

I. THE WATERSHED AND STUDY AREA

A. General Characteristics

1. The Rifle River watershed is located in Ogemaw and Arenac counties, draining an area of approximately 385 square miles. The river originates in northeastern Ogemaw County and flows for approximately 60 miles in a southeasterly direction to its confluence with Lake Huron.
2. The study area includes the entire mainstream as well as the numerous smaller tributaries which make up the system.

B. Physiography and Soils

The topography of the Rifle River area is varied. The northern portion of the watershed has rolling hills that rise above 1,300 feet in elevation. Below the City of Omer near Lake Huron, the river enters a broad flat area that includes an extensive system of drains.

Like many other watersheds in Michigan, the effects of glaciation are evident. Rolling hilly moraines predominate in the Ogemaw County area of the watershed and the old Lake Huron lake bed characteristics the Arenac County portion. To the west of the watershed is a major glacial moraine, the West Branch moraine, and in the east is the Gladwin moraine. The entire mainstream flows through outwash plain. Much of the watershed is underlain with claypan. The resulting rapid water runoff makes the Rifle one of lower Michigan's least stable streams. Clay ledges are seen extensively throughout the Rifle River system.

Soils can be grouped into associations based on texture and drainage characteristics. The soil associations throughout the watershed along with their various characteristics can be seen on the map on the preceding page, along with the accompanying table.

C. Water Quality

Considering the intensity of agricultural uses and practices in the watershed, water quality of the Rifle River system is surprisingly high and fairly stable.

The water quality of the Rifle near its mouth is shown graphically on page 5. The river is shown as averaging 79.2 on the Water Quality Index. The index is rated as follows:

70 – 100	- high water quality
50 – 70	- moderate water quality
50 and lower	- poor water quality

For comparison purposes, the Rifle River is rated with several other streams throughout Michigan, again, using the Water Quality Index. This comparison is shown on page 6.

At the present time, there are two proposals for improving sewage treatment facilities in the river basin. It has been recommended that the wastewater treatment plant in West Branch be expanded from secondary to tertiary treatment, and it also has been proposed to increase the secondary treatment capacity in Rose City. Expansion of these facilities will further improve water quality in the basin.

