

# ODANA POND ECOLOGICAL EVALUATION MG&E GROUNDWATER RECHARGE PROJECT

MADISON, WISCONSIN

August 4, 2005

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NRC Project # 05-098

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## **INTRODUCTION AND OBJECTIVES**

As part of a Madison Gas & Electric (MG&E) groundwater recharge project Montgomery Associates: Resource Solutions, LLC is developing a plan to divert a portion of the water from the large pond at the Odana Hills golf course (Pond) for a stormwater infiltration system. As a result, water levels in the Pond are expected to periodically fluctuate. The proposed plan for operating the Pond water level includes installation of a new water control structure at the outlet of the Pond with an overflow elevation of 976.7 ft. (MSL). This structure is intended to allow the large pond to be drawn down below this elevation while maintaining the small pond in the golf course and the waterway connecting the two ponds at 976.7 ft. Under typical conditions the proposed water pumping scenario calls for water levels to fluctuate between approximately 976.7 ft. and 976.0 ft. The water pump will be programmed to automatically shut-off at an elevation of 975.5 in order to maintain enough water in the Pond to minimize impacts to the aquatic organisms that reside there.

The subject pond is located in the northwest corner of the Odana Hills Golf Course near the intersection of U.S. Highway 12/14 and Odana Road. There are concerns that these periodic changes in the surface water elevation may cause harm to some of the natural resources that occupy this water feature. The relevant biological surveys and this ecological evaluation only include the pond (approximately 4 acres) and emergent vegetation immediately adjacent to it. The field surveys were conducted at appropriate phonological periods over a 3-month period extending from late May through July 2005, and address presence/absence and, to the extent practicable, relative abundance of aquatic vegetation, fish, reptiles and amphibians (herpetiles), birds and aquatic mammal species. In addition to the biological inventory, an evaluation of the presence of cultural resources was conducted.

## **SURVEY METHODS**

### **Aquatic Vegetation Inventory**

In an effort to identify emergent aquatic vegetation and detect the presence of submersed aquatic plant beds, a survey was conducted by a qualified biologist. Initially the biologist traversed the shoreline of the pond looking for evidence of emergent and submersed aquatic plants. A metal rake was used to search for samples of submersed aquatic plants. An inventory of the plant species composition and, to the extent practicable, relative abundance was compiled and the locations of emergent aquatic plant beds were mapped.

### **Fish Survey**

An inventory to identify fish species composition and, to the extent practicable, relative abundance was conducted by setting three fyke nets for one 24-hour period. Also, two biologists using a seine net sampled areas of the pond that were shallow enough to access (up to 3.5 feet deep) with the use of chest waders. All fish captured were identified to species, enumerated and released.

In addition, NRC contacted the local Wisconsin Department of Natural Resources (WDNR) Fisheries Manager to determine if there was any historic information available related to the fish species composition or abundance of this pond.

### **Breeding Bird Surveys**

Breeding bird surveys were conducted twice in each habitat type between June 1 and July 17. All habitat types within the defined project area were surveyed in a single morning between the hours of 5:00 am and 7:00 am. Five-minute point count surveys were conducted at 4 point count stations located around the periphery of the pond. All birds detected by sight or sound (singing/calling) were identified to species and tallied at each station. Additional species were recorded while enroute from one survey location to the next and during other field survey activities associated with this ecological evaluation.

Supplemental breeding bird information was provided by Mr. Chuck Heikkinen, a nearby resident. Mr. Heikkinen has recorded migratory and breeding bird observation from habitat associated with the pond since 1995.

### **Reptile and Amphibian Survey**

A number of frog and turtle observation sites were established around the pond adjacent to representative habitat types. Frog surveys were conducted on May 25 and July 13, 2005 to coincide with the phenology of frog calling during spring and summer. Frog surveys began after dark and under favorable weather conditions in accordance with the *Wisconsin Frog and Toad Survey* protocol. All observations and ambient conditions were recorded on the standard survey form (see attached).

Turtle surveys were conducted in concert with the breeding bird surveys and aquatic vegetation survey from strategic vantage points around the Pond using binoculars and/or a spotting scope to identify the species of turtles inhabiting the pond. A large number of turtles were also captured in the fyke nets during the fish survey effort. In addition, NRC consulted with Mr. Robert Hay (WDNR herpetologist) to determine if there is any historic information pertaining to reptiles and amphibians in the immediate area.

