proposal with the Commission to clarify assumptions and answer questions.

# ***Appendix A***

## ***Resumes***

# **Todd A. Hartleben, P.E.**

## **Principal Engineer**

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### **Experience Summary**

Todd has over 15 years of experience as an engineer and technician in general civil engineering, construction services, environmental permitting and review, waste management facility design, landfill gas extraction system design and testing, and materials testing.

### **Employment History**

**Principal Engineer, VP**, McCain and Associates, Inc, Bismarck, ND (present)  
**Senior Engineer**, Earthworks, Inc., Bismarck, ND (2006)  
**Senior Engineer**, McCain and Associates, Inc., Maple Plain, MN (2002-2006)  
**Project Engineer**, Polaris Group, Inc., Bloomington, MN (2000-2002)  
**Project Engineer**, Natural Resource Group, Minneapolis, MN (1997-2000)  
**Environmental Inspector**, Cleveland Inspection Services, Cleveland, OK (1997)  
**Staff Engineer**, STS Consultants, Maple Grove, MN (1994-1997)  
**Civil Technician**, North Dakota Department of Transportation, Fargo, ND (1993-1994)

### **Areas of Expertise**

- General civil engineering services
- Solid waste facility design and permitting
- Construction management
- Environmental review (NEPA) documentation and permitting
- Materials testing

### **Relevant Experience**

**Alliance Pipeline, L.P.** – North Dakota/Canada Border to Chicago Natural Gas Pipeline.  
Involved in permitting, construction, and environmental compliance activities.

- Responsible for reviewing construction specifications and plan sheets for 880 miles of pipeline installation to ensure compliance with environmental regulations.
- Served as environmental inspector during construction of portions of the pipeline and HDD drilling activities.
- Assisted in compiling survey data and then preparing and submitting environmental permit applications across North Dakota, Minnesota, Iowa and Illinois. Permitting agencies included FERC, Corps of Engineers, EPA, Department of Natural Resources, Watershed Districts, Soil Conservation Districts and Counties.
- Assisted in managing and compiling environmental survey data for inclusion in Resource Reports and Environmental Impact Statements.
- Assisted in producing scoping documents, Resource Reports, Environmental Assessment Worksheets and Environmental Impact Statements.

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## **Todd A. Hartleben (cont.)**

**Lakehead Pipeline Company – SEP II Project, Wisconsin.** Involved in permitting and environmental inspection activities.

- Managed consultations with Department of Natural Resources regarding specific endangered species impacts. Designed critical habitat structures for endangered species along pipeline route.
- Assisted in obtaining environmental permits at state and local levels.
- Performed environmental inspections during construction.

**Northern Natural Gas, Inc. – Farmington Compressor Station.** Construction and environmental inspector during construction of new natural gas compressor station.

- Inspected construction operations to ensure compliance with construction plans and specifications and environmental regulations.
- Prepared as-built drawings upon completion of construction.

**Touch America, Inc. – Minneapolis to Chicago Fiber Optic Project.** Permit manager for construction and operation.

- Managed environmental permitting process for fiber optic cable installation from Minneapolis to Chicago. Permitting agencies included Corps of Engineers, Department of Natural Resources, Department of Transportation, Counties and Cities. Permits applications included wetland and river crossings, floodplain development, erosion control, conditional use permits and various other local permits.
- Assisted Owner's Representative with site and route evaluations.
- Directed environmental and civil survey crews. Managed data obtained from surveys and organized to include as required by permit.
- Reviewed and interpreted permit requirements and communicate requirements to construction supervisor's and inspectors.

**Various Pipeline Projects**—Assisted in writing and preparing permit applications, EAW and EIS documents, directed environmental and civil survey crews.

**Confidential Oil and Gas Clients** – Currently managing the preparation of several environmental assessments related to the development of oil and gas wells on the Fort Berthold Reservation. Instrumental in compliance with the BIA programmatic EA process for the developments.

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## Todd A. Hartleben (cont.)

**Minnesota Pollution Control Agency** – Project manager for assisting the MPCA with preparing an EIS related to a proposed landfill expansion. Collected and managed data relevant to the analysis and supervised the production of a draft and final EIS suitable for publication. Also assisted the MPCA project manager with public meetings. Issues analyzed in the EIS included:

- A hydrogeologic evaluation
- Storm water management
- Landfill gas emissions and controls
- Visual impacts
- Planning and alternatives
- Land use
- Socioeconomics

**Indian Hills Disposal, Inc.** – Project manager for site design and re-permitting an existing special waste disposal and composting facility. The facility accepts oil field and other industrial wastes. Contaminated soils from oil field development are composted on site to reduce contaminant levels below minimum State standards for disposal. Consulting services include overall site design and phasing plans, cost/benefit analysis, designing a tipping pad and containment area for contaminated soils and drilling fluids, designing settling pods, and storm water collection and treatment.

