

# Organization of the Plan

This plan defines an approach that is to be taken to protect ecological, hydrological, and cultural resources of the subwatershed. It presents all of the data, analyses, public inputs, and conclusions used in developing the approach as well as components of the approach itself, including goals and objectives, actions to achieve the goals and objectives, plan evaluation and revision, and plan sustainability.

## 1. Introduction

**Geographic Scope**  
The Lake St. Clair Direct Drainage Subwatershed (DSW) shown in Figure 1.1, is a hydrologically based, Michigan Department of Environmental Quality (MDEQ) approved portion of the Lake St. Clair Regional Sub-basin (RSB) located in Southeast Michigan. The DSW, along with the Clinton River Watershed and the St. Clair River Watershed, comprise the 1/3 portion of the Lake St. Clair Regional Sub-basin.

**Plan Applicability**  
The abstract group comprises the public sector to permit Lake St. Clair, its shore waters, fish, wildlife, and habitat, recreational opportunities, and its role as an economic engine for the area. The goals, objectives, and actions in this plan apply only to the land comprising the DSW, which is just a small percentage of the total area that drains to Lake St. Clair. However, these goals, objectives, and actions are consistent with the public's expectations and the Lake St. Clair Comprehensive Management Plan.

**Quoteable Quotation**  
"The highest problem we have cannot be solved at the same level of thinking we were at when they were created."  
- Albert Einstein

**Introduction**  
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**Drainage Areas**  
The subwatershed covers approximately 41 square miles in general boundary was based on the topographically-derived United States Geological Survey (USGS) 7.5 Minute Contour Interval (CIR) (USGS) classification system (see additional discussion later in chapter). The final boundary and the three drainage areas that comprise it were drawn considering man-altered drainage patterns. A map showing the drainage areas is presented in Figure 1.1.

## 1. Introduction

This chapter introduces the reader to the subwatershed, describes its significance as portion of the Lake St. Clair Regional Sub-basin, and defines the drainage units, or catchments, that comprise the subwatershed and the municipal entities represented in it.

The chapter goes on to introduce the reader to some background information such as watershed science, water pollution control and its history, and other relevant plans that are supported by this watershed management plan (WMP).

Finally, the chapter discusses the partners that were involved in development of this WMP.

## 2. Inventory of the Subwatershed

**Introduction**  
This chapter provides pertinent background information about the natural environment, population demographics, and infrastructure in the subwatershed. This information is important to the adaptive management scheme of watershed planning. It allows the reader to understand the subwatershed and will be used in analyses presented in later chapters of this plan and to support implementation of this plan in the future.

**The Natural Environment**  
The natural environment generally describes all living and non-living resources that define a given place. In this section of the chapter, a discussion of the natural environment is presented that includes an introduction to many of these features.

**Climate**  
Climate is defined as the meteorological conditions, including temperature, precipitation, and wind, which prevail in a region. The climate of the Lake St. Clair Direct Drainage Subwatershed (DSW) is a temperate one that shows variation between summer and winter.

**Temperature**  
The temperature in southeast Michigan is seasonal, with a difference of 49°F between the highest and lowest average monthly temperature. Table 2.1 presents the low, average, and high average monthly temperatures. The record high temperature in the region is 89°F on July 30, 1993. The record low is 27°F on February 10, 1942 (MDEQ, 2005).

In comparing the data from the last 10 years to the entire set (1971-2005), an average warming or cooling trend in temperature was identified.

**Table 2-1. Climatic data for the subwatershed.**

Month	Avg. Monthly Temperature (°F)		Avg. Monthly Precipitation (inches)		Average Wind Speed (mph)	Peak Wind Speed (mph)
	Low	High	Low	High		
January	21.0	27.0	3.00	4.00	10	35
February	21.0	27.0	3.00	4.00	10	35
March	21.0	27.0	3.00	4.00	10	35
April	21.0	27.0	3.00	4.00	10	35
May	21.0	27.0	3.00	4.00	10	35
June	21.0	27.0	3.00	4.00	10	35
July	21.0	27.0	3.00	4.00	10	35
August	21.0	27.0	3.00	4.00	10	35
September	21.0	27.0	3.00	4.00	10	35
October	21.0	27.0	3.00	4.00	10	35
November	21.0	27.0	3.00	4.00	10	35
December	21.0	27.0	3.00	4.00	10	35
Annual	21.0	27.0	3.00	4.00	10	35

Inches rounded. \* As a general rule, divide the overall count by six to convert to equivalent inches of rainfall. \*\* See footnote in section on annual precipitation in the subwatershed on the following page.

