

## **9. Chapter 9 – Project Sustainability: Sub-Watershed Action Plans**

### **9.1 *Identifying and Analyzing Proposed Programs, Policies and Ordinances***

The stakeholder group consists of local governmental officials, local agencies of the state and federal government and other interested parties. From this group, discussions ensued regarding the amount of planning that is done in the watershed at the township level. A review sheet will be developed to determine the status of all local governments in the review process. It is known that Monitor Township and Bangor Township have planning commissions in place and site development projects are reviewed on a routine basis. It is also known that site stormwater drainage is reviewed by the Bay County Drain Commissioner for all developments over one acre in size and that are discharging to an established county drain. Furthermore, if a township has an established procedure in place to authorize the BCDC to review development plans for storm water quantity and quality on their behalf, which will also take place during the site review process.

Though the NPDES Phase II MS4 stormwater program, one of the recommendations for compliance with MIG610000 in the permit cycle was an ordinance review related to site development and water quality for runoff events. This will be carried out by the BASWA members for the regulated areas to meet permit requirements.

#### **Mills Township Policy Review Document**

In Mills Township of Midland County a Policy Review Document (PRD) was completed by Fishbeck, Thompson, Carr, & Huber in 2003 as part of a grant from the MDEQ. The results of the policy review identified existing development rules that were generally effective in their efforts toward watershed protection. Additionally, the results recognized other rules which could be modified to improve watershed protection in the township. Assessing the current developmental rules and the identification of the impediments to the use of innovative site design, such as LID, will assist the Township to create and implement better development designs.

The principles presented in this document can be used to develop goals and objectives for the township's Master Plan. Not all of the principles will be applicable to the township and should be considered as guidelines rather than milestones. The use of the principles can be used as a starting point for discussion on issues related to development and will eventually lead to protecting natural and aquatic resources and revising the Master Plan, as necessary.

### **Kawkawlin River Watershed Build Out Analysis**

The Kawkawlin River Watershed was divided into sub-watersheds of about 10 square miles. The existing level of imperviousness was determined for those sub-watersheds, and they were placed into one of the following three categories:

*Protected streams* have watersheds that are under 10% impervious and typically have good water quality, good habitat structure, and diverse biological communities if riparian zones are intact and other stresses are absent. Protected streams typically will be in rural areas that have not seen a great deal of development and may contain significant natural areas.



*Degraded streams* have watersheds that are 10% to 25% impervious and show clear signs of degradation and only fair in-stream biological diversity. Degraded streams have already seen some measure of development.



*Impacted streams* have watersheds that are more than 25% impervious, a highly unstable channel, and poor biological conditions supporting only pollutant-tolerant fish and insects.