**Federal Highways Administration** – Project manager for developing a wetland mitigation and construction plan to restore drained wetlands. This project was undertaken to develop wetland credits for wetlands impacted by road construction at various locations in the state of North Dakota.

**Archer Daniels Midland Corporation** – Project manager for the mitigation of wetlands impacted by railway expansion. The railway expansion added several additional tracks and crossed a tributary of the Mouse River. Project tasks included performing a topographical survey of the tributary and surrounding area, surveying wetland boundaries, U.S. Army Corps of Engineers permitting, and determining mitigation strategy and location.

**Port Crosby (Kaposia Landing) Site Development** – Project manager for the closure of a former dump site located in the City of South St. Paul. The Port Crosby property is an old dump site located on the Mississippi River that was purchased by the City for development into a city park. Project elements included design, permitting, and construction management services for implementation of a Response Action Plan (RAP) administered by the MPCA Voluntary Investigation Cleanup (VIC) program. Evaluated design elements to determine feasibility for waste relocation, grading, riverbank stabilization, and minimizing infiltration to suit the end use plan as a City park and athletic fields.

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## **Todd A. Hartleben (cont.)**

**Central Disposal Systems, Inc.** – Involved in numerous design, construction, permitting and environmental compliance projects.

- Designed and performed construction management of an Alternative Final Cover (ACAP).
- Designed, modeled, prepared and submitted NSPS landfill gas management plan to DNR and EPA.
- Prepared and submitted Air Construction Permit application to DNR.
- Assisted site in modifying Title V Operating Permit.
- Prepared and submitted permit-required data and reports.
- Directed performance test of landfill gas flare. Prepared and submitted test reports for compliance with Air Construction Permit.
- Prepared construction drawings and specifications for landfill gas extraction system.

**Sauk Centre Landfill** – Provided design for waste consolidation and footprint reduction, final cover upgrade, stormwater management, site security and landfill gas migration controls.

- Prepared construction plans and specifications.
- Provided bidding assistance including preparing and distributing bid documents, answering contractor questions, review of bids and contractor recommendation.
- Directed CQA personnel during construction.
- Responsible for construction and contract management.

**St. Augusta Landfill** – Designed active landfill gas extraction system.

- Prepared construction plans and specifications for active landfill gas extraction system.
- Prepared and submitted permit applications to local POTW's for condensate disposal.
- Performed construction and contract management.
- Conducted system start-up and tuned landfill gas system.
- Responsible for operations and maintenance of landfill gas system.

**Anoka-Ramsey Landfill** – Involved in the various activities relating to force-main construction, ground water treatment and a constructed wetland complex.

- Prepared plans and specifications.
- Performed construction surveying and staking.
- Construction and contract Management.
- Obtained appraisal services for easements along county road.

**NSP Sherco Generating Plant** – Performed construction observation of Pond 2 vertical expansion.

**Becker Ash Disposal Facility** – Performed construction observation of Cell 5 construction.

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## Todd A. Hartleben (cont.)

### Various Landfills Nationwide

- Construction and contract management for environmental monitoring upgrades.
- Construction oversight of landfill gas extraction system construction.
- Evaluation and testing of existing landfill gas extraction systems.
- Prepared plans and specifications for landfill gas extraction system construction.
- Performed pump testing and site evaluations for landfill gas-to-energy projects.
- Conducted system start-up and tuned landfill gas extraction systems.
- Designed landfill gas extraction systems and system modifications.

### Miscellaneous Experience

- Construction inspections include reinforcing steel placement, determining suitability of soil for fill, nuclear density testing, concrete testing and bridge piling installations.
- Laboratory materials testing experience includes concrete compressive tests, Marshall extractions, Proctor tests, and sieve grain-size analysis.

**Education**      B.S. Civil Engineering, North Dakota State University, 1994  
                         B.A. Math and Biology, Jamestown College, 1990

**Registration**    Civil Engineer: ND, MN, IA, IL, VA, MT

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# Kathie J. Kjar, PhD

## Senior Ecologist/Botanist

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### Experience Summary

Kathie has over thirty-three years experience in vegetation and wildlife research and reporting. Kathie has conducted Biological Assessments and Evaluations and collected quantitative data for land grant colleges, federal offices, and coal companies. Kathie was instrumental in writing the Public Service Commission surface coal mine regulations for evaluations of vegetation in North Dakota. She has also delineated wetlands and has experience with GPS and GIS data acquisition and preparation.

