

TO: Mark Rosenbury, Chair
Watershed Improvement Review Board (WIRB)
DATE: January 15, 2012

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FROM: Palo Alto County Conservation Board (PACCB)
c/o Steve Pitt and Mary Barrick
3259 355th Avenue
Ruthven IA 51358

RE: 1009_004 Lost Island Lake final project report and closeout for a Watershed Improvement Review Board funded project

The goal of the Lost Island Lake Watershed Enhancement Project is to restore ecological health to Lost Island Lake and its intricate watershed resulting in improved water quality and a diverse native plant and wildlife community. The purpose of the WIRB Grant was to obtain funding for the construction of two combination fish barrier/water control structures placed at key locations in the watershed within the Blue Wing Marsh complex. The two structures are referred to as the Barrier Marsh structure and the Blue Wing Marsh structure. These two structures are part of a larger construction project that involves a total of four combination fish barrier/water control structures and one additional fish barrier.

Construction of these structures is designed to aid restoration efforts by preventing spawning common carp from entering wetlands in the watershed and to establish the ability to manage water levels in the large wetland areas. Water level management is critical to wetland health and common carp control.

In addition to structural components, project partners implemented incentivized commercial harvest of common carp to reduce the overall population number and biomass in an effort to reduce the effects of this fish on water quality. The WIRB requires that by the end date of the grant agreement the recipient will provide a final report that documents the project's results to the WIRB. The following is provided by the PACCB as the final report for our Watershed Improvement Review Board funded project.

Financial Accountability

Table 1. Budget Items – Approved application amounts and actual expenses

Expense Category	Total Funds Approved	Total Funds Amended	Total Funds Expended	Available Funds	Total WIRB Funds Expended
Construction	\$667,000	\$861,623	\$861,623	\$0	\$180,000
Engineering	\$73,000	\$108,037	\$108,037	\$0	
Construction Management	\$107,000	\$113,000	\$113,000	\$0	
Carp Removal	\$90,000	\$52,913	\$52,913	\$0	
Totals	\$937,000	\$1,135,573	\$1,135,573	\$0	
Difference		\$198,573			

Table 2. Total project funding

Funding Source	Cash		In-Kind Contributions		Total	
	Actual	Approved	Actual	Approved	Actual	Approved
Approved Application Budget						
WIRB	\$180,000	\$180,000	\$0	\$0	\$180,000	\$180,000
Iowa DNR	\$883,573	\$700,000	\$0	\$0	\$883,573	\$700,000
DU	\$0	\$0	\$20,000	\$20,000	\$20,000	\$20,000
LIPA	\$25,000	\$10,000	\$0	\$0	\$25,000	\$10,000
PA Co.	\$13,000	\$13,000	\$14,000	\$14,000	\$27,000	\$27,000
Totals	\$1,101,573	\$903,000	\$34,000	\$34,000	\$1,135,573	\$937,000

Funding Contribution:

WIRB approved application percent of budget: 19%

WIRB actual percent of budget: 16%

All WIRB funds (\$180,000) were spent on construction of five fish barrier/water control structures

Environmental/Project Accountability

Construction

- Construction completed on five fish barriers, four of which incorporate water level control capabilities for the lake and associated wetland complexes (Figures 1, 2 and 3)
- The Blue Wing Marsh Complex, Barringer Slough, and DU Marsh have all been dewatered, eliminating spawning areas for common carp, eliminating resident populations of common carp, and allowing for restoration of aquatic plants.
- **Project goal of reducing access of common carp to key spawning areas has been met.**

Biological

- Population and biomass estimates were completed yearly from 2008 – 2011 (Figure 4)
- 891,000 lbs of common carp and buffalo were removed from the lake in 2010 and 2011 through a subsidized commercial harvest program (Figure 5)
- Common carp population and biomass levels have been reduced to within objective levels (< 100 lbs/acre, Figure 4). **This is a 90% reduction in population and a 80% reduction in carp density. Project goal was to reduce common carp density in Lost Island Lake by 75-80%.**
- An aggressive stocking schedule was implemented to increase predator fish populations and reduce common carp reproduction potential

