

United States Fish and Wildlife Service
Private Stewardship Grant Program Application
January 23, 2006
Title Page

Project Title: Whitby Property Rare Species Native Habitat Restoration

Project Location: Evan and Nancy Whitby Property,
Located within Columbus Township, Anoka County, Minnesota

Project Objectives: Restoration, enhancement, and management of habitats supporting two confirmed state-listed vascular plant species populations, one confirmed state-listed animal species, and one confirmed federally/state-listed animal species within Evan and Nancy Whitby's 80-acre property in Columbus Township, Anoka County, Minnesota.

As of December 2005, rare plant species documented on the Whitby property include Tubercled Rein Orchid (*Platanthera flava* var. *herbiola*, Minnesota Endangered) and Lance-Leaved Violet (*Viola lanceolata*, Minnesota Threatened), which face local (and possibly state-wide) extinction due to habitat loss, invasive species competition, and habitat degradation. Two populations of the St. Lawrence Grapefern (*Botrychium rugulosum*, Minnesota Threatened) have been recently confirmed within 500 meters of the Whitby property boundaries and potential habitat occurs for this species on the applicants' property. State listed animal species observed in the native habitats of the Whitby property include: Blanding's turtles (*Emydoidea blandingii*, Minnesota Threatened), and Bald eagles (*Haliaeetus leucocephalus*, MN Threatened/Federally Threatened). Blanding's turtles have been observed searching for suitable nesting sites on the property in late spring 2005. Bald eagles regularly use habitats on the property for hunting and feeding, and have been observed on the property from 2003 through 2005.

Additional state listed or otherwise rare plant species could likely be present within suitable habitats present on the Whitby property. These include: *Xyris torta* (Twisted Yellow-Eyed Grass, MN Endangered), *Scleria triglomerata* (Tall Nut Rush, MN Endangered), *Polygala cruciata* var. *aquilonia* (Cross-Leaved Milkwort, MN Endangered), Tooth cup (*Rotala ramosior*, MN Threatened), Autumn Fimbristylis (*Fimbristylis autumnalis*, MN Special Concern), Clinton's Bulrush (*Trichophorum clintonii*, MN Special Concern), Big Horseshoe Lake Dewberry (*Rubus stipulatus*, MN Proposed Endangered - 2006), Slim Spike Three Awn Grass (*Aristida longespica* var. *geniculata*, MN Proposed Endangered - 2006). All of the above species have been discovered within 10 to 15 miles of the Whitby property by Jason Husveth (CCES Principal Ecologist and project collaborator) from 1997 through 2005, and all are associated with the same habitats and rare species populations present on the Whitby property. Research conducted by Critical Connections Ecological Services and the Minnesota DNR has demonstrated that all of the above listed rare plant species are threatened by competition from invasive perennial and woody species encroachment, and require habitat management and natural disturbance to persist within their respective native habitats. It is the hope of the landowners and project collaborators that additional restoration work on the property will reveal one to several additional state listed species.

The project objectives will be accomplished through the restoration and management of suitable rare species habitats (potentially-diverse rich fen, dry prairie, wet prairie, and oak

forest plant communities) on the Whitby's private property. Ecological restoration and management of the Whitby property will expand and enhance the regional habitat corridor comprised of the Carlos Avery WMA and adjacent natural lands. The proposed private restoration project would capitalize on the successful restoration methods, invasive species management methods, and rare species population management approaches that have been developed by the project collaborators over the past nine years for similar rare species populations and associated native communities on the Anoka Sand Plain. Furthermore, continued restoration and management of the Whitby property will further refine these methods and our understanding of the state-listed plant populations present on the site and adjacent properties. **Figure 2** depicts the locations of documented rare plant populations and rare animal observations within and adjacent to the Whitby property (see **Appendix A**). **Figure 3** depicts the location of proposed restoration areas, existing restoration areas, conservation easements, ponds, and planned residential use areas on the property.

Restoration and management tasks proposed for this property as part of this PSGP grant application include: site assessment and restoration planning, invasive species removal, herbicide treatments, and management, local ecotype native seed collection and dispersal within restored habitats, creation, enhancement, and management of Blanding's turtle nesting areas within south and west facing sandy hillsides adjacent to wetlands, restoration monitoring, and development of a long term conservation and management plan for this exceptional property.

Summary of Costs: The total proposed project costs are \$74,850, of which the landowner has dedicated \$15,000 (20% cash/in-kind match), and \$59,850 is requested of the US FWS Private Stewardship Grant Program.

Duration of PSGP Funding Request: September 1, 2006 through August 31, 2008 (additional local sources of funding will be sought to continue management following the successful completion of the proposed PSGP project).

Contact Information:

Landowner:

Evan and Nancy Whitby
Private Landowners
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Columbus Township, MN 55025
Phone: (651) 464-7771
Fax: (651) 464-7771
Email: evan@chimeratech.com

Application Technical Contact:

Jason J. Husveth, M.S.
Restoration Ecologist/Botanist
Critical Connections Ecological Services, Inc.
14758 Ostlund Trail North
Marine on St. Croix, MN 55047
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Email: jhusveth@ccesinc.com

Project Description:

Evan and Nancy Whitby's 80-acre property is located adjacent to the Minnesota DNR's Carlos Avery Wildlife Management Area, a 23,000 acre state wildlife refuge. The property is also located between two large contiguous areas of Regional Biological

Significance identified by the MN DNR's Natural Heritage Program (see **Figure 1**). The primary objective of the proposed PSGP project is to restore and manage native habitats that support two confirmed state-listed (or 'at-risk') plant populations and two confirmed state listed animal species that regularly use the property. In addition, the project collaborators anticipate that additional assessment, restoration, and management work would likely reveal additional rare species populations on the property. Natural communities and rare species habitats on the Whitby property are increasingly threatened by the encroachment of invasive plant species, such as glossy and common buckthorn (*Rhamnus frangula* and *R. cathartica*), reed canary grass (*Phalaris arundinacea*), hybrid and narrow leaf cattail (*Typha X Glauca* and *T. angustifolia*), purple loosestrife (*Lythrum salicaria*), and giant reed (*Phragmites australis*). The state-listed vascular plant species that will directly benefit from this proposed project include: Tubercled Rein Orchid (*Platanthera flava* var. *herbiola*, Minnesota Endangered) and Lance-Leaved Violet (*Viola lanceolata*, Minnesota Threatened). State-listed animals that frequently use the native habitats of the Whitby property include: Blanding's turtles (*Emydoidea blandingii*, Minnesota Threatened), and Bald eagles (*Haliaeetus leucocephalus*, MN Threatened/Federally Threatened).

