

**CONSERVATION MANAGEMENT PLAN
FOR BLANDING'S TURTLE & SANDHILL CRANE**

AT

**THE PROPOSED HANKIN PARCEL
COMMERCIAL DEVELOPMENT
LAKE IN THE HILLS, ILLINOIS**

**Illinois Department of Natural Resources
Natural Heritage Database Review #05-03099**

Prepared for:

PAR Development, Inc
1141 East Main Street
Suite 100
East Dundee, Illinois 60118

Prepared by:

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018

CBBEL Project No. 04-602 002

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CHRISTOPHER B. BURKE ENGINEERING , LTD.

9575 West Higgins Road Suite 600
Rosemont, Illinois 60018-4920 Tel (847) 823-0500 Fax (847) 823-0520

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REVISED CONSERVATION MANAGEMENT PLAN FOR BLANDING'S TURTLE & SANDHILL CRANE

Hankin Parcel Commercial Development, PAR Development, Inc.
Lake in the Hills, McHenry County, Illinois

Introduction and Background

This Revised Conservation Management Plan was developed as part of an application for an Incidental Takings Authorization for Blanding's turtles (*Emydoidea blandingii*) and sandhill cranes (*Grus canadensis*) from the Illinois Department of Natural Resources (IDNR). Revisions were made to include the sandhill crane in the Incidental Takings Authorization application per the IDNR May 19, 2006 letter with recommendations and the January 5, 2007 e-mail with guidance to the Village of Lake in the Hills. Practices to potentially benefit sandhill crane and Blanding's turtle are proposed in this plan. The plan is necessary due to the proposed commercial retail development of a ±19.4-acre site (Hankin Parcel Commercial Development) located approximately 500 feet east of Lakewood Road and north of Huntley-Algonquin Road in Lake in the Hills, McHenry County, Illinois. Geographically, the site is located in Township 43 North, Range 7 East of the Third Principle Meridian, in the southwestern quarter of the northeastern quarter of Section 26. Please reference the ITA application submittal dated September 23, 2005 and the re-submittal with additions and clarifications dated November 7, 2005, prepared by Christopher B. Burke Engineering, Ltd. (CBBEL).

The ±19.4-acre property is owned by PAR Development, Inc. (PAR) and is located adjacent to and partially within the Exner Marsh Illinois Natural Area Inventory (INAI) site. Note that the Hankin Parcel lies between the Lakes of Boulder Ridge Residential Development/West Nine Golf Course and Lake Pointe Commercial Developments. The Boulder Ridge parcel, located east of the Hankin Parcel, received IDNR endangered and threatened species sign-off. PAR previously obtained an Incidental Take Authorization for the Lake Pointe parcel, which is located adjacent to (west of) the Hankin Parcel.

This Revised Conservation Management Plan incorporates many of the IDNR recommendations that were required in order to obtain the Incidental Take Authorization for the neighboring Lake Pointe parcel, and incorporates recommendations listed in the IDNR May 19, 2006 letter to the Village of Lake in the Hills. In addition, PAR offers site design criteria and information regarding the Best Management Practices to improve discharge water quality entering Exner Marsh.

No part of the proposed development occurs within the U.S. Army Corps of Engineers (COE) verified wetland boundary or the Exner Marsh INAI area. The proposed building footprint is outside of the 100' wide buffer area. Only an approximate 20' wide area of the stormwater detention wetland slope occurs within the 100 foot average buffer width required by the McHenry County Stormwater Management Ordinance. Buffer averaging is used, as allowed in the McHenry County Stormwater Ordinance, to locate the stormwater detention wetland inside the buffer, but outside of the COE verified wetland

boundary. This provides for more efficient design and function of the stormwater detention wetland.

We have included guidance previously developed for the adjacent Lake Pointe site by Justin Congdon, Ph.D., a research scientist at the Savannah River Ecology Laboratory in South Carolina (affiliated with the University of Georgia) and Michael Pappas, a reptile consultant from Minnesota. Dr. Congdon and Mr. Pappas previously visited the marsh and adjacent areas and prepared a report discussing their findings and suggestions (Appendix A). They have completed, reviewed, and authored extensive research regarding Blanding's turtles. IDNR has reviewed this report previously in regards to the Lake Pointe project and accepted its findings and recommendations.

Biological Data

Blanding's Turtle

Biological data on Blanding's turtle was taken from correspondence from Keith Shank at IDNR, November 26, 2001.