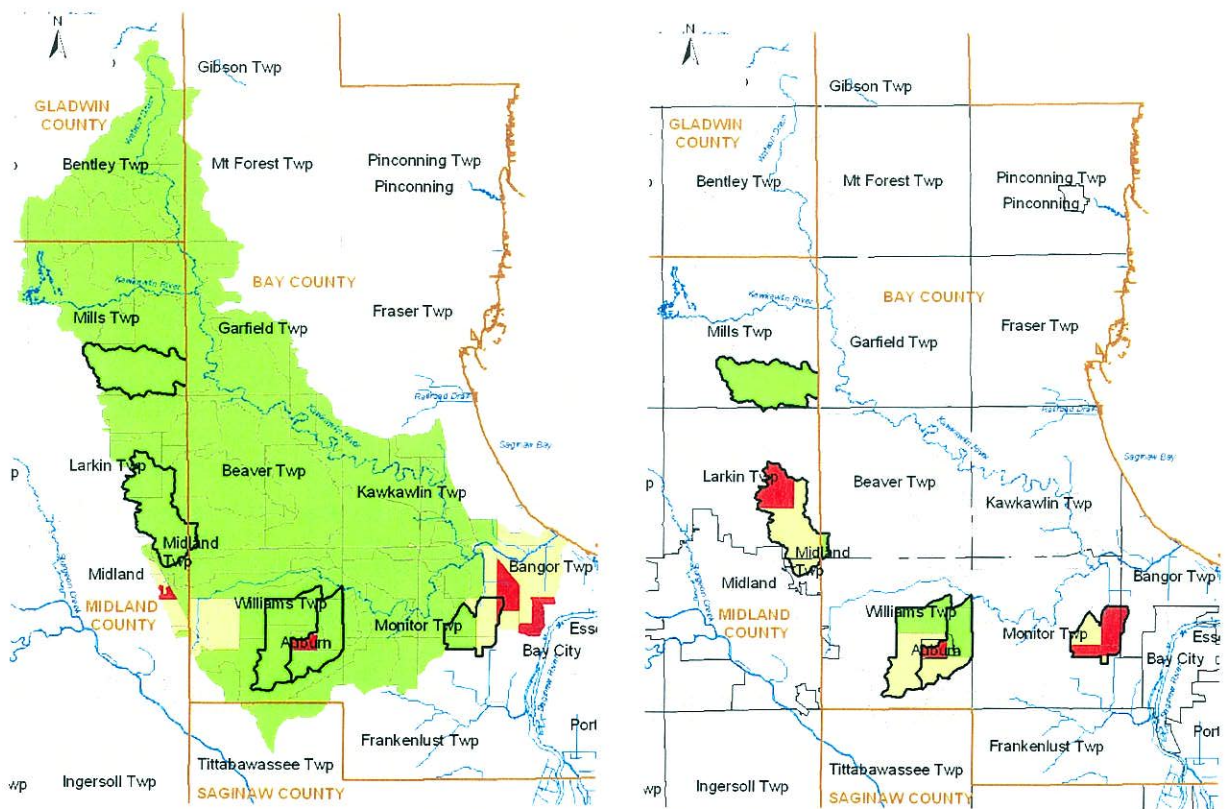
In the Kawkawlin River Watershed, a build-out analysis was used to determine the effects of impending land cover change on five selected sub-watersheds. The analysis used population

density, land cover, and land use intensities to determine changes in impervious surfaces that would occur if communities developed according to future land use plans.

The results of the analysis run on existing conditions identified small areas in the Cities of Midland, Auburn, and Bay City that are currently surpassing impacted threshold levels and may be experiencing adverse water quality effects. The results of the analysis using future land use maps illustrated the effects of development, showing the selected sub-watershed areas within Larkin Township and Monitor Township reaching impacted threshold levels when developed.

Existing Level of Imperviousness

Future Level of Imperviousness



LEGEND

- Watershed < 10% Impervious, protected streams
- Watershed 10%-25% Impervious, degraded streams
- Watershed > 25% Impervious, impacted streams

Many of the sub-watersheds in the Kawkawlin River Watershed are entirely contained within the same political jurisdiction, which helps to establish a clear and direct regulatory authority. This study was conducted on a sub-watershed and census block group scale to provide management units that are meaningful to the planners and the public. These sub-watersheds are also small enough in which to perform monitoring and evaluation to assess the effectiveness and success of a project.

### **Stream Protection Goals**

The classification of the sub-watersheds as *protected*, *degraded*, and *impacted* can assist the communities in developing goals and criteria for development. With these goals and criteria in place, developers and consultants can refer to the sub-watershed and determine applicable site requirements for that particular sub-watershed (Schueler and Holland, 2000 - Article 29).

*Protected sub-watersheds*, with less than 10% impervious cover, should have a goal of maintaining predevelopment hydrology and biodiversity and set limits on site development impervious cover to less than 10%. To protect the streams, wide buffers are recommended through land acquisition or conservation easements.

*Degraded sub-watersheds*, with 10% to 25% impervious cover, should have a goal of limiting degradation of stream habitat and quality through mitigating the impacts of existing and new development through site design, setting an upper limit for the watershed imperviousness, implementing stormwater BMPs, and restoring natural areas. Implementation practices should focus on pollutant removal and channel protection measures.

*Impacted sub-watersheds*, with over 25% impervious cover, should have a goal of minimizing downstream pollutant loads by preventing flooding and creating preservation areas to reduce the effects of flooding. Many planners recommend that these watersheds be target areas for urban infill development.