This proposal seeks funding assistance from the US FWS PSGP to assist with restoration and management of native communities that support rare plant and animal species. These resources will be used to assist the land owner with invasive species removal, abatement, and management, restoration of native species and natural communities, creation/enhancement of potential Blanding's turtle nesting sites, and development of a long-term, cost effective restoration and management plan for the property.

Evan and Nancy Whitby are the sole owners of the 80-acre tract of land proposed for restoration and management in this PGSP proposal (see **Figure 1**). Since 2003, Jason Husveth, Principal Ecologist for CCES, has worked closely with the Whitby's to initiate the long-term restoration and management planning and implementation of native habitats on their property. Evan and Nancy Whitby have a strong conservation ethic, and are focused on restoring and managing ~77 of their 80 acres as high quality natural communities in perpetuity. A small portion of the property is already protected with conservation easements (~3 acres), and the landowners are interested in placing the majority of their remaining acreage into conservation easements in future years. From 2003 through 2005, the Whitby's have voluntarily invested over \$20,000 of cash, labor, and materials into the restoration and management of portions of their property. In 2005, CCES collaborated with the Whitby's to obtain a small matching grant (\$7,000) from the Rice Creek Watershed District to help finance the costs of restoring and managing a small portion of their property. (While implementing restoration work under this watershed partnership grant, CCES botanists discovered the population of tubercled rein orchid on the property). The Whitby's interest in natural resources conservation, habitat restoration, and rare species preservation serve as a model for other private landowners in the region, and has earned the support of many local conservation agencies such as the Minnesota DNR, the Rice Creek Watershed District, the Coon Creek Watershed District, and the Anoka Conservation District. The Whitby's efforts have already generated much local interest among neighbors in restoring and managing natural communities on private

properties within close proximity to the Carlos Avery WMA and Rice Creek Chain of Lakes regional habitat corridors.

Evan and Nancy Whitby have agreed to match at least \$15,000 (cash and in-kind) as matching contributions towards the successful completion of this two-year proposed PSGP project. In the absence of the requested Federal assistance, restoration and management of the Whitby property would be greatly hindered, allowing for invasive species to further encroach into existing high-quality natural communities and rare species populations and associated habitats.

Potential Long-Term Funding Strategies: The landowners are dedicated to the long-term restoration, management, and conservation of native habitats and protection and management of rare species populations on their property. As in the past, the project collaborators will continue to seek additional outside funding and resources for the long-term restoration and management of their property. Recent changes in Minnesota state budgets and funding priorities have temporarily suspended state-sponsored restoration grants for private lands in Minnesota. However, the landowners and project collaborators plan to apply for state funding assistance from the Minnesota DNR when these programs are reauthorized in the coming years. Examples of such state-funded conservation programs that have recently been cut from the governor's bonding bill recommendations (2005 and 2006) include: the Minnesota DNR Metro Greenways Site Restoration grant program and the Minnesota DNR Conservation Partners grant program. Should the US FWS choose to fund Whitby's proposal, these federal dollars could serve as a match for most grant applications at the state and local level during the life of the grant.

Project Statement of Work:

Project Design: The proposed restoration design for the Whitby rare species habitat restoration project is based on the restoration research and methods developed by Critical Connections Ecological Services (CCES) over a nine-year period, and successfully implemented by CCES similar habitats and for similar species from 2003 - 2005. More specifically, the restoration methods have been developed through detailed surveys of remaining rare species populations throughout the Anoka Sand Plain ecoregion of Minnesota, historic herbarium records and species accounts, literature reviews, and life history accounts of the target rare plant species and associated communities present within on the Whitby property. In the absence of natural disturbance due to fire suppression, exotic species invasion, succession, and suburbanization, these target species are commonly out-competed by more aggressive native and non-native perennial species. However, local ecologists and botanists have successfully demonstrated that within select wetlands throughout the Anoka Sand Plain, viable propagules of these target species often can persist in diverse native seed banks. Through a variety of restoration methods, wetland habitats that have been invaded (and even overrun) with invasive perennial species such as Glossy Buckthorn, Reed Canary Grass, Purple Loosestrife, Giant Reed, and even Aspen and American Elm can be successfully restored through the release of this native seed bank. Furthermore, some of the most rare wetland plant species of Minnesota have been found to re-establish from this preserved seed bank, as is the case

with *Xyris torta*, *Polygala cruciata*, *Viola lanceolata*, and *Fimbristylis autumnalis* after two years of restoration at nearby sites.

The Whitby's lack the financial resources needed to complete large-scale treatment of invasive species that currently threaten natural communities, native habitats, and rare species populations that occur on their property. The proposed project design focuses on management of natural communities and removal and treatment of invasive species (exotic and native) that have established on the property. The property owners and project collaborators intend to design and implement restoration and management strategies that favor both rare plants and rare animals that occur on the property. The proposed project design includes the following tasks: 1) a detailed pre-restoration assessment of the 80-acre proposed project area, 2) refinement of site specific restoration and management approach and plan, 3) Glossy Buckthorn, Reed Canary Grass, Purple Loosestrife and Giant Reed removal, treatment, management/control, and monitoring, 4) aggressive removal of Reed Canary Grass monotypes and invasive seed banks, 5) monitoring of restoration areas, 6) on-site collection and dispersal of select local ecotype native species seed (from habitats on the property and within adjacent properties), 7) creation/enhancement of Blanding's turtle nesting habitat within suitable upland areas, 8) development of a long-term management plan, and, 9) preparation of a final Report to the US FWS (and other interested agencies/parties). Detailed descriptions of these tasks are provided in the Proposed Project Tasks, Descriptions, Timeline, and Costs (please see **Page 10** of this proposal).

Project Implementation/Responsibilities: The proposed restoration and management project will be implemented by Evan Whitby and professional restoration crews with a proven track record for successful completion of these highly specialized restoration projects. Mr. Whitby has played a major role in implementing initial restoration prescriptions on his property over the past three years. Furthermore, the Whitby's already own a considerable amount of restoration and agricultural equipment. Critical Connections Ecological Services, Inc. (CCES) will collaborate with the Whitby's and local and state conservation agencies implement the proposed restoration plan. Jason Husveth, Restoration Ecologist with CCES, has successfully restored similar rare species habitats within the region, and will oversee all facets of the proposed the Whitby's rare species restoration project. Mr. Husveth and CCES will complete the pre-restoration site assessment and surveys (Task 1), and developed the site-specific restoration and management plan and methods (Task 2). CCES crews, under the supervision of Mr. Husveth and Mr. Milburn, and CCES restoration crews will work with Mr. Whitby to complete invasive species management tasks (Tasks 3, 4, 7, and 9). Mr. Husveth and Scott Milburn (CCES botanist) will conduct vegetation surveys and monitoring throughout the project area (Tasks 5 and 10). Mr. Husveth will collaborate with Carol Hall, MN DNR Herpetologist, and John Moriarty, Professional Herpetologist, to design and implement Blanding's turtle nesting habitats on the Whitby property (Task 8). CCES and Mr. Whitby will develop the long-term management plan for the property (Task 11), and CCES ecologists shall complete the final report to the US FWS (Task 12). Furthermore, Mr. Husveth and Mr. Milburn will request the assistance of local watershed districts, the Anoka Conservation District, and the Minnesota DNR for technical assistance and permits (if required).