Source: NOAA, NCEP, 1998; NCEP, 2002; MDEQ, 2005.

## 2. Inventory of the Subwatershed

This chapter walks the reader through the natural environment of the subwatershed, including coverage of each category in the watershed. A brief introduction to the hydrological processes, vegetation, habitat and wildlife provides the reader with a greater understanding of the valuable natural features.

The chapter goes on with details of the community profiles, population trends and statistics. Past, present and future land use data educates the reader about trends in development and infrastructure.

The chapter concludes with existing infrastructure and potential sources of pollution discharges.

## 3. Documented Subwatershed Conditions

**Introduction**  
The previous chapter discussed the natural environment, the human population, and the infrastructure in the subwatershed. This chapter discusses how human and their infrastructure impact the natural environment by:

- Documenting, in general terms, what human activities impact the environment and what the effects are;
- Defining the indicators used to assess the health of the environment;
- Analyzing the results of those indicators to assess the health of the environment;
- Documenting human and current aspects of water quality;
- Presenting the results of those preliminary assessments used to assess the health of the environment;
- Documenting the current environmental protection practices implemented by the community; and
- Presenting the requirements to contribute based on the findings of the Michigan Department of Environmental Quality (MDEQ).

**Environmental Impacts of Human Activity**  
There are numerous ways in which people and infrastructure influence the natural environment. This section provides a general discussion of those impacts. More detailed information can be found later in the chapter.

**Infrastructure Impacts**  
The construction of roads, bridges, and other infrastructure influence the natural environment. This section provides a general discussion of those impacts. More detailed information can be found later in the chapter.

**Rooftops, Roads, and Parking Lots - Alterations to St. Clair Shores**  
The construction of roads, bridges, and other infrastructure influence the natural environment. This section provides a general discussion of those impacts. More detailed information can be found later in the chapter.

## 3. Documented Subwatershed Conditions

This chapter begins with a discussion of the impacts on the environment caused by human activity and government defined water quality standards and indicators. An in-depth discussion of qualitative water chemistry conditions, biological conditions and hydrologic conditions supplies the reader with an overview of historic and current subwatershed conditions.

The chapter continues by providing the reader with results from road-stream crossing surveys, unified stream assessments and an analysis of impervious cover and the effect on stream quality.

There are several subwatershed protection practices already in place and are summarized for the reader. The chapter is closed out with a list of the existing waterbody impairments.

A vast amount of the information in this chapter provides a baseline for future chapters in this WMP and future planning efforts.

## 4. Community Outreach and Public Involvement

Chapter 4 begins with a discussion of the public involvement processes that were used to obtain input into the content of this WMP and comments on a draft version. This discussion includes details of the participants in the various mechanisms and lists the specific feedback received.

The chapter goes on to discuss the education that was done for benefit of the municipal officials and concludes with a detailing of the public education efforts that were conducted during development of and will continue after submittal of the WMP.



## 5. Problem Assessment and Stressor Summary

This chapter distills the information contained in Chapters 2, 3, and 4 into a number of significant stressors that impact water quality. It begins by listing the data sources, including a determination of the status of designated uses and a listing of general potential stressors.

The chapter then discusses the methodology employed to analyze the significant stressors and provides a section for each stressor that discusses topics associated with each: sources, impacts and impairment, indicators, water quality standards, load estimates and reduction goals, critical areas, monitoring progress, and improvement ideas.

The chapter finishes with a brief discussion of other known and suspected stressors in the subwatershed.