### **Semi-Aquatic Mammal Survey**

An inventory of aquatic mammals, such as muskrat, mink and other mammals inhabiting the immediate pond periphery, was documented through the identification of tracks and observations made while conducting other field survey aspects of this biological evaluation effort.

### **Cultural Resources Review**

Existing records, available at the Wisconsin Historical Society, were reviewed to identify if there are any documented cultural resources associated with the Pond which is located in T7N, R9E, Section 30.

## **RESULTS**

### **Aquatic Vegetation Inventory**

Based on the shoreline reconnaissance the only emergent aquatic vegetation observed was narrow-leaf cattail (*Typha angustifolia*). This species occurs in relatively large stands and primarily occupies the north shoreline. Efforts to locate submerged aquatic vegetation were unsuccessful and there was no other evidence (floating fragments or uprooted plants) to indicate the presence of such species.

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## Fish Survey

Three fyke nets were deployed for a 24-hour period during June 2-3, 2005. This sampling effort resulted in the capture of six species of fish common to urban ponds that receive stormwater runoff from the local watershed. Table 1 lists the species and the respective numbers of fish collected from each fyke net and Table 2 lists the results of the seine netting effort.

**Table 1 – Fyke Net Results**

Common Name	Scientific Name	Net 1	Net 2	Net 3	Total	Length Range (inches)
Green Sunfish	<i>Lepomis cyanellus</i>	44	5	258	<b>307</b>	2 - 6
Golden Shiner	<i>Notemigonus crysoleucas</i>	8	2	10	<b>20</b>	<4
Black Bullhead	<i>Ameriurus melas</i>	2	3	8	<b>13</b>	7 – 9.5
Fathead Minnow	<i>Pimephales promelas</i>	2	1	12	<b>15</b>	<4
Bluegill	<i>Lepomis macrochirus</i>	2	1	10	<b>13</b>	3 – 6
Common Carp	<i>Cyprinus carpio</i>	---	1	1	<b>2</b>	15
<b>Total</b>		<b>58</b>	<b>35</b>	<b>299</b>	<b>370</b>	

**Table 2 – Seine Haul Results**

Common Name	Scientific Name	Seine Haul 1	Seine Haul 2	Seine Haul 3	Seine Haul 4	Seine Haul 5	Seine Haul 6	Total
Fathead Minnow	<i>Pimephales promelas</i>	49	12	12	54	35	81	<b>243</b>
Green Sunfish	<i>Lepomis cyanellus</i>	4	6	7	11	3	6	<b>37</b>
Bluegill	<i>Lepomis macrochirus</i>	2	---	---	---	---	1	<b>3</b>
Black Bullhead	<i>Ameriurus melas</i>	1	---	---	---	---	---	<b>1</b>
<b>Total</b>		<b>56</b>	<b>18</b>	<b>19</b>	<b>65</b>	<b>38</b>	<b>88</b>	<b>284</b>

Result from the two fish survey methods suggest that green sunfish and fathead minnows are the most abundant species present in the pond followed by golden shiner, bluegill, black bullhead and common carp respectively. Many of the fathead minnows and *Lepomis* species were gravid (females with eggs) at the time of collection.

## Breeding Bird Surveys

The breeding bird survey effort and supplemental observations made during other field activities resulted in documenting 32 species present within and around the Pond. Appendix B contains tables that summarize the results of each survey event. The species observed are consistent with those typically associated with aquatic and riparian habitat in an urban setting and verifies that suitable breeding/nest habitat is available at this location.

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The cumulative results of Mr. Hiekkinen's 8+ years of observations identified 35 species as confirmed nesting and 8 species of probably nesting in close proximity to the pond. In addition, he has recorded approximately 100 species that have temporarily stopped in this area during migration. Although the

breeding bird survey effort for this ecological evaluation only included one breeding season, the numbers and species composition are fairly consistent with the more long-term records provided by Mr. Heikkinen.

### **Reptile and Amphibian Survey**

The two frog and toad surveys resulted in no audible observations. In addition, there were no visual observations of adults or tadpoles. Due to the lack of evidence it is suspected that no frogs or toads inhabit the Pond.

In addition to visual observations of painted turtles (*Chrysemys picta*) swimming in the Pond, 30 snapping turtles (*Chelydra serpentina*) and 68 painted turtles were captured in three fyke nets during the 24-hour fish survey event.

