Summary of 2009-2010 Invertebrate Study Grant Request to DNR

c. DISCUSSION OF GOALS AND OBJECTIVES

Reduction of the annual drawdown of Lake Wissota is likely to have allowed for a stabilization of the benthic invertebrate community resulting in less fluctuation in community structure, increased species richness and diversity (particularly species that are sensitive to water level fluctuations) and overall improved health of the littoral zone ecosystem. The goals of this study are to:

1. **Document the response of the benthic invertebrate community since drawdown regime was changed from ten feet for 60 days to three feet for seven days.**
2. **Document current composition of benthic invertebrate community**
3. **Document the value of critical habitat areas as fish and wildlife food sources**

Data will be analyzed to statistically prove the following hypotheses:

Hypothesis 1: Fewer differences between the fall and spring sampling periods will be observed compared to Delong (1994).
Hypothesis 2: The benthic invertebrate community will show an increase in overall species richness, abundance and diversity compared to Delong (1994).
Hypothesis 3: The benthic invertebrate community of critical habitat areas will have greater species richness and diversity compared to non-critical habitat areas. Critical habitat areas will also have a greater number of species commonly associated with healthy waters when compared to non-critical areas.

d. DESCRIPTION OF PROJECT METHODS AND ACTIVITIES

Sampling will follow protocols established by Delong and Mundahl (1995). Twenty-two transects will be established that approximate the position of those selected by Delong. Five additional transects will be established to incorporate sampling of all critical habitat areas. Samples will be collected at 2, 5, 10 and 15 ft depths along these transects. The current locations will be geo-referenced. One sampling period will occur in November when abundance should be greatest. One sampling will occur in April to assess differences from the post drawdown community documented by Delong. One additional sampling period will occur in late June to assess the post emergence/pre reproduction communities. The number of spring sampling periods was reduced from Delong (1995), as we will not be assessing recolonization. A Peterson dredge or Surber sampler will be used to collect samples depending on substrate composition. Samples will be preserved in 70% ethanol and stained with rose bengal stain. All taxa will be identified to lowest possible level.

Itemized breakdown of expenses: Phase One					
Salaries		**Hours**	**Wage**	**Item cost**	**Donated Value**
Lead Researcher salary					
Sample collection	*(108 samples @ 0.5 hrs)*	54	$18.70	$1,009.80	
Sample identification	*(108 samples @ 3 hrs)*	324	$18.70	$6,058.80	
Data analysis	*(53 hours)*	53	$18.70	$991.10	
Citizen Science Director	*(12 wks for 5 hrs wk)*	60	$27.00	$1,620.00	
Research Assistant					
Sample collection	*(108 samples @ 0.5 hrs)*	54	$11.00	$594.00	
Sample sorting	*(13 samples @ 2 hrs)*	26	$11.00	$286.00	
Supplies					
Isopropyl alcohol				$2,000.00	
Rose Bengal Stain				$200.00	
Chlorazol black				$200.00	
Collection jars	27 quart jars ($1ea.) 27 gallon jars ($3 ea.)			$108.00	
Boat Gas and Motor Oil				$175.00	
Mileage				$300.00	
Miscellaneous	*trays, mesh screens, forceps and other misc. supplies*			$1,000.00	
Match					
Volunteer match time and student service learning (sorting of invertebrate samples)	*(53 samples @ 2 hrs)*	106	$12.00		$1,272.00
Boat w/motor					$500.00
GPS Units					$150.00
Peterson Dredge					$767.00
Surber Sampler					$73.00
Microscope rental					$83.00
Collection jars	27 quart jars ($1ea.) 27 gallon jars ($3 ea.)				$108.00
TOTAL ITEM COSTS				$14,542.70	
TOTAL IN-KIND MATCH					$2,953.00
Administrative Overhead (10% of total project cost)				$1,749.57	
TOTAL PROJECT COST				**$19,245.27**	
Beaver Creek Reserve SHARE				$2,953.00	
Xcel SHARE - CASH MATCH	*Chippewa River Natural Resources Fund*			$6,292.27	
WDNR SHARE REQUESTED				**$10,000.00**	