Exner Marsh supports the largest known McHenry County population of this species; over 70 individual turtles have been tagged by McHenry County Conservation District (MCCD) in this location. However, fewer than 40 are sexually mature individuals that may be capable of reproduction. Exner Marsh is one of the primary research sites for this species in Illinois.

While the species is primarily aquatic, it will travel farther afield in upland areas to nest than any other North American aquatic turtle. Upland areas suitable for nesting are an essential element of habitat for this species. On-going tracking studies at Exner Marsh have demonstrated that some females have traveled up to one-quarter mile from the marsh, a radius that easily includes the parcel in question.

Eggs are laid in gravelly/sandy soil from June through September; [Congdon & Pappas (2002) state that other material suggests mid-May through mid-July] nesting periods may be earlier or later depending on the prevailing weather for the year and the amount of successful basking by females. South-facing open areas are preferred. Eggs take up to 60 days to incubate, so hatchlings may be present from late July to as late as November [Congdon & Pappas (2002) state that hatchlings would emerge by early October]. Hatchling gender is determined by egg temperature at a specific stage of development; warmer temperatures produce females, slightly cooler temperatures produce males.

Blanding's turtles are the longest-lived North American turtle, with documented ages over 65 years; females do not reach reproductive maturity until 16-20 years of age and do not necessarily lay a clutch every year. Being a long-lived species, clutches are relatively small, seldom exceeding a dozen eggs. Reduction of nesting habitat, nest predation, and the untimely loss of breeding-age females to road-kill and reptile collectors are major threats to this species. At present, the Exner Marsh

population appears to be gender-balanced, but older females may not be reproductive [Congdon & Pappas (2002) state that the previous statement has no supporting evidence]. Thus there are likely significantly fewer than 20 reproductive females at Exner Marsh. Females are at greater risk because they are exposed during the nesting process.

Blanding's turtles are omnivorous [Congdon & Pappas (2002) stated that Blanding's turtles are primarily carnivorous], but, like snapping turtles, appear to prefer feeding on fish, amphibians, and insect larvae. Hence, a healthy ecosystem with a complete food web is important to them.

Blanding's turtles appear able to persist successfully in agricultural areas. The conversion of agricultural areas to urban environments--with heavy vehicular traffic, frequent exposure to humans, and many barriers to overland movement, not to mention degradation of water quality and the aquatic environment--is detrimental to them.

See Appendix A: Congdon & Pappas. 2002. Review of the Status of Exner Marsh Blanding's Turtles: Potential Impact of Lake Pointe Development for more biological information.

Sandhill Crane

Biological information was taken from Tacha, T. C., S. A. Nesbitt, and P. A. Vohs. 1992. Sandhill Crane (*Grus canadensis*). In The Birds of North America, No. 31 (A. Poole, P. Stettenheim, and F. Gill, Eds.). Philadelphia: The Academy of Natural Sciences; Washington, DC: The American Ornithologists' Union.

The sandhill crane breeds across Alaska and Canada, eastward to western Quebec, and southward to northern United States, and also in scattered localities across the western United States. The crane is resident in southern Florida and Cuba and winters in the southern United States and northern Mexico. The crane feeds in marshes and grain fields, on mostly grains and seeds, some insects, other invertebrates, and small vertebrates. Sandhill cranes breed in open marshes or bogs, and in wet grasslands and meadows. The nest is a large mound of vegetation in water, floating or attached to vegetation. A sandhill crane egg is pale brownish, irregularly marked with darker brown. A hatchling is covered with down, and is able to walk soon after hatching and feed itself within one day.

Potential Impacts

Blanding's turtle

This project consists of the construction of a commercial retail development. PAR will take measures to prevent the taking of turtles during and after construction and does not anticipate a negative impact on the local population. However, because this species may travel away from the marsh to adjacent upland areas, the development could potentially result in a negative indirect impact on turtle individuals. Potential takings of the Blanding's turtle may occur during and after construction by construction machinery, vehicles, human contact and physical barriers.

Anticipated adverse impacts on the Blanding's turtle as expressed by IDNR for the Lake Pointe site include:

- Conversion of open upland area to a commercial development and wetland/stormwater treatment areas resulting in the loss of nesting and foraging habitat.
- Conversion of areas within the INAI site.
- Degraded water quality from automotive pollutants and road salt.
- Addition of windblown trash throughout the Nature Preserve/Conservation Area
- Intrusive security lighting altering the food chain.
- Barriers to overland movement.