Proposed Project Collaborators:

Evan and Nancy Whitby (Private Landowners):

Evan and Nancy Whitby are the sole owners of the 80-acre tract of land proposed for restoration and management in this PGSP proposal. Evan and Nancy Whitby have a strong conservation ethic, and are focused on restoring and managing ~77 of their 80 acres as high quality natural communities in perpetuity. A small portion of the property is already protected with conservation easements (~3 acres), and the landowners are interested in placing the majority of their remaining acreage into conservation easements in future years. The Whitby's interest in natural resources conservation, habitat restoration, and rare species preservation serve as a model for other private landowners in the region, and has earned the support of many local conservation agencies such as the Minnesota DNR, the Rice Creek Watershed District, the Coon Creek Watershed District, and the Anoka Conservation District.

As stated in the Application for Federal Assistance (Form 424), Evan and Nancy Whitby shall be the recipient of the Federal Assistance under the US Fish and Wildlife Service's Private Stewardship Grant Program / Endangered Species Program. Furthermore, the Whitby's welcome the opportunity for US Fish and Wildlife biologists, as well as other local and state agency staff, to visit the proposed restoration area on their property.

The Whitby's recognize the need for long-term management of the restoration areas and natural communities on their property. They have agreed to provide no less than \$15,000 of matching funds and in-kind services/equipment towards the successful completion of this proposed restoration project.

Key Implementing Organizations:

Critical Connections Ecological Services, Inc.:

Critical Connections Ecological Services, Inc. (CCES) is a natural resource and ecological restoration firm based in Marine on Saint Croix, Minnesota. The company was incorporated in 2000, with the goal of providing the highest quality scientific expertise and innovative environmental solutions to local municipalities, state and federal government agencies, and select private clientele. CCES provides a number of environmental services including focused botanical inventories, rare plant surveys, natural community restoration design and implementation, large-scale natural resource inventories, greenway and open space planning and design, land cover mapping, wetland delineations, wetland mitigation design and monitoring, and technical/scientific report writing. Furthermore, CCES excels at integrating detailed natural resource field data into GIS, CAD, and database software applications, enabling municipalities, agencies, and private landowners to make cost effective and ecologically sensitive land use and land management decisions.

Jason Husveth, Principal Ecologist and President of CCES, and Scott Milburn, CCES Botanist, are responsible for documenting the rare plant and animal populations on the Whitby property and adjacent properties from 2000 through 2005. In addition, Mr. Husveth has documented and studied over 250 state-listed plant populations within the

Anoka Sand Plain since 1997. In 2003, he established experimental restoration plots and developed and researched restoration methods within similar habitats, and has been designing and implementing rare species habitat restoration and management projects on public and private lands throughout the Anoka Sand Plain. Critical Connections Ecological Services offers highly specialized restoration crews and services, and controls costs with relatively low overhead and innovative and effective restoration methods. CCES will serve as the project manager and primary implementing organization. CCES will work closely with Evan and Nancy Whitby and other project collaborators to oversee and ensure the successful and timely completion of the proposed scope of work.

Other Project Supporters:

Several local and state conservation agencies are familiar with the Whitby's conservation and restoration efforts and the regional significance of the natural communities and rare plants and animals on their property. The following agencies and staff have expressed their interest and support for this proposal. We encourage the US Fish and Wildlife Service to contact the following local/state conservation agency professionals to learn more about their support for and merits of the Whitby's private conservation efforts:

Mr. Steve Hobbs
District Administrator
Rice Creek Watershed District
Blaine, Minnesota
763-398-3071
shobbs@ricecreek.org

Mr. Tim Kelly
District Administrator
Coon Creek Watershed District
12301 Central Ave. N.E., Suite 100
Blaine, Minnesota 55434
763-755-0975
tkelly@cooncreekwd.org

Mrs. Kate Drewry, Director,
MN DNR Metro Greenways Grant Program
Minnesota Dept. of Natural Resources
Metro Regional Offices
1200 Warner Road
Saint Paul, MN 55106
651-772-7946
kate.drewry@dnr.state.mn.us

Mr. Chris Lord
District Manager
Anoka Conservation District
16015 Central Ave NE, Suite 103,
Ham Lake, Minnesota 55304
763-434-2030 ext. 13

Project Milestones:

Proposed project milestones include, but are not limited to:

- 1) Removal and successful treatment of Glossy and Common Buckthorn monotypes within proposed restoration areas after the Fall/Winter of Year 1, and Spring of Year 1 and 2,
- 2) Removal and successful treatment of Reed Canary Grass monotypes within the proposed restoration area after the Spring of Year 1, and Spring of Year 2,
- 3) Treatment and control of Giant Reed and Cattail clonal stands within the proposed restoration areas after the Spring of Year 1, and Spring of Year 2.
- 4) Re-establishment and spread of rare target species within the proposed restoration area following initial invasive species management and after the first and second full growing seasons,
- 5) Restoration/management of rare plant populations that increases vigor, flowering, and abundance of these species on the site,
- 6) Documentation of additional state listed plant (or animal) populations on the property as a result of the Year 1 ecological assessment,
- 7) Establishment of previously undocumented state-listed or otherwise rare species that may establish from the dormant seed bank following Year 1 or Year 2 of the proposed restoration project,
- 8) Installation of Blanding's turtle nesting habitats in suitable areas of the property after Year 1. Monitoring and documentation of successful Blanding's turtle nests during the timeline of this project, or in years following the completion of this project,
- 9) Establishment of a long-term and cost effective adaptive restoration and management plan for the Whitby property by the completion of the project. The management plan should seek to identify additional grant/funding opportunities to assist with the long-term management of the site. Furthermore, the plan should identify collaborative management practices between the City of Blaine and the private landowner to manage both restoration areas as one cohesive ecological unit.