Water quality

- **Lost Island Lake is part of on-going monitoring by Iowa State University, three times per open water season, for a variety of chemical, physical and biological parameters and this information will be the primary source of information to track changes in lake water quality.**
- Although 2011 Secchi depth (water clarity) averaged only 2 feet, our goal is to still attain 4.5 feet average Secchi depth throughout the open water season in the future. It is important to keep in mind that the lake will take time to respond to recent intensive fish removal and initial work to re-establish healthy wetland systems above the lake. In lake turbidity trends indicate reduced turbidity and support that we are observing improved water clarity in recent years (Figure 6).
- Other measurements to water quality and ecological health will continue to be monitored and are expected to show significant improvement in coming years. Documentation of reductions in internal loading will be estimated by comparing watershed loading versus in-lake conditions.
- **To date there has been no measurable increase in aquatic plant growth in Lost Island Lake (a goal of the project).** DNR staff will continue to monitor the lake and expect that submerged aquatic plants will respond to improved water quality conditions.
- **Significant aquatic plant growth has been noted in nearly 1,000 acres of wetland habitat in the watershed and supports a positive response toward our goal of establishing diverse stands of aquatic plants in the wetlands.**

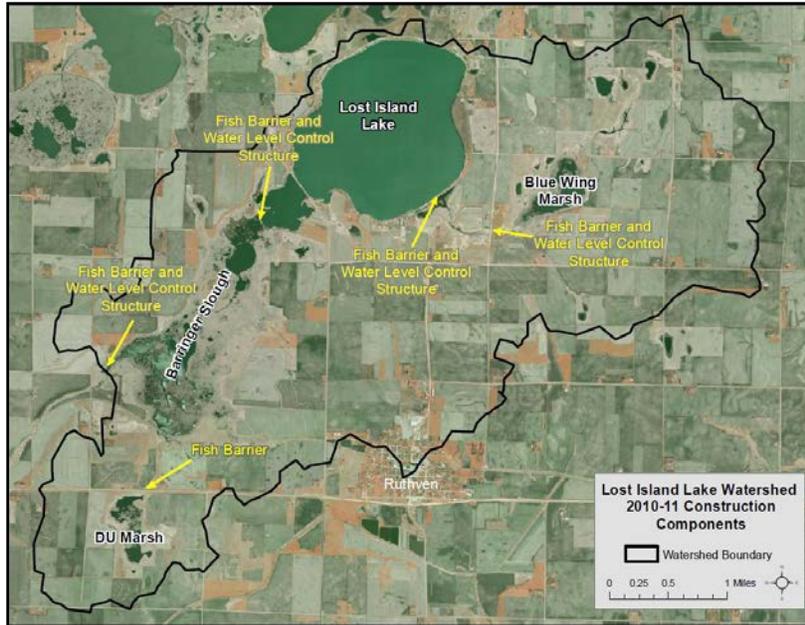


Figure 1. Map of the Lost Island Lake watershed showing the location of fish barriers and water level control structures.



Figure 2. New infrastructure in the Lost Island Lake Complex. Clockwise from top left – Blue Wing Marsh water level control structure and fish barrier, DU Marsh fish barrier, Barrier Marsh

(Lost Island Inlet) fish barrier and water level control structure, Barringer Slough water level control structure and fish barrier.



Figure 3. Lost Island Lake outlet. Sliding fish barrier screens are not shown.