### Employment History

**Senior Ecologist Botanist**, McCain and Associates, Inc., Bismarck ND (present)

**Senior Environmental Ecologist**, Earthworks, Inc., Bismarck ND (2005-2007)

**Consultant / Owner**, Dakota Grassland Consulting, Bismarck ND (1992-2005)

**Environmental Scientist**, North Dakota Public Service Commission, Bismarck ND (1985-1992)

**Graduate Teaching Assistant**, North Dakota State University (NDSU), Fargo ND (1981-1984)

**Research Technologist**, University of Nebraska at Lincoln (UNL, Lincoln, NE (1979-1981)

**Graduate Research Assistant**, UNL, Lincoln, NE (1977-1979)

**Herbarium Assistant**, Kearney State College (KSC), Kearney, NE (1976-1977)

### Areas of Expertise

- **Field Surveys:** Wildlife and habitat surveys for species of concern, land use, weed species, vegetation habitat types, range sites, and wetlands.
- **Flora:** Field identification, collections and identification for over 30 years; over 5 years herbarium experience including collecting, pressing, identification, mounting, filing and plant exchanges
- **Wetlands:** Field delineations, mapping, and acreage calculations.
- **Teaching:** Coached undergraduate students for international competition on plant Identification teams; instructed college laboratory classes including Biology, Botany, Plant Systematics and assisted with Plant Ecology class; occasional volunteer teaching grade schools
- **Crew Leading:** Managed technical assistants associated with ecological field work and writing; instructed and oversaw graduate student field crews; oversaw field assistants for graduate work
- **Vegetation Sampling:** Extensive quantitative sampling experience including 10-point frame, Daubenmire cover frames, cover analysis in 0.1 acre plots (line intercept), biomass sampling (by species and by growth forms), double sampling, range condition, and hand sampling annual crops.
- **Coal Mines:** Regulation of active mines, vegetation monitoring, wildlife monitoring, permit applications, pre-mine data collection, land use mapping, acreage calculations, development of vegetation standards, bond release, and other tasks.

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## **Kathie J. Kjar (cont.)**

- **Oil and Gas Exploration:** Botanical surveys, wildlife surveys, and biological evaluations and assessments.
- **Data analysis:** Compilation of collected data and appropriate statistical applications such as means, variances, sample adequacy, and t-tests.
- **Mapping:** GPS field data collection, ArcMap, and AutoCAD.
- **Compliance:** Knowledgeable of ND mining laws 1969 to permanent program, ND Public Service Commission revegetation requirements, US Forest Service botany survey requirements, USCOE Wetland Delineation Manual, USFWS Endangered Species Act, USFWS Bald and Golden Eagle Protection Act, USFWS Migratory Bird Treaty Act, National Environmental Policy Act, and others.

## **Relevant Experience**

### **Minnesota DNR**

Collected baseline vegetation monitoring data on native prairie sites in Western Minnesota

- Established 54 permanent vegetation transects and relèves
- Measured vegetation structure: visual obstruction readings, vegetation height, and litter depth
- Estimated plant cover and species occurrence
- Determined presence of quality and exotic indicators
- Collected data on two relèves

**United States Forest Service** – Evaluated sensitive plant populations.

- Collected quantitative data on 23 sensitive plant populations in McKenzie, Billings, Slope, and Golden Valley Counties, North Dakota.
- Located and mapped populations with GPS unit.
- Investigated the habitat of each population including: percent cover of species, slope, elevation, topographic position, soil, phenology, and other features.
- Prepared a report with methods, descriptions, population data, conclusions, and maps.

**Confidential Oil and Gas Clients** – Evaluated more than 700 areas - surveying species of concern, wildlife, habitat, land use, and weeds - for various proposed disturbances in the Little Missouri National Grasslands. Project include: oil well sites, pipeline routes (oil, gas, saltwater and fresh water), underground and overhead power lines, telephone lines, road upgrades, and borrow areas.

**North Dakota State Land and State Engineer** – Ordinary high water mark delineation on the Yellowstone River in North Dakota and the Missouri River (Montana to Williston).

**Brosz Engineering** – Delineated wetlands and conducted tree counts for transportation projects in Adams and Bowman Counties.

- Delineated wetlands per USCOE Wetlands Manual.
- Mapped wetlands with GPS unit.
- Computed wetland acres.
- Prepared documentation and wetland forms.
- Performed a tree count for mitigation requirements.

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## **Kathie J. Kjar (cont.)**

**North Dakota Heritage Program** – Contracted to write reports for five proposed Research Natural Areas (RNA's) in western ND.

- Documented historical background, land uses, owners, and other land designations.
- Justified use as RNA's.
- Studied literature and documented distinguishing features, cover types, fauna, flora, geology, soils, cultural sites, and other data.
- Interpreted impacts and possible conflicts on minerals, grazing, watershed, recreation, wildlife, etc.
- Created maps for location, vegetation, contour and soils.

## **North Dakota State University**

- Collected quantitative vegetation data in western North Dakota.
- Classified western North Dakota grassland and shrub ecosystems
- Instructed botany and biology labs.
- Organized and coached university Range Plant team to compete in Society for Range Management (SRM) Plant Identification Contests.
- Coordinated with college and university herbariums SRM plant collection and plant specimen exchange.

