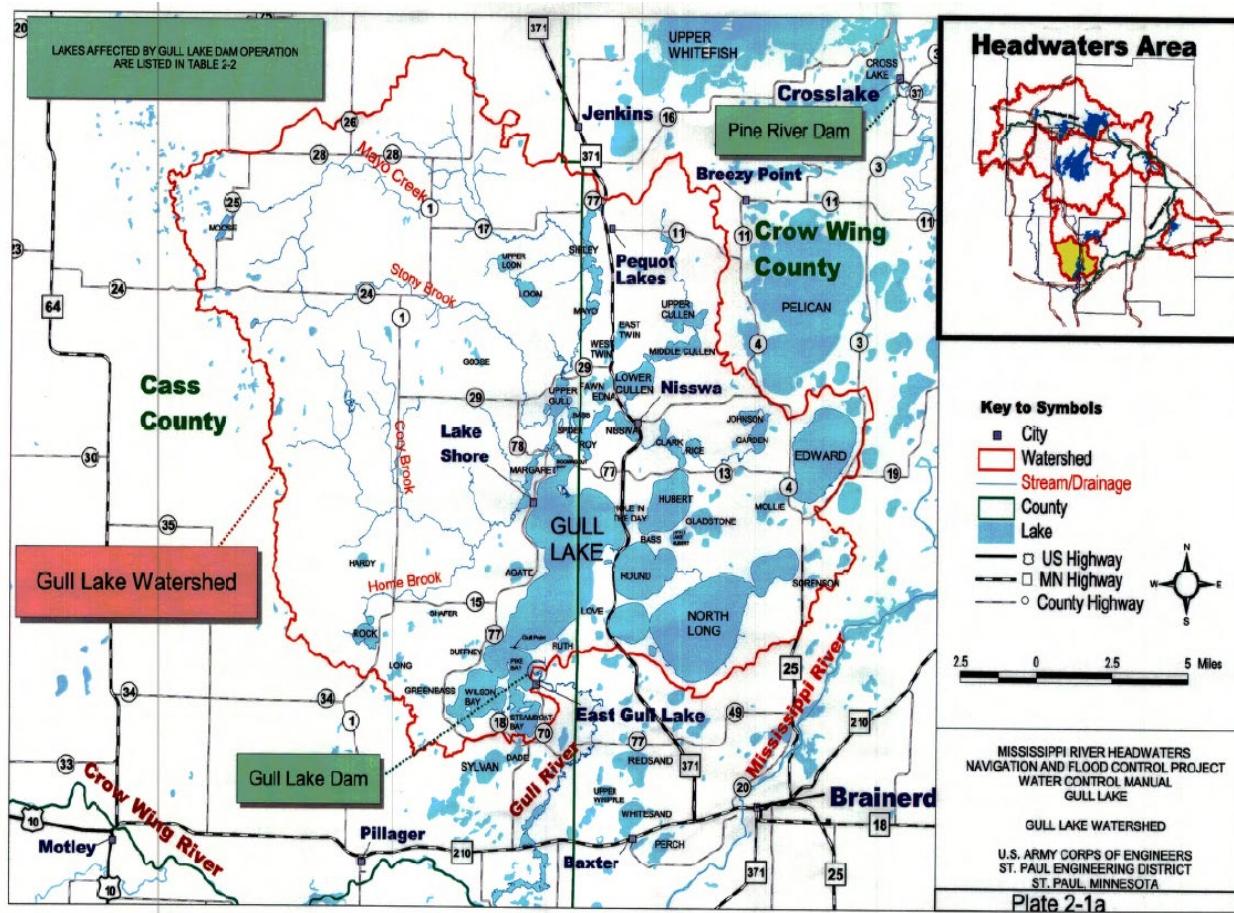


Reservoir Summary: Gull Lake Project

Project General Objectives: The reservoir is regulated primarily for recreation, flood control and fish and wildlife. The Water Control Plan supports recreation by maintaining, when possible, stable reservoir levels within a specified elevation band during the summer. Flood control objectives are met by a fall/winter drawdown schedule and a designated flood control storage pool, which provides storage capacity for spring and summer flood events. Water levels are managed, when conditions permit, for various fish and wildlife concerns. The lowflow plan manages water resources both upstream and downstream of the dam during critical periods.

Basin Map



Pertinent Data Sheet

Location Gull Lake Dam is located at the outlet of Gull Lake on the Gull River, 11 miles upstream of its confluence with the Crow Wing River. This confluence is 16 miles upstream of its confluence of the Crow Wing and Mississippi River. The confluence with the Mississippi River is at river mile 990.4 above the Ohio River. The dam is in Cass County, 8 miles northwest of Brainerd, Minnesota. It is at Lat. $46^{\circ} 24' 40''$, Long. $94^{\circ} 21' 12''$, in Section 20, T134 N, R29 W.

Type of Project Dam and Reservoir

Project Owner U.S. Government, Department of the Army

Operating Agency U.S. Army Corps of Engineers, St. Paul District

Regulating Agency U.S. Army Corps of Engineers, St. Paul District.

Closure Dam Dam discharge records begin 1 September 1911, concrete structure complete 1912. Some records for the logging dam at the outlet of Gull Lake are available back to September 1895.

