SECTION 319 NONPOINT SOURCE POLLUTION CONTROL PROGRAM IMPLEMENTATION PROJECT

FINAL REPORT, SEGMENT 7
August 31, 2022

CONTINUATION OF THE
UPPER BIG SIOUX RIVER WATERSHED PROJECT

City of Watertown, SD, Grant Sponsor
P O Box 910, 23 2nd St. NE
Watertown, SD 57201-0910

Roger Foote, Project Coordinator

Watershed Advisory Board Officers
Deanna Kunkel, Chairman
Greg Blow, Vice- Chairman
John Moes, Secretary

Project Period: June 02, 2016 – August 31, 2022

This project was conducted in cooperation with the South Dakota Department of Environment and Natural Resources and the U.S. Environmental Protection Agency, Region 8**.**

Grant
#9998185-16, #9998185-19,#9998185-20

Table of Contents

Appendices

EXECUTIVE SUMMARY

PROJECT TITLE: Segment 7 Continuation of the Upper Big Sioux River Watershed Project

Grant #9998185-16, #9998185-19, #9998185-20

Initiation Date: June 02, 2016; Completion Date August 31, 2022

FUNDING REQUESTED	
Total EPA Grant: Cash	$250,000
Other Federal Funds	$133,400
Total Local Match	$1,074,878
TOTAL FUNDING	**$1,458,278**

ACTUAL EXPENDITURES	
Expenditures EPA Funds	$68,259
Expenditures – Other Federal	$133,400
Expenditures Local Funds	$876,879
ACTUAL TOTAL EXPENDITURES	**$1,078,538**

Project Activities Completed.

Best Management Practice	Milestones	Accomplished
Evaluation of Clearas Water Recovery	1 system	1 system
Grassed Waterways	6,900 linear feet	100 linear feet
Small Ponds	22 units	47 units
Riparian Grazing Management (revised)	416 acres	161 acres
CRP Incentives	1,515 acres	306 acres
Lake Shoreline Stabilization	1,031 linear feet	2,948 linear feet
Water Quality Testing	68 samples	70 samples
Information Education Activities	60 units	54 units

This segment continued the restoration effort initiated in 1994 for the Upper Big Sioux River Watershed and the immediate Lakes Kampeska and Pelican sub-basins. As shown in the project activities completed table, small ponds, shoreline stabilization and water quality testing milestones were surpassed. The milestones that were not reached can be attributed to numerous circumstances. Global pandemic, wet weather, changes in incentives, and changes in production practices combined to limit participation in the project.

As the weather changed in the watershed area, so did attitudes and perceptions on water quality. Future efforts should continue increased information and education activities, more local media exposure, and more opportunities with partners to promote practices.

NPS PROJECT SUMMARY SHEET

AWARD FISCAL YEAR: FY2016_

PROJECT TITLE: CONTINUATION, UPPER BIG SIOUX RIVER WATERSHED PROJECT SEGMENT 7

NAME: CITY OF WATERTOWN_____ **ADDRESS**: 23 2ND ST NE, P O BOX 910

CITY WATERTOWN, SD **ZIP** 57201-0910

PHONE 605-882-5250_ **EMAIL** ubsrw@watertownsd.us

PROJECT TYPE: WATERSHED
WATERSHED NAME: UPPER BIG SIOUX RIVER WATERSHED, LAKES KAMPESKA AND PELICAN SUBWATERSHEDS

LATITUDE: 44.9317 N **LONGITUDE**: -97.2033 W
HYDROLOGIC UNIT CODE: 10170201

HIGH PRIORITY WATERSHED:YES

POLLUTANT TYPE NUTRIENTS, SEDIMENT,AND BACTERIA

WA CATEGORY CATEGORY 1, WATERSHEDS IN NEED OF RESTORATION

TMDL DEVELOPMENT _YES__

TMDL IMPLEMENTATION __YES____

TMDL PRIORITY ___HIGH_____

WATERBODY TYPES: LAKES, RIVERS, STREAMS, WETLANDS

ECOREGION: NORTHERN GLACIATED PLAINS

PROJECT CATEGORY: AGRICULTURE

PROJECT FUNCTIONAL CATEGORY: BMP IMPLEMENTATION/DESIGN

GROUNDWATER PROTECTION: NO

§**319 FUNDED FULL TIME PERSONNEL:** 0

GOALS: Segment 7 is a continuation program. The continuing goal of the project segment was to improve the quality of the water entering the Big Sioux River and Lakes Kampeska and Pelican, and to continue restoration of the full beneficial uses of the lakes and river by reducing phosphorus and sediment loads.

PROJECT DESCRIPTION: The project was designed to continue to improve water quality of the Big Sioux River and Lakes Kampeska and Pelican by reducing nutrient and sediment loads originating from grazing and animal feeding operations from crop ground and pasture lands, and from stream/river banks and lake shoreline erosion.

INTRODUCTION

Water quality monitoring done in 2014 by the SD DENR shows low oxygen levels in the Big Sioux River from Ortley near the river headwaters to Lake Kampeska. The 2014 SD Integrated Report for Surface Water Quality Assessment indicates that *Warm Water Semi-Permanent Fish Life Propagation* is impaired in Lake Pelican. The Upper Big Sioux River has an impaired *Warm Water Semi-permanent Fish Life Propagation* use and *Limited Contact Recreation* nonsupported designation. The Big Sioux River and Lake Pelican are included on the South Dakota Nonpoint Source Priority Waterbody List. Designated beneficial uses and impairment status of Lake Kampeska, Pelican Lake and the Big Sioux River have changed during the Upper Big Sioux River Watershed project implementation. Current status of designated uses listed in the 2020 SDIRSWQA shows project effectiveness by having uses removed from impaired status. (Table 1. Source: https://danr.sd.gov/Conservation/WatershedProtection/ReportsPublications.aspx)

Table 1. Designated Beneficial Uses of Lake Kampeska, Pelican Lake and the Big Sioux River

	Lake Kampeska		Lake Pelican		Big Sioux River	
Designated Use	Use	Impaired	Use	Impaired	Use	Impaired
Wildlife Propagation, Stock Water, Irrigation	YES	YES	YES	NO	YES	NO
Immersion Recreation	YES	INS	YES	NO	N/A	N/A
Limited Contact Recreation	YES	INS	YES	NO	YES	YES
Domestic Water Source	YES	INS	NO	N/A	N/A	N/A
Warm Water Permanent Fish Life Propagation	YES	YES	NO	N/A	N/A	N/A
Warm Water Semi-Permanent Fish Life Propagation	N/A	N/A	YES	NO	YES	YES

This segment was a continuation of a project to reduce phosphorus and sediment loads entering the Big Sioux River, Lakes Kampeska and Pelican. The goal was consistent with meeting targets set by the 1994 SD DENR Diagnostic/Feasibility Study, the 1995 Pelican Lake Assessment and the 2000 NRCS PL 566 River Basin Study.