## **University of Nebraska**

- Supervised graduate students during field, laboratory, and greenhouse activities.
- Trained graduate students in vegetation sampling techniques.
- Instructed various field sampling techniques such as biomass hand sampling, mechanical equipment harvesting, line interceptions, point sampling, density quadrants, frequency measurements, and soil core sampling.
- Applied various land treatments including fertilization, herbicide application, and burning techniques.
- Conducted laboratory analysis of soil samples and esophageal fistula samples.
- Served as curator of Department of Agronomy Herbarium.
- Coached UNL Range Plant team to compete in Society for Range Management Plant Identification Contests.
- Initiated and co-authored North America Range Plants book.

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**Kathie J. Kjar (cont.)**

**BNI Coal, Center and Larson Mines** – Served as interim Reclamation Specialist for 2½ years.

- Evaluated and prepared revisions of surface coal mining permits.
- Conducted an extensive revision and developed revegetation standards for BNCR 8702.
- Collected data, mapped and documented an area to extend the permit area.
- Supervised wildlife monitoring, prepared and submitted biennial wildlife reports.
- Monitored vegetation on mine site.
- Collected data on reclaimed cropland, native grassland, hay land, tame pastureland, shelterbelts, and industrial land use areas.
- Prepared and achieved final bond release applications on native grassland and industrial land use areas.
- Represented BNI Coal on Task Force II.

**Consolidation Coal Company, Velva Mine** – Contracted to obtain final bond release for reclaimed mine site.

- Monitored vegetation and collected data on reclaimed cropland, native grassland, hay land, woodlands, and industrial land use areas.
- Selected and established native grasslands reference area.
- Aided in landowner relations and communications.
- Developed an alternate vegetation sampling method that was submitted to and approved by the US Office of Surface Mining and ND Public Service Commission.
- Prepared data and documentation for bond release applications.
- Achieved final and complete bond release of the mine site.

**Bentonite Performance Minerals, Smith Ullman Mine** – Contracted to obtain final bond release for mine site.

- Monitored vegetation and collected data on native grassland.
- Coordinated use of alternate reference area.
- Prepared data and documentation for bond release application.
- Achieved final and complete bond release of the mine site.

**American Colloid Company, Page Mine** – Contracted to conduct a pre-mine assessment.

- Collected and prepared vegetation and land use data.
- Calculated proposed revegetation standards.
- Sampled range condition on native grassland areas.
- Prepared data and documentation for permit application.

## **Kathie J. Kjar (cont.)**

### **North Dakota Public Service Commission – Regulated surface coal mines in ND.**

- Inspected surface coal mines for compliance.
- Reviewed surface coal mining permits and revisions for accuracy with primary responsibilities in land use, vegetation, wildlife, and cultural resources.
- Evaluated biennial wildlife monitoring reports.
- Co-authored the first regulations for the Standards for Evaluation of Revegetation Success and Recommended Procedures for Pre- and Post-mining Vegetation Assessments.
- Coordinated information with State and Federal Agencies including ND Game and Fish, ND Soil Conservation Committee, ND Heritage Center, US Fish and Wildlife Service US Natural Resources Conservation Service, US Corp of Engineers, US Bureau of Land Management.

**Education:** Ph.D. in Botany, North Dakota State University, Fargo, North Dakota, 1985.  
Thesis: Habitat Type Classification of Grassland and Shrublands of Southwestern North Dakota

M.S. in Agronomy (Range Ecology emphasis), University of Nebraska at Lincoln, Lincoln, Nebraska, 1979. Thesis: Natural Revegetation Trends on Rangeland Following Control of *Geomys bursarius*

B.S. in Biology, Kearney State College, Kearney, Nebraska (now known as University of Nebraska at Kearney), 1977

### **Publications**

- Hirsch, K.J. 1985. Habitat type classification of grasslands and shrub lands of southwestern North Dakota. Dissertation, North Dakota State University. Fargo, North Dakota, USA
- Hirsch, K.J., K. Mastel, and W.T. Barker. 1984. Grassland and shrubland habitat types of southwestern North Dakota. Page 121 in Proceedings of the Society for Range Management 37th Annual Meeting. Society of Range Management, February 16-21, 1984. Calgary, Alberta, CAN
- Hirsch, K.J. Kjar, J. Stubbendieck, and R.M. Case. 1979. Relationships between vegetation, soils and pocket gophers in the Nebraska Sandhills. Transactions of the Nebraska Academy of Sciences. Vol. XII: 5-11
- Hirsch, K.J. and D.J. Nilson. 1990. Use of Glyphosate and interseeding to improve seasonality of reclaimed grasslands. Proceedings of the Fifth Billings Symposium on Disturbed Land Rehabilitation. March 25-30, 1990, Billings, Montana, USA
- Hirsch, K. J. and D. J. Nilson. 1990. Native grassland bond release criteria using technical information and reference area data. Proceedings of the Symposium on Disturbed Land Rehabilitation. March 25-30; Billings, Montana, USA
- Hirsch, K.J. and W.T. Barker. 1984. Classification of grasslands and shrublands in southwestern North Dakota. Volume 38 page 82 in proceedings of the 76<sup>th</sup> Annual Meeting of the North Dakota Academy of Sciences Annual Meeting. Fargo, North Dakota, USA

