Chapter 6 Project Implementation Strategies

6.0 Best Management Practices

Included in this chapter are land management practices that landowners implement to control sources or causes of pollutants in the Les Cheneaux watershed and pollutant load reduction estimates. These practices are considered *Best Management Practices,* or *BMP's.* There are three types of BMP's:

Structural: "brick and mortar" practices that require construction activities to install, such as stormwater basins, grade stabilization structures, and rock and riprap.
Vegetative: Use plants, including grasses, trees, and shrubs, to stabilize eroding areas.
Managerial: Involve changing the operating procedures at a site.

6.1 Systems of BMP's

Best Management Practices are typically applied as systems of practices because one practice rarely solves all water quality problems at a site, and the same practice will not work for all the sources and causes of a pollutant. All three types of BMP's may be needed to address a source of pollutants. Several manuals of reference were used to develop the BMP's for the Les Cheneaux watershed:

Table 6.1.1. BMP References

Source	BMP Manual	System of BMP's
On-site septic systems and municipal discharge	Information and education	Seek alternative wastewater discharge management; Information and education; ordinance development
Stormwater-roadside ditches, lot boundary drainages, Impervious surfaces	Guidebook of BMP's for Michigan Watersheds; Stormwater Management Guidebook; Information and education	Land use planning, ordinances, riparian buffers, check dams, grassed waterways and ditches, Information and education
Improper hazardous material/waste management	Information and education	Information and education; develop local hazardous waste management program
Development and human disturbance, high impact recreation	Guidebook of BMP's for Michigan Watersheds; Information and education	Habitat protection ordinances, SESC and wetland law education and enforcement; construction strategies (staging and scheduling), conservation easements, deed restrictions, land trusts
Invasive species	Information and Education	Information and Education
Eroding road/stream crossing embankments, streambanks, shoreline erosion	Guidebook of BMP's for Michigan Watersheds	Riparian buffers, stream course clean up, riparian landowner education, stream bank stabilization. Culvert replacement, embankment stabilization, run-off deterrents
Water quality monitoring	GLEAS Procedure 51	Information and education; develop local monitoring program
Desired Uses		
Low impact recreation	Information and Education	Information and Education
Promote natural character	Information and Education	Information and Education
Protect threatened and Endangered species	Information and Education	Information and Education

6.2 Recommended BMP's

The goal of this watershed implementation plan is to suggest activities that will provide the most benefit for the Les Cheneaux watershed in terms of restoring degraded areas, preventing further pollution, and protecting aquatic resources. The following strategy for protecting water quality is organized by pollution sources found in the watershed. Some sources can contribute many different pollutants. Consequently, treating a pollution source may reap multiple pollution control benefits. There are a number of objectives for each source of pollution, a task to reach the objective along with partners who will help perform the respective task. Typical systems of BMP's are described along with, milestones, and a timeline within which the BMP's are proposed to occur. The BMP's are designed to eliminate the total pollutant loads described in chapter 2 and these pollutant load totals serve as benchmarks or criteria for evaluation. Success will come with realizing a respective goal in the time frame proposed or a measure of pollutant load reduced. Short-term objectives are slated for completion and adoption within the first 3-5 years and long-term objectives were determined to require 5-10 years. These time proposals, however, are suggestions and will depend on the type and availability of funding.

Structural cost estimates are based on Conservation Resource Alliance's *unit costs for road crossing repair estimates* (CRA 2001), Natural Resource Conservation Service (NRCS 2002), and the Grand Traverse Bay Watershed Plan (U'ren 2003).

Estimated milestones and the timeline are based on the LCWC volunteers coordinating the project for the first year with a full time project manager coordinating the project for the subsequent minimum 3-5 years. Many of the costs associated with coordinating workshops, meetings, and other I/E activities will not be broken down into specific dollar amounts. They are included in the manager's salary, since minimal extraneous costs would be incurred other than work performed by the project manager.