### **Semi-Aquatic Mammal Survey**

Several species of aquatic-associated mammals and/or evidence of their presence (tracks, scat, etc.) were observed while conducting the various ecological surveys within and around the Odana Pond. The species documented include raccoon (*Procyon lotor*) and river otter (*Lutra canadensis*). Other observed mammals associated with the adjacent upland habitat include the Eastern cottontail (*Sylvilagus floridanus*), Eastern gray squirrel (*Sciurus carolinensis*), fox squirrel (*Sciurus niger*), and woodchuck (*Marmota monax*). With the exception of the otter these species have adapted over time and are quite common in such urban settings.

### **Cultural Resources Review**

The Archaeological Site Inventory search conducted on June 21, 2005 revealed no records of documented archaeological sites within T7N, R9E, Section 30. Three site records were identified in T7N, R9E, Section 31 but are not in close proximity to the Pond.

## **CONCLUSIONS**

### **Aquatic Vegetation Inventory**

During seasonally wet periods (typically spring and fall) the water levels will likely be similar to existing conditions. However, during typical summer conditions, the median water level will be approximately 0.5 ft. lower than existing conditions thereby exposing some areas of the pond bed along the north shoreline. Depending on the frequency and duration of precipitation events and subsequent inundation of these exposed areas the existing population of cattails along this portion of the pond is likely to colonize the exposed mud flats.

Since there is no existing submergent vegetation in the Pond, likely due to the turbidity of the water, no change in the status of submergent macrophytes is expected.

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### **Fish Survey**

The fishery survey indicates there is a thriving population of fish that are tolerant of the low water quality conditions typically associated with urban ponds that receive stormwater runoff. The Pond is relatively shallow with a maximum depth of approximately 5 feet and currently experiences sporadic water level fluctuations correlated with local precipitation events. With the proposed typical water level operations

the fluctuations will occur on a more regular basis but will not significantly alter the amount of water and available habitat for the fish. Given that the fish population doesn't appear to be effected by existing shallow water and water quality conditions it is anticipated that the proposed water level fluctuations will not significantly effect the quantity or species composition of fish in this Pond. The automatic water pump shutoff at elevation 975.5 will further limit potential effects to the fishery by maintaining enough water to temporarily support the fish population while the pond fills back to typical conditions. Since the fish population doesn't appear to experience winter kill under current conditions no adverse impacts are anticipated if pumping continues to occur through the winter. In addition, NRC consulted with the local WDNR fisheries manager (Kurt Welke) to discuss the proposed pumping scenario and conclusions presented above and he concurred.

### **Breeding Bird Surveys**

Results of the breeding bird surveys and observations made while conducting other activities related to this ecological evaluation indicate that there are a variety of bird species that utilize habitat associated with the Pond and adjacent uplands. A number of the species, such as great blue heron, green heron, belted kingfisher, Canada goose, and several species of ducks, use the Pond for foraging and/or loafing. For fish-eating species such as the kingfisher and heron species the Pond provides an abundant forage base. As described above in the fish survey section, the abundance and species composition of the fishery is not expected to be significantly effected by the proposed water level operations. Therefore, no significant impacts are anticipated regarding the foraging opportunities for migrating or seasonal resident birds that feed on the fish in this Pond. Furthermore, during periods of lower water levels, herons will be able to access more areas of the Pond while foraging. The exposed mud flats that will periodically occur along the north shore of the Pond will provide foraging opportunities for migrating and seasonal resident shorebird species. As for the birds that are associated with the adjacent riparian and upland habitat, the proposed water regime changes will have no impact.

### **Reptile and Amphibian Survey**

Since there do not appear to be any amphibians present within the Pond the water level operations will have no further impacts on these species. As for the snapping turtle and painted turtle populations they appear to be thriving under the current conditions of the pond and, for the same reasons as the fish population should not experience negative impacts from the proposed plan, the turtles are expected to maintain their current status. Under certain winter scenarios the water drawdown may impact some hibernating turtles but will not significantly effect the population as a whole. Similar conditions naturally occur during winters that experience below normal temperatures and precipitation and turtle populations continue to exist. In addition, NRC consulted with the WDNR herpetologist (Robert Hay) to discuss the proposed pumping scenario and, based on his personal experience with this Pond, concluded that the current water levels appear to be held at an artificially higher elevation than historically documented and that the lower water levels being proposed as part of the pumping operation should have no adverse effect

on the resident turtle population.