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**Kathie J. Kjar (cont.)**

- Hirsch, K.J. and W.T. Barker. 1984. Grassland and shrubland classification in southwestern North Dakota. Page 10 in proceedings of the Ninth North American Prairie Conference, July 29 - August 1, 1984, Moorhead, Minnesota, USA
- Hirsch, K. J., L. A. Ogaard, and N. M. Safaya. 1986. Standards for evaluation of revegetation success and recommended procedures for pre- and post mining vegetation assessments. Public Service Commission, Bismarck, ND. USA
- Hirsch, K.J. Kjar, J. Stubbendieck, and R.M. Case. 1979. Relationships between vegetation, soils and pocket gophers in the Nebraska Sandhills. Transactions of the Nebraska Academy of Sciences. Volume XII: 5-11
- Kjar, K.J. 1979. Natural revegetation trends on rangeland following control of *Geomys bursarius*. M.S. Thesis. University of Nebraska. Lincoln, Nebraska, USA
- Kjar, K.J. and J. Stubbendieck. 1981. Natural vegetation on rangeland following control of the plains pocket gopher. Page 40 in proceedings of the 34<sup>th</sup> Annual meeting of the Society for Range Management, Tulsa, Oklahoma, USA
- Kjar, K.J. and J. Stubbendieck. 1980. Natural revegetation on rangeland following control of the *Geomys bursarius*. Transactions of the Nebraska Academy of Science 19:55
- Kjar, K.J. and J. Stubbendieck. 1977. Rangeland recovery following control of the plains pocket gopher. Sixth Annual Progress Report. Sandhills Agricultural Laboratory, University of Nebraska, Lincoln, Nebraska, USA. NPS 1-10
- Stubbendieck, J., S.L. Hatch, and K.J. Hirsch. 1985. North American Range Plants, Third edition. University of Nebraska Press, Lincoln, Nebraska, USA
- Stubbendieck, J., S.L. Hatch, and K.J. Kjar. 1982. North American Range Plants, Second edition. University of Nebraska Press, Lincoln, Nebraska, USA
- Stubbendieck, J., C.J. Wiederspan, and K.J. Kjar. 1980. Prairie restoration: an evaluation and specific recommendations for management. RFP-FOLS-80-001. Natural Resources Enterprises, Inc. Lincoln, Nebraska. USA
- Wiederspan, C.J., J. Stubbendieck, and K.J. Kjar. 1980. A vegetation analysis of three selected farm. Transactions of the Nebraska Academy of Science 19:50

# Greg W. Meyer

Wildlife Biologist/Ecologist

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## Experience Summary

Greg has over 9 years experience in wetland delineations, and mitigations; and wildlife and habitat research. Greg's wetland experience includes wetland delineations, mitigation projects, scope and effect determinations, wetland health assessments, wetland vegetation studies, and wetland gas emission studies. Greg's wildlife and habitat experience includes avian surveys, raptor surveys, endangered, threatened, and sensitive plant and animal surveys for Biological Assessments and Evaluations, prairie dog surveys, botany surveys, habitat evaluations, and land inventories.

## Employment History

**Wildlife Biologist/Ecologist**, McCain and Associates, Inc. Bismarck, ND (present)  
**Environmental Scientist/Ecologist**, Earthworks, Inc. Bismarck, ND (2006-2007)  
**Wetland Botanist/Crew Leader**, US Geological Survey, Jamestown, ND (2004-2006)  
**Graduate Teaching Internship**, University of North Dakota, Grand Forks, ND (2004)  
**Biological Contractor**, Red River Regional Council, Grafton, ND (2003)  
**Graduate Research Assistant**, University of North Dakota, Grand Forks, ND (2001-2004)

## Areas of Expertise

- Wetland delineations, permitting, and mitigation
- Scope and effect determinations
- Endangered, threatened, and sensitive plant and animal surveys
- Vegetation sampling and surveys
- Bird surveys
- Raptor surveys
- Wildlife surveys
- Biological Assessments and Biological Evaluations
- Global Positioning System (GPS)
- Geographic Information System (GIS)

## Relevant Experience

**Minnesota Department of Natural Resources** - Prairie vegetation monitoring at Blue Mound State Park. Collected data on plant groups, plant community composition, indicator species, and vegetation structure and litter depth.

**Minnesota Department of Natural Resources (MNDNR)** – Conducted surveys for northern goshawks in Aitkin and Cass Counties, Minnesota on five large study areas. Used broadcast surveys to elicit northern goshawk response and identified all raptor species encountered. Project tasks included:

- Identified adult and juvenile plumage of raptors encountered.
- Created GIS maps for orientation.
- Utilized Garmin GPS unit for navigation through dense woods.
- Conducted two survey periods –nesting stage and fledging stage.
- Documented northern goshawks on two study areas.