Sandhill crane

PAR will take measures to prevent the taking of sandhill cranes during construction and does not anticipate a negative impact on the local population. Although there are no confirmed crane sightings, this species may possibly forage, nest, or otherwise occur in portions of the proposed project area; therefore, the development could potentially result in a negative indirect impact on cranes or their young (colts). Potential takings of the sandhill crane may occur during construction by construction machinery, vehicles, human contact, and physical barriers.

Potential adverse impacts on the sandhill crane include:

- Loss of foraging habitat due to conversion of upland habitat to a commercial development.
- Loss of nesting and/or brood rearing habitat.

Please note that the majority of the proposed development occurs in an existing turf and pasture grass area containing scattered trees, an occupied residence, and outbuilding (barn), which are not favored crane habitat.

Measures Taken to Minimize Impacts

PAR has incorporated measures from their previous Taking Authorization for Lake Pointe suggested by IDNR, MCCD, Illinois Nature Preserves Commission (INPC) and COE to minimize development impacts to the ecology of the area. PAR has also gone beyond minimization of impacts to mitigate for any incidental impacts. PAR proposes to create a turtle nesting area and enhance the existing wetland and non-native grass area located south of the existing on-site pond with a supplemental native species seeding. We anticipate taking no Blanding's turtles; however, despite impact minimization measures, we estimate that 0-2 turtles and 0-2 sandhill cranes per year may be taken as a result of the development.

The project site consists of 19.4 acres, of which ± 11 acres will remain in open space. These 11 acres consist largely of an existing pond that was excavated prior to regulation, an herbaceous wetland fringe around the pond, and an adjacent wooded wetland area. A stormwater detention wetland will be constructed and vegetated with native species. Because only a narrow 20' wide strip of the detention wetland occurs within a portion of the required 100' buffer, nearly 11 acres remains available for use by

turtles and cranes during construction. The construction of the proposed stormwater detention wetland and surrounding buffer will result in approximately 13 acres of open space available for wildlife habitat. In addition, PAR proposes to create one sand/gravel turtle nesting area at the northernmost tip of the upland buffer adjacent to the existing wetland/pond.

Sandhill cranes will benefit from the continued availability of the preserved upland buffer between the development and the wetland and from the proposed stormwater detention wetland that will provide additional foraging habitat. Current upland land use is residential and vegetation consists of mostly monocultural turf and non-native pasture grasses with scattered trees, that will be enhanced.

The following measures will be implemented to minimize potential effects of the development on Blanding's turtles and sandhill cranes:

- UPLAND HABITAT AREAS: Existing upland areas consist of dense turf and pasture grasses in silt loam and silty clay loam, which provide limited foraging or nesting habitat for Blanding's turtle and sandhill crane. Blanding's turtles prefer sand and gravel substrates for nesting; therefore it is not likely that these upland areas are used for nesting. (See Observation/ Recommendation #3, Congdon & Pappas, 2002).

The north and east construction limits within the buffer will be silt fenced to help prevent downslope sedimentation and protect water quality. The silt fence will be maintained throughout construction until the site is stabilized, and will provide a barrier preventing potential turtle access to the construction area.

To help offset potential effects of the development, PAR will enhance the undisturbed upland areas by creating a sand/gravel turtle nesting area as well as enhancing the upland and wetland habitats for foraging. The buffer located south of this beach/turtle nesting area will provide the turtles a large undisturbed area. The buffer, including the stormwater detention wetland with its bottom at normal water level and sideslopes will be planted to native vegetation. The wetland limits are no closer than 100 feet to the development; therefore, the buffer ranges from 100-500+ feet wide. In addition, signs will be posted outside of the buffer area to inform passersby of the possible presence of State-listed threatened species including Blanding's turtle and sandhill crane.

To benefit turtles and cranes, the upland buffer will be enhanced by herbiciding non-native grasses and installing native grass and forb seed into non-native grass duff. Interseeding into the herbicided grass duff will help to prevent soil erosion while the seeded species establish. Native emergent, wet prairie, and upland buffer seed will be installed within the stormwater detention wetland to provide habitat for Blanding's turtle, sandhill crane, and other species including yellow-headed blackbird and common moorhen. Note that an Invasive Plant Species Management Plan will be provided to MCCD, the Exner Marsh site steward, for notification prior to herbiciding, prescribed burning, or other activity that may affect runoff.