### **Semi-Aquatic Mammal Survey**

With fish being the primary forage for river otters as well as a part of the diet for raccoons, and no significant impacts are expected to the fishery, there should be a continued source of food available for these species. The lack of evidence of muskrats may have to do with the lack of aquatic vegetation in the Pond.

### **Cultural Resources Review**

Since there are no known archaeological resources associated with the Pond no impacts are anticipated.

### **SUMMARY**

Under typical summer condition the median Pond stage will expose portions of the pond substrate along the north shoreline and these areas will likely become populated with cattails. Additional substrate will be exposed periodically at the low Pond stage but due to the temporary nature of these events the additional mud flats will not likely become vegetated and may provide occasional foraging habitat for shorebirds and loafing areas for waterfowl. Since the Pond is relatively shallow and currently experiences periodic water level fluctuations due to local precipitation events, and the associated fish and wildlife species appear to be thriving under these conditions, the extent of water level changes being proposed are not expected to have an adverse impact to the overall ecology of the Odana Pond.

## **APPENDIX A**

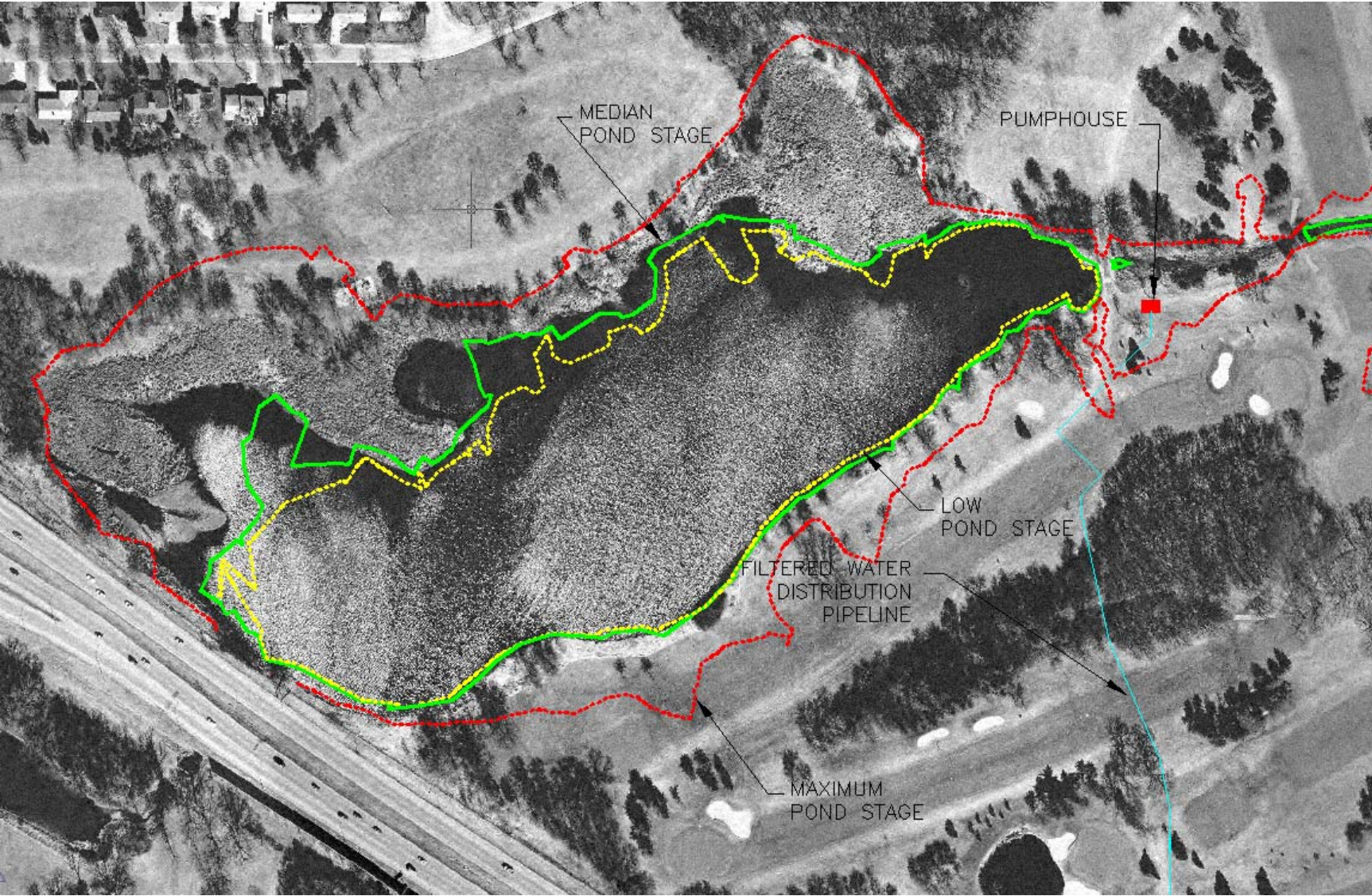


Figure 1-5. Maximum, Median and Minimum Pond Water Levels for Typical Summer Conditions with Proposed Pumping

Montgomery Associates: *Resource Solutions*, LLC

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MG&E Groundwater Recharge Project  
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## **APPENDIX B**

Odana Pond Breeding Bird Survey / 05-098  
 June 1, 2005 (count period # 1)  
 Temperature: 50 deg. F  
 Wind: calm (1-3 mph)  
 Sky: clear (few clouds)  
 Time: 0551-0657

Species	Point 1			Point 2			Point 3			Point 4		
	50 m	> 50 m	Outside count period	50 m	> 50 m	Outside count period	50 m	> 50 m	Outside count period	50 m	> 50 m	Outside count period
American Goldfinch			x									
American Robin	1						1					
Barn Swallow										2		
Black-capped Chickadee			x									
Blue Jay			x		2							
Blue-gray Gnatcatcher			x									
Brown-headed Cowbird	1		x									
Canada Goose									x			