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**Greg W. Meyer (cont.)**

**Federal Highways Administration** – Conducted a Scope and Effect Determination on an 880-acre site located in the upper Devils Lake Basin. The site consisted of manipulated wetlands and non-manipulated wetlands. Determined the current and original hydric boundary of the manipulated wetlands, and calculated the current and original acreage and current and original depth of ponding. Completed Natural Resources Conservation Service (NRCS) ND-CPA-339 forms for the wetland sites located on the project area. Delineated non-manipulated wetlands by identifying hydrophytic vegetation, hydric soils, and hydrology indicators at observation points along the wetland boundaries. Created a Scope and Effect Determination report compliant with NRCS rules and regulations.

**Federal Highways Administration** – Developed a wetland mitigation plan for an 880-acre site in the upper Devils Lake Basin to provide restoration credits for various highway development projects in the area. The mitigation plan consisted of a mitigation strategy, site design, a monitoring plan, success criteria, and contingency measures.

**North Dakota State Land Department** - Delineated the Ordinary High Water Mark (OHWM) along approximately 50 miles of portions of the Missouri and Yellowstone Rivers using multiple transects. Completed an OHWM Delineation Data Form for each transect. Identified hydrophytic vegetation above and below the OHWM site and documented soil characteristics and other physical indicators at each transect OHWM site.

**SRF Consulting Group, Inc.** - Conducted a wetland delineation along six stretches of ND Highway 19 that were being impacted by the rising waters of Devils Lake. Identified and delineated all wetlands and Other Waters of the US in the project areas. Identified hydrophytic vegetation, hydric soils, and hydrology indicators as outlined in the U.S. Army Corp of Engineers (USACOE) wetland delineation guidelines and completed a USACOE wetland determination form for each observation point. Used a Trimble GeoXH GPS to collect the wetland boundary and observation points' spatial data, up-loaded the data into GIS, and post-processed it for sub-meter accuracy. Utilized GIS to calculate the acreage of the delineated wetlands and create figures of the project sites and wetlands. Produced a wetland delineation report, following the guidelines set forth by the North Dakota Department of Transportation, that consisted of: pertinent background information of the project area, USACOE wetland determination data sheets, project maps with evident delineated wetland boundaries, and field photographs of the project site. Project tasks included:

- Creation of field maps prior to field delineation
- Identification and delineation of wetlands in project areas
- Identification of hydrophytic vegetation, hydric soils, and hydrology indicators
- Collection of spatial data with GPS
- Post-processing of GPS data in GIS
- Calculation of wetland acreage in GIS and creation of figures
- Compilation of wetland delineation findings into a draft report
- Addressed NDDOT comments
- Produce a Final Wetland Delineation Report

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**Ames Construction, Inc.** – Conducted a wetland delineation on six borrow areas. Identified and delineated all wetlands in the borrow sites. Identified hydrophytic vegetation, hydric soils, and hydrology indicators as outlined in the U.S. Army Corp of Engineers (USACOE) wetland delineation guidelines and completed a USACOE wetland determination form for each observation point. Collected spatial data of the wetland boundaries and observation points with a Trimble GeoXH GPS. Up-loaded the GPS data into GIS and post-processed it for sub-meter accuracy. Utilized GIS to calculate the acreage of the delineated wetlands and create figures of the project sites and wetlands. Produced a wetland delineation report that consisted of: pertinent background information of the project area, USACOE wetland determination data sheets, project maps with evident delineated wetland boundaries, and field photographs of the project site. Project tasks included:

- Creation of field maps prior to field delineation
- Identification and delineation of wetlands in project areas
- Identification of hydrophytic vegetation, hydric soils, and hydrology indicators
- Collection of spatial data with GPS
- Post-processing of GPS data in GIS
- Calculation of wetland acreage in GIS
- Creation of GIS figures
- Compilation of wetland delineation findings into a report

**North Plains Energy, Inc.** – Conducted a wildlife survey in the North Dakota badlands for proposed oil and gas well sites. Surveyed the potential impact area for any endangered, threatened, and sensitive wildlife species. Utilized GIS to create field maps and evaluate the probable habitats found in the project area. Collected field data and wrote a Biological Assessment and Evaluation of the field findings. Project tasks included:

- Creation of field maps prior to field survey.
- Identification and evaluation of any endangered, threatened, and sensitive wildlife species and their habitats.
- Compilation of field survey findings into a Biological Assessment and Evaluation report.
- Created GIS maps to illustrate the project area and field findings.