Based on the studies, best management practices (BMPs) were recommended to help reduce sediment, nutrients and bacteria loads entering the Big Sioux River, Lakes Kampeska and Pelican from priority areas before attempting in-lake restoration activities such as sediment removal. The BMPs included:

- Lake shoreline stabilization/management
- Construction of small ponds
- Construction/repair of grassed waterways
- Filterstrips/grass seeding in riparian areas
- Construction of animal nutrient management systems
- Streambank stabilization
- Information/education programs
- Wetland restoration

- Promotion of Conservation Reserve programs
- Identification of failing septic systems at Pelican Lake
- Investigation of feasibility of river flow control structures
- Investigation of feasibility of new lake outlet
- Consideration of selective in-lake sediment removal

The Diagnostic/Feasibility Study (DENR, 1994) and the PL 566 River Basin Study (NRCS, 2000) identified two nonpoint source (NPS) pollutants, sediment and phosphorus, which became the project's focus. Sediment and phosphorus are in surface water runoff and also come from in-channel bank erosion in the watershed upstream from the receiving waters. Some coliform bacteria loading was found near animal feeding operations. While the bacteria were found most often in close proximity to livestock operations, they were periodically found in Lakes Kampeska and Pelican.

The Big Sioux River, from its headwaters near Summit, SD, south to and including Pelican Lake, drains a 245,399-acre watershed (USDA/NRCS 10/1996) in the Prairie Coteau region of northeast South Dakota. Waters in the Upper Big Sioux River watershed exist in linear, riverine, temporary, seasonal, semi-permanent and permanent wetlands. Most of these wetlands have a direct connection with the Big Sioux shallow aquifer and water moves back and forth. Storm event runoff carries quantities of sediment, phosphorus and coliform bacteria. The origin of the pollutants has been identified as farming practices and livestock production in the watershed. (NRCS PL 566 Study, 2000)

Runoff drains to four tributaries on the eastern side of the watershed: Mud Creek, Mahoney Creek, Soo Creek and Indian River; and Still Lake on the west, through temporary or seasonal linear wetlands before entering the Big Sioux River. (Appendix 1 – Watershed and Subwatershed Maps)

Lake Pelican is located three miles south of Lake Kampeska. The major tributary to both lakes is the Big Sioux River.

Watershed General Information (Appendix 1—Watershed and Subwatershed Maps) The entire Prairie Coteau, including Lakes Kampeska and Pelican, are of glacial origin. Groundwater moves to and from the lakes by gravel channels that were formed by the retreating glacier melt. These gravel channels form the shallow Big Sioux Aquifer, which is exposed to the surface in some areas. The Big Sioux River, as it winds through the watershed, directly connects the surface water and the aquifer and gathers the drainage from the subwatersheds.

During flood periods the lakes receive water from the Big Sioux River via their inlets/outlets, when the level of the river is higher than that of the lakes. When the water level of the river drops below that of the lakes, the reverse occurs and the lakes discharge water back into the river. The river high flow periods carry volumes of sediment and nutrients. These pollutants settle out and remain in the lakes while the cleaner water is discharged back into the river. Thus the pollutants accumulate in the lake. Both lakes have weir structures that divert low flow events downstream past the lakes.

The watershed contains mostly small- to medium-sized family farms. Many operators farm all available property, even in environmentally sensitive areas. At the beginning of

the project, most cultivated lands were planted to wheat; currently these same fields are planted mostly to row crops of corn and beans. Producers who have enrolled in CRP programs in the past now farm the land as those contracts expire.

Average annual precipitation is 21-23 inches per year with an average evaporation of 41 inches per year. (http://efotg.sc.egov.usda.gov/references/public/SD/averageannlprecip.pdf) Actual rainfall amounts vary widely. Irrigation systems within the watershed area are center pivot systems that pump out of the shallow Big Sioux aquifer. As an example of how intimately connected the river and aquifer are, it is possible to watch the river levels drop over a couple of days when the irrigation pumps are running. The first year of the grant, 2016, saw a severe drop in rainfall and water levels (Lake Kampeska 31" below full in August, 2016).

Animal agriculture is a large part of the business in the watershed area. Cattle producers are mostly cow/calf enterprises with background feeding of calves and some finishing operations. The producers who feed cattle exclusively tend to be in the 300-500 animal range; however, the trend is to increase numbers up to and exceeding the 999 Concentrated Animal Feeding Operation (CAFO) animal unit threshold. With the current market value of lamb, the expectation is a rise in numbers of the few sheep operations in the watershed. Equine trends are mainly recreational with a few specific training and breeding facilities. (Appendix 2—Tier 1 Feeding Operations and Water Sampling Sites)

Range condition is a concern in the watershed area. Currently conditions can be rated fair to poor with a few excellent exceptions. The rental price of pasture acres is driving the decline of range conditions. Producers are unsure whether they will be outbid for the rental of pastures in the following year; as a result, they over-utilize pastures to recoup perceived value. Conversion of pasture to row crops is increasing, driven by commodity prices.

Table 2. Project Area Land Ownership (NRCS PL 566 Study, 2000)

Subwatershed	Total Acres	Private	Federal	State	Tribal
Upper Sioux	43,911	41,767	979	280	885
Indian River	24,972	24,872	100	0	0
Soo Creek	19,811	19,771	0	40	0
Mahoney Creek	15,206	15,072	0	134	0
Mud/Gravel	44,763	44,658	0	105	0
Middle Sioux	34,774	33,858	399	277	240
Still Lake	6,940	6,741	80	119	0
Lower Sioux	15,351	14,822	0	506	23
Lake Kampeska	17,278	17,223	0	55	0
Pelican Lake	17,326	16,426	0	900	0
Watertown	5,067	5,007	0	60	0
Totals	245,399	240,217	1,558	2,476	1,148

Table 3. Land Use (NRCS PL 566 Study, 2000)