Cedar Waxwing			9	1								
Chimney Swift	1						2					
Chipping Sparrow					1							
Common Grackle									x			
Common Yellowthroat						x	1					
Downy Woodpecker							1					
Eastern Wood-Pewee												1
Gray Catbird			x							2		
Great Crested Flycatcher					1	x						
Green Heron						x						
House Wren			x				1	1			1	
Killdeer		1									2	
Mallard						x						
Northern Cardinal					1			1				
Red-winged Blackbird	1	1	x	1	2		3	2		3	1	
Ring-billed Gull									3			
Song Sparrow		1	x		1			1		1		
Tree Swallow					1							
Warbling Vireo	1	1	x		1		1					
Wood Duck			x									
Yellow Warbler		1	x	1			1					

Additional bird species observed during frog and toad survey conducted on May 25, 2005 include Common Nighthawk and Great Blue Heron

Mammals observed during bird survey on June 1, 2005 include River Otter and Eastern Cottontail.

No turtles were observed during bird survey.

Odana Pond Breeding Bird Survey / 05-098  
 June 17, 2005 (count period # 2)  
 Temperature: 52 deg. F  
 Wind: calm (0 mph)  
 Sky: clear (few clouds)  
 Time: 0532-0651

Species	Point 1			Point 2			Point 3			Point 4		
	50 m	> 50 m	Outside count period	50 m	> 50 m	Outside count period	50 m	> 50 m	Outside count period	50 m	> 50 m	Outside count period
American Crow												x
American Goldfinch	1			1			1					x
American Robin	2								x			
Baltimore Oriole				1								x
Barn Swallow	1											
Black-capped Chickadee						x						x
Blue Jay				1	1			1				
Blue-gray Gnatcatcher									x			
Brown-headed Cowbird				1					x			
Cedar Waxwing									x			
Chimney Swift			x									
Common Grackle				1						1		
Common Yellowthroat		1			1					1		x
Cooper's Hawk									x			
Downy Woodpecker									x			x
Eastern Kingbird	1								x			
Eastern Wood-Pewee									x			x
Gray Catbird							1					x
Green Heron	2			1				2				
House Wren								1			1	
Indigo Bunting												x
Killdeer		1									1	x
Mallard	2	22										
Northern Cardinal					1							x
Red-winged Blackbird	2	1			2		1	2		3	2	
Rock Dove							3					
Sandpiper, unknown			2									
Song Sparrow					1		2			1		
Tree Swallow	1										3	
Warbling Vireo					1		1					x
Wood Duck		1										
Yellow Warbler					2			1				x

Mammals observed during bird survey on June 17, 2005 include raccoon.

No turtles were observed during bird survey.