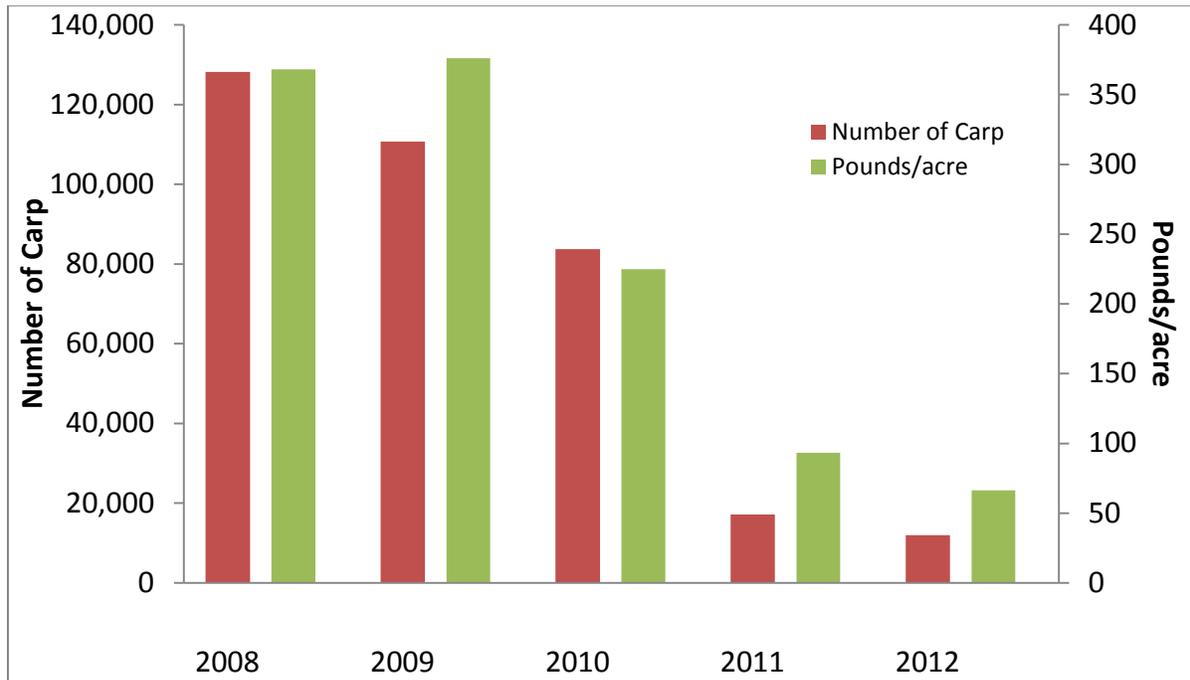


Figure 4. Population and biomass estimates for common carp in Lost Island Lake. Estimates for 2012 are a projection based on harvest which occurred during fall 2011 and assumes no recruitment.