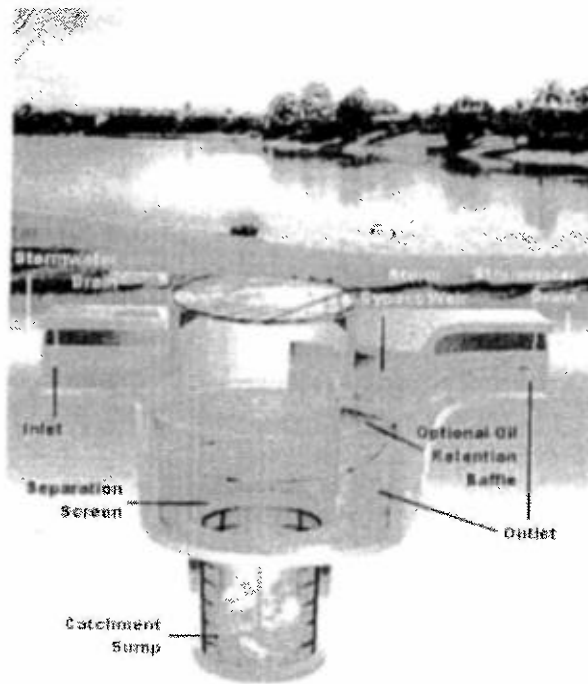
Nesting: PAR will install the sand and gravel turtle nesting area in coordination with the IDNR. An area of sand beach along the south central shoreline of the existing pond (northernmost portion of the buffer) will be enhanced with additional sand, gravel, and seeding with dry prairie species to provide turtle nesting habitat. The proposed turtle nest area is more than 500 feet north of the proposed turtle fence along the edge of the commercial development.

The enhancement of the current non-native turf and pasture grass area with native grass and forb seed is expected improve the quality of the available crane habitat for nesting.

Habitat and Foraging: The wetland and buffer areas between the existing pond edge and the development will be enhanced using a variety of management techniques. Portions of the wetland area that contain quality wetland species will be enhanced with prescribed burning. Lower quality areas containing invasive species such as reed canary grass will be herbicided and will receive supplementary seeding. Similarly, the upland buffer will be herbicided and re-seeded to native species. These areas will be maintained by PAR for a three year period to help prevent invasive weeds and to promote the establishment of native plant species.

- STORMWATER MANAGEMENT AND WATER QUALITY: PAR proposes to maintain water quality and provide proper stormwater treatment for the runoff draining to the Nature Preserve. A series of Best Management Practices (BMP's) will be implemented to provide multiple treatment of stormwater runoff associated with the commercial development. Proposed BMP's are described in the following paragraphs.

Stormwater runoff will be directed into a Continuous Deflective Separator (CDS) system (see below) before draining through a vegetative swale into the stormwater detention wetland. The stormwater detention wetland is being designed to include low berms to lengthen the path to the outfall, increase residence time, and thus, provide greater water quality benefits. The bottom and side slopes of the stormwater detention wetland will be planted with native wetland vegetation including salt tolerant plants. The stormwater detention wetland will discharge via level spreader overland through the upland buffer (vegetated filter strip), and finally into the existing pond for further treatment before discharging into Exner Marsh.



Graphic taken from [Http://www.cdstech.com](http://www.cdstech.com)

The BMP treatment train will result in the removal of an estimated 95% of the total suspended solids and 90% of the total phosphorous entering the stormwater management system. Note that an 80% removal of pollutants is commonly required in areas where water quality is regulated. Table 1 below provides a summary of the proposed BMP treatment train and removal rates for the Hankin Parcel. Also see pollutant removal rates listed in the Illinois Urban Manual and information available from the U.S. EPA.

Table 1. Pollutant Removal Efficiencies (RE's) of Best Management Practices (BMP's) for Total Suspended Solids (TSS) and Total Phosphorous (TP)

BMP	IL Urban Manual		U.S. EPA	
	RE for TSS (%)	RE for TP (%)	RE for TSS (%)	RE for TP (%)
CDS (manufacturer testing)	(50-80)	NA	(50-80)	NA
Grassed swale/ Vegetated filter strip	28	30	50-80	50-80
Stormwater Detention Wetland	50-90	30-90	50-90	15-45
Level Spreader	NA	NA	NA	NA
Upland Buffer (Grassed swale/ Vegetated filter strip)	28	30	50-80	50-80
Existing Pond (Wet pond or Retention basin)	50-90	30-90	50-80	30-45
TOTAL %	93.5-99.9	75.3-99.5	96.9-99.8	85.1-98.8