Creating a plan based on these goals can protect rivers, lakes, and streams from the effects of development in a watershed. This method of classifying and managing urbanizing watersheds

can improve the effectiveness of practices implemented by limiting the amount of new impervious cover that can be created. But further change will require a shift in how runoff is thought about. Planners have begun, and must continue, to get away from the idea that rain is wastewater, something to get rid of, to pass along to our neighbors downstream. Storm water needs to be kept where it falls, and the way to keep it is to get it back into the ground.

Several tools are available that can be used to meet stream protection goals. One of those tools involves working with local land conservancies and the variety of conservation options that are available to preserve existing natural areas within the Kawkawlin River Watershed. A land conservancy is a non-profit 501(c)3 community-based land conservation organization working to protect land. In the Kawkawlin River Watershed, The Little Forks Conservancy, and the Saginaw Basin Land Conservancy work with landowners who voluntarily choose to protect their lands. (source: Fact Sheet: Kawkawlin River Watershed Impervious Surfaces Build-out Analysis, 2004).

#### **Plan Reviews**

A project is planned to collect information on local governments within the watershed. This is part of the development of an overall recreational effort for a County Planning document being developed. If not all areas, then minimally those sub-watersheds that are deemed critical to the recovery of the Kawkawlin River will take place by the end of 2011. The data collected and reviewed will consist of:

- Master Plans
- Recreational Plans
- Zoning Ordinances
- Building Plan Review process and ordinances

A letter will be developed and sent to townships and county commissions and agencies to gather this information as it relates to water quality. Once this regulatory review is completed, a report will be generated with recommendations to the local governing entities on how to amend or implement in their existing plans a format to assist with addressing water quality on a local level.

### Wetland Ordinance or Wetland Protection review

The following table is a review of existing ordinances related specifically to wetland preservation initiatives or practices. This provides the framework for approaching the local government in the watershed's boundaries in order to implement training for planners and to provide awareness for local trustees to develop wetland protection practices. There is an I&E initiative to apply for funds to educate local planning commissions for site development reviews to be trained on the use of the LLWFA developed by the MDEQ for the Kawkawlin Watershed. Training in the use of this tool in the site planning review process is very important for the long range goals of wetland preservation and wetland restoration.

Municipality	Wetland Ordinance	Zoning Ordinance or Master Plan	Site Review Process	Does Ordinance Provide Wetland Protection
<b>BAY COUNTY</b>				
Kawkawlin Twp	No	Yes	Yes	No
Mt. Forest Twp	No	Unknown	Unknown	Unknown
Bangor Charter Twp	No	Yes, Ord.#300	Yes	Yes <sup>6</sup>
Monitor Charter Twp	No	Yes, Ord. # 52 of 2003, no Master Plan	Yes	Yes <sup>4</sup>
Beaver Twp	Unknown	Unknown	Unknown	Unknown
Williams Twp	No	Yes, Ord. #33-5-2010, no Master Plan	Yes	Limited <sup>1</sup>
Garfield Twp	Unknown	Yes, Ord. , Yes Master Plan 2010	Yes	Yes <sup>7</sup>
City of Auburn	No	Yes	Yes	Yes <sup>3</sup>
<b>SAGINAW COUNTY</b>				
Tittabawassee Twp	No	Yes, Ord. , Yes - Master Plan	Yes	No <sup>5</sup>
<b>MIDLAND COUNTY</b>				
Larkin Township		Both, Master Plan (2005) and Zoning Ordinance – No. 116	Yes	Master Plan – Yes <sup>2</sup> Zoning Ordinance - No
Mills Township	No	No	No	No

1) Williams Twp Ordinance #33 references on pg 61- A compost site shall not be located in a wetlands or on a floodplain.