Subwatershed	Acres	Crop Land		Range Land		Pasture Hay		CRP		Wood Land		Other	
		%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres
Upper Sioux	43,911	55.5	24,371	25.7	11,286	4.8	2,107	7.6	3,337	0.9	395	5.5	2,415
Indian River	24,972	56.4	14,084	27.3	6,817	4.9	1,224	6.1	1,523	0.7	175	4.6	1,149
Soo Creek	19,811	63.4	12,560	24.7	4,893	5.5	1,090	0.3	59	1.3	258	4.8	951
Mahoney Creek	15,206	74.6	11,344	12.2	1,855	6.5	988	0.3	46	1.2	183	5.2	790
Mud/Gravel	44,763	62.7	28,066	23.8	10,654	5.5	2,462	1.0	448	2.0	895	5.0	2,238
Middle Sioux	34,774	65.9	22,916	17.4	6,051	5.7	1,982	5.1	1,773	1.0	348	4.9	1,704
Still Lake	6,940	59.7	4,143	18.3	1,270	5.2	361	4.9	340	0.8	56	11.1	770
Lower Sioux	15,351	69.1	10,608	14.4	2,211	6.0	921	0.4	61	1.0	153	9.1	1,397
Lake Kampeska	17,278	52.8	9,123	24.8	4,284	4.6	795	1.1	190	1.3	225	15.4	2,661
Pelican Lake	17,326	64.4	11,158	15.0	2,599	5.6	970	2.0	347	1.0	173	12.0	2,079
Watertown	5,067	26.6	1,348	31.7	1,608	2.3	117	1.0	52	1.4	70	37.0	1,872
Totals	245,399	61.0	149,721	21.8	53,528	5.3	13,017	3.3	8,176	1.2	2931	7.4	18,026

Land use in the study area was inventoried for each subwatershed and the entire study area.

Type of Watershed Quality Problem

Sediment and phosphorus were identified as the major pollutants of the Big Sioux River and Lakes Kampeska and Pelican ((D/F Study, DENR, 1994 and PL 566, NRCS, 2000). The reports stated that lake loads were largely the result of agricultural activities in the watershed.

Subwatersheds Contribution (Appendix 1 Maps—Subwatersheds) According to watershed analyses completed during the 1989-2006 time period, the Upper Sioux River subwatershed contributes the greatest suspended solids load. However, because of its distance from the lake, it was not identified as a high priority subwatershed for restoration efforts. The analyses also indicated large loadings of suspended sediment from the Mud Creek subwatershed. A majority of these loadings do not enter Lake Kampeska, because Mud Creek joins the Big Sioux slightly below the Kampeska inlet/outlet. However, Mud Creek flows have an impact on Lake Pelican. The Middle Sioux subwatershed contributes the highest sediment and nutrient load which reaches Lake Kampeska. Mahoney Creek, Soo Creek, Indian River and the Upper Sioux subwatersheds are all confluent in the Middle Sioux subwatershed.

Water quality monitoring during 2011 showed dissolved oxygen levels in the Big Sioux River often at low to impaired levels. Work is continuing to identify the sources of this low oxygen, so that best management practices can be developed to correct impairments.

Phosphorus currently trapped in Lake Kampeska has no natural escape from the lake. As the flood waters advance and recede in the spring, the lake acts as a large settling basin

for the river system. This process causes nutrients and sediment to build up within the lake. The phosphorus that is not dissolved is trapped in the sediment layer or is utilized by the naturally-occurring algae. As wind churns the lake, as low oxygen levels occur and as the algae die, much of the phosphorus becomes available again and the cycle repeats. Along with changes in concentrations due to water volume changes the cycles can be seen on the Kampeska phosphorus concentration trend graph.

PROJECT GOALS, OBJECTIVES AND TASKS

Environmental

Restore and/or maintain beneficial uses of Lakes Kampeska, Pelican and the Upper Big Sioux River by reducing nutrient and sediment loads that contribute to their over-enrichment.

Programmatic (BMPs)

This project is a continuation of a project to reduce phosphorus and sediment loads entering the Big Sioux River, Lakes Kampeska and Pelican. The goal is consistent with meeting targets for recommended BMPs in the 1994 SD DENR Diagnostic/Feasibility Study, the 1995 Pelican Lake Assessment and the 2000 NRCS PL 566 River Basin Study.

Table 4 Planned v. Implemented Milestones

Best Management Practice	Unit	Total Planned	Total Implemented
Clearas Water Recovery System	units	1	1
Grassed Waterways	feet	6,900	100
CRP incentives	Acres	1515	306
Small Ponds/Dams	units	22	47
Riparian Grazing Management	acres	416	161
Shoreline Stabilization	feet	1,031	2,948
Water Quality Monitoring	samples	68	70
Information & Education	units	60	54

OBJECTIVES AND TASKS

Objective 1. **Reduce nutrient loads to Lake Kampeska**

Task 1 Reduce nutrient loads to Lake Kampeska by operating a next generation photo bioreactor which uses natural lake algae to remove phosphorus from the lake water.

Products

Product 1. The matching funds were used for an engineering feasibility study to quantify the structural integrity of the existing phosphorus removal facility and the cost of and methods for installing the industrial scale photo bioreactor. The new system is capable of processing 330,000 gallons a day, removing 98% of total phosphorus. The feasibility study is complete and preliminary construction plans are available. Project is on City of Watertown's capital improvement plan scheduled for 2027.
Total Cost: $50,000 319 Funds: $ 0
Local Cash/In-kind: $50,000
Milestones: Planned 1 System
Completed 1 System
Outcome Better than expected. The new system design and feasibility is on track to remove the excess lake nutrients as promised. The engineer's best estimate of probable cost for final construction is in the $4 million dollar mark with operation and maintenance cost offset by sale of excess algae grown in the system.

Objective 2. Reduce sediment loads entering the Big Sioux River, Lakes Kampeska and Pelican by 1,390 lbs. per year.

Task 2. Reduce sediment loads to the Big Sioux River, Lake Kampeska and Pelican Lake by reducing loads originating from crop and grazing lands, stream/river banks and lake shoreline. Enroll acres in riparian area management/buffers along the Big Sioux River corridor and major tributaries. Loads are calculated using the STEPL model. Landowners are responsible for a minimum of 25% of the total cost of these systems**.**

Products

Product 2. Install grassed waterways in crop land where drainage swales are susceptible to erosion thereby trapping sediments and filtering runoff.

Planed: 6,900 feet
Completed: 100 feet
Outcome: less than expected due to weather & commodity prices.

Product 3. Install new dugouts and clean existing dugouts in range and pasture land. This will entrap sediment and provide water sources for livestock and wildlife.

Planed: 27 units
Completed: 47 units
Outcome: Better than expected.

Product 4. Stabilize Lake Shoreline, primarily by rock rip-rap with additional landowner cost options for abutments.

Planed: 835 feet
Completed: 2,948 feet
Outcome: Much better than expected.

Product 5. Stabilize streambanks and install buffer strips by enrolling in Riparian area management.

Planed: 2,920 acres
Completed: 465 acres
Outcome: Less than expected due to insufficient incentives.