Pollutant removal efficiencies were taken from the Illinois Urban Manual and/or the Structural BMP Expected Pollutant Removal Efficiency, U.S. EPA 1993, except for CDS, which was provided by University testing completed for the manufacturer. Inferred removal efficiencies of TP by CDS system were based on removal efficiencies of listed BMP's, since TP is typically tightly bound to soil particles.
NA - Not Available

Note that the removal efficiency of total phosphorous by the CDS system was not available at the time of this report, but the adherence of phosphorous to soil particles should be considered, intuitively resulting a much greater total pollutant removal efficiency than reported above. In addition, the pollutant removal efficiency for a level spreader was not available, but may also be considered as a BMP for pollutant removal. This multiple stage stormwater treatment system greatly exceeds the typical one or two stage stormwater treatment system that is permitted to discharge directly into a wetland. In our opinion, the designed BMP treatment train will function to maintain good water quality discharging into Exner Marsh.

Also note that silt fence will be installed prior to grading and will be maintained in good working condition at the grading limits (approximate middle of buffer), with the remaining half of the buffer vegetation undisturbed throughout construction. Other soil erosion and sediment control devices including filter fabric in storm inlets and riprap outlets will be installed and maintained in good condition.

PAR will incorporate the following water quality recommendations listed in the IDNR May 19, 2006 letter into the site plans and management strategy:

- 1) PAR will provide advance notice to stewards of the Exner Marsh Nature Preserve before any prescribed burning or herbicide applications are to occur on the subject property;
 - 2) PAR will provide an Invasive Plant Species Management Plan to site stewards;
 - 3) PAR will periodically maintain the Continuous Deflective Separator system;
 - 4) Vegetative swales and the wetland detention basin will be planted with native vegetation;
 - 5) PAR will re-design the wetland bottom detention basin to include several interior berms to add topography and lengthen the flow path of water prior to discharge; and,
 - 6) PAR will install salt tolerant plant species into the wetland bottom detention basin and vegetated swale plantings, and will consider non-saline alternatives for parking lot de-icing.
- **FENCING:** Installation of fences is proposed to discourage the entrance of turtles into the commercial area and to act as a debris barrier. Silt fencing will be installed along the perimeter of the construction area to prevent sediment from leaving the site during construction, and will help prevent turtles from entering the construction area.

A chain link fence will be installed next to the curb along the north and east sides of the commercial development to prevent wind-blown debris from entering the marsh. At the request of the Endangered and Threatened Species program, openings have been added to the fence to allow turtles to exit the commercial

development, although this is contrary to the advice of Congdon and Pappas. (See Observation/ Recommendation #2, Congdon & Pappas, 2002).

- LIGHTING: To minimize the possible effects of external building lights attracting insects from the Nature Preserve and thereby disrupting the food chain, the external perimeter lights on the north side of the commercial building will consist of shoebox lights and will have amber lenses. The shoebox style lights will shine downward to the ground and not into the Nature Preserve. PAR will cause not more than one horizontal foot-candle at the nature area boundary.
- BARRIERS TO OVERLAND MOVEMENT: While the development may possibly create a barrier to turtle movement, PAR will create a high curb barrier to limit turtles from entering the developed area. Curbs will be installed with a back 6" above grade to function as a vertical barrier to prevent turtles from entering the commercial area. If turtles somehow gain access to the commercial area, the low curb height on the commercial side will not impede turtles from leaving the commercial area.

PAR proposes to install the stormwater detention wetland within the upland buffer, in accordance with the McHenry County Stormwater Ordinance, in order to provide the largest open upland space possible for turtle habitat, while providing the area necessary for the commercial development. As mentioned previously, the proposed upland buffer provides a contiguous undisturbed area that will be enhanced using several management techniques. The upland buffer and the stormwater detention wetland will provide a large open space area between the commercial development and Exner Marsh. The buffer, nesting area, fence, and curb barrier should discourage turtle entrance into the commercial area. Algonquin Road and Lakewood Road are existing barriers to turtle movement to the south and west.

There are no barriers to movement by adult sandhill cranes, since they can fly. The proposed chain link fence will also help to prevent juvenile sandhill cranes that may occur in-site from entering the construction area.

- EDUCATION: By informing customers and employees of the commercial development to the presence of Blanding's turtles and sandhill cranes in the area, PAR will raise awareness of the value of these species and their habitat. PAR will post signs around the perimeter and within the commercial development. Signs will be posted at 100-200' intervals, and will include the MCCD contact information. Contractors working on the development will also be informed of the possible presence of State-listed species on-site.