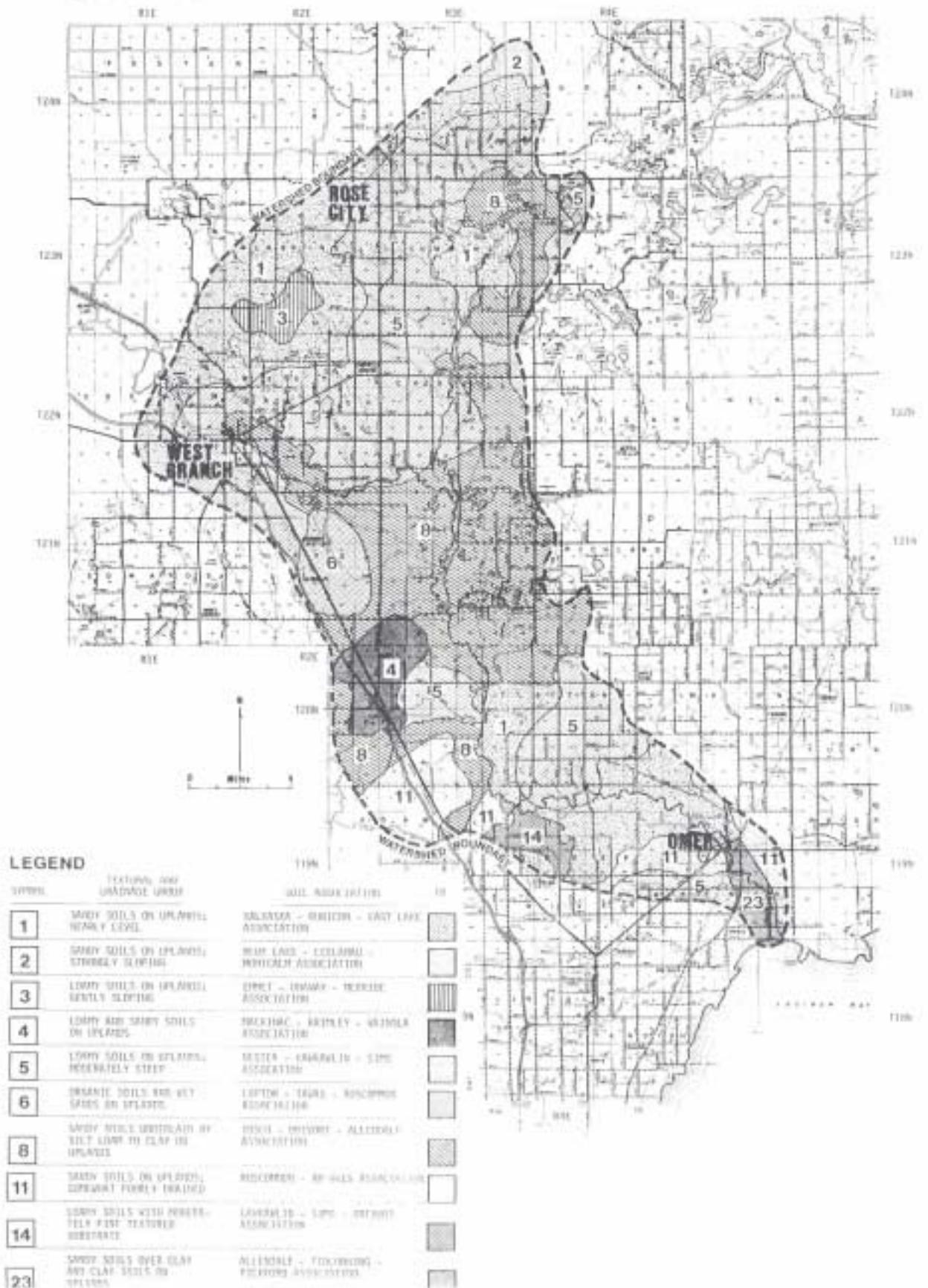
The water quality of the Rifle River system is protected for:

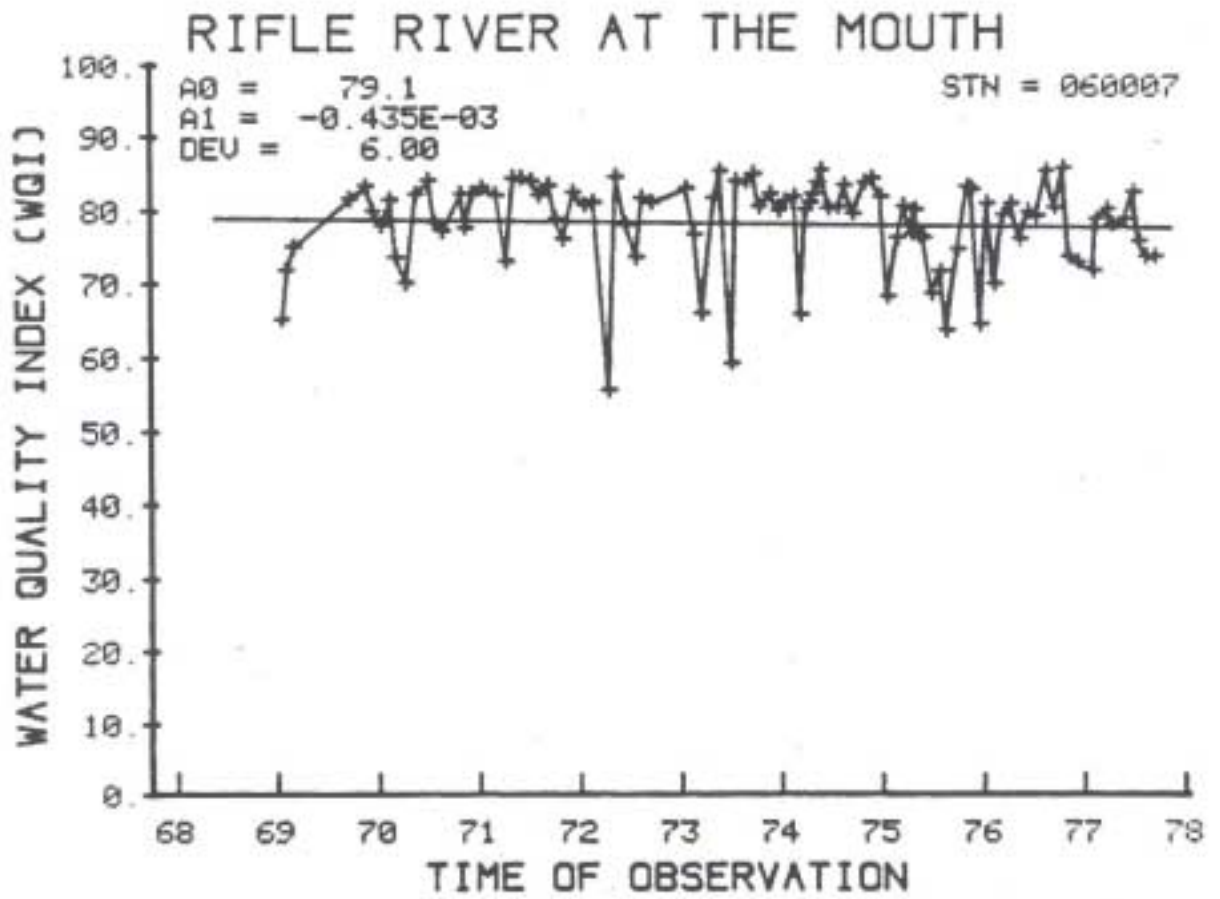
1. total body contact – recreation
2. agriculture
3. industrial water supply'
4. navigation
5. public water supply
6. cold water fish