Product 6. Not listed in the most recent Project Implementation Plan.

Cost: $778,048 **EPA:** $250,000 **Other Fed:** $133,400 **Local Match:** $438,500

Cumulative Pollutant Reduction Achieved:

Nitrogen – 2,974.9 pounds per year
Phosphorus – 758.1 pounds per year
Sediment – 370.9 tons per year

Objective 3. Information and Education

Task 3. Education activities promote water quality improvement efforts. Information activities will keep watershed stakeholders, taxpayers, residents and others informed of the water quality improvement and the availability of water quality programs. Water quality improvement will be monitored through water quality sampling and analysis.

Products

Product 7. Water Quality Monitoring: Scheduled sampling sources are located at two sites in each lake, collected mid-winter and mid-summer. Additional samples are collected at four locations on the Big Sioux River and at the lake inlet/outlets. River sampling begins with the spring thaw of snow and ice, and continues with rainfall events that cause runoff into the river. The sampling sites are at predetermined monitoring points. (See Appendix 2 Maps – Water Sampling Sites)

Analytical measurements include: alkalinity, pH, dissolved oxygen, ammonia, nitrates, total suspended solids, total Kjeldahl nitrogen, total phosphorus, total dissolved phosphorus and E. coli bacteria.

Planned: 68 samples
Completed: 70 samples
Outcome: Testing shows long term improvement in water quality.

Product 8. Education: Every effort will be made to reach out to students in the watershed. Emphasis will be on the importance of improving water quality and demonstrating monitoring procedures. Four days of six groups from Watertown middle school with additional private school sixth grade classes participate annually in a riparian outdoor education program in partnership with the Bramble Park Zoo Sixth Grade Environmental Days. There are partnership activities with the Lake Area Technical Institute Environmental Technology program, and with programs such as Roots 'N Shoots, Camp Chance and Second Grade Days. Activities can also be tailored to individual teacher interests. Watertown city-wide opportunities include the Chamber of Commerce Adopt-A-First-Grade program, the annual Winter Farm Show and National Night Out.

Planned: 60
Completed: 54
Outcome: Less than expected due to global pandemic.

Product 9. Not listed in the most recent Project Implementation Plan.

Product 10. Outreach: A newsletter will be published for distribution to area stakeholders as well as being available at public locations such as Codington County Courthouse, City Hall and the Public Library.

Product 11. Outreach: Three project tours are scheduled to demonstrate project effectiveness, expose stakeholders to BMP's and an opportunity for the general public to see needs and solutions to water quality.

Cost: $8,200 **EPA: $0**

Objective 4. Reports: There will be annual GRTS reports, a final report, and continuous GIS and Project Tracker updates.

EVALUATION OF GOAL ACHIEVEMENTS

As shown by the outcomes of each task, the overall achievements of this segment show a mixed result. The small number of grassed waterways and riparian area buffer milestones was driven by market conditions and a perceived need for increased incentives. While the numbers of Best Management Practices were not reached in all tasks, progress has been made in all tasks of the project.

LONG TERM RESULTS IN TERMS OF BEHAVIOR MODIFICATION, STREAM/LAKE QUALITY, GROUND WATER AND/OR WATERSHED PROTECTION CHANGES

Strength of local support is manifest in the thirty plus years of this continuing locally-sponsored watershed project. Program staff at SD Department of Agriculture and Natural Resources has cited (promoted) the Upper Big Sioux River Watershed Project as an

example of strong local sponsorship, which included local coordination, project development and implementation accomplished through the project advisory committee.

Project staff developed and implemented outreach programs that conveyed information and participation opportunities to targeted segments of the area's population through partnerships, the project website/electronic media and local newspaper and radio.

Behavior Modification: a striking modification was shown by the interest in planting alternative turf grasses and native plants. The project promoted the widespread use of filter fabric for erosion control which is now common practice and a "known" thing to use. A livestock producer contact helped him realize animals in the drainage were causing pollution and worked with the project to find a solution even though his site would not accommodate a full animal nutrient management system. The landowner has become a well-spoken advocate of Riparian Area Management. Producers would be more willing to enroll in RAM if some of the acre restrictions were modified.

BEST MANAGEMENT PRACTICES DEVELOPED/REVISED

- Manure application management responsibility rests with landowner. Improved landowners' equipment replaced the need for cost share for the practice
- Riparian Area Management developed to replace streambank stabilization, in cooperation with NRCS CP30 program
- Phosphorus Removal Facility

COORDINATION EFFORTS

STATE INVOLVEMENT

- The SD Discovery Center: I&E Minigrant promoting information about land stabilization
- The SD Department of Agriculture and Natural Resources: project administration and funding resources
- The SD Game, Fish and Parks: permits, educational opportunities and project partners
- South Dakota State University: study of phosphorus and duckweed, consultation, and educational opportunities.
- SD School of Mines and Technology – study of the types of algae in the Phosphorus removal facility.

FEDERAL AGENCY INVOLVEMENT

Partnerships with the USDA Natural Resources Conservation Service for developing CRP contracts in conjunction with the Riparian Area Management program. US Army Corps of Engineers in approving Riparian Area Management project and mitigation site. US EPA for funding resources.

LOCAL GOVERNMENT, ENVIRONMENTAL AND OTHER GROUPS

The Upper Big Sioux River Watershed Project has enjoyed strong local support from the outset, and continues to build on that support. Support is evident in the upcoming Phase 8

continuation segment by the willing and generous support of three local financial partners: City of Watertown, Watertown Municipal Utilities and Kampeska Water Project District. Other groups that took an active part in the project included the Lake Pelican Water Project District through financial assistance for small ponds and dams, Lake Area Technical Institute through student interns and consultation on environmental technologies and meeting space for seminars. Kampeska Water Project District continued to be a prime sponsor, but also has been involved with other water quality projects such as selective dredging and phosphorus removal. Local chapter involvement of the Isaac Walton League of America continued through educational seminars for the public and opportunities for hands-on outdoor experiences for area youth.

SUMMARY OF PUBLIC PARTICIPATION

Public involvement in the project has been a driving factor for many of the best management practices that were installed. Every contact, whether for shoreline stabilization or cleaning out a stock pond, provided the opportunity to expand the conversation beyond the immediate need to the overall goals of the project. Many calls received from the public were for news and information regarding watershed issues and advice on installing practices and impacts to the area water quality. Contact and outreach came by way of volunteer advisory board members, from invitations by the area service groups, and visibility at public events. The public wants to know what is being done for water quality and how they can help.