To help determine the potential impacts to Blanding's turtle and sandhill crane, PAR Development, Inc. proposes to monitor for these wildlife species and to manage the stormwater detention wetland and enhancement wetland and buffer areas as follows:

Monitoring Measures

In consideration of IDNR concerns, PAR will authorize Christopher B. Burke Engineering, Ltd. (CBBEL) to monitor the effectiveness of the measures implemented to minimize Blanding's turtle and sandhill crane takings. CBBEL staff will search for the presence of turtles and sandhill cranes around the entire 19.4 acre parcel weekly during a six-week period for three years as specified below. The areas to be monitored include along the fence line located between the commercial development and the upland buffer, the existing wetland and pond, within the created nesting grounds, within the stormwater detention wetland, in the commercial area (parking lots, etc.), and along the right-of-way of Huntley-Algonquin Road. If a tagged turtle has been observed, the tag information will be recorded and reported to MCCD. Any sightings of Blanding's turtles or sandhill cranes will immediately be reported to MCCD. The results of our findings will be documented with a summary of findings submitted to IDNR following the searches.

PAR will implement the following recommendations specific to sandhill cranes that were recommended in the May 19, 2006 letter from the IDNR to the Village of Lake in the Hills:

- A) The Village should require the developer to report if cranes appear on the property;
- B) Cranes should be closely observed to determine whether and where a nesting attempt may be made and the distances at which the birds appear to respond to intrusions into their territory [should cranes be observed]; and,
- C) The IDNR requests that it be notified by the developer immediately if cranes are present at any point during the proposed activity.

Monitoring will include weekly monitoring visits to search for sandhill cranes during the May 1 through June 15 period over three years when searches for Blanding's turtles will be conducted. In addition, PAR will inform construction crews to report any sightings during daily construction activities.

PAR Development, Inc. will monitor the establishment of the installed wetland and upland buffer seeding on an annual basis for a three year period, including the year of installation. CBBEL will help control invasive weeds by herbiciding or spot-mowing, and will provide additional management recommendations, as needed. Management activities will be documented in a short report for submittal to PAR and MCCD.

Modifying Minimization Measures

If it is determined that the measures taken to minimize Blanding's turtle and sandhill crane takings are not effective, modifications will be developed and implemented. Management measures will be adapted to address issues of concern, as necessary.

No Take Alternatives

There are no practicable no take alternatives. The only no take alternative would be to cease all use of the site. Since ceasing land use is not practicable or economically feasible, the proposed development including the associated wetland/buffer enhancement and taking minimization measures offers the least detrimental alternative. Because the parcel is located adjacent to Exner Marsh, the only alternative that will not

result in any takes, is not developing the site and idling the land. In our opinion, the proposed development provides a balance of limited development and preservation/enhancement of wildlife habitat at the interface of an extremely valuable natural area and an expanding suburbia.

Funding Verification

PAR Development, Inc. is the land development firm responsible for project implementation in the initial phases of site improvements. PAR, or the ultimate developer of the proposed commercial development, if the development is transferred, will be responsible for project funding including implementation of the Revised Conservation Management Plan, as required by the Village of Lake in the Hills (Village). The Village requires a performance bond to cover site improvement costs prior to issuing development permits. We understand that the performance bond covers all costs to construct the permitted plan set. A landscape plan will be submitted as part of the building permit and stormwater management permit applications, following receipt of the Incidental Take Authorization. The preparation of landscape plans and/or other plans or documents necessary for permit application submittal are contingent upon receiving the IDNR Incidental Take Authorization.

The McHenry County Stormwater Committee (MCSC) requires verification of funding for the construction of stormwater management facilities, if such funding is not required by the Village. Because MCSC review incorporates COE, USFWS and IDNR findings, the IDNR approved Revised Conservation Management Plan would be submitted to MCSC as part of the stormwater permit application package. A planting plan including the seed lists in Tab 3 will be prepared and submitted as part of the permit application in order to satisfy MCSC stabilization requirements for wetland/pond buffer areas.

Regarding compliance with the McHenry County Stormwater Management Ordinance, the Enforcement Officer is the MCSC Chief Engineer or a Registered Professional Engineer employed by a certified community. As stated in Article III: Procedure and Enforcement, Part D. Enforcement and Records, Item 5, "the Enforcement Officer may require deed restrictions, performance bonds or sureties, as-built certification, or maintenance guaranties as stipulated in this ordinance to assure projects are built and maintained according to permitted plans." Therefore, PAR or the ultimate developer will be bound to complete the permitted project, including the Conservation Management Plan.