One problem that does exist, which can be seen dramatically after a rain, is erosion. The graph on page eight shows suspended solids in the mainstream near the mouth of the Rifle from the years 1964 to 1978.

Causes for this erosion are varied. Much of it is natural. The clay pan which underlies much of the watershed results in rapid water runoff. Another cause of the erosion problem is livestock management practices, particularly on several of the tributary streams. And there are many high exposed sandbanks, particularly in the lower portions of the stream.

Soil Associations

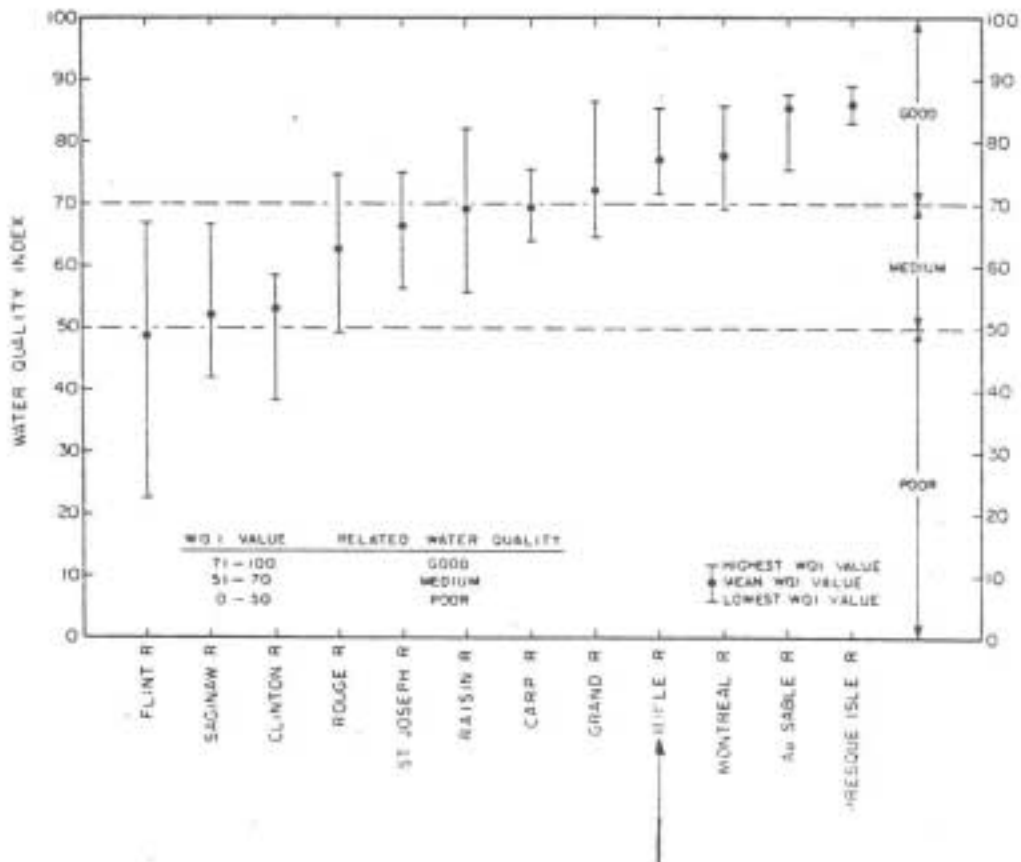


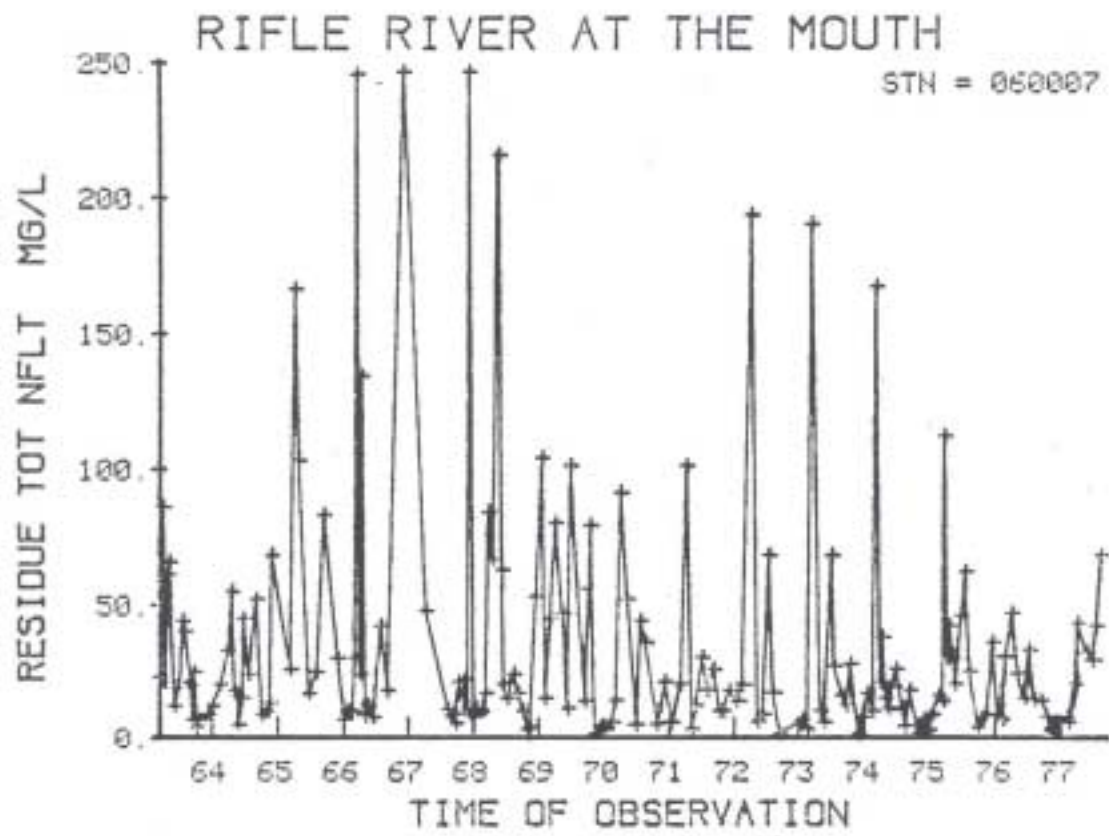


Rifle River Water Quality Data
1974-75 vs. 1977-78

<u>Parameter & Reporting Units</u>	<u>1977-78</u>	<u>1974-75</u>
Dissolved Oxygen mg/l	10.49	11.17
5 day BOD mg/l	2.19	2.69
Turbidity	9.93	10.87
Dissolved Solids mg/l	288.0	264.0
Chloride mg/l	17.77	16.75
Total Phosphorus mg/l	.035	.051
Soluble Orthophosphate mg/l	.007	.018
Nitrite and Nitrate mg/l	.171	.201
Amonia Nitrogen mg/l	.022	.031
Hardness mg/l	211.0	204.0
Total Coliform count/100 ml	3050.0	1607.0
Fecal Coliform count/100 ml	223.0	85.0

