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Corporate Plan Output: Waterways and Wetlands (Vol 2 Ch 9.3)	

The purpose of this report is to advise the Board of the current state of Bottle Lake and suggesting options for its possible restoration.

### HISTORY

Copies of the photos shown below are tabled for the committee's perusal, also tabled is a plan showing the location and extent of the Lake.



*Painting by John Gibb 1871*



*Painting by William Gibb 1890*

Bottle Lake was recorded by the early surveyors and shown on the Black maps of the time as a large teardrop shape with its outfall stream flowing north along the foot of sand hills to the Styx River. The lake had a plentiful supply of wildlife and was used for eeling by the Maori. The old outfall Stream is known as Shepards Stream and is currently pumped into the Styx.

Shortly after the arrival of the first European settlers the area was included in a grazing lease called the "Sandhills" with disastrous results. The area was so heavily grazed that the denuded sand hills began migrating inland towards Marshland Road. In 1860 the lease was stopped and divided into smaller holdings. It is likely that the outfall to Shepards stream was choked by the advancing dunes. The Reeses bought the land after this and were part of the planting effort that stabilised the dunes. The painting by John Gibb (1871) shows exotic species used to arrest the dunes east of the lake. Another painting by William Gibb (1890) shows a collection of exotic, deciduous trees around the edge of the lake.

A legal survey of Reese's land in 1888 shows a new outfall drain from the lake cut through land to the north to an old horseshoe bend of the Styx River. At this stage the lake level appears to remain unchanged. From about the 1900s the lake, described as "a Canterbury landmark with its swans and treelined carriage track surrounding it" appears to have been neglected. Ongoing drainage for agriculture and reclamation of the adjacent swamps allowed encroachment of willows into parts of the lakebed.

Army engineers occupied the site during World War II and during this time they cut a deep tank trap across the lake and along the line of the outfall drain. Excavated material from this tank trap was spread over the lakebed. This and natural accretion has raised the lakebed a metre or more. Before they left the site at the end of the war they were obliged to restore the land to its former condition or satisfy the owner with some form of compensation. A 600mm pipe was laid with its intake at the north end of the lake and flowing north towards the Styx. The invert of the pipe was laid about 500mm lower than the original water level.

From that time on the Windsor Golf Club began lowering lake levels by pumping. This series of events has helped the establishment of exotic tree growth in the bed of the lake.

In 1974 Mr Muschamp of Lower Styx Road complained about excessive flooding of his paddocks resulting from the continuous flow of water from Bottle Lake. As a result the Windsor Golf Club applied to the North Canterbury Catchment Board for a water right to discharge excess stormwater runoff from the lake catchment to the Styx River. The water right records that the size of the lake at this time was 9.3ha. The purpose of the water right was to formalise the piping, which was deemed to allow an increase in discharge from the lake. In conjunction with drain deepening downstream of Muschamp land a water right was granted in 1978 that allowed the Windsor Golf Club to discharge up to 300l/s when lake levels were above the invert of the outfall pipe. The water right recognised that pumping below the level of the discharge pipe was detrimental to the lake. Throughout most of the last 20 years the lake level has been pumped down a metre below the pipe invert, the pumping lasting three hours each day. The water right was not complied with during this time and apparently no attempts at enforcement were made.

In 1996 Council staff noticed that the club had begun filling part of the lakebed at the south-west end. The Regional Council, City Council and Golf Club discussed the filling and the Regional Council asked the Golf Club to apply for a resource consent for the filling. The tone of the letter indicated that this would formalise the filling that had already occurred. The resource consent that was granted did not address the filling but allowed the Club to maintain the drain to the pumps and to construct a new pond near the clubhouse. The City Council was not asked to comment on this resource consent.

#### **CURRENT SITUATION**

It appears that most of the lakebed is now level with the invert of the pipe outfall and this has allowed the lakebed to become choked with exotic trees, which have thrived on the lowered lake levels. Without pumping the lakebed would become waterlogged and revert to its original swampy base.