There has been strong interest and participation in education events throughout this segment. Staff received numerous requests to help with related water topics and presentations. Constant approaches made by the public for information about the water in the area, and feedback from what people see happening with the lakes and river. One RAM participant specifically comes to mind. He is strongly connected with the agriculture and business communities, and an excellent, well-spoken advocate for protecting surface water from contamination.

ASPECTS OF THE PROJECT THAT DID NOT WORK WELL

Riparian Grazing Management has not been the most popular program available, although 161 acres have been enrolled. Producers would be more willing to enroll in RAM if some of the acre restrictions were modified. One producer offered many more acres than the project would be allowed to enroll.

RESULTS AND FUTURE ACTIVITY RECOMMENDATIONS

Phase 7 has been an interesting time period for the Upper Big Sioux River Watershed Project. As always, the climate shifts with no regard to watershed project planning. Below average snowpack contributed limited runoff throughout the Big Sioux drainage system. As the limited runoff contributed to lower lake levels, it also provided opportunities to complete projects in some areas that are traditionally wet.

100 linear feet of grassed waterways have been completed, wet field conditions and crop timing the greatest shortcomings. 47 small ponds have been created or cleaned of their sediments opening capacity for additional silt and nutrients in the years to come.

Access to damaged shorelines has been good with work continuing. With 2,948 linear feet completed, those who remember the high water years are now prepared. The Phosphorus Removal Facility has undergone its feasibility study and is ready for the next level.

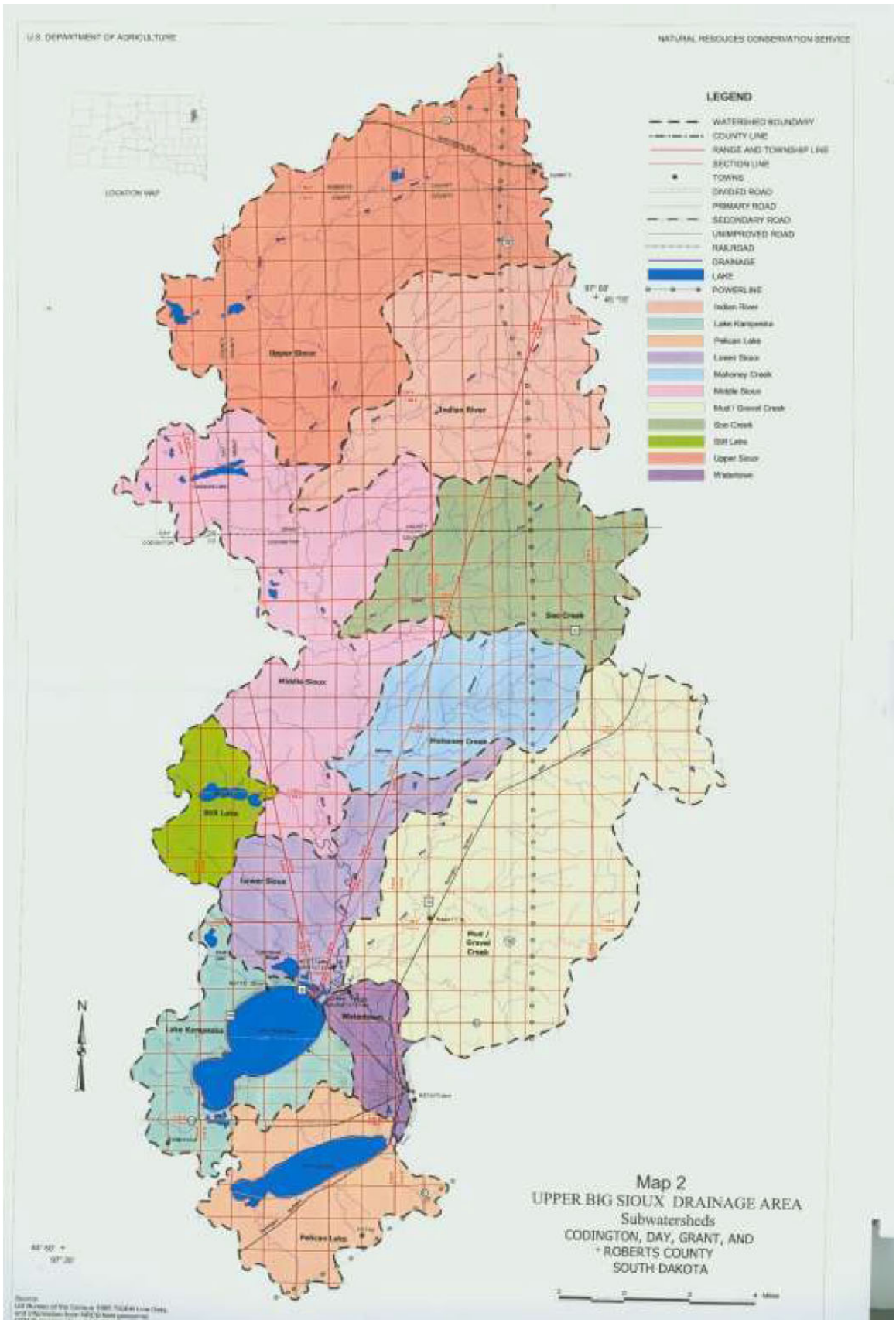
Educational efforts continue as a vital part of the program. Involvement of LATI students for hands-on training with the NOAA Harmful Algae Bloom monitoring. 6th grade days at BPZ, Conservation Connections, tours and activities with high school science and biology classes are all part of the yearly calendar.