6.3 Description of Project Implementation Tasks

Descriptions include objective by source, task number, system of best management practice (task), responsible party, milestones/pollutant load reduction[18]/timeline, estimated cost/per site, and number of sites where applicable. Many of the following strategies include informational/education activities that are developed in the I/E plan.

1. Objective by Source: Reduce Pathogens, nutrients, and toxins from on-site septic systems by restoring approximately 170 failing on site septic systems.

Task A
Reduce the input of pollutants (pathogens, nutrients, and toxins) reaching groundwater and surface water from on-site septic systems by completing shoreline and creek surveys to determine potential failing septic system sites based on *Cladophora* populations, observations of illicit discharges, or discussions with landowners with no State well log registration. Enter data into GIS format. Number and location of sites: 200 linear miles of shoreline.

Responsible Party:	LCWC, LCIA, LSSU, LCCS
Milestones/timeline:	Total linear mileage of shoreline surveyed/year 2; GIS map complete/year 2
Estimated Total Cost:	$5,000

Task B
Conduct focus meetings with LMAS Health Department to devise a strategy for local OSS problems to be suggested for Clark/Marquette Township Ordinances. Poor building sites, consideration for alternative OSS for special situation residents in watershed, lack of inspections, etc. will be considered in strategic planning. Include 20 hours preparation time per meeting.

[18] Objectives designed to eliminate total pollutant load mentioned in chapter 2 from each corresponding pollutant source.

Responsible party:	LCWC, LMAS, MDEQ, LCIA
Milestones/Timeline:	Host introductory strategic planning during year 1. Ordinance developed by year 3.
Estimated Cost:	Manager's salary; $250/meeting

Task C
Reduce the input of pollutants (pathogens, nutrients, and toxins) reaching groundwater and surface water by consulting area financing institutions, civic groups, regional funding organizations to create a funding system to provide resources to local landowners to repair failing OSS and upgrade non-compliant OSS. An endowment fund will be explored to provide funding for this project goal.

Responsible Party:	LCWC, LCIA, CEMCD, LMAS Health, MDEQ
Milestones/ Timeline:	Proposal presented to local and regional groups by year 3; Establish endowment fund by year 5
Estimated Cost/Site:	Manager's salary

Task D
Work with LMAS, MDEQ, Township Officials, and other appropriate parties to develop a strategic plan to protect drinking water. Project staff will work with USGS, MDEQ, MDNR to identify priority groundwater discharge and recharge areas, groundwater flow, and aquifer characteristics, produce local aquifer maps, and determine strategic activities to protect existing water sources. Project staff will also assess prevalence of abandoned wells throughout watershed and assess applicability of MDEQ's Wellhead Protection Program for groundwater protection. The product will be a groundwater protection plan including I/E strategies and management actions based on this focused inventory and assessment.

Responsible parties:	LMAS, CEMCD, TWP's, MDEQ, MGSP
Milestones/Timeline:	Gather and present existing groundwater concerns/data into a locally-based characterization including ground-proofing wetland areas; potential recharge areas by year 3
Estimated Total Cost:	Manager's salary; $6,500

2. **Objective by Source: Eliminate pollutants originating from discharge of the Clark Township municipal wastewater treatment facility.**

Task A
Reduce the input of pollutants (pathogens, nutrients, and toxins) reaching Pearson Creek and Cedarville Bay from the municipal wastewater discharge by seeking and providing technical assistance to Clark Township officials to explore feasibility of discharge alternatives and/or treatment strategies to eliminate nutrients, toxins, and potential pathogens from wastewater discharge and from the water bodies in which it is discharged. Members from LCWC will seek technical assistance from wastewater treatment industry to explore feasibility of tertiary treatment of wastewater as well as industry suggested alternatives. Feasibility of alternative discharge methods will be investigated, including constructed wetlands, land spray, and deeper water discharge. Industry leaders will be solicited to provide preliminary alternative systems with competitive cost, low maintenance guarantees, and low impacts to aquatic and terrestrial systems as criteria for consideration. LCWC will sponsor at least 1 meeting to introduce respective vendors and other successful officials to township officials.