## 6. Goals and Objectives

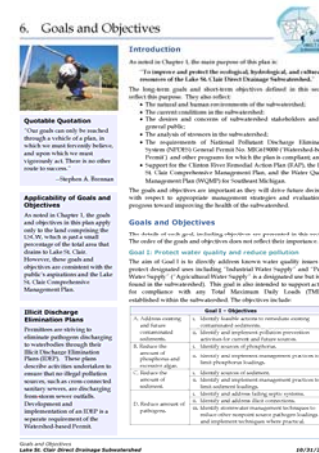
This chapter defines the goals and objectives of the plan.

First, the sources of information utilized in developing the goals and objectives (the information presented in the previous chapters) are detailed.

Then the goals are listed along with each of the objectives associated with them.

The chapter goes on to list the general decision-making principles that were used in distilling the goals and objectives.

The chapter ends with a reflection on how the goals of this WMP fit into goals of other WMPs that reflect larger management areas including the Clinton River Watershed, Southeast Michigan, and the entire Lake St. Clair Regional Sub-basin.

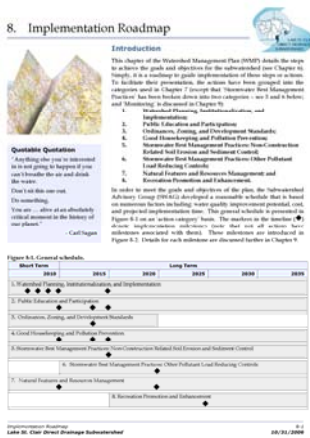




## 7. Watershed Protection

This chapter presents many tools and resources that are available to achieve the goals and objectives presented in the previous chapter. The tools are discussed in general groupings, in the following order: Watershed Planning, Institutionalization, and Implementation; Public Education and Participation; Ordinances, Zoning, and Development Standards; Good Housekeeping and Pollution Prevention; Storm Water Best Management Practices; Natural Features and Resources Management; Recreation Promotion and Enhancement; and Monitoring.

This chapter ends by introducing a methodology that will allow the implementing agencies to help select the most appropriate tools and resources.



## 8. Implementation Roadmap

This chapter details the roadmap that the implementing agencies will follow, utilizing the actions and resources presented in Chapter 7, to achieve the goals and objectives of the WMP (see Chapter 6). It details the steps that will be taken and includes: a textual description of each action, a table linking the actions to the appropriate goals and objectives, the lead implementing agency, a projected schedule, estimates of cost and time, financial and technical assistance needed, the authority related to each action, and Watershed-based Permit (NPDES Phase II) details such as SWPPI inclusion and level of commitment.

The chapter concludes with a discussion of how the actions will be implemented to achieve the loading reductions calculated and presented in Chapter 5.



## 9. Evaluation and Revision

Chapter 9 describes the iterative process of watershed planning and how evaluation and revision are an essential component of this.

The chapter also details potential evaluation mechanisms (or measures of success) and what options are available to assess them.

The bulk of the chapter lays out the evaluation and revision plan (ERP) for this WMP, including: measures of activity completion, measures of usage, and measures of change; monitoring protocols and existing monitoring programs; and the specific actions involved in the plan with details such as lead implementing agency, timeline/schedule, and estimates of cost and time.

The chapter goes on to list out all of the interim milestones used to track implementation of the WMP actions and concludes with a table of specific evaluation questions that may be used to gauge success in achieving each of the goals and objectives of this WMP.

## 10. Plan Institutionalization

Chapter 10 presents some organizational structures and legal relationships that the subwatershed entities will consider to ensure that the actions of the WMP are implemented and the goals and objectives of the WMP are met.

Finally, the chapter defines a number of potential funding mechanisms that may be utilized when implementing the actions defined in the WMP.

## Appendices

The appendices include products generated during the WMP-development process (e.g. fact sheets) contact lists, and other information not essential to the text of the WMP but important for those requiring additional information on selected topics.



### WMP as a Planning Document

This WMP is a planning document only and it is fully expected that ongoing modifications will be necessary to reflect actual resources obtained and available for its implementation. The Permittee's individual SWPPI should be referenced to more clearly indicate commitments to programs and activities especially for those in multiple watersheds where the definitions of similar actions/activities is widely variable and the logistics of implementing so many variable activities are complex.

### A Note about Photos

Photos with no reference have public domain usage rights.

### WMP Contact Info:

The following individuals may be contacted with questions about this WMP:

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