Criteria for Success:

- 1) Number of acres of rare species habitat (rich fen, poor fen, wet prairie, oak forest edge) successfully restored from invasive species monotypes and species poor assemblages,
- 2) Overall degree/aerial extent of invasive species abatement at project completion,
- 3) Expansion and proliferation of targeted rare plant species populations (in square feet, acres, and/or number of reproducing individuals). In similar restoration areas, numbers of reproducing individuals of several of the target species have increased by one and two orders of magnitude over period of two growing seasons,
- 4) Establishment of suitable nesting habitat for Blanding's turtles, and use of nesting sites by Blanding's turtles in subsequent years,
- 5) Discovery and documentation of additional state or federally listed (or otherwise rare) plant and animal species as a result of restoration planning, assessment, and project implementation,

- 6) Re-establishment of previously undocumented state-listed or otherwise rare plant species from the suppressed plant material and/or dormant native seed bank,
- 7) Development of collaborative management approaches between the private land owner, adjacent land owners, and local/state/federal agencies, and,
- 8) Establishment of a cost-effective, long-term restoration and management plan for the 80-acre private property.

Duration of Time Commitment:

Evan and Nancy Whitby, private landowners, are interested in managing their property as high quality native communities in perpetuity. The Whitby's plan to retire on this property, and are currently considering placing most of their acreage (up to 77 acres) in conservation easements. The Whitby's understand that long-term management of the restoration areas will likely involve continual follow-up of invasive species treatments and prescribed burning and maintenance every two to three years following completion of initial restoration tasks. Furthermore, the private landowners understand that long-term sustainable management of their 80-acre property will likely involve collaborative restoration and management efforts with the local government agencies, watershed districts, the Minnesota DNR, and other community groups. With assistance from the project collaborators, the Whitby's are interested in pursuing additional grant opportunities, to provide additional resources for restoration and management beyond ten years.

Project Budget (Tasks and Timeline):

The following proposed project tasks, timeline, and budget have been developed from the experience gained in successfully restoring and managing similar habitats on public and private sites throughout the Anoka Sand Plain (ASP) of Minnesota. Overall restoration costs (on a per acre basis) have decreased in recent years due to the refinement of restoration methods during the implementation of similar projects in the ASP. This PSGP proposed rare species / habitat restoration project will seek to implement restoration tasks over 77 acres private land at a total cost of \$74,850 over a two-year period. Although the Whitby's prefer to receive the total amount of assistance requested, they are willing to accept a partial award from the US FWS Private Stewardship Grant Program if funding is limited for the 2006 fiscal year.

Proposed Project Tasks, Descriptions, Timeline, and Costs:

Task 1: Detailed Assessment of Proposed Restoration Areas

Timeline: September 1, 2006 through June 30, 2007

Proposed Costs: \$6,250

Task 1 involves the detailed documentation and mapping of pre-restoration conditions throughout the 80 acre Whitby property, including: identification of all state listed plants and population extents within the proposed restoration area, identification and mapping of major exotic species populations within the project area, compilation of a complete pre-restoration plant species list through meander surveys and establishment of permanent vegetation plots, and assessment and mapping of site hydrology and soils. Costs for Task 1 include: delineation of the proposed restoration areas with a sub-meter global positioning system (GPS) unit and field flagging, detailed vegetation surveys by the project ecologists/botanists, mapping of vegetation, invasive species, and rare plant populations with sub-meter GPS hardware and GIS software. Material costs associated with Task 1 are limited to field flagging, lathe, marking materials, and permanent metal survey stakes, and minimal printing costs. Rental costs include \$75.00 per day for a sub-meter GPS unit. Data obtained from Task 1 will be used to directly inform, develop, and refine the design of restoration and management methods, timelines, and priorities for rare species and native habitats on the property (see Task 2).

Task 2: Refinement of Site Specific Restoration and Management Approach/Plan

Timeline: September 1, 2006 through June 30, 2007

Proposed Costs: \$3,100

Based on the detailed assessment information gathered in Task 1, a site-specific restoration plan will be developed for the natural communities and rare species habitats on the 80-acre property. The plan will specify methods aimed toward removing and managing invasive species (Reed Canary Grass, Common and Glossy Buckthorn, Cattail, and Giant Reed) monotypes and populations that pose an immediate threat to the rare species populations present on the property. Areas suitable for established restoration approaches will be identified, such as manual brush removal, herbicide treatments, raking, soil scraping and/or scarification. Furthermore, areas not suitable for herbicide applications (i.e. within or immediately adjacent to existing rare plant populations will be

prescribed manual restoration methods that do not require herbicide). Task 2 also includes obtaining of wetland restoration permits/exemptions through the US Army Corps of Engineers (Section 404, Clean Water Act) and the Coon Creek Watershed District (as per the Minnesota Wetland Conservation Act). Both agencies have granted permits for identical work in similar habitats (on public and private properties), and have agreed that the proposed restoration work on the Whitby property is eligible for both State and Federal wetland restoration permits and/or exemptions. Costs include the cost of a professional ecologist refining and developing a site-specific restoration plan and management approach, as well as correspondence with local agencies, and securing any required permits/exemptions from the appropriate regulatory agencies.

Task 3: Year 1 Common Buckthorn, Glossy Buckthorn, Reed Canary Grass, Cattail, Purple Loosestrife, and Common Reed Management

Timeline: October 1, 2006 through March 30, 2007

Proposed Costs: \$21,500

Task 3 includes the initial management (Year 1) of invasive species monotypes, and populations throughout the native habitats on the Whitby property. Common and Glossy Buckthorn will be cut, treated, and removed from rare species habitats, oak forest and wetland edges, and elsewhere on the property. Small areas of Reed Canary Grass monotypes will be mowed, herbicide-treated, and controlled. Cattail and Giant Reed monotypes will be treated with herbicide and thatch will be removed from wetlands to foster native species competition and proliferation. Purple Loosestrife occurs in very small numbers in the Whitby's wetlands, and this species shall be hand pulled and herbicide treated. Loosestrife beetles shall be collected from donor sites and released within wetlands during the late spring on Year 1 to control the additional spread of Purple Loosestrife. T

To treat Giant Reed, the culms of several dozen plants are grouped and bound together and cut at chest-high. The tethered and cut ends of Giant Reed culms are then spot treated with a Glyphosate-based herbicide suitable for use in wetlands (i.e. Rodeo™). In addition, within monotypic invasive species stands that are superficially-scraped and/or scarified, Giant Reed rhizomes are hand pulled from the peat surface prior to germination of the diverse seed bank that currently lies dormant in the surface peat layer and revegetation.

