

6. GILMORE CREEK*

Gilmore Creek is an integral portion of the Lake Winona watershed and it has profoundly affected the lake in the past, mainly as a contributor of soil which washed in from mismanaged, eroded farm land. As noted previously, agricultural soil filled the lake twice in the past, resulting in two massive dredging projects. Today, because of soil conservation, changes in land use, and the construction of Boller Lake as a silt basin, Gilmore Creek frequently provides a substantial flow of clean water into the lake.

From its sources in spring-fed watercress beds, the creek flows 2.6 miles through Gilmore Valley and the St. Mary's College Campus before it terminates in Boller Lake. Much of the creek's water is "lost" in Boller Lake due to evaporation and seepage. There are times, however, throughout the year when water is allowed to pass out of Boller Lake and reach Lake Winona via County Ditch No. 3 (Fig. 3-12). Water level is regulated by a stop-log dam built into the causeway which divides the lake into two sections. This stop-log dam is located at the north end of the causeway and a bridge is located at the south end. Water from Gilmore Creek must therefore pass westward through the bridge and then eastward through the dam before it is ultimately passed on to Lake Winona.

During periods of high temperatures, fish in Boller Lake probably seek refuge in the cooler water of Gilmore Creek. A dam, located on the St. Mary's College campus, is the only barrier to upstream movement by fish.

The depth of Gilmore Creek averages 7 inches and the maximum depth is 5 feet. Water flow on August 1, 1973, varied from 2.3 CFS at the headwaters to 4.8 CFS below the St. Mary's College campus. Water flow on November 5, 1973, varied from 2.8 CFS in the headwaters area to 5.8 CFS below the St. Mary's College campus.

Bottom type of the stream is principally sand (57%), followed by gravel (28%), rubble (8%), ledgerock (6%), boulder (1%) and a trace of silt. In the length of the stream, pools make up 26% of the area; riffles make up 32% and bars 42%. There are five small tributaries entering into Gilmore Creek at various locations. Spring areas are common throughout the stream length. Up to 90% of the stream can be shaded. The amount of shade has increased from 10% in 1946 to 25% in 1959 to 90% in 1973. Most of the bank cover is weeds, willow, and elm.

Use of the land in Gilmore Valley is as follows. In 1975, 49% of the land was wooded, 22% was St. Mary's College campus, 9% is pasture, 8% is wooded pasture, 6% is hay and 6% of the land is used for row crops.

*This account is an adaptation of Minnesota DNR, Division of Fish and Wildlife Stream Survey Report FW-1-R-20 of Gilmore Creek in Winona County.

In general, soil erosion is light. Lack of agriculture, especially row crops, is the main reason. Pastured areas are the main areas of bank erosion.

Flooding in this area is very well controlled. Previous to a Soil Conservation Service watershed control project in the 1940's, flooding was serious. Stream banks were badly eroded and the channel was spread across the valley bottom. At its maximum flow on July 21, 1951, Gilmore Creek carried 5,360 CFS (Upper Mississippi River Comprehensive Basin Study, 1970). Retention dams on many of the gullies have reduced much of the flooding. The watershed control project also included spreading dirt over much of the lowland adjacent to the stream. This made land suitable for agricultural use and stabilized the stream banks.

A stream improvement project was conducted from 1947 to 1949. However, according to a 1959 survey, the structures were no longer present or could not be recognized. Some willows on stream banks may have been planted during this period.

Gilmore Creek is a clear, cold creek where agricultural pollution appears minimal. Temperatures in the creek average about 14°C. (58°F.) during the summer. Housing developments in the valley may become a source of pollution in the future.

Water buttercup and water cress are the most common aquatic plants present in the stream and provide considerable fingerling trout habitat. Amphipods (scuds) and caddisfly larvae are common invertebrates in the stream.

Gilmore Creek upstream to the St. Mary's dam was electro-shocked in 1973, and the following fish were present: brown trout, central mudminnow, northern pike, carp, bigmouth shiner, fathead minnow, blacknose dace, longnose dace, creek chub, white sucker, bigmouth buffalo, brook stickleback, green sunfish, hybrid sunfish, largemouth bass, and johnny darter. In 1975, the following species were found below the dam: brown trout, northern pike, fathead minnow, blacknose dace, creek chub, and white sucker.

Prior to chemical treatment in 1973 as part of the Lake Winona reclamation project, Gilmore Creek below the St. Mary's dam had trout and total fish standing crops of 72 and 138 lbs./acre, respectively, white suckers being the most prominent in the latter group. At this time, 215 adult brown trout (127.2 pounds total weight) and approximately 1000 fingerling brown trout (37.9 pounds total weight) were rescued. These trout were distributed to Trout Run Creek (Winona County), Gribben Creek and Camp Creek (both in Fillmore County). The streams received 382 (50.36 lbs.), 270 (72.42 lbs.), and 562 (42.24 lbs.) brown trout, respectively. The untreated portion contained an average of 79 lbs./acre of trout and 23 lbs./acre of other fish. In April of 1975 the treated portion of the stream supported 25 lbs./acre of trout. Other species previously listed provided little poundage at this time. All fish present at this date moved upstream from the treated and restocked Lake Winona or downstream from the untreated area. Two separate areas in the untreated stream section contained 249 and 158 lbs./acre of fish in April, 1975.

Growth of brown trout in Gilmore Creek appears slow for southeastern Minnesota streams. The following table compares the age and growth of trout in Gilmore Creek to two other area creeks, Pickwick and East Burns (1973-1975 data).

<u>Age (yrs.)</u>	<u>Gilmore</u>	<u>Pickwick</u>	<u>East Burns</u>
$\frac{1}{2}$	5.0"	6.0"	6.0"; 6.5"
$1\frac{1}{2}$	7.5"; 8.0"	9.5"	9.5"; 10.0"
$2\frac{1}{2}$	10.0"	11.0"	11.0"; 11.0"
$3\frac{1}{2}$	13.5"	12.5"	12.5"; 13.0"

Presently, Gilmore Creek supports one of the largest wild brown trout populations in southeastern Minnesota. Apparently this population has been present for many years. The stream was first stocked with trout fry in 1910. Early attempts at brook trout stockings were not successful. Stocking yearling brown trout started in 1940. From 1946 to 1954, 14,326 brown trout yearlings were stocked. The annual quota until 1959 was 1,700 brown trout yearlings. The 1959 survey of the stream decreased the quota to 123 yearlings; from 1962-1974 about 150 were stocked annually, except in 1969 when an additional 750 were stocked. Brown trout fingerlings also have been stocked in 1960 (17,976) and 1969 (9,079). Prior to rotenone treatment of Gilmore Creek as part of the Lake Winona reclamation project, 215 adults and 1,000 fingerlings were removed and stocked in other streams.

Conclusion:

Unstable stream conditions from frequent flooding have limited trout populations in southeastern Minnesota for many years. A Soil Conservation Service watershed control project initiated in Gilmore Valley in the 1940's had positive effects. Results have been dramatic; erosion is light, flooding is minimal, and stream banks are stable.

A self-sustaining brown trout population has responded accordingly; from a standing crop of 10 lbs./acre in 1946 to at least 100 lbs./acre in 1973 (and possible 200 lbs./acre in 1975). Presently Gilmore Creek supports one of the largest wild brown trout populations in southeastern Minnesota.