Itemized breakdown of expenses, Phase Two					
Salaries		**Hours**	**Wage**	**Item cost**	**Donated Value**
Lead Researcher salary					
Sample collection	*(216 samples @ 0.5 hrs)*	108	$18.70	$2,019.60	
Sample identification	*(216 samples @ 3 hrs)*	648	$18.70	$12,117.60	
Data analysis	*(106 hours)*	106	$18.70	$1,982.20	
Citizen Science Director	*(23 wks for 5 hrs wk)*	115	$27.00	$3,105.00	
Research Assistant					
Sample collection	*(216 samples @ 0.5 hrs)*	108	$11.00	$1,188.00	
Sample sorting	*(27 samples @ 2 hrs)*	54	$11.00	$594.00	
Match					
Volunteer match time and student service learning (sorting of invertebrate samples)	*(106 samples @ 2 hrs)*	212	$12.00		$2,544.00
Boat w/motor					$1,000.00
GPS Units					$300.00
Peterson Dredge					$1,534.00
Surber Sampler					$146.00
Microscope rental					$166.00
Collection jars	27 quart jars ($1ea.) 27 gallon jars ($3 ea.)				$72.00
TOTAL ITEM COSTS				$21,006.40	
TOTAL IN-KIND MATCH					$5,762.00
Administrative Overhead (10% of total project cost)				$2,676.84	
TOTAL PROJECT COST				**$29,445.24**	
Beaver Creek Reserve SHARE				$5,762.00	
Xcel SHARE - CASH MATCH	*Chippewa River Natural Resources Fund*			$13,683.24	
WDNR SHARE REQUESTED				**$10,000.00**	

k. OTHER INFORMATION IN SUPPORT OF PROJECT NOT DESCRIBED ABOVE

Lake Wissota Improvement and Protection Association. In order to fund both phases of this project, LWIPA is requesting two $10,000 grants from the WDNR Lakes Management Planning Grant Program, $19,991 from Chippewa River Natural Resources Fund (CRNRF) and $8,667 in kind match from Beaver Creek Reserve Citizen Science Center. These funds will be used to contract with the Beaver Creek Citizen Science Center to implement the study and prepare all documents and reports.

Beaver Creek Reserve Citizen Science Center. Beaver Creek Reserve Citizen Science Center will hire the lead researcher and research assistants for this project. The Citizen Science Center will also recruit citizen volunteers as needed to assist with sorting invertebrate samples. Staff from the Citizen Science Center who will implement this study include:

Lead Researcher. Jodi Swanson received her Bachelor's degree in Biology and Chemistry from the University of Wisconsin-Eau Claire. She received her Master's degree in Entomology from the University of Minnesota-Twin Cities. Jodi will be performing specimen collections, species identification and data analysis. She is familiar with sampling techniques for aquatic invertebrates and aquatic invertebrate taxonomy. Jodi is currently conducting an aquatic plant survey of Lake Wissota and is familiar with the lake. CV available upon request.

Beaver Creek Reserve Citizen Science Center Director. Sarah Braun is the Citizen Science Director for Beaver Creek Reserve and has been with the Reserve since 2007. She received her Bachelor's degree in Wildlife Management, Biology, and Spanish from the University of Wisconsin-Stevens Point in 2004 and her Master's degree in Ecology from Florida State University in Tallahassee, FL in 2007. She is collaborating with the LWIPA to write an aquatic plant management plan for Lake Wissota and oversees work on over 130 lakes in Eau Claire, Chippewa, Dunn, Rusk, Barron, and St. Croix counties. Sarah will oversee the study, assist with recruitment of volunteers, and assist with sampling as needed.

Research Assistants. Undergraduate biology major students will be recruited to perform specimen sorting and broad taxonomic classifications (i.e. sorting Trichoptera from Odonata). A portion of these students will incorporate this work into service learning hours to provide grant match.