Sporadic areas of Reed Canary grass within more diverse areas of the wetland are spot treated with a Glyphosate-based herbicide suitable for use in wetlands (i.e. Rodeo™). However, individual Reed Canary Grass plants that occur within close proximity to any rare plant populations are hand pulled or dug to remove the rhizomes. Large contiguous monotypic stands of Reed Canary Grass (and their associated seed bank) are mechanically scraped from the organic peat surfaces (to 2 inches), and removed from the site, thus revealing the diverse native seed bank below that is relatively free of noxious weed species (see Task 4).

Costs for Task 3 include: brushing equipment rental and operation costs, machine maintenance (such as saw blades, machine oil, repairs, etc.), professional restoration crew

labor and associated costs, herbicide and dilutant costs, and field flagging costs. \$1,200 of the costs of the Task 3 will be covered by the private landowner, and represents \$1,200 of the landowners \$5,000 total dedicated match.

Task 4: Surface Scraping and Removal of Reed Canary Grass Monotypes and Surficial Invasive Seed Bank (selected areas).

Timeline: April 2007 (Coinciding with wetland soil surface thawing)

Proposed Costs: \$13,450

Task 4 involves a restoration method that has been designed to restore diverse native herbaceous wetland assemblages within organic soil/peatland areas previously dominated by Reed Canary Grass through the mechanical scraping and removal of the Reed Canary Grass seed bank and perennial rhizomes. This scraping method has been successfully employed on similar restoration sites nearby, and has resulted in the re-establishment of over 80 native species from viable seed banks. This method capitalizes on an early spring time-window in which the surface of the peat has thawed and the subsurface frost layer is still in tact (frozen up to 36" in depth). The top peat layer (including the Reed Canary Grass seeds and rhizomes) is mechanically scraped to 1 to 2 inches in depth and this material is removed from the site and composted. The underlying peat layer is relatively free of weed seed, and typically contains viable seed for at least 40 to 80 native grasses, sedges, rushes, and forbs (including several rare plant species). Seed dormancy within scraped areas is typically broken by mid-July, with diverse native herbaceous assemblages establishing by mid September.

The costs of Task 4 include machine rental and/or contracting, oversight by a professional ecologist(s), and costs associated with the removal of weed-infested material from the site (to a local compost facility and/or incinerator).

Task 5: Monitoring of Restoration Areas (First Growing Season)

Timeline: May 1 through September 30, 2007

Proposed Costs: \$2,400

Task 5 includes a season long monitoring and assessment of the Fall 2005 – Spring 2006 restoration areas. Monitoring and assessment includes: evaluation of invasive species management success, establishment of native flora from the seed bank, expansion of existing rare plant populations within restored and managed areas, establishment of new rare plant populations from the seed bank, and emergence of previously undocumented species from the seed bank. Meander surveys and focused rare plant surveys will be conducted by the project ecologist/botanists throughout the growing season to determine and map the extent of target/rare species population expansion. Based on this season-long assessment of the site's response to restoration activities, restoration and management strategies will be refined and adapted to most efficiently and effectively carry out the remaining project tasks.

Task 6: Collection and Dispersal of Local Ecotype Native Seed
Timeline: May 1 through October 30, 2007
Proposed Costs: \$6,500

Throughout the growing season, the mature seeds of common and/or beneficial native species are collected throughout the restoration area. These seeds are stored and dispersed throughout the project site as determined through the restoration monitoring process. Only site-specific ecotypes are collected and dispersed throughout the site (i.e. seed is not purchased or introduced from other sites or sources). For ecological, research, and legal reasons, only non-protected species are collected and dispersed. Protected (or rare) species will typically re-establish from the seed bank and existing populations within the restoration site. If desired, the project collaborators would likely be able to secure permits from the Minnesota DNR to collect and disperse seed of selected protected species (i.e. state Endangered and Threatened) on-site. Special Concern species are not protected under Minnesota Statute 84.0895, and could therefore be collected and dispersed without a permit. However, the past restoration projects within similar habitats have relied primarily upon Endangered, Threatened, and Special Concern species successfully establishing in various restoration areas on their own from the dormant seed bank or suppressed rhizomes, or from remnant populations. Costs for Task 6 include site reconnaissance, collection of mature seed within the project site, storage of seed, dispersal of seed in Fall 2006 or Spring 2007, and in some cases, propagation of seedlings for re-introduction into appropriate restoration areas on the property.

Task 7: Year 2 Common Buckthorn, Glossy Buckthorn, Reed Canary Grass, Cattail, Purple Loosestrife, & Common Reed Management
Timeline: September 15, 2007 through March 30, 2008
Proposed Costs: \$5,750

Task 7 involves the second year treatment and management of Glossy Buckthorn, Reed Canary Grass and Giant Reed stands and resprouts that were not completely treated during the first year of treatment. As with most long-term restoration projects, invasive species will need to be monitored and managed over time to ensure adequate treatment, control, and abatement. The costs associated with Task 7 include follow up mechanized brushing and herbicide treatments of Glossy Buckthorn, as well as spot spraying and treatment of Reed Canary Grass and Giant Reed. Costs include professional licensed pesticide applicator crew labor, as well as equipment rental and maintenance (blades, etc.), and herbicide and dilutant costs.

Task 8: Creation and Management of Blanding's Turtle Nesting Sites
Timeline: April 1 through May 30, 2008
Proposed Costs: \$7,750

In collaboration with DNR herpetologists and state experts, the land owners and CCES ecologists will design and implement suitable Blanding's turtle nesting sites on sandy open uplands on the Whitby property. Native dry prairie species shall be planted over 1 to 2 acres of suitable upland habitats adjacent to wetlands. Sparse vegetation with many sandy openings shall be maintained to ensure numerous suitable micro-sites for nesting.

Costs for Task 8 include: professional ecologist design time, collaboration with local experts, research, native prairie seed (or seed collection time), implementation of native seeding and habitat creation by restoration crews and landowner.

Task 9: Follow-Up Treatment of Remaining Invasive Species Patches / Resprouts
Timeline: April 1 through September 15, 2008
Proposed Costs: \$2,100

Task 9 includes the final follow-up spot treatment of persistent invasive species patches and resprouts under the PSGP funding. Costs covered in Task 9 include: professional licensed herbicide applicator crews, manual removal of invasive species within sensitive areas, and herbicide and dilutant costs.