Responsible Party:	LCWC, CT, MDEQ, LMAS
Milestones/ Timeline:	Implement iron chloride BMP during year 1. Contract consultant by year 2
Estimated Total Cost:	Manager's salary; $60/hr for consultant services

3. Objective by Source: Reduce the input of pollutants (pathogens, nutrients, sediment, and toxins from urban and rural stormwater.

Task A
Reduce the input of pollutants (pathogens, nutrients, toxins, sediment) reaching groundwater and surface water and altered hydrology from urban and rural stormwater by organizing appropriate Mackinac County

officials, township officials, LCWC, and local hydrology specialists to develop a stormwater management plans and/or ordinances for Cedarville and Hessel and the surrounding watershed. LCWC will present priority concerns to group, state and federal regulations and facilitate strategic planning to adopt local stormwater management in local ordinances. A planning consultant will be hired to develop ordinance regulations such as stormwater retention/detention requirements, into Clark Township zoning ordinances. The planner, LCWC, and project manager will assist the township in promoting and adopting protective ordinance for stormwater management.

Responsible Parties:	LMAS, TWP's, LCWC, MDEQ, CCRC, MCRC
Milestone/Timeline:	Host focus meetings/public meetings by year 3
Estimated Cost:	Video development $6000; photo presentation $250; public meeting $250; coordination $1,200, ordinance development council $8,000 = $15,700 per ordinance

Task B
Work with aforementioned group to install appropriate stormwater BMP's in urban and rural areas where appropriate based on information obtained from stormwater management plan. Preliminary BMP's include revegetate all county maintained ditches entering several creek sites including PRS-3, PRS-5, PRS-6, CED-2, FLR-5, FLR-7, MCK-4, MCK-5, BVR-5, and BVR-6); and install BMP's including check dams and turnouts along same routes according to MDEQ consultation.

Prior to installing BMP's several tasks will need to be completed: A water quality resource management plan (WQRMP) will be developed for each BMP site. The plan will detail the proposed system of BMP's, site plan, cost estimates, and certified engineering plans for MDEQ approval. A contract with the landowner will also be affirmed to facilitate the project and future maintenance. All permits will be secured upon initial project approval.

Responsible Parties:	LCWC, CEMCD, LMAS, TWP's, MDEQ, CCRC, MCRC
Milestones/Timeline:	Define BMP needs by year 2; Begin installation of corrective BMP's by year 3
Estimated Cost:	$25,000/year salary for coordination; BMP's $10,000 per site; 10 sites

4. Objective by Source: Improve hazardous waste management

Task A
Work with township, hazardous waste hauler, and other successful (hazardous waste program) communities to develop a regular hazardous waste pick-station to provide opportunity for watershed residents to regularly discard hazardous waste.

Responsible parties:	LCWC, CEMCD, MDEQ, LMAS, Waste Management
Milestone/Timeline:	Sponsor one hazardous waste collection in watershed per year
Estimated Costs:	$5,000 per collection

5. Objective by Source: Reduce development and other human disturbance impacts to warm/coldwater fishery; other indigenous aquatic and terrestrial wildlife; and threatened and endangered species

Task A
Host strategic workshops for contractors, developers, realtors, local government, and other appropriate organizations to recommend BMP's and wise land use planning guidance during construction activities, real estate development, local township decision-making and other activities impacting the local fishery and aquatic organisms. Activities to promote will include increased enforcement of SESC and wetland regulations, water quality protective ordinances, development of indicators, point of sale disclosure/protection, stormwater management. Evaluation and product will be confirmation from local building inspector, realtor partners, and township officials of voluntary regulation compliance, low impact construction techniques, and other stewardship activity through strategies from participating stakeholders.