During site development, and continuing through the three year proposed management and monitoring period, PAR or the ultimate developer if other than PAR, will provide the Village of Lake in the Hills and MCSC funding requirements for the implementation of the taking minimization measures. Following the completion of the three year period, a Business Association representing the development will be responsible for funding additional management/monitoring.

The schedule for implementing this project is estimated to be one year from the groundbreaking. A typical construction sequence will be followed, including installation of soil erosion and sediment control practices, site grading, underground sewer and water, streets and curbs, building slab and interior construction, and landscaping. Revised Conservation Management Plan items including the wetland bottom detention

facility, turtle fence and curb, and turtle nesting area will be constructed concurrent with site improvements. The wetland/pond will be completed at the time of grading; the turtle fence/curb will be installed during pavement and curb installation. The native seed installation and buffer area enhancements will be completed concurrent with construction. Monitoring for Blanding's turtles, sandhill cranes, and the native plantings will be completed for three years.

Likelihood of Survival

Blanding's Turtle

See Appendix A for a copy of the report by Congdon & Pappas for which Incidental Takings Authorization was granted for the adjacent Lake Pointe development, entitled, "Review of the Status of Exner Marsh Blanding's Turtles: Potential Impact of Lake Pointe Development" This report discusses the issues of Exner Marsh and the resident Blanding's Turtle population. The following summarizes some of the main supporting factors that the proposed taking will not reduce the likelihood of the survival of the Blanding's Turtle:

- The current population is most likely overestimated and over half of the estimated population consists of headstarted individuals.
- Wildlife corridors from Exner Marsh have already been destroyed.
- Most upland areas surrounding Exner Marsh have already been developed.
- No current areas within Exner Marsh provide high quality nesting opportunities.

Please see the report for specific details on the current status of the turtles and the challenges facing them. The proposed taking will not reduce the likelihood of survival of the turtle by impacting habitat essential to the species existence. The proposed development affects monocultural turfgrass and non-native pasture land on silt loam soil, which is not preferred by Blanding's turtles for habitat or nesting. Existing wetland and upland buffer habitat will be enhanced, and will be fenced off from the development to allow turtles the continued use of the area. While the proposed development may negatively impact individual turtles, the proposed enhancements including establishment of native vegetation, creation of a nesting area, and installation of preventative barriers may improve the condition of Blanding's turtle population associated with Exner Marsh.

Sandhill Crane

In our opinion, the proposed taking will not reduce the likelihood of survival of sandhill cranes by impacting habitat essential to the species existence. The proposed development affects monocultural turfgrass, non-native pasture, and a residence in an area having scattered mature trees which, in our opinion, is not preferred habitat of cranes for habitat or nesting. While the proposed development may negatively impact individual crane(s), the proposed enhancements of the remaining low quality wetland and buffer areas, including herbiciding of non-native grasses, native seed installation, maintenance including prescribed burning, and three years of monitoring will likely benefit sandhill cranes and other animal and plant populations associated with Exner Marsh.