- 2) Larkin Twp Master Plan, 2005, Natural Features Section, pp 20-22: In any environmentally sensitive areas are lands whose destruction or disturbance will affect the life of a community, and where it should be discouraged, ..surface waters bodies are then listed.
- 3) City of Auburn has many aspects of its zoning ordinance that protects wetlands. For example, pg146 under Excavation Site Requirements: “Avoid sites of ecological significance, such as wetlands, or mature forest. If wetlands are to be affected, as State permit may be needed.” Also on page 142 Section 810 under part F. Open Space: “at least 10% of a parcel containing a PUD must be devoted to open space. Forest, wetland or other unique environmental areas may be left in their natural state.” Also, site development requirements dictate that wetlands is a site feature that must be displayed on a development plan, pg 159, 203
- 4) Monitor Twps Ord. #52 on pg 64 states: “Wetlands – Documentation by a qualified wetland specialist shall be required wherever the Township determines there is a potential state or federally regulated wetland with may be impacted by the proposed project.” Pg 65 requires an “Environmental impact – Description of any general impacts expected to wildlife areas, lakes, streams, ponds, and regulated wetlands...”, Pg 65 “If wetlands are to be used as a stormwater basin methods to control fertilizers and filter runoff shall be identified. BCDC must provide a letter of their concerns.” Pg 73 indicates all site plans must show wetlands. Numerous other references are in ordinance.
- 5) No specific wetland reference but there is a Green Belt, floodplain restriction that basically covers wetlands contiguous with the Tittabawassee River floodplain.
- 6) Bangor Charter Twps Ordinance describes wetlands on pg 21 of Article 5 as needing, “Documentation by a qualified wetland specialist shall be required wherever the Township determines there is a potential state or federally regulated wetland with may be impacted by the proposed project.” And Pg 21 requires an “Environmental impact – Description of any general impacts expected to wildlife areas, lakes, streams, ponds, and regulated wetlands...” Pg 22, “If wetlands are to be used as a stormwater basin methods to control fertilizers and filter runoff shall be identified. BCDC must provide a letter of their concerns.” Pg 73 indicates all site plans must show wetlands. Numerous other references are in ordinance referring to preservation of open space and wetlands.
- 7) The Master Plan on page 32, Natural Environments part 1 states: “Implement land use patterns which will direct new growth away from environmentally sensitive areas, such as woodlands, wetlands, steep slopes and areas subject to flooding.

It is recommended that municipalities and counties within the watershed address wetlands in their Master Plans, Zoning Ordinances, Site Review process and in Recreation Plans. A natural features inventory of the townships or county within the GIS framework for a county with access by the Townships during the planning process would be beneficial as a tool. It may also be worthwhile for County GIS to incorporate the LLWFA in their base data and map data for a county’s GIS. This data should be used in the site review process to help minimize impacts on existing wetlands and their function, and for use in any restoration projects.

## **9.2 *Action Items to be Implemented***

The stakeholders and property owners have had numerous meetings during the planning process to discuss priorities and the significant issues of the watershed. The priorities have been identified and essentially have not changed since the start of the planning process in 2008. The following are to be considered high priority and are listed to help focus efforts for the next ten years of implementation projects. The critical sub-watersheds were discussed in Chapter 3 and listed in order of priority as Sub-watershed 7 ranking as the number one priority, followed by Sub-watersheds 6, 3, 2, 5, 8, 4 and 1. See Map Exhibit, 1 in Appendix A

### **Highest Priority Sub-Watersheds**

The highest priority sub-watersheds are located in the most intensively farmed portion of the Kawkawlin Watershed and are impacted by overland sediment and nutrient pollution. These are as follows: Sub-Watershed 7 (aka Culver Creek), Sub-Watershed 6 is next, as is 3, 2, and 5.

### **Moderate Priority Sub-Watershed**

The moderate priority sub-watershed are as follows, Sub-watershed 8 and 4. Sub-watershed 8 is primarily an urbanized area and is under the programs instituted by the BASWA for the watershed. It certainly has the same issues of priorities of E. coli, sediment and nutrients as the other sub-watersheds and is being analyzed as a source of E.coli through the MS4 IDEP program. But the issues for this portion of the watershed are being addressed by an existing program and implementation of action items for MS4s that are not currently being implemented in other areas of the watershed. Sub-watershed 4 is a combination of a rural / urban headwaters region that needs to be protected and efforts at soil erosion and sediment control from both the urban environment and agricultural land uses and associated problems with each of those land uses.

### **Low Priority Sub-Watershed**

The lowest ranking sub, number 1, is located in the northern portion of the Kawkawlin Watershed, which contains much more wetland and forested land. The primary issue of concern in Sub 1 appears to be livestock access and streambank erosion.



### **Protection Priorities for the Sub-Watersheds**

In terms of implementation of programs for protection of resources the priorities are almost reversed. Sub-Watershed 1 has the highest priority for establishing BMPs, procedures, policies and ordinances at the local level to provide for protection of this sub-watershed. Land use ordinances and planning will be implemented for protection of the headwaters for the entire watershed.