Responsible parties: TWP's, LMAS, MDEQ, MNFI, realtors, contractors, LCIA, CEMCD, and LCWC.
Milestones/Timeline: Host at least one SESC, Real Estate, and Township Planning workshop each year.
Estimated Cost: $11,000 per year

Task B
The group will work to guarantee SESC and wetland regulation compliance at construction sites through monthly compliance communications with local regulators. LCWC will keep track of local SESC permits and building permits to assess compliance.

Responsible party: LCWC, LMAS, MDEQ, local contractors
Milestones/Timeline: Partnership with LMAS to monitor SESC/Wetland Regulations where appropriate by year 3
Estimated Cost: $12,500/year

Task C
The CEMCD will develop resources to assist contractors, prospective landowners, and realtors with site plan review, building site review, permit applications, and strategies to minimize development impacts on priority fishery and other indigenous wildlife habitat. A consultant will be hired to work with project manager to provide technical assistance on site plan development, SESC measure selection, land use assessment for purchase and development as well as low impact development techniques. Consultant will provide technical assistance to contractors and landowners with permit requirements, for contractors and developers.

Responsible Party: CEMCD, LMAS, CCHD, LCWC
Milestones/Timeline: Partners will hire consultant, host one low impact building/development workshop by end of first year.
Estimated Cost: $50,000/year

Task D
LCWC and local township officials will review current master plans and zoning ordinances and enforcement trends for counties and townships to determine the effectiveness of protection given to water quality and natural resources. A planner will be consulted to assist townships and counties with land management regulations to develop guidelines that protect water quality and natural resources. Activities include assistance with improving ordinances concerning land splits, setbacks from water bodies, wetland protection, and point of sale protections.

Responsible Parties: LCWC, TWP's, LMAS, MDEQ
Milestones/Timeline: All documents assessed by year 3; recommendations made to boards, commissions, etc.
Estimated Cost: $8,000 per ordinance; $250 per meeting: $30,000 by year 3

Task E
Little Traverse Conservancy will work with the project manager to promote land protection strategies to local township officials, the State of Michigan, and owners of tier 1 and 2 (see Chapter 3) lands to protect priority habitats through purchasing development rights/conservation easement or outright purchase. Focus would be on lands priority to water quality, wildlife habitat, and lands that would protect against degradation of these entities. The partnership will provide technical assistance and promotional materials to priority landowners throughout the project.

Responsible Parties: MDNR, TWP's, TNC, Little T, LCWC, LCIA
Milestones/Timeline: Contact all tier 1and 2 landowners by year 3.
Estimated Cost: $7,000 year ($500/workshop, $500 site reviews, $200 site inspections, $4,000 coordination, $1000 presentation materials (pictures, maps))

Task F
Provide technical assistance to local townships and counties to promote the development and/or improvement of zoning regulations that preserve habitats priority to warm/coldwater fishery and other indigenous wildlife, especially priority areas defined by MNFI and Little T. (Chapter 3)

Responsible Party:	Mackinac County Officials, Local Township officials, MNFI, LCWC, Little T, TNC
Milestones/Timeline:	Local Zoning ordinance updated with protective language by year 3
Estimated Cost:	$18,000 plus Manager's salary

Task G
Work with Little Traverse Conservancy, The Nature Conservancy, and other land trusts to protect lands priority to water quality and aquatic and terrestrial organisms, especially undeveloped shoreline, riparian, and wetland parcels following Little Traverse Conservancy land protection criteria (Chapter 3). Work together to develop a strategy including short and long term land protection priorities, landowner contacts, promotion addressed to the specific community, and financial resource attainment. Purchase lands and easements and other strategies upon available funding.