**Jamestown Airport** – Developed a wetland mitigation plan to compensate for proposed wetland impacts at the Jamestown Airport. Located and evaluated the mitigation site. Worked closely with client, mitigation site owner, NRCS, and USFWS to obtain approval of the site and the developed mitigation plan. Project tasks included:

- Located and evaluated suitable mitigation site.
- Gathered background information of the mitigation site.
- Conducted scope and effect determination.
- Developed mitigation plan.
- Calculated available mitigation acreage.
- Created GIS maps of the mitigation wetlands and site.
- Worked intimately with client, mitigation site owner, NRCS, and USFWS.

## **Greg W. Meyer (cont.)**

**Ottertail Power Company Transmission Line** – Conducted wetland delineations along an approximately 70 mile long transmission corridor. The extent of the hydrology, hydrophytic vegetation, and hydric soils were identified and spatially recorded with a GPS unit. The spatial data was downloaded into GIS and used to calculate impact acreage and create accurate maps. Produced a wetland delineation report that consisted of: pertinent background information of the project area, USACOE field data sheets, project maps with evident delineated wetland boundaries, and field photographs of the project site. Worked intimately with a certified soil classifier. Conducted tree counts to identify the number and species of tree that would be removed within the transmission line corridor.

**US Geological Survey** - Conducted wetland vegetation and their surrounding catchment surveys in Iowa, Minnesota, Montana, North Dakota and South Dakota, and led a field crew collecting wetland gas emissions in Iowa, Minnesota, and North Dakota. Supervised botany technicians and oversaw clipping and drying of the vegetation samples collected during the wetland carbon sequestration study.

- Conducted wetland vegetation surveys.
- Identified species and assigned cover class to vegetation with sampling quadrats throughout wetland zones.
- Led six-person wetland gas emission collection crew.
- Supervised vegetation biomass clipping and drying technicians.
- Prepared clipped samples for drying and processing.

### **Professional Registration:**

Wetland Delineator Certified, MN

### **Education:**

Master of Science, Wildlife Biology, University of North Dakota, 2004  
Bachelor of Arts, Biology Major and Chemistry Minor, Concordia College, 2000

**Memberships:** North Dakota Chapter of The Wildlife Society (2002 to present)

### **Professional Presentations and Lectures:**

Meyer, G. W., 2003 Implications Of Conservation Agriculture On Wetland Health. Prairie University Biological Symposium, Winnipeg, Manitoba, Canada.

Meyer, G.W. and S. Clancy, 2003 Biological Implications of Surrounding Land Use on Wetland Health: A Conservation Agriculture Analysis. International Water Conference, Fargo, North Dakota

Meyer, G.W. and S. Clancy, 2003 Biological Implications of Surrounding Land Use on Wetland Health: A Conservation Agriculture Analysis. North Dakota Chapter of the Wildlife Society Annual Meeting, Bismarck, North Dakota.

Meyer, G.W. and S. Clancy, 2002 Conservation Agriculture: A Comprehensive Approach to Watershed Management. Wetlands National Symposium, Indianapolis, Indiana.

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**Greg W. Meyer (cont.)**

Meyer, G.W. and N.H. Euliss, Jr., 2003 Nutrient Cycling and Carbon Sequestration, University of North Dakota. Prairie and Wetland Ecology

**Publications:**

Biological Implications of Surrounding Land Use on Wetland Health: A Conservation Agriculture Analysis. Master's Thesis

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# Ryan J. Krapp, MS

Ecologist/GIS Specialist

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## Experience Summary

Ryan has over 9 years experience working in the field of natural resources. His professional experience includes wildlife habitat investigations, raptor and avian surveys, botanical surveys, threatened, endangered, and species of concern surveys, wetland delineations and fisheries investigations. He analyzes and prepares field collected data for production of Environmental Assessments (EA) under NEPA guidelines and Biological Assessments and Biological Evaluations (BA/BE) for review by the US Forest Service. He has extensive experience in creating GIS databases used to manage large volumes of spatial and temporal data aiding in management, monitoring, analysis and comparisons.

## Employment History

**Ecologist**, McCain and Associates, Inc. Bismarck, ND

**Environmental Scientist / Ecologist**, Earthworks, Inc. Bismarck, ND (2006-2007)

**Fisheries / GIS Specialist**, North Dakota Game and Fish, Bismarck, ND (2003-2006)

**Graduate Research Assistant**, University of North Dakota, Grand Forks, ND (2001-2003)

**Fisheries Technician Assistant**, North Dakota Game and Fish, Dickinson, ND (2000)

**Fisheries Technician Assistant / Creel Clerk**, South Dakota Game, Fish and Parks Webster, SD (1999)

## Areas of Expertise

- Biological Assessments and Biological Evaluations
- Environmental Assessments
- Botanical surveys
- Wildlife surveys
- Habitat Evaluations
- Raptor surveys
- Global Positioning Systems (GPS) mapping
- Geographic Information Systems (GIS)
- Fisheries surveys

## Relevant Experience

### **North Dakota Parks and Recreation Department - Western Prairie Fringed Orchid Survey**

Surveyed 3,000+ acres of the Sheyenne National Grassland for the endangered orchid, classified habitats of, and identified associated species. Created a geo-database to aid in collection of spatial and temporal information during the 2009 orchid survey.