A COMPARISON OF THE RIFLE RIVER W.Q.U. WITH SELECTED RIVERS





D. Stream Characteristics

There are approximately 200 miles of streams in the Rifle River system. The mainstream is approximately 60 miles long and there are about 140 miles of tributaries.

The following list shows the length of the Rifle River and its tributaries:

Mainstream	From the outfall of Mallard Pond to Saginaw Bay, 58.2 miles
Skunk Creek	From George Lake to confluence with the Rifle River, 5.2 miles
Vaughn Creek	From its source to its confluence with Gamble Creek, 3.1 miles
Gamble Creek	From its source to Mallard Pond, 2.7 miles
Oyster Creek	From Oyster Road to Mallard Pond, 4 miles
Mayhue Creek	From its source to the confluence with Oyster Creek, 3 miles
Andrews Creek	From Reasoner Road to Mayhue Creek, 2.4 miles
Houghton Creek	From its source to its confluence with the Rifle, 7.8 miles
Wilkins Creek	From its source to Houghton Creek, 6.5 miles
Prior Creek	From its source to its confluence with the Rifle, 6.5 miles
Ammond Creek	From its source to Prior Creek, 2.8 miles
Little Klacking Creek	From its source to its confluence with Clacking Creek, 2.8 miles
Shepard Creek	From Bedelyn Road to its confluence with the Rifle, 1.2 miles
Dedrich Creek	From its source in Dedrich Swamp to its confluence with the Rifle, 2.2 miles
West Branch	From the outfall of Flowage Lake to its confluence with the Rifle, 10.1 miles
Campbell Creek	From its source to its confluence with the West Branch, 4.8 miles
Peach Creek	From its source at Peach Lake to its confluence with Campbell Creek, 4.2 miles
Rifle Creek	From the outfall of Rifle Lake to Flowage Lake, 2.4 miles
Crapo Creek	From its source at Engle Road to Rifle Lake, 2.5 miles
Rapid Creek	From its source (spring) to Crapo Creek, .4 miles
Woods Creek	From pond below Heintz Lake to its confluence with Rifle Creek, 5.9 miles
Ogemaw Creek	From its source to Flowage Pond, 6.3 miles
Smith Creek	From its source to Ogemaw Creek, 1.1 miles
Eddy Creek	Mainstream, 1 mile

North Eddy Creek	From its source to its confluence with South Eddy Creek, 3.6 miles
South Eddy Creek	From its source to its confluence with North Eddy Creek, 5 miles
Silver Creek	From the outfall of Burch Lake to its confluence with the Rifle, 5.4 miles
Mansfield Creek	From its source to its confluence with the Rifle, 5.8 miles
Feeding Ground Creek	From Feeding Ground Lake to its confluence with Mansfield Creek, 1.6 miles
Mud Creek	From its source to the Feeding Ground Creek, 1.1 miles
Mills Creek	From its source to the confluence with Feeding Ground Creek, .4 miles
Wells Creek	From Forest Lake to its confluence with the Rifle, 2.3 miles
Townline Creek	From its source to the confluence with the Rifle, 2 miles
Saveline Creek	A drain, 2.4 miles
Unnamed creeks	8.6 miles.

The Rifle River system originates in the northeastern part of Ogemaw County. At one time, the source of the stream was Devoe Lake. Back in the early 1950's, however, a diversion was dredged around the lake. This was done to allow the cold water streams that once flowed into Devoe Lake to flow directly into the Rifle, thus avoiding the warming effect of the lake.

The upper ten miles of the Rifle River flows through the Rifle River Recreation Area and the Ogemaw State Forest. This upper portion is fairly slow moving and easy to negotiate by canoe.