Responsible Party:	Little T, TNC, LCWC, LCIA, TWP's
Milestones/Timeline:	Ongoing
Estimated Cost:	$18,000 plus Manager's salary

Task H
Consult Les Cheneaux Community Foundation to develop, advertise, seek funding, and implement land protection endowment fund to assist local land conservancies and the Les Cheneaux Watershed Council in purchasing conservation easements on Little Traverse Conservancy tier 1 and 2 priority parcels.

Responsible Party:	Little T, TNC, LCWC, MDNR, Les Cheneaux Community Foundation
Milestones/Timeline:	Endowment fund established in first year
Estimated Total Cost:	$1,500,000

Task I
Develop a Revolving Conservation Land Acquisition Fund for conservancies to purchase lands for conservation easement implementation and resale. This would be for Little Traverse Conservancy tier 1 and 2 priority properties that are on the market or in cases where landowners are unwilling to sell the conservation easement, but would rather sell the land outright. This would provide a mechanism to allow local land conservancies, including LCWC to purchase the land, restrict the land with a conservation easement prohibiting or severely limiting building /development, and then resell the land to conservation buyers: at its restricted value. This would require funds to cover the cost of the conservation easement (i.e. difference in value).

Potential Project Partners:	Little T, TNC, LCWC
Milestones/Timeline:	Consult local land trusts, local community foundations, and suggested philanthropists within 1st year. Establish fund within 3 years
Estimated Cost:	$1,500,000 for 3 years

Task J
Following Little Traverse Conservancy criteria for tier 1 properties, present to local units of government feasibility of a locally funded purchase of development rights/conservation easement acquisition and protection of appropriate tier 1 properties priority to water quality and wildlife habitat preservation where public support exists. An initial public opinion poll will be administered to determine public voter support.

Responsible Parties:	Local Township officials, LCWC, Little T, TNC
Milestones/Timeline:	Public survey complete within 2 years
Estimated Cost:	$15,000/survey

Task K
Consult MDNR to assess availability of remaining transferable State lands and most fragile tier 1 and 2 properties (Chapter 3) for addition as Designated Natural Areas throughout the watershed for recreation, education, and protections. Upon selection, consult Little T to assist MDNR with pursuit of properties for protection.

Responsible Party:	LCWC, Little T, TNC, MDNR, MDEQ, MNFI
Milestones/Timeline:	Partner consultation begun within first year. Landowner contacts by end of year 2.
Estimated Total Cost:	$18,000

Task L
Conduct watershed survey following MDEQ watershed survey protocol (MDEQ 2000) at creek locations developed in planning project before installation of any suggested BMP's. In addition, conduct visual survey of entire watershed shoreline to document aquatic habitat conditions and development trends prior to implementation activities. Conduct follow up surveys near end of first phase of implementation (after BMP installation) to evaluate success of BMP's implemented as part of the Watershed Implementation Project.

Responsible Party:	LCWC, LCCS, LSSU, LCIA
Milestone/Timeline:	Conduct initial survey during spring 2007; progress survey summer 2008, follow up, evaluation survey late summer 2009.
Estimated Cost:	$25,000 per year salary; 10 creeks; 200 miles of shoreline

Task M
Provide assistance to MDNR in their effort to enhance fishery and other indigenous wildlife habitat including collecting information, conducting surveys, and evaluating lacustrine and riparian sites for installation of habitat enhancing structures.

Responsible Party:	MDNR, Trout Unlimited, LC Sportsman's Club, LCWC
Milestone/Timeline:	Host organizational meeting within first year to define MDNR needs, partner involvement, and develop work plan
Estimated Costs:	$500

Task N
Install in-stream and lake habitat improvements in consultation with MDNR and appropriate partners, including at priority road/stream crossing sites in addition to sediment and hydrological improvements, MCK 2a and PRS 4a.

Responsible Party:	MDNR, LCWC, CEMCD, Trout Unlimited, LC Sportsman's Club
Milestone/Timeline:	Fish enhancement structures installed within 10 years
Estimated Cost:	$100,000

6. Objective by Source: Reduce warm/coldwater fishery, threatened and endangered species, and other indigenous organism habitat impacts from invasive species.