Additionally, to assist the remaining sub-watershed in protection of their regions and water sources, Sub-watershed 4 has a high priority for protection, its water sources are in a combined land use area consisting of urban and rural utilization. Implementation of protective planning review efforts will assist greatly in protecting this headwater region for the South Branch of the Kawkawlin River.

Finally, Sub-watershed 8 needs to have support for protection as it is an urbanized area. Local communities in this sub-watershed need to complete an ordinance review and site development review process to determine future efforts to help clean up the surface water contributions of this regions. Furthermore, this area needs to have a completion of all records related on the condition of sanitary sewer systems both on site and regional collection systems in order to plan for the future to assure elimination of this sub-watershed as a contributor to the E.coli problems of the watershed which is the highest prioritized pollutant to be addressed in this plan.

### **Implementation Plan - Summary**

The following is a potential implementation plan based on the top issues as presented to the planners involved in development of this WMP.

- 1) Pathogens and *E.coli* – The focus will be on education and surveys in the Main Branch of the Kawkawlin as it relates to failing on-site treatment systems and efforts on the North and South Branch of the Kawkawlin will focus on hobby farms and livestock access points to the river. **(Lead: BCHD, MSUE)**
  - Development of an I&E program for small and mid size horse management on small hobby farms or parcels in the watershed
  - Continuing implementation and upgrading the monitoring program for the region

- 2) Establishment of an on-site treatment system failure recognition program – focus on Sub-watershed 8 which was recognized as the critical sub-watershed for pathogen issues.

**(Lead: BCHD)**

- Efforts will be made to obtain funding to develop a long-term program in the watershed to upgrade on-site treatment systems, educate owners and upgrade records and the newly established database to help develop an analytical approach to solving the issues related to pathogens and water quality.
  - Development of a database to identify and locate failing on-site treatment systems and map them. Develop a long-term strategy to bring in municipal sanitary systems. Determine funding options for such projects.
  - Bay County Health Department is taking the lead in addressing this issue in the watershed. They have been identifying areas along the Main Branch of the Kawkawlin that have the high potential for failing on-site treatment systems. Further work needs to be completed on the discovery and elimination of this source of pathogens and nutrients in this reach of the Kawkawlin.
  - Establishment of a program to address failing on-site treatment system that can help the homeowner in replacement or repair of the system through financial assistance.
  - Development of an inspection program through a regulatory mechanism and support of adoption of a statewide consistent and comprehensive sanitary code.
- 3) Implement practices which will result in the reduction of sediment loading in the Kawkawlin River. **(Lead: Bay County CD, Saginaw Bay RC&D, BCDC)**
- Implement agricultural BMPs such as vegetated buffer strips, vegetated swales and outlets
  - Use of innovative BMPs for surface drainage V-ditches such as vegetated outlet areas, check dams, stone filters and filter sump outlets
  - Use of check dams and sediment traps in drains at agricultural surface point sources to encourage the deposition of sediment loads as they leave the fields
  - Other BMPs designated as sediment reduction practices
  - Streambank stabilization using “green” techniques
  - Reduction of sedimentation in drains to prevent load from entering river system

- Use of BMPs to prevent sediment from leaving county drains and entering system
  - Addressing drain crossing erosion sites in Sub-watershed 7's upper reach.
  - Use list of sites with flow impediments listed from aerial photos to find and prioritize sites to address. Appendix H
- 4) Implement an I&E program to address sediment issues in the watershed with concentration on farms that are not participating in NRCS or Farm Bureau programs or education. **(Lead: BCDC; MSUE, KRWPOA)**
- Implement an I&E related to farming in areas with flood recurrence incidence of 90% or greater
- 5) Protection of areas of the watershed by establishment of green zones with conservation easements in critical sub-watersheds. **(Lead: Saginaw Bay Land Conservancy, Little Forks Conservancy)**
- 6) Implement monitoring programs related to sedimentation issues. **(Lead: KRWPOA, SVSU)**
- 7) Remove former and abandoned petroleum pipeline crossings in the watershed to prevent potential pollutants in the future as these metal pipes age and corrode and present an increase risk to the watershed. **(Lead: BCDC, KRWPOA)**
- 8) Nutrients are a major issue in the watershed and create problems such as algal blooms, excessive growth rates of aquatic plants and effect water quality. **(Lead: BASWA, KRWPOA)**
- Continue the I&E program on phosphorus in the watershed and its associated issues
  - Implement strategies as recommended in the Saginaw Bay Phosphorus Report of 2009
  - Establish a sediment monitoring program to identify areas of nutrient "hot spots" and target sediment areas for removal from the watershed, especially in areas with anoxic conditions
- 9) Establish a wetland restoration strategy for the watershed using the tools developed by the MDEQ. **(Lead: Saginaw Bay Land Conservancy, Little Forks Conservancy)**
- Encourage townships in the watershed to use the wetland tool developed by the MDEQ in land use and development conditions