Task 10: Monitoring of Restoration Areas Year 2
Timeline: April 1 through September 30, 2008
Proposed Costs: \$2,400

Restoration areas throughout the 80-acre property will be monitored from April 1 through June 15, 2008. Through meander surveys and focused rare plant surveys, the project ecologist/botanists will document the post-restoration extents of target rare species populations, new rare plant populations that have established from the seed bank, and the extent and abundance of invasive species remaining within the restoration areas. Furthermore, the project ecologists will compile a comprehensive plant species list for the restoration habitats that will include ecological notes with regard to pre-restoration and post-restoration presence/absence/abundance. Furthermore, rare species population extents will be mapped with a sub-meter GPS hardware and GIS software. The costs associated with Task 10 include professional services provided by CCES project ecologists and botanists, and GPS costs.

Task 11: Development of a Long-Term Management Plan
Timeline: June 1 through July 30, 2008
Proposed Costs: \$3,000

In Task 11, a long-term management plan will be developed for the Evan and Nancy Whitby's 80-acre property. The plan will define long-term strategies, tasks, and timelines to manage the restored wetlands for the rare target species over a 5 to 15 year timeline. The plan will be based on an adaptive management approach. Potential grant funding sources and other available resources will be identified to assist with the implementation of the long-term management plan and identified tasks. The plan will likely rely heavily of the use of prescribed burning as a cost effective management tool. Although the long-term management plan will focus primarily on the Whitby property, it will also address opportunities to collaborate with adjacent landowners and the Minnesota DNR staff at the Carlos Avery WMA. Costs associated with Task 11 include professional services provided by the project restoration ecologist (CCES), and printing costs.

Task 12: Final Report to the US FWS (and other interested agencies/parties)
Timeline: Delivered to US FWS Regional Office by August 31, 2008
Proposed Costs: \$650

CCES and the Whitby's will prepare a final report that documents the process, methods, and results of the Whitby rare species restoration and management project. The report will be provided to the US Fish and Wildlife Service by August 31, 2008. The final report will document the pre-restoration conditions, restoration process, and post-restoration successes (as well as any set backs). The long-term management plan will be included as part of this final report. The final report will include a site plan and maps depicting pre-restoration site conditions, the pre-existing and post-restoration extents of the rare target species populations and rare animal sightings, diverse plant assemblages, and invasive species. A comprehensive plant species list for the site will be included. With the permission of the US FWS, electronic copies of this report could be made available to other agencies, community groups, and individuals that are interested in the project approach and results. Costs associated with Task 12 include report writing, map production, and hard-copy report production.

Other Non-Billable Tasks (Not Included in Grant Request/Cost Estimate):

During the proposed project timeline, the project collaborators will continue to assist the Whitby's in pursuing additional grant funding and local, state, and federal resources to assist with the long-term management of the proposed restoration area.

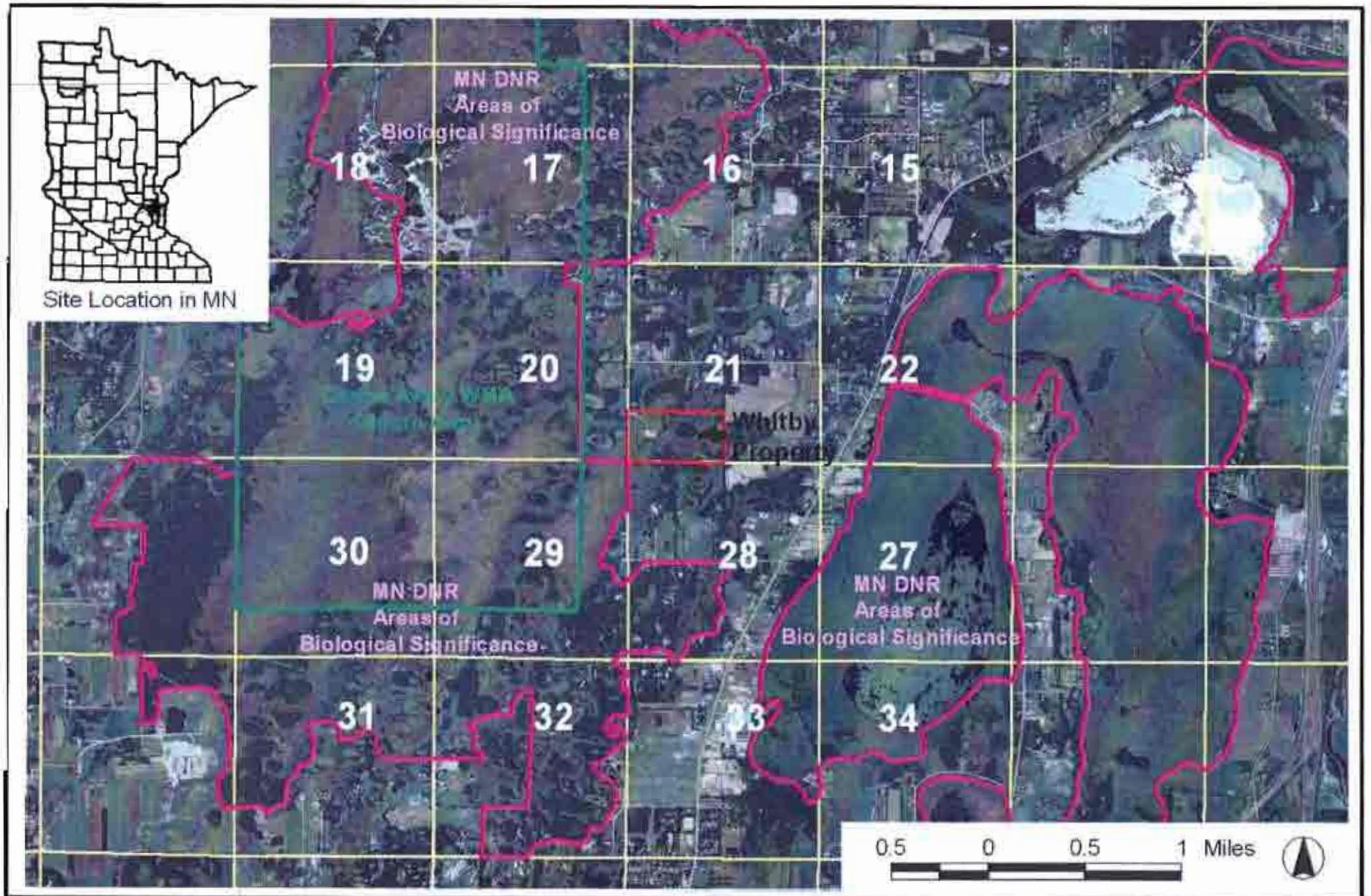
**Evan and Nancy Whitby Rare Species Habitat Restoration Proposal
PSGP Request Cost Summary:**