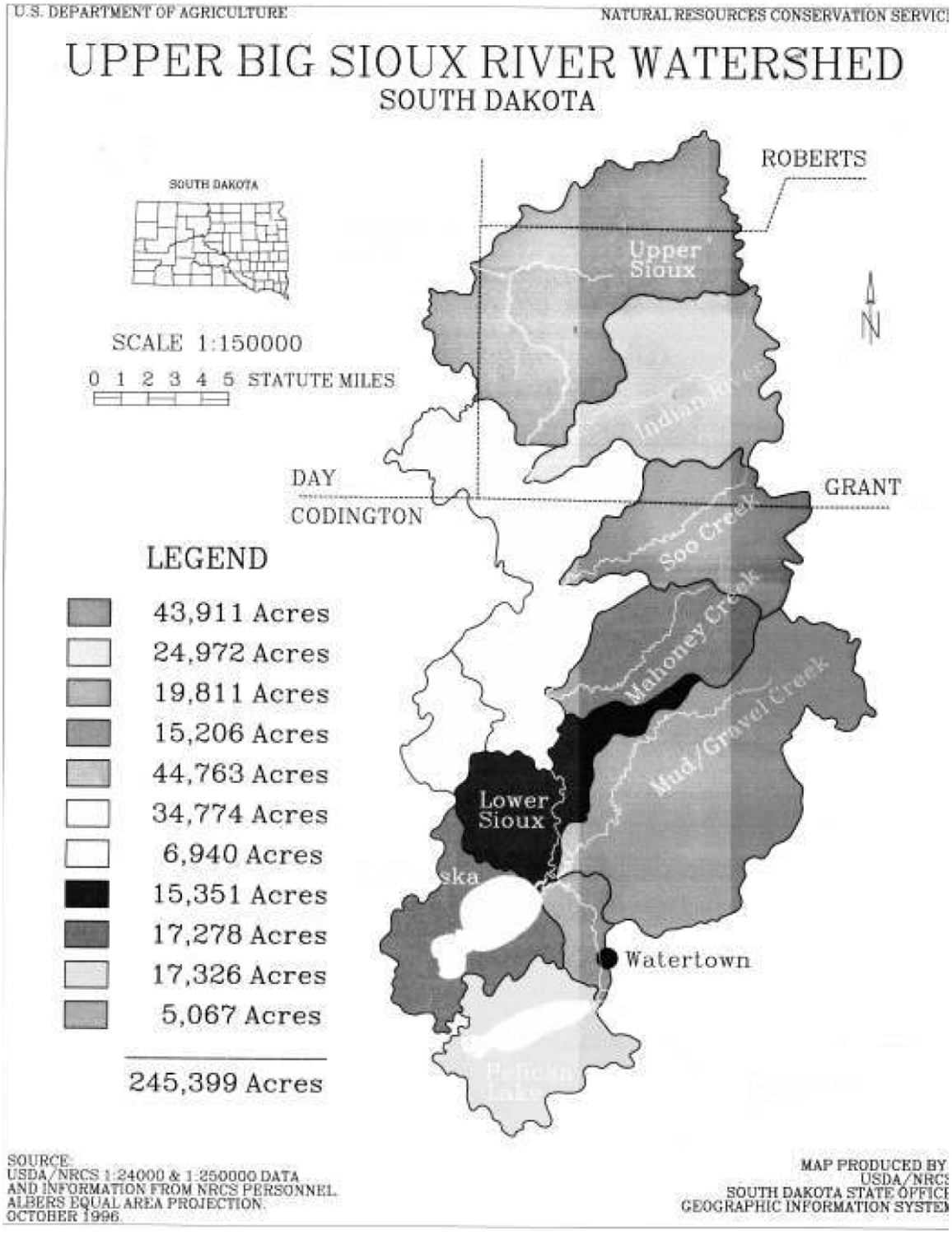
Lake Pelican, Lake Kampeska and the Big Sioux River are still impaired for assigned beneficial uses.(Table 1. Source: https://danr.sd.gov/Conservation/WatershedProtection/ReportsPublications.aspx). Our recommendation for future activities should center on the immediate Lake Pelican watershed, with additional BMPs promoted and installed. Efforts should continue throughout the watershed area with emphasis on grassed waterways and riparian area management.