Task A
Work with the Clark Township to install boat washing stations at the Cedarville (Site # PRS-2 and Hessel Marina launches (Site # HES-1) along with informational kiosks with Invasive species information to reduce potential for spread of invasive species.

Responsible Party:	Clark Township, MDNR, LCWC
Milestones/Timeline:	Installation within 3 years
Estimated Costs:	$10,000 total for project coordination, design, and meetings $25,000 for two structures

Task B
LCWC will perform visual surveys of Lake Huron shoreline and watershed creeks at project start (2007) to assess purple loosestrife and eurasian milfoil infestation each summer and monitor spread of both. After MDEQ consultation, surveyors will attempt to control both species and survey locations each year (spring 2007, summer 2008, late summer 2009) to monitor success and perform continuous control methods.

Responsible Party:	LCWC, LCCS, LSSU, LCIA
Milestone/Timeline:	Conduct initial survey during spring 2007; progress survey summer 2008, follow up, evaluation survey late summer 2009.
Estimated Cost:	$25,000 per year salary; 10 creeks; 200 miles of shoreline

Task C
Consult regional biological experts to develop appropriate invasive species (purple loosestrife, Eurasian milfoil) control methods. (Prior to #7task B (above))

Responsible Parties:	LCWC, CEMCD, U of M, USGS, MSU, Little T, TNC
Milestone/Timeline:	Comprehensive, local plan developed within first year.
Estimate Cost:	Manager's salary with $500 for focus workshop

7. Objective by Source: Reduce impacts from erosion/sediment on coldwater fishery, threatened and endangered species, and other indigenous organisms.

Task A (Same as Task 5L and 6B)
Continue watershed survey (MDEQ 2000) of riparian corridors and lakeshore at project start (spring 2007) to affirm priority areas where riparian vegetated creek and lakeshore buffers and other possible BMP's should be installed, at mid project to assess installation and project success (summer 2008), and near project end (late summer 2009) to evaluate success of BMP's installed during watershed implementation project.

Responsible Party:	LCWC, LCCS, LSSU, LCIA
Milestone/Timeline:	Conduct initial survey during spring 2007; progress survey summer 2008, follow up, evaluation survey late summer 2009.
Estimated Cost:	$25,000 per year salary; 10 creeks; 200 miles of shoreline

Task B
Work with landowners to install riparian buffers and stabilize eroded stream banks on private lands that have been inventoried and prioritized, including revegetation to PRS-2a (Cattails Cove parking lot), PRS-4a (upstream of Perkins Bridge); and MCK–2a (downstream of M-134), and MCK-2b (Clay Banks erosion sites approximately 0.5 miles upstream of M-134).

Prior to installing BMP's several tasks will need to be completed: A water quality resource management plan (WQRMP) will be developed for each BMP site. The plan will detail the proposed system of BMP's, site plan, cost estimates, and certified engineering plans for MDEQ approval. A contract with the landowner will also be affirmed to facilitate the project and future maintenance. All permits will be secured upon initial project approval.

Responsible Party:	LCWC, LCIA, TWP's, MDNR
Milestone/Timeline:	Install buffers recommended PRS-2a, PRS-4a, MCK-2a, and MCK-2b upstream and downstream. Complete all sites by year 3
Estimated Cost:	Total project cost = $54,000

Task C
Establish shoreline and riparian buffer demonstration sites throughout the watershed to promote landscaping for habitat protection and erosion and sediment control, including sites PRS-2a, PRS-4a, MCK-2a, and MCK-2b. Work with LCIA to solicit high traffic area landowners to volunteer lakefront properties for buffer demonstration. Work with creek riparian landowners to install buffers for later demonstration activities. Also, solicit potential new homeowners to install buffers and landscaping around building site to control erosion and sediment transport.

