

Source:

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5. Lake Dredging

5.1 Overview of Dredging Needs

5.1.1 Initial Dredging

Under the Lake Alternative, a significant initial dredging project will be performed to regain much of the flood storage lost over the half-century since construction of the Capitol Dam in 1951. Initial dredging is assumed to take place in the North and Middle Basins (a relatively small amount will be dredged from the South Basin; this is included with the Middle Basin for this discussion). The lake will be dredged to a uniform elevation of -7.2 feet NGVD29, which is the sill elevation of the Capitol Dam. This corresponds to a lake depth of about 13 feet during the summer months, based on the summer lake level of +6.22 feet NGVD29, consistent with the Managed Lake Alternative defined by the CLAMP Technical Work Group (CLAMP Technical Work Group 2007).

The optimal lake depth for biological purposes is a minimum of 15 feet. However, there are concerns that lowering the lake bottom below the sill elevation of the dam could increase saltwater intrusion into the lake. Additionally, dredging to a lower elevation would not increase the flood storage, since the lake cannot be drawn down below the sill elevation – the additional volume would be dead storage. Consequently, this report assumes the less costly alternative of dredging to -7.2 feet NGVD28.

No dredging will occur within 100 feet of the shoreline (taken at +10 feet NGVD29). The full yellow line in Figure 18 illustrates the outline of the proposed dredging. A relatively large part of the North Basin already is currently at an elevation below -7.2 feet NGVD, so the dredge area and volume are much smaller here compared to the Middle Basin. Table 1 gives the dredge areas and volumes for the Lake Alternative.

Table 1. Dredge areas and volumes for the lake dredging

Basin	Area (acres)	Volume (cy)
North Basin – dredge to a distance 100-feet from the shoreline	48.8	158,000
Middle Basin – dredge to a distance 100-feet from the shoreline	94.9	717,000
Total Dredge Area and Volume	143.7	875,000

5.1.2 Maintenance Dredging

The quantity of material deposited in the lake by the Deschutes River has averaged 35,000 cubic yards annually (USGS 2006). This is assumed the average quantity for future maintenance dredging.

Part of the maintenance dredging could be accomplished by constructing and maintaining sediment traps. Sediment traps are formed by excavating or dredging a depression in the bottom of a waterway. Sediment-laden runoff encounters the larger cross-sectional area created by the depression, the flow velocity decreases, and the sediment settles into the sediment trap.

In order to be effective in the long term, sediment traps require regular surveys and maintenance dredging. In the past, sediment traps have been excavated in both the South and Middle Basins of Capitol Lake. However, maintenance dredging of these traps has been haphazard at best. This report assumes that sediment traps in Capitol Lake will be re-excavated in the same general vicinity as those constructed in 1979 (General Administration 1996); see the red broken line in Figure 18. Based on a dredge depth of 4-feet below the existing lake bed (South Basin) or the