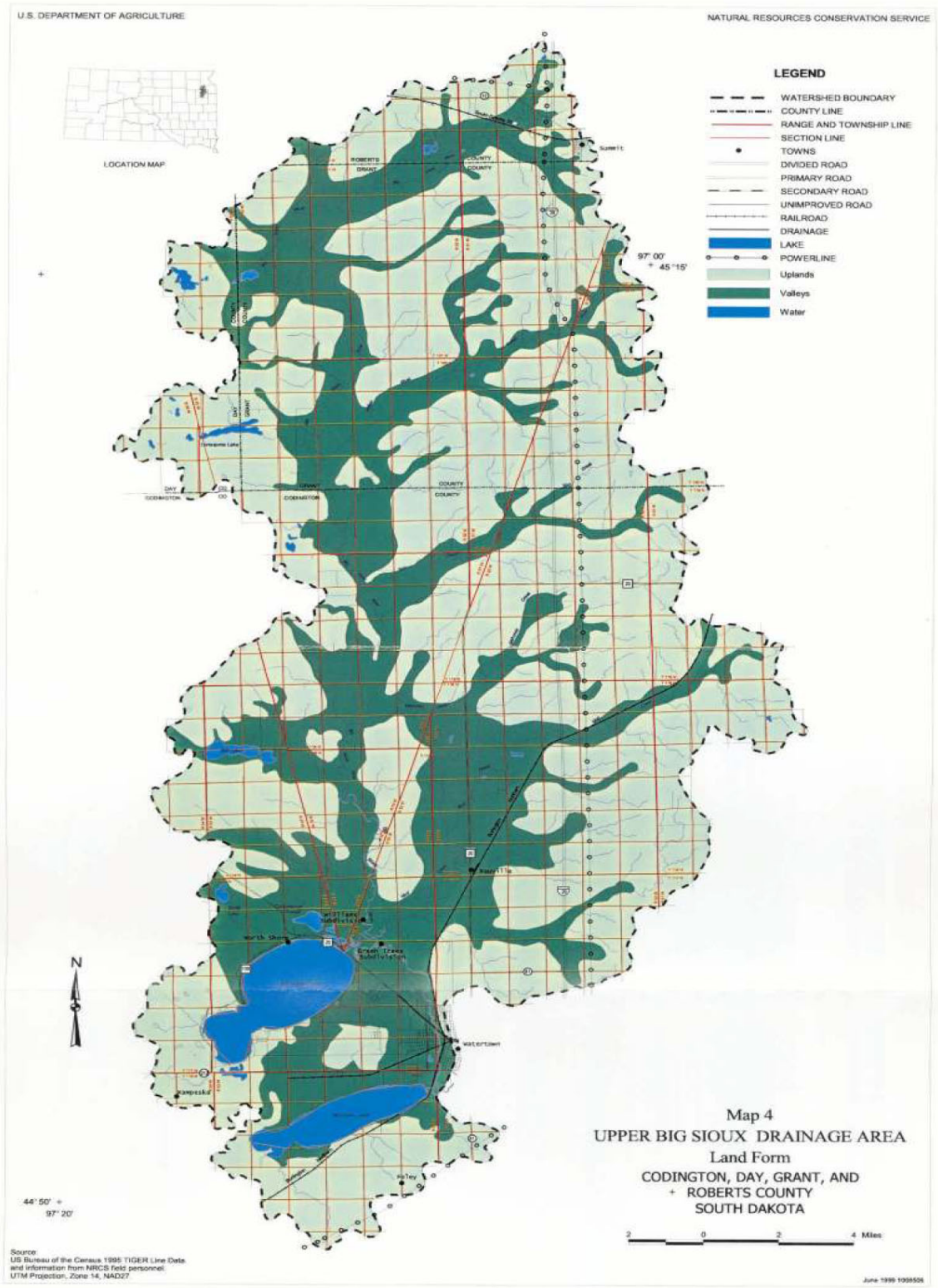
Budget Details

BMP Practices	EPA 319	City of Watertown	Lake Kampeska Water Project District	Local	Municipal Utilities	Pelican Water Project District	USDA	Totals
In-Lake Biomanipulation			$ 17,224.01					$ 17,224.01
Grassed Waterways	$ 1,080.26			$ 10,011.71	$15,927.35			$ 27,019.32
Sediment Traps				$ 34,147.79	$38,736.17	$ 63,360.99		$ 136,244.95
Bank Stabilization			$ 156,434.81	$476,849.38				$ 633,284.19
Riparian Area Management	$55,679.25			$ 18,315.99	$ 1,680.00			$ 75,675.24
CRP Incentives	$11,498.92			$ 2,163.81	$ 1,659.55		$166,523.00	$ 181,845.28
Water Quality Monitoring			$ 3,967.94					$ 3,967.94
Information and Education			$ 3,847.64					$ 3,847.64
Ag Waste Systems			$ 12,173.79	$ 6,054.26				$ 18,228.05
Non BMP Expenses								
Phosphorus Plant Operations			$ 28,944.36					$ 28,944.36
Admin Assistant		$ 51,047.36						$ 51,047.36
Project Coordinator		$237,929.02	$ 17,196.02					$ 255,125.04
Totals	**$68,258.43**	**$288,976.38**	**$ 239,788.57**	**$547,542.94**	**$58,003.07**	**$ 63,360.99**	**$166,523.00**	**$ 1,432,453.38**

Appendix 1
Watershed Maps

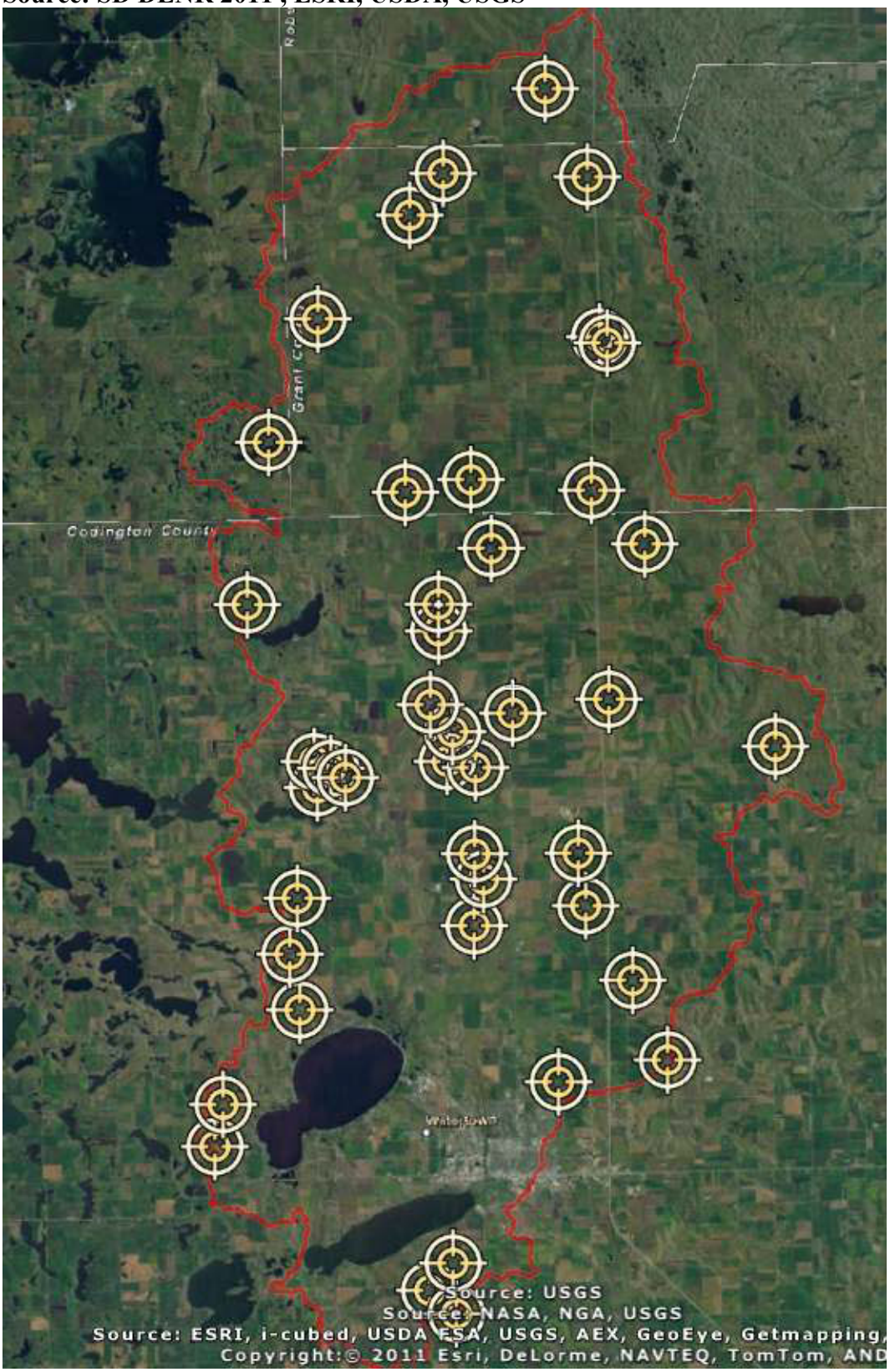

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
LEGEND
WATERSHED BOUNDARY
COUNTY LINE
RANGE AND TOWNSHIP LINE
SECTION LINE
TOWNS
DIVIDED ROAD
PRIMARY ROAD
SECONDARY ROAD
UNIMPROVED ROAD
RAILROAD
DRAINAGE
LAKE
POWERLINE
Indian River
Lake Kampeska
Pelican Lake
Lower Sioux
Mahoney Creek
Middle Sioux
Mud / Gravel Creek
Sac Creek
Still Lake
Upper Sioux
Watertown
LOCATION MAP
Upper Sioux
Indian River
Sac Creek
Middle Sioux
Mahoney Creek
Still Lake
Lower Sioux
Mud / Gravel Creek
Lake Kampeska
Waterdown
Pelican Lake
N
Map 2
UPPER BIG SIOUX DRAINAGE AREA
Subwatersheds
CODINGTON, DAY, GRANT, AND
ROBERTS COUNTY
SOUTH DAKOTA