Task 1:	Detailed Assessment of the Proposed Restoration Areas	\$ 6,250
Task 2:	Refinement of Site Specific Restoration & Management Plan	\$ 3,100
Task 3:	Year 1 Invasive Species Management	\$21,500
Task 4:	Scraping and Removal of Reed Canary Monotypes/Seedbank	\$13,450
Task 5:	Monitoring of Restoration Areas (First Growing Season)	\$ 2,400
Task 6:	Collection and Dispersal of Native Local Ecotype Seed	\$ 6,500
Task 7:	Year 2 Invasive Species Management	\$ 5,750
Task 8:	Design and Installation of Blanding's Turtle Nesting Habitat	\$ 7,750
Task 9:	Final Follow-Up Treatment of Invasive Species	\$ 2,100
Task 10:	Monitoring of Restoration Areas (Second Growing Season)	\$ 2,400
Task 11:	Development of a Long-Term Management Plan	\$ 3,000
Task 12:	Final Report to the US FWS	\$ 650
	Private Land Owner Cost Share:	\$15,000
	Total PSGP Funding Request:	\$59,850
	Total Project Cost:	\$74,850

Appendix A

Supporting Documentation

1. **Proposed Project Location (2003 FSA Color Aerial Photograph)**
2. **Site Figure with Rare Species Locations**
3. **Proposed Restoration and Management Areas on the Whitby Property**
4. **Photographs of Rare Species on the Whitby Property**
5. **Selected References**



January 23, 2006

**Location of the Whitby 80 Acre Property
 T32N R22W S1/2 of the SW1/4, Sec 21
 Columbus Township, Anoka County, Minnesota
 US FWS PSGP Grant Application**



Appendix A
 Figure 1

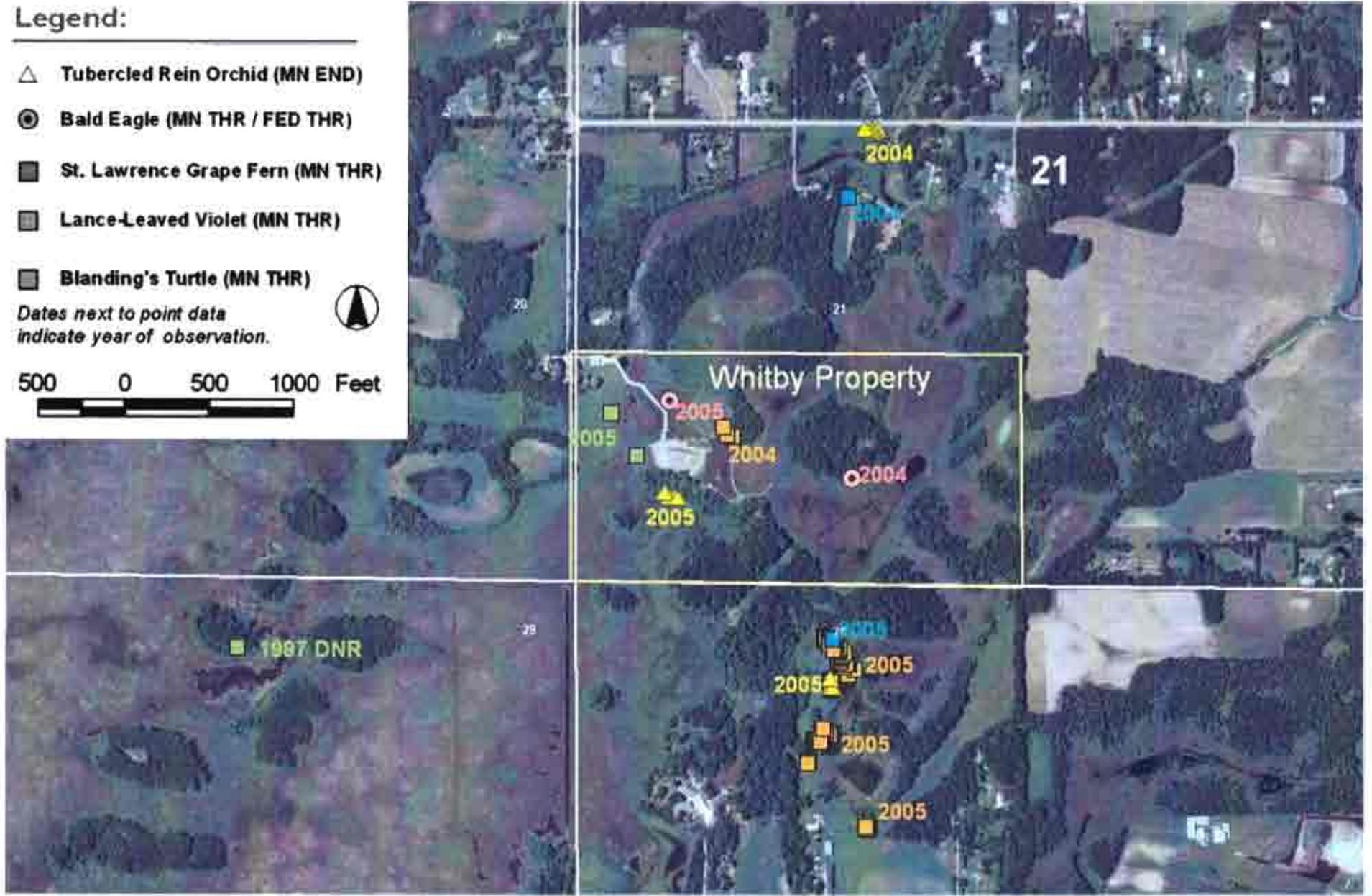
Legend:

- △ Tubercled Rein Orchid (MN END)
- ⊙ Bald Eagle (MN THR / FED THR)
- St. Lawrence Grape Fern (MN THR)
- Lance-Leaved Violet (MN THR)
- Blanding's Turtle (MN THR)

Dates next to point data indicate year of observation.



