

Option 1

The first option controls the level of Round Lake at the current location of the dam and allows Osprey Lake to fluctuate based on the natural overflow conditions. This would require the following modifications to the Round Lake drainage system:

- Lowering the culverts at Highway NN to the natural streambed elevation and increasing the size of the total opening. A total of four 48-inch culverts would need to be installed at elevation 72.0 (two more than the existing crossing).
- Widening the excavated channel downstream of the Little Round Lake Dam and lowering the bottom of the channel. The channel would need to be excavated to a width of about 40 feet for a distance of about 450 feet, with the channel bottom sloping from elevation 74.2 at the dam to elevation 74.0 at the entrance to the Osprey Creek wetland.
- Widening the Little Round Lake Dam to a total width of about 40 feet and lowering the sill of the dam to elevation 74.2.

Option 2

The second option controls the normal water level of Osprey Lake at about elevation 76.2 (assuming a normal baseflow of about 10 cubic feet per second) and limits the increase in water level between Osprey Lake and Round Lake. This option would require the following modifications to the Round Lake drainage system:

- Lowering the culverts at Highway NN to the natural streambed elevation and increasing the size of the total opening. A total of four 48-inch culverts would need to be installed at elevation 72.0 (two more than the existing crossing).
- Constructing a weir control structure in Osprey Creek upstream of or at Highway NN with an overflow at elevation 76.0. This structure would need to have a width of about 120 feet (the approximate channel width 1,200 feet upstream of the Highway NN road crossing). The weir could be designed with a low flow section for fish passage and/or drawdown section for maintenance.
- Widening the excavated channel downstream of the Little Round Lake Dam and lowering the bottom of the channel. The channel would need to be excavated to a width of about 60 feet for a distance of about 450 feet, with the channel bottom sloping from elevation 74.2 at the dam to elevation 74.0 at the entrance to the Osprey Creek wetland.
- Widening the Little Round Lake Dam to a total width of about 50 feet and lowering the sill of the dam to elevation 74.2.

the flood levels for the remainder of the drainage system, restricting the outflows from Round Lake because of the high tailwater.

C. Flood Flow Capacity and Floodplain Elevation Impact of Highway NN Crossing

The hydrologic and hydraulic models were used to analyze the potential reduction in the flood level and the changes to the outflows with modifications to the Highway NN crossing. The hydraulics model was modified to reflect 4 – 48-inch CMP culverts at elevation 72 (about 2 feet lower than the 2 existing 48-inch CMP culverts). Figure 10 is a profile of the reach that was analyzed using the revised crossing data at County Highway NN, showing the resulting flood levels for a range of flows. This revised capacity curve was input into the HEC-1 model to determine the resulting 100-year flood level and outflows for the four precipitation events analyzed above.

The following table compares the existing flood levels to those using the revised culverts.

Precipitation Event	Round Lake Peak Flood Level (adjusted local datum)		Osprey Lake Peak Flood Level (adjusted local datum)	
	Existing Conditions	Revised Culvert Conditions	Existing Conditions	Revised Culvert Conditions
Type II 24-Hour	78.6	78.6	77.5	75.2
4-day Rainfall	78.8	78.8	77.7	75.5
10-day Rainfall	79.1	79.1	78.2	75.7
10-day Snowmelt	79.2	79.2	78.3	75.6

The analysis indicates that increasing the capacity of the culverts at County Highway NN would lower the water level of Osprey Creek upstream of County Highway NN and of Osprey Lake from 2-3 feet (depending on the storm event). The width of the floodplain in this reach would decrease from about 15 - 100 feet with installation of larger and lower culverts at County Highway NN. Floodplain widths are listed in the table below:

Cross Section Station	Existing Floodplain Width (feet)	Revised Floodplain Width (feet)	Reduction in Floodplain Width (feet)
8950	343	248	95
8050	2083	2054	29
6750	2083	2054	29
6250	583	554	29
4595	583	554	29
4335	305	286	19
4035	583	554	29

Cross Section Station	Existing Floodplain Width (feet)	Revised Floodplain Width (feet)	Reduction in Floodplain Width (feet)
2725	583	554	29
2225	154	118	36
1450	154	117	37
1440	154	100	54
1150	124	79	45
1090	124	27	97
1040	116	80	36

Increasing the capacity of the County Highway NN culverts would only have a minor impact on the water levels of Round Lake without further modifications to the drainage system between Round Lake and Osprey Lake. However, the 100-year flood level on Round Lake cannot be lowered to the state designated levels without increasing the capacity of the County Highway NN culverts. Increasing the capacity of the Little Round Lake Dam and the drainage channel to Osprey Lake without increasing the capacity of the County Highway NN culverts could lower the 100-year flood levels on Round Lake by about 1 foot.

The longer duration storm events continue to produce the higher peak flood levels; the 4-day rainfall event produces the peak flood level for Osprey Lake.

D. Documentation

The following documentation of the hydrologic and hydraulic analyses is attached to this report as appendices:

- Appendix A. HEC-RAS model of the Lake Placid Diversion channel
- Appendix B. HEC-RAS model of the channel from Round Lake through Osprey Creek
- Appendix C. HEC-1 models of Round Lake and Osprey Lake
- Appendix D. Comparison of Results with Gage Data
- Appendix E. Background Information