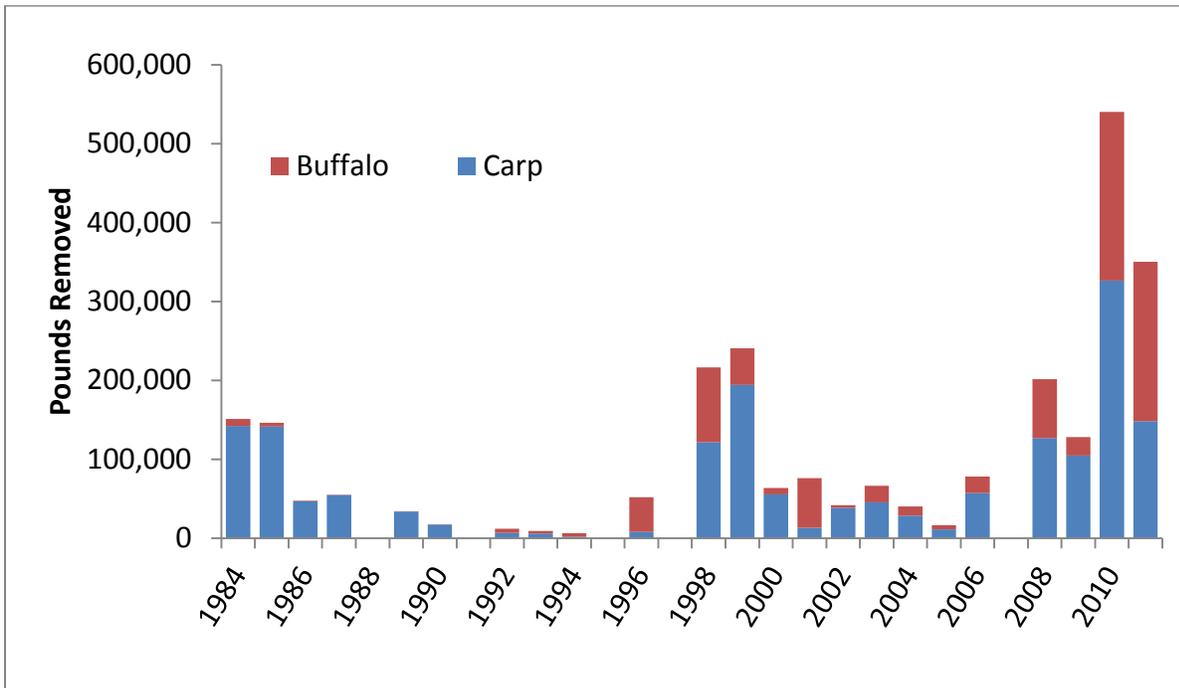


Figure 5. Common carp and buffalo commercial harvest history for Lost Island Lake.