Below the Village of Selkirk, the gradient of the river steepens. The topography of the area becomes more varied as well, with hills and river ridges becoming more pronounced. Below the confluence of the West Branch and Lake Ogemaw (an artificially created lake), the valley becomes more pronounced. Here 75 to 100 foot embankments have been carved out by the river. Also, it is here the first of the rapids on the Rifle River are found. Much of this portion of the river has sand and gravel stream bottom offering good spawning areas. South of Skidway Lake, the river is much the same, offering good trout fishing. And the normally fast water offers a challenge to the canoeists as well. Thus, this area is extremely popular with canoeists and fishermen.

A notable exception to the moderately fast moving water is a stretch of river near the Ogemaw-Arenac County line. Here the water is slow and fairly sluggish.

In the vicinity of the old M-70 bridge, the generally southerly direction of the river turns eastward toward the City of Omer.

The bottom type between old M-70 and Lake Huron is predominately sand. In this portion of the river, the river valley is still quite pronounced and the river still flows moderately fast.

Below Omer, the character of the river changes dramatically. The bottom type is all sand. The speed of the river slows considerably and the upland portion becomes a broad flat plain.

Where the Rifle enters Lake Huron is called Wigwam Bay. This area is being recommended for acquisition by the Coastal Program Unit of Land and Water Management Division of the Department of Environmental Quality for the purpose of developing an estuarine sanctuary. The area provides an excellent fish and wildlife habitat. The proposed Wigwam Bay estuarine sanctuary would provide an excellent Great Lakes research area, should this area be acquired.

E. Vegetation

Vegetation along a river serves many functions, including stabilizing the soil and preventing erosion, absorbing nutrients, providing shade for cooling the water, and providing a visual barrier giving privacy to the property owner and maintaining the aesthetics along the river corridor.

The major vegetative types in the basin are aspen, jackpine, scrub oak, northern hardwoods, red and white pine plantations and mixed swampland species, particularly in the northern portion of the water shed. Most of the forest stands are in second and third growth, with over 60 percent of the watershed forested.

F. Climate

The climate of the Rifle is modified continental. That portion of the Rifle basin near Lake Huron does not have the abrupt variations in temperature typical of the continental climate. These variations are reduced, particularly when the winds are from the west.

In the upper portion of the Rifle basin, farther away from Lake Huron, the effects of the Great Lakes are less evident. For example, near Standish the average growing season (frost free-days) is 127 days. At West Branch, farther away from Lake Huron, the growing season is about 135 days.

Throughout the watershed, summers are warm and pleasant. Temperatures reach 100°F only about once in ten years, and an average of only seven days each summer have temperatures of 90° F or higher. Nights are cool and comfortable. The average annual temperature is about 43°F. The coldest month is January, with an average temperature about 19°F; the warmest month is July, with an average temperature about 67°F.

Precipitation averages about 29 inches annually. More than 50 percent of the precipitation received falls during the five-month period of May through September.

G. Ownership

The Rifle River basin covers an area of approximately 385 square miles. A small part of the Huron National Forest is located in the extreme northern portion of the watershed. Also, in the northern portion of the watershed is the over 4,000-acre Rifle River Recreation Area managed by the Department of Natural Resources.

Public lands on the Rifle River mainstream are generally limited to the Rifle River Recreation Area and the Au Sable State Forest. However, small state holdings are found scattered along the length of the mainstream.

The following table gives a breakdown of public lands and their ownership in Ogemaw and Arenac counties.

	All Land	National Forest	% National Forest	State Forest	State Park	Water Access Site	% DNR Lands	Local Public Recreation Lands	Total Public Recreation Lands
ARENAC	235,136	0		28,008	200	110	12	21	28,339
OGEMAW	365,696	19,543	5.5	71,277	4,329	529	20.8	75	96,153

H. Accessibility

The Rifle River is readily accessible to Michigan’s southeast population centers. Direct access to the watershed is easily accomplished by I-75 which skirts in on the west. Cutting the watershed in two is the east-west route of M-55. M-33 roughly parallels much of the Rifle on the west and U.S. 23 crosses the river at Omer.

In all, there are nine road bridge crossings from the Rifle River Recreation Area to the City of Omer.