Prior to installing BMP's several tasks will need to be completed: A water quality resource management plan (WQRMP) will be developed for each BMP site. The plan will detail the proposed system of BMP's, site plan, cost estimates, and certified engineering plans for MDEQ approval. A contract with the landowner will also be affirmed to facilitate the project and future maintenance. All permits will be secured upon initial project approval.

Responsible Party:	LCWC, LCIA, CEMCD, MDEQ
Milestone/Timeline:	Demonstration areas planted within 5 years
Estimated Cost:	All four riparian locations $54,000; Shoreline demonstrations = $5,000 per 100 foot lot

Task D

Identify, contact, promote to shoreline owners needing shoreline stabilization practices biotechnical and soft engineering erosion stabilization and habitat protection techniques. Pursue local funding for a demonstration project on BMP installation, and supervise installation and maintenance of BMP's.

Prior to installing BMP's several tasks will need to be completed: A water quality resource management plan (WQRMP) will be developed for each BMP site. The plan will detail the proposed system of BMP's, site plan, cost estimates, and certified engineering plans for MDEQ approval. A contract with the landowner will also be affirmed to facilitate the project and future maintenance. All permits will be secured upon initial project approval.

Responsible Party:	LCIA, LCWC, USACE, MDEQ, MDNR, CEMCD
Milestones/Timeline:	Conduct watershed assessment, determine potential demonstration sites, implement promotional campaign and distribute by year 2, including newspaper article, brochure, and presentation to LCIA membership.
Estimated Costs:	$1,000 for print advertisement

Task E

Where priority road/stream crossings have been identified, improve, repair, or replace outdated, failing, or eroding road/stream crossing by implementing the appropriate BMPs from the following:

1) Road Crossings
   - Remove obstructions that restrict flow through the culvert
   - Replace undersized (too small or too short) culvert
   - Remove and replace perched or misaligned culverts to avoid erosion and provide for fish passage
   - Install bottomless culverts and bridges where possible upon MDEQ approval
   - Replace culverts with a length that allows for $\geq$ 3:1 slope on embankments
   - Revegetate all disturbed or bare soils on embankments
2) Road Approaches
   - Create diversion outlets and spillways to direct road runoff and stormwater away from streams
   - Dig or maintain (vegetated) ditches where needed. Insure that ditches are properly installed with erosion control structures such as check dams, vegetated surfaces, etc.
3) Road Maintenance
   - Encourage Road Commissions to look at the long-term savings of crossing improvements over cumulative maintenance costs.
   - Encourage Road Commissions to accommodate creek ecosystem integrity when maintaining road crossings, Install erosion controls, work to maintain low impacts to creek channel, and stabilize embankments adequately.

Project Cost by Site:

STL-2	$90,000	FLR-6	$50,000
STL-3	20,000	FLR-7	90,000
LAW-3	7,000	MCK-3	50,000
MAC-4	50,000	MCK-4	7,680
MAC-5	300	MCK-5	15,000
PRS-2	150,000	MCK-6	50,000
PRS-3	7,500	BSH-2	136,000
PRS-5	200,000	PRN-3	150,000
PRS-6	60,000	PRN-5	450
PRS-7	3,000	BVR-3	20,000
PRS-8	3,000	BVR-4	20,000
CED-2	200	BVR-5	20,000
FLR-2/3	150,000	BVR-6	20,000

Note: See Road and Stream Crossing Inventory for detailed BMP description and priority.

Prior to installing BMP's several tasks will need to be completed: A water quality resource management plan (WQRMP) will be developed for each BMP site. The plan will detail the proposed system of BMP's, site plan, cost estimates, and certified engineering plans for MDEQ approval. A contract with the landowner will also be affirmed to facilitate the project and future maintenance. All permits will be secured upon initial project approval.