- Documented >1,300 orchids across three study areas.
- Created geodatabase and datasets.

**EA Consultation and Preparation – Fort Berthold Reservation** – Prepare Environmental Assessments (EA) for oil and gas development within the Reservation Boundaries. Coordinate

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## Ryan J. Krapp (cont.)

on-site visits with Realty and Natural Resource Specialists from the BIA. Collect data on wildlife habitats, botanical composition, surface hydrology, water wells, aquifers, soils, and other oil and gas developments near the proposed development(s).

**Minnesota Department of Natural Resources (MNDNR)** – Conducted surveys for northern goshawks in Aitkin and Cass Counties, Minnesota on five large study areas. Used broadcast surveys to elicit northern goshawk response and identified raptor species encountered. Project tasks included:

- Identified adult and juvenile plumage of raptors encountered.
- Conducted two survey periods –nesting stage and fledging stage.
- Documented northern goshawks on two study areas.

**McKenzie Electric Power Cooperative** – Conducted surveys for endangered, threatened, and sensitive plants and animals for approximately 25 miles of proposed underground utility routes. Evaluated areas of sensitive wildlife habitat and produced corresponding Biological Assessment and Evaluation under guidance of and for review by the US Forest Service. Project tasks included:

- Conducted nesting raptor survey
- Delineation of prairie dog colony
- Assisted in complete botany survey
- Produced Biological Assessment and Evaluation report

**Dakota Prairie Grasslands** – Performed field delineation of prairie dog colonies on federal grasslands. Project tasks included:

- GPS mapping and delineation of known and previously undocumented prairie dog colonies.
- Record incidents of burrowing owls.
- Update US Forest Service maps based on survey results

**Bathymetric Lake Surveys** – Developed, conducted and managed bathymetric GIS data collection on over 180 lakes ranging 5 acres to >100,000 acres.

- Collected sub-meter GPS field data and lake depths using advanced bathymetric software and hardware
- Digital orthophoto interpretation to delineate and classify lake and river shoreline
- Post-processed collected bathymetric data
- Produced GIS layers including depth and position data
- ArcInfo and ArcMap Spatial and 3D Analyst grid development
- Complete statistical analysis of lake data
- Georeferenced color-contour map production utilizing ArcMap

**Confidential Oil and Gas Clients** – Conducted 50+ surveys for endangered, threatened, and sensitive plants and animals for siting of oil and gas well pad and access routes. Wrote and produced the corresponding Biological Assessments and Evaluations for the project area.

- Conducted nesting raptor surveys

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## Ryan J. Krapp (cont.)

- Assisted in complete botany survey
- Delineated prairie dog colonies
- Managed project GIS data
- Produced Biological Assessment and Biological Evaluation report

**Development and Management of Natural Resource GIS Geodatabase** – Created natural resource GIS datasets into a centralized GPS-enabled geodatabase. The GPS-enabled geodatabase allows for the checkout of data for use in field by Trimble mobile device with ArcPad, field data collection and check-in capabilities with sub-foot post-processing accuracy.

- Design, create and manage geodatabase for reference base data and field collected GIS data for use in ESRI ArcGIS
- Verify and collect in-field threatened, endangered and species of concern locations producing sub-foot accurate location coordinates

**Digitize Hydrologic Unit Watershed Boundaries** - Digitization of three sub-basins to state Watershed Boundary Dataset (WBD) for the ND Game and Fish Department and the ND Department of Health.

- Scan US Geological Survey topographic paper map to digital format
- Register digital images to correct geographic coordinates
- Heads-up digitization of hydrologic unit boundaries

## Education

Geographic Information Systems Certificate, University of North Dakota, 2003

Master's of Science, Biology, University of North Dakota, 2003

Bachelor of Science, Fisheries and Wildlife Biology, University of North Dakota, 2000

## Memberships

North Dakota Chapter of the Wildlife Society

North Dakota Wildlife Federation

Dakota Chapter American Fisheries Society

## Publications

Effects of fluctuating water levels on quantity and quality of fish habitat in Devils Lake, North Dakota. Master's Thesis

## Professional Presentations and Lectures

Krapp, R.J., 2004 *Bathymetric Mapping of North Dakota Fishing Waters Using GIS*. Great Plains Fisheries Workers Association - Winnipeg, MAN, Canada

Krapp, R.J., 2003 *Effects of dramatically increasing water levels on spatial and temporal variation in age-0 yellow perch (*Perca flavescens*) abundance in Devils Lake, North Dakota*. International Water Conference - Moorhead, Minnesota

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**Ryan J. Krapp (cont.)**

Krapp, R.J., 2003 *Developing a GIS Baseline Project of the Devils Lake Basin*. Dakota Chapter American Fisheries Society - Chamberlain, South Dakota

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