500 0 500 1000 Feet

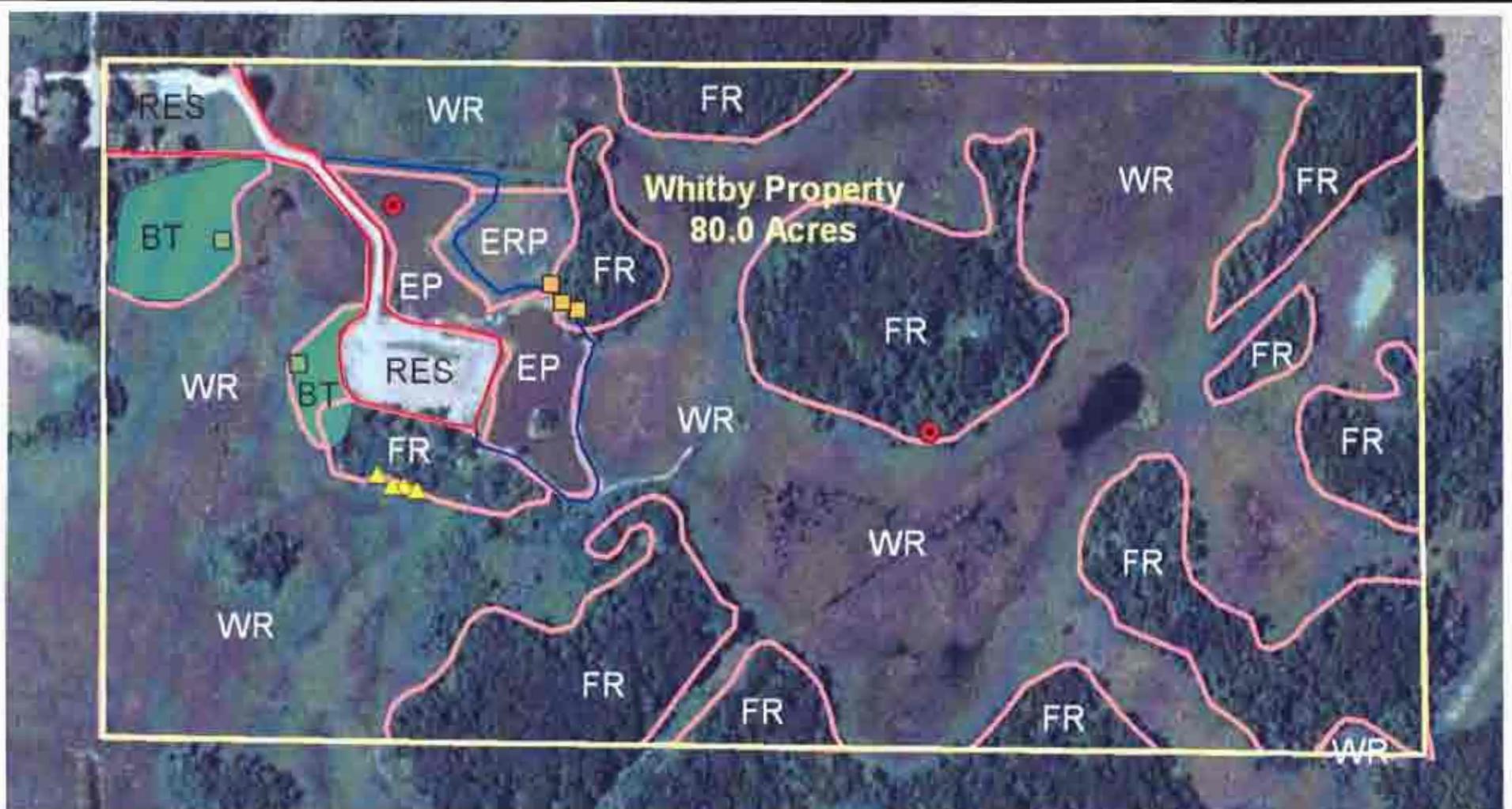


January 23, 2006



**Confirmed Rare Species Location Within
and Immediately Adjacent to the Whitby Property
Columbus Township, Anoka County, Minnesota
US FWS PSGP Grant Application**

**Appendix A
Figure 2**



Legend:

-  Existing Conservation Easment (~ 3 Acres)
-  Planned Residential Use (~ 3 acres)
-  ERP Existing Prairie Restoration (1 Acre)

-  WR Proposed Wetland Restoration Areas (50 acres)
-  FR Proposed Forest Restoration Areas (22 acres)
-  EP Existing Ponds (2 Acres)



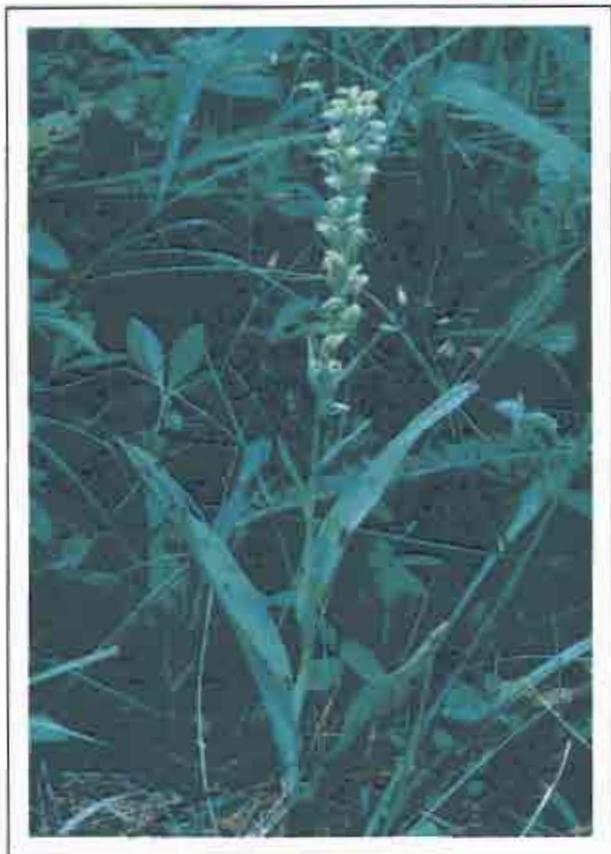
 Potential Blanding's Turtle Nesting Sites and Dry Prairie Restoration Areas

January 23, 2006



Proposed Restoration Areas within the Whitby Property
 Columbus Township, Anoka County, Minnesota
 US FWS PSGP Grant Application

Appendix A
 Figure 3



Tubercled Rein Orchid (*Platanthera flava* var. *herbiola*, MN Endangered) on the Whitby Property.
Documented by Jason Husveth, CCES Botanist, July 2005.



Lance-Leaved Violet (*Viola lanceolata*, MN Threatened) on the Whitby Property.
Documented by Jason Husveth, CCES Botanist, May 2004 and May 2005.



Blanding's Turtle (*Emydoidea blandingii*, MN Threatened) on the Whitby Property.
Documented by Jason Husveth and Evan Whitby, July 2005



Representative photograph of rare species native habitats on the Whitby Property, July 2005.

Selected References

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