Responsible Party: MCRC, CCRC, LCWC, MDEQ, MDOT
Milestones/Timeline: 9 crossings improved by end of 3rd year; all crossing complete withing 10 years
Estimated Costs: $1,369,630

8. Objective by Source: Water quality monitoring

Task A
Land Information Access Association (LIAA) will work with the project manager and LSSU to create an on-line interactive water quality database which will provide community access to research results and other water quality associated information about the Les Cheneaux area watershed. LIAA will be contracted to develop the database, create a web page to access the information and web tools to enable users to continuously update information. LSSU will help enter available research reports.

Responsible Party: LCWC, LSSU, LCCS
Milestones/Timeline: Organize database, interactive GIS tool for LCCS schools, residents, landowners by year 3
Estimated Cost: $16,000 plus manager's salary

Task B
Implement beach monitoring of E. coli bacteria at local swimming areas with LMAS. Pursue funding resources, and utilize LSSU volunteers to collect water samples during summer recreation months to monitor bacteria levels.

Responsible Party: LMAS, LCIA, LSSU, Chippewa County Health Dept.
Milestones/Timeline: Create partnership with LMAS, CCHD, to create a beach-monitoring program in Mackinac County; pursue monitoring funds by year 2
Estimated Costs: $10,000 plus Manager's Salary

Task C
Conduct hydrological analysis of subwatersheds (following MDEQ consultation) slated for BMP installation prior to installation and near end of project to assess success of BMP's.

Responsible Party: LSSU, MDEQ, LCWC

Milestone/Timeline: Perform hydrology study summer of 2007 and 2009
Estimated Costs: Manager's salary

Task D (Same as task 5L, 6B, and 7A)
Perform watershed survey (DEQ 2000) of creeks, inland lakes, and other water bodies, including wetland areas using visual assessment through walking, canoeing, obtaining annual aerial photographs to document current water quality conditions prior to BMP implementation and near project end to assess installed BMP success.

Responsible Party: LCWC, LCCS, LSSU, LCIA
Milestone/Timeline: Conduct initial survey during spring 2007; progress survey summer 2008, follow up, evaluation survey late summer 2009.
Estimated Cost: $25,000 per year salary; 10 creeks; 200 miles of shoreline

9. Objective by Source: Create appropriate low environmental impact recreational opportunities and access to the enjoyment of aquatic and terrestrial resources.

Task A
Provide water quality technical assistance to township and interested community in developing M-134 bike path, recreation park, and in improving public boat launch areas. Project manager will facilitate partnership with Clark Township recreation planners and similar regional successful recreation planners to help Clark Township realize these recreational opportunities while minimizing effects on water quality and other indigenous wildlife.

Responsible Party: TWP's, MDNR, LCWC, USACE, MDEQ
Milestones/Timeline: Facilitate group communications and consultations for each project by year 2
Estimated Cost: Manager's salary

Task B
Consult MDNR to assess availability of remaining transferable State lands and most fragile tier 1 and 2 properties (Chapter 3) for addition as Designated Natural Areas throughout the watershed for recreation, education, and protections. Upon selection, consult Little T to assist MDNR with pursuit of properties for protection.

Responsible Party: LCWC, Little T, TNC, MDNR, MDEQ, MNFI
Milestones/Timeline: Partner consultation begun within first year. Landowner contacts by end of year 2.
Estimated Total Cost: $18,000

10. Objective by Source: Promote the preservation of existing environmental and social features that defines the character of the Les Cheneaux Islands area. See I/E strategies #10.

Task A
Work with the township, MDNR, LCWC, and other appropriate groups to host at least one creek walks, kayaking, fishing, hunting, and other low impact recreational workshops per year and one information/education opportunity per year to foster an appreciation for protection of natural resources. Partnership will meet regularly to devise ways to promote stewardship ethic about local environment and protective activities to guarantee the natural integrity of the environment.

Responsible Party: LCIA, MDNR, TWP's, LCWC
Milestones/Timeline: Two stewardship tours/workshops/or presentations/per year
Estimated Costs: $10,000/year