Gull Lake	Elevation in Feet	Area in Acres	Cumulative Storage in Acre-Feet
Maximum Operating Limit	1194.75	13,100	71,000
Normal Summer Pool Level	1194.00	13,000	59,000
Minimum Operating Limit	1192.75	12,750	45,000
Sill	1188.75	---	0

Maximum Pool Elevation (Historic) 1195.09 ft., 22 July 1952 event

See Paragraph 4-06.e

Real Estate Taking Line for Easement Elevation 1194.75 feet
(See Chapter 2)

Reservoir Length at Top of Summer Pool Level 8.4 miles
Shoreline Length at Top Summer Pool Level 35.6 miles

HYDROLOGY

Drainage Area 287 square miles
One Inch of Runoff Equals 15,307 acre-feet

OUTLET STRUCTURE

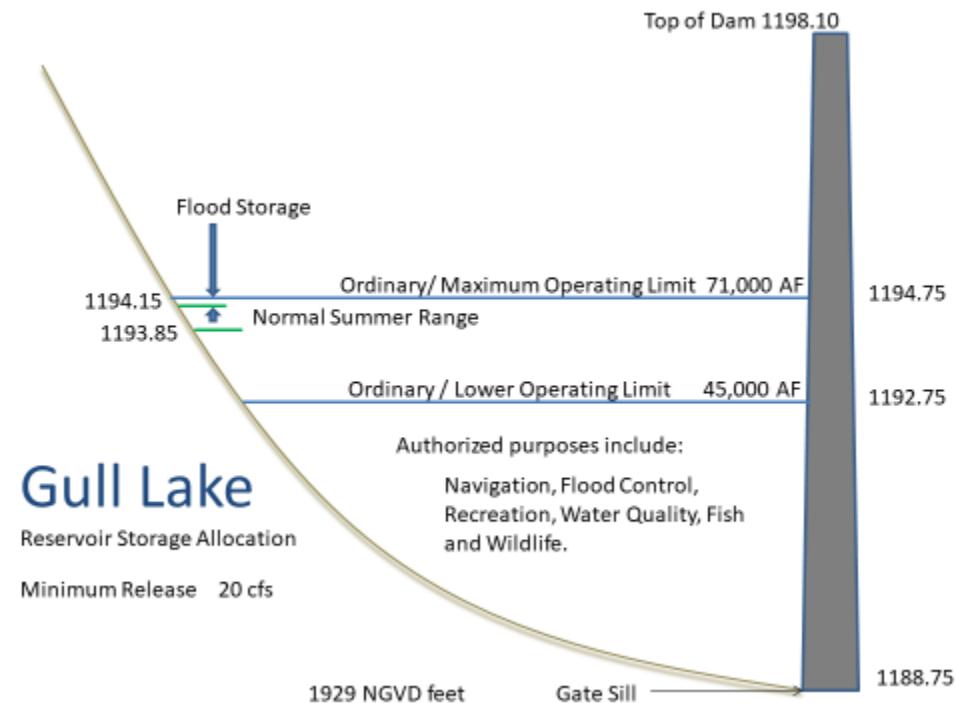
Type Gated multi-bay concrete control structure

Structure Length Between Abutments	with concrete apron
Number/Size/Type of Gates	68.9 feet
	5 - 5.0 ft. wide x 4.0 ft. high slide gates
Entrance Invert Elevation	1 - 11.0 ft. wide stoplog bay (log sluice)
Top of Roadway Elevation (top of the curb)	(The 5.0 ft. wide fishway is blocked off.)
	1188.75 feet
	1199.75 feet

Basin Characteristics

Gull Lake Dam is located on the Gull River 11 miles upstream of its confluence with the Crow Wing River. The confluence of the Crow Wing and the Mississippi Rivers (at river mile 990.4 above the Ohio River) is approximately 16 river miles downstream of the dam and 11.5 river miles downstream from Brainerd, Minnesota. Gull Lake Reservoir watershed is slow and significantly attenuated as a result of the relatively flat topography and the presence of many lakes and wetlands. Gull Lake Dam controls the runoff from a 287 square mile area, of which 54 percent is dry land, 23 percent is water, and 23 percent is wetlands. In general, the land not covered by wetlands is forested. The average overland slope is 58.08 feet per mile.

Pool Allocation



Overall Plan for Water Control

Gull Lake reservoir is regulated between a minimum elevation of 1192.75 feet and a maximum elevation of 1194.75 feet. If possible, the reservoir level should be within its summer range/band of 1193.85 feet to 1194.15 feet by the first day of the fishing season (approx. mid-May). The winter drawdown of the reservoir for spring flood control begins in the fall. The ordinary (normal) spring drawdown elevation is 1192.75 feet, which is the lower operating limit of the reservoir.

The Water Control Manuals (WCM) are in the process of being updated with the findings of the 2009 Reservoir Operating Plan Evaluation (ROPE) Study. The table below summarizes reservoir operation for both the WCM and ROPE parameters.

TABLE S-9
GULL LAKE OPERATING RULES

	CURRENT	FINAL
Summer Band (elev. - feet)	1193.75-1194.0	1193.85-1194.15
Summer Target (elev. - feet)	1193.87	1194.0 (May 1 – Sep 1)
Band Width (feet)	0.25	0.3
Normal Drawdown (elev. - feet)	1192.75	1193.0
Maximum Drawdown (elev. - feet)	1192.75	1192.75
Rate of Release (change/day)	20-30%	20-30%
Spring Pulse	NA	250 cfs
Minimum Flow Requirements	$\geq(1192.75): 20 \text{ cfs}$	$\geq(1192.75): 20 \text{ cfs}$
	$\leq(1192.75): 10 \text{ cfs}$	$\leq(1192.75): 10 \text{ cfs}$

TABLE S-10
Gull Late Summer Elevations

	Current (feet)	Final (feet)	Difference (inches)
August 1	1193.87	1194.0	+1.56
September 1	1193.87	1194.0	+1.56
October 1	1193.87	1193.87	0

Note: The difference was calculated from the target in the current operating plan (1193.87), rather than the top of the band (1194).