**HANKIN PARCEL COMMERCIAL DEVELOPMENT
PAR DEVELOPMENT
CBBEL PROJECT NO. 04-602**

STORMWATER DETENTION WETLAND SEED MIX

Install in NWL Basin Bottom to HWL, Vegetative Swales,
& Level Spreader

MESIC PRAIRIE UPLAND SEED MIX

Install from NWL Slope and Higher Elevations, Upland Buffer,
& Vegetative Swales

Scientific Name	Common Name	Lb. per Acre
<i>Agrostis alba palustris</i>	bent grass	1.500
<i>Calamagrostis canadensis</i>	blue joint grass	0.500
<i>Elymus virginicus</i>	Virginia wild rye	2.250
<i>Glyceria striata</i>	fowl manna grass	1.250
<i>Leersia oryzoides</i>	rice cut grass	1.500
<i>Panicum virgatum</i>	switchgrass	1.000
<i>Alisma triviale</i>	water plantain	0.250
<i>Asclepias incarnata</i>	swamp milkweed	0.125
<i>Boehmeria cylindrica</i>	false nettle	0.063
<i>Carex blanda</i>	common wood sedge	0.125
<i>Carex stipata</i>	awl fruited sedge	0.125
<i>Carex vulpinoidea</i>	fox sedge	1.000
<i>Cyperus sp.</i>	flat sedge sp.	0.125
<i>Eleocharis erythropoda</i>	red-rooted spike rush	0.063
<i>Eleocharis obtusa</i>	blunt spike rush	0.063
<i>Erechtites hieracifolia</i>	fireweed	0.015
<i>Helianthus grosseserratus</i>	saw tooth sunflower	0.015
<i>Iris virginica shrevei</i>	blue flag	0.500
<i>Juncus dudleyi</i>	Dudley's rush	0.031
<i>Juncus torreyi</i>	Torrey's rush	0.063
<i>Penthorum sedoides</i>	ditch stonecrop	0.125
<i>Polygonum coccineum</i>	heartsease	0.250
<i>Polygonum pensylvanicum</i>	giant smartweed	0.500
<i>Potentilla palustris</i>	marsh cinquefoil	0.031
<i>Rudbeckia laciniata</i>	green coneflower	0.063
<i>Rumex altissimus</i>	pale dock	0.063
<i>Sagittaria latifolia</i>	arrowhead	0.250
<i>Scirpus acutus</i>	hard stem bulrush	0.250
<i>Scirpus atrovirens</i>	dark green rush	0.500
<i>Scirpus cyperinus</i>	wool grass	0.125
<i>Scirpus pendulus</i>	red bulrush	0.125
<i>Scirpus validus creber</i>	soft stem bulrush	0.250
<i>Scirpanium eurycarpum</i>	great bur reed	0.500
<i>Spartina pectinata</i>	prairie cordgrass	0.250
<i>Teucrium canadensis</i>	germander	0.031
<i>Verbena hastata</i>	blue vervain	0.125
Total Weight of Seeds (lbs)		14.001

Scientific Name	Common Name	Lb. per Acre
<i>Andropogon gerardii</i>	big bluestem	0.500
<i>Andropogon scoparius</i>	little bluestem	4.000
<i>Bouteloua curtipendula</i>	side oats	2.250
<i>Elymus canadensis</i>	Canada wild rye	1.000
<i>Festuca obtusa</i>	nodding fescue	2.000
<i>Panicum virgatum</i>	switch grass	0.250
<i>Sorghastrum nutans</i>	indian grass	0.500
<i>Amorpha canescens</i>	leadplant	0.125
<i>Aster laevis</i>	smooth blue aster	0.062
<i>Aster novae-angliae</i>	New England aster	0.062
<i>Baptisia leucantha*</i>	white wild indigo	0.062
<i>Carex bicknellii</i>	Bicknell's sedge	0.062
<i>Cassia fasciculata*</i>	partridge pea	0.125
<i>Echinacea purpurea</i>	purple coneflower	0.420
<i>Eryngium yuccifolium</i>	rattlesnake master	0.188
<i>Heliopsis helianthoides</i>	ox-eye sunflower	0.031
<i>Heuchera richardsonii</i>	prairie alum root	0.063
<i>Lespedeza capitata*</i>	roundhead bushclover	0.125
<i>Liatris pycnostachya</i>	prairie blazing star	0.188
<i>Monarda fistulosa</i>	bergamot	0.031
<i>Parthenium integrifolium</i>	wild quinine	0.063
<i>Penstemon digitalis</i>	foxglove beardtongue	0.125
<i>Petalostemum purpureum</i>	purple prairie clover	0.063
<i>Potentilla arguta</i>	prairie cinquefoil	0.063
<i>Ratibida pinnata</i>	yellow coneflower	0.125
<i>Rosa blanda</i>	early wild rose	0.125
<i>Rudbeckia hirta</i>	black-eyed susan	0.250
<i>Rudbeckia subtomentosa</i>	sweet coneflower	0.250
<i>Silphium integrifolium</i>	rosin weed	0.188
<i>Silphium laciniatum</i>	compass plant	0.188
<i>Solidago riddellii</i>	Riddell's goldenrod	0.063
<i>Solidago rigida</i>	stiff goldenrod	0.063
<i>Tradescantia ohioensis</i>	spiderwort	0.063
<i>Verbena stricta</i>	hoary vervain	0.125
<i>Vernonia fasciculata</i>	common ironweed	0.188
<i>Veronicastrum virginicum</i>	Culver's root	0.015
Total Weight of Seeds (lbs)		14.001

Cover Crop:

<i>Echinochloa crusgalli</i>	barnyard grass	10.000
<i>Lolium multiflorum</i>	annual rye	20.000

* = inoculant required

Cover Crop:

<i>Lolium multiflorum</i>	annual rye	20.000
<i>Avena sativa</i>	oats	50.000