If an effort to restore the lakebed is decided on, recourse could be made to the provisions of the Resource Management Act, Clause 6a and 13. These clauses (*see Appendix A, page 33*) could be used to require the club to remove the fill it placed in the lake bed, providing the area is deemed to be a lake. However the Regional Council has advised by letter that the lake (9.3ha in area when the water right was granted) is no longer a lake and is now a wetland. It states that unless the wetland is covered by a rule in the Regional or District Plan little or nothing can be done to prevent further filling. No mention of Bottle Lake is made in either the Proposed City plan or the Regional Plan, but it was referred to in the Natural Areas Survey (Meurk, Ward & O'Connor 1993) with B rating, site 9.02. Without recognition as a wetland or lake in the city or regional plan filling at the rate of 2000m<sup>3</sup> per 10 year period is allowed as of right and this will result in the eventual loss of the lake.

The Regional Council's "Canterbury Regional Policy Statement" makes many references to the need for protection and restoration of wetlands (*see Appendix B, page 34*).

### **OPTIONS FOR RESTORATION**

In order to restore the lake to its original condition of 9.3ha of open waterbody the lakebed would need to be excavated by an amount varying between 0.5m to 1.5m. This large volume of material (93,000m<sup>3</sup>) would need to be disposed of nearby (approximate cost \$465,000). In addition the removal of the trees in the lake bed would be a considerable operation (\$60,000). The old lake outlet, protected by a drain reserve, could be restored in its former channel to Shepards Stream. This option would allow a wide overflow that would prevent flooding of the catchment.

Another option may be the excavation of half the lake allowing views of open water while leaving some of the exotic trees to act as a nursery for indigenous planting along parts of the lake edge. The avenue of oaks planted by the Reeses, over 120 years ago, along the lake edge could be retained. The golfing fairway along the east side could be used to deposit fill from the lake to raise it and provide a dryer surface. Retaining the existing piped outfall will inevitably result in flooding of the lake catchment when its capacity is exceeded.

A third option would be to partially restore the lake (as above) and reinstate the old lake outlet to Shepards Stream.

### **DISCUSSION**

If the Council were to restore the lake, public access to the lake would be desirable. It seems likely that the Council may have to offer an inducement to the Golf Club to allow access and restoration. This may be achieved with the goodwill of the club, if it has a genuine interest in restoration, and the Council were to cover the cost of the work.

The Club is concerned that it will lose the new practice green area created by their filling of the lakebed. An offer of an alternative area for the practice green would certainly assist them to consider change.

Land owned by the Wakelins is available to the north of Windsor. Their block of land, astride the old lake outlet reserve, is 22ha in extent, and connects to Lower Styx Road via a 10m wide drive. Murray and Trevor Wakelin are quite prepared to sell the land for market rates. (They thought this to be \$980,000, but GV is \$235,000.) Windsor has offered to purchase part of their land, but this offer was declined as being insufficient. Purchase and lease back to Windsor of part or all of this land would enable the Council to exchange the area of the Lake, restore the outlet and achieve a link with Lower Styx Rd and Styx River.

The restoration of the Lake would provide historical, cultural, landscape, ecological, recreational and possibly drainage values. A water feature of this nature would complement the adjacent Bottle Lake Forest Park and be an asset for Christchurch City.

A new visitors centre is to be built near the Park entrance soon. This could be relocated later to provide a view of the restored lake the Park is named after.

- Recommendations:**
1. That Bottle Lake be recorded as a natural feature in the City Plan to be protected from further degradation.
  2. That the Community board support the setting up of a working party comprising the key stakeholders(eg the Owners, Windsor Golf Club, Local residents association, Water Services and Parks units, etc) to explore opportunities for the restoration and protection of Bottle Lake.
  3. That the Community Board nominate at least one member to be part of this working party.

**Chairperson's**

**Recommendation:** That the aforementioned recommendations be adopted, and that the Chairperson and Carole Evans be nominated as the Board's representatives to the Working Party.