- Develop and implement the I&E strategy for wetlands
- 10) Assess altered hydrology in North Branch (Sub-watershed 2) for determination of the oxygen depletion that is an issue. **(Lead: SVSU, Spicer Group)**
- Assess areas of flow diversions that create stagnant water situations that could be the cause of the anoxic conditions in the 8-mile reach of the North Branch that has a low DO TMDL
  - Implement BMPs to increase centralized flows in these areas during low flow conditions and protect the floodplain utilization during high flow periods
  - Use list developed from aerial photos to prioritize action areas for projects.
- Appendix H

- 11) Assess and correct localized recurrent flooding in areas of Sub-watershed 3. **(Lead: BCDC)**

- Determine annual cause for flooding and address the problem

- 12) Implement a review process to assess the land use planning review process for local governments within the watershed. In any development or planning review process, using the LLWFA tool developed by the MDEQ for the Kawkawlin Watershed. Use this information toward development of an I&E strategy for local government. **(Lead: Bay County Planning, BCDC)**

- Update community recreational and master plans to reflect the goals and objectives of the Kawkawlin WMP
- Educate local municipal and county planning commissions on the MDEQ developed Landscape Level Wetland Functional Assessment tool for use during plan reviews or land use changes
- Implement LLWFA in site plan reviews at all planning levels
- Determine if ordinance needs to be developed for wetland function protection

As the implementation of this plan moves forward, it will be necessary over time to reassess this plan and update it with new strategies, objectives and determine if goals of the watershed have changed with time. If portions of the project meet with substantial success, goals may develop lower or higher priorities and this plan must change to meet the newer implementation climate.

### **9.3 Conclusions**

The stakeholders of the watershed have expressed their desire to have a successful implementation of the watershed management plan. They have invested a considerable amount of time, patience and effort to get to the implementation stage of this watershed management plan. This plan will be an implementation tool for those wishing to address problems in the watershed. This plan should be reviewed and updated every three years by the original stakeholder committee. It will be the Bay County Drain Commissioner's or their designee's task to keep moving forward with this project and implement as many aspects of this plan as funding can be found or established.

The overall goal of the plan is to develop a riverine system that the stakeholders are proud of and that the beneficial uses for the watershed are again a resource for the communities of the watershed. The value and health of each watershed around the Greater Saginaw Bay is crucial to the effort to delist the beneficial use impairments of the Saginaw Bay. The effort put into the restoration of the Kawkawlin River and Watershed will assist in the delisting process that has begun over the past two years in the Bay. As the watershed and Bay improve in water quality so will the economic and recreational quality of life in the Kawkawlin Watershed. The goals of the watershed are as presented in the first meetings:

- Protect and improve the warmwater fisheries and conditions for the river system
- Protect and improve habitat and conditions for other aquatic life and wildlife along the river
- Determine causes and correction of sediment loading in the river
- Identify and protect quality natural features including forested areas, floodplains, wetlands, wetland functions, riparian buffers and contiguous greenway buffers
- Provide for flood management
- Provide and improve water recreation opportunities and public access to the river
- Preserve the rural character (farmland and open spaces) of the watershed
- Maintain and/or increase the aesthetics of the water resources

By remaining faithful to these goals and developing objectives to reach to accomplish them, this plan will be a good tool to assist those willing to use it. Overall, the vision of the stakeholders

and property owners is to have an aesthetically pleasing river to pursue recreational opportunities in a clean and healthy environment.