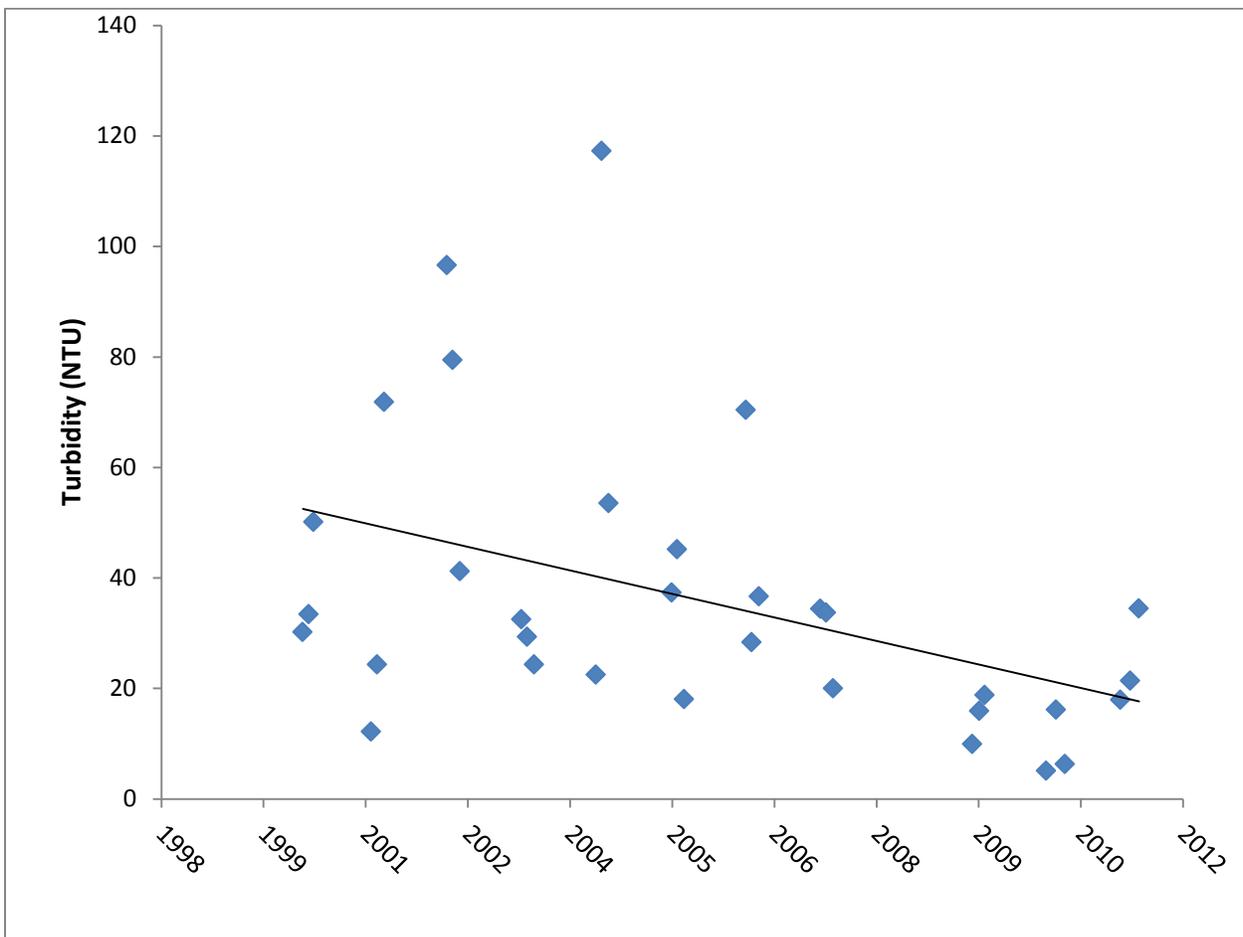


Figure 6. Graph levels and trend of turbidity measured from Lost Island Lake, 2000-2011.

Watershed Assessment

(Information taken from Palo Alto CCB WIRB Application dated June, 2011)

Palo Alto SWCD staff conducted an assessment of land use and management practices in the watershed. During this assessment, current land use and practices were documented in an effort to determine priority areas within the watershed. Contacts were also made with both summer home and year around lake homeowners to evaluate opportunities for urban infiltration-based practices. This information enabled district staff to evaluate properties for site specific conditions and potential practice locations. Dickinson SWCD also assisted in this assessment and planning process. The Lost Island Protective Association (LIPA) was contacted during the assessment to gather additional background information and to discuss opportunities for practice implementation. Subsequent public meetings with homeowners were held to discuss urban practices. Watershed assessment work completed thus far includes information gathered while promoting and implementing other state and federal conservation cost-share programs such as; CRP, WRP, EQIP, REAP, and IFIP. This has allowed SWCD Staff to better gauge the attitudes and conservation ethic of the landowners in the watershed in an effort to determine the potential for future project success in the area.

Underground tile outlets which drain excess water from the surrounding agriculture land were identified and located with GPS. Due to nearly level slopes in many portions of the watershed, GIS tools were utilized to develop “stream” center lines throughout the watershed. These center lines identify areas where water is concentrated into flows for potential implementation of BMPs. This assessment also identified areas where excess rainfall might be permanently and temporarily stored in marsh systems throughout the watershed.



Figure 7. An example of concentrated flow in agricultural areas



Figure 8. Example of load carried by concentrated flow en route to the lake

Personal interviews were conducted with nearly all watershed landowners and representatives of the home owners. This further enabled district staff to identify and catalog tile line, surface water runoff, and on-shore issues. Homeowners in the developed portions of the watershed were overwhelmingly responsive to having the opportunity to participate in the project and open urban infiltration practices.

Agricultural landowners, were also quiet supportive of project objectives. These interviews enabled district staff to better understand current management practices as well as potential landowner acceptance of various conservation practices. Agricultural producers were open to the idea of trying some of the newer management practices such as cover crops, strip till and to a lesser degree, no-till practices. Based upon the conversations held it is apparent that landowners are willing to keep an open mind about the “newer” management practices although demonstrations in the watershed will be a key component to encourage their full participation.

Watershed modeling information received from the DNR, data obtained during the assessment, and communications with individuals in control of private lands in the watershed have identified a number of priority sites for implementation should funding become available. Future efforts will target installation of BMP’S to address water quality concerns and achieve **reductions in external agriculture/urban loading.**

Public Outreach and Education

- Regular newsletters were distributed throughout the project period
- Two information/educational brochures were created
- A large display of the project was constructed in the Palo Alto County Nature Center
- News releases were completed to announce project milestones, public meetings, and project updates
- Project presentations were given to the numerous groups and events including the Iowa Association of County Naturalists, Clay and Palo Alto County Soil and Water Soil and Water Conservation District, District Three County Conservation Board Meeting, and the Midwest Fish and Wildlife Conference.
- A door to door education and fund raising campaign was completed
- Four public meetings were held by the project partners to discuss and gain input for the project concept, preliminary engineering, final engineering, and post construction (example – 70 stakeholders attended a December 2009 public meeting and voiced strong support for the project design)