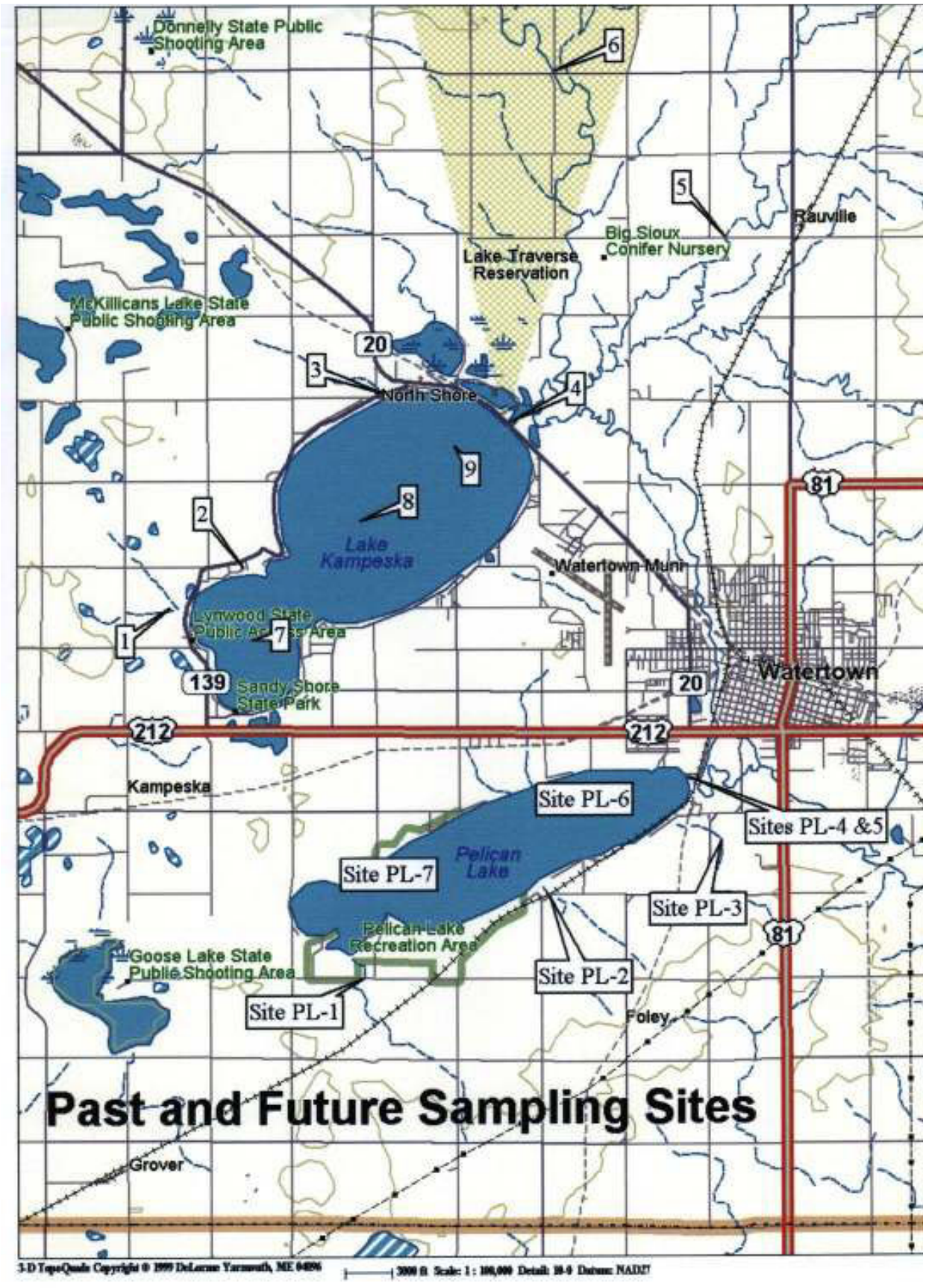

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
UPPER BIG SIOUX RIVER WATERSHED
SOUTH DAKOTA
SOUTH DAKOTA
SCALE 1:150000
0 1 2 3 4 5 STATUTE MILES
ROBERTS
DAY
CODINGTON
GRANT
Upper Sioux
Soo Creek
Mahoney Creek
Mud/Gravel Creek
Lower Sioux
Watertown
N
LEGEND
43,911 Acres
24,972 Acres
19,811 Acres
15,206 Acres
44,763 Acres
34,774 Acres
6,940 Acres
15,351 Acres
17,278 Acres
17,326 Acres
5,067 Acres
245,399 Acres
SOURCE:
USDA/NRCS 1:24000 & 1:250000 DATA
AND INFORMATION FROM NRCS PERSONNEL.
ALBERS EQUAL AREA PROJECTION.
OCTOBER 1996.
MAP PRODUCED BY
USDA/NRCS
SOUTH DAKOTA STATE OFFICE
GEOGRAPHIC INFORMATION SYSTEM


U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
LOCATION MAP
LEGEND
WATERSHED BOUNDARY
COUNTY LINE
RANGE AND TOWNSHIP LINE
SECTION LINE
TOWNS
DIVIDED ROAD
PRIMARY ROAD
SECONDARY ROAD
UNIMPROVED ROAD
RAILROAD
DRAINAGE
LAKE
POWERLINE
Uplands
Valleys
Water
97° 00'
45° 15'
44° 50'
97° 20'
N
Map 4
UPPER BIG SIOUX DRAINAGE AREA
Land Form
CODINGTON, DAY, GRANT, AND
ROBERTS COUNTY
SOUTH DAKOTA
2 0 2 4 Miles
Source:
US Bureau of the Census 1995 TIGER Line Data
and information from NRCS field personnel.
UTM Projection, Zone 14, NAD27
June 1999 1009506

Appendix 2
Feeding Operations and Water Sampling Sites

Upper Big Sioux River Watershed Project (Red Outline)
Distribution of Tier 1 Feeding Operations
Source: SD DENR 2011 , ESRI, USDA, USGS




Donnelly State Public Shooting Area
6
5
Rauville
Big Sioux Conifer Nursery
Lake Traverse Reservation
McKillicans Lake State Public Shooting Area
20
3
North Shore
4
9
8
2
Lake Kampeska
Watertown Munn
81
Lynwood State Public Access Area
7
1
139
Sandy Shore State Park
Watertown
20
212
212
Kampeska
Site PL-6
Sites PL-4 &5
Pelican Lake
Site PL-7
Site PL-3
Pelican Lake Recreation Area
81
Goose Lake State Public Shooting Area
Site PL-2
Site PL-1
Foley
Past and Future Sampling Sites
Grover