

Replacement text for 5/26 35 Scudder meeting minutes on Stewart Creek”

Stewarts Creek. After observing the status and functioning of the Ocean Ave. culvert, Brad communicated with Larry Oliver (U.S. Army Corps of Engineers), Griffin Beaudoin (Barnstable Town Engineer) and the Woods Hole (WH) Group (Consultants) to gain additional understanding of how the system functions and might be improved. There are three reports relevant to the culvert: an Operations and Maintenance Manual (O&M) (2014, USACE), a Stewart’s Creek Year 5 Monitoring Report (2019, WH Group), and a Stewart’s Creek Planning Document (2021, WH Group). Copies are available and might be added to the website.

With the new culvert, installed in 2013, the tidal range in Stewart’s Creek is improved over operation with the old culvert, but the tide range is less than predicted pre-construction; high tide is close to prediction, but the low tide is not as low as predicted. In the 2019 report, the WH Group suggested this reduction might be due to a grate on the upstream side of the culvert which blocks about 30% of the opening. This grate (13 vertical bars) was added as a safety precaution to ensure people are not swept into the culvert on an outgoing tide. There is also a protective grate on the downstream side of the culvert, but this one is set several feet away from the opening, is wider than the culvert opening, and is thus less restrictive to the flow. Both upstream and downstream grates occasionally accumulate floating debris (wrack – grasses, sticks, etc.) which also partially blocks the flow at times. The upstream opening, and thus outflow, is likely more affected by wrack because of the grate-limited cross-sectional area.

In addition to the grates on both sides of the culvert, the downstream side has a gate that can be raised or lowered to partially or fully block the flow into Stewart’s Creek. The gate is operated by the Barnstable Department of Public Works following protocol in the USACE O&M manual. The gate is operated to limit storm surges to the water level reached with the old culvert to prevent flooding of existing homes. Brad observed the gate in a partially down position during normal weather conditions, restricting flow, and questioned why it was not in the fully up position. It turned out that a website providing data for determining gate position had been unavailable, and the default in the USACE manual was to leave the gate in the partially down position. USACE updated the protocol and the gate is now in the fully up position.

Brad thinks that any increase in tidal range would increase flushing and be beneficial to Stewart’s Creek. Replacing the restrictive upstream grate might result in a significant improvement in flow and seems a relatively simple and likely inexpensive modification to the current culvert. He discussed with Oliver the possibility of replacing the upstream grate with one set back from the opening. Apparently, the Town and USACE are now seeking funding for this project.

One of the goals of the new culvert (with increased tidal range) was to eliminate the Phragmites by inundating it with salt water. In an exchange with the WH Group, Brad was told that the invasive Phragmites have been growing for so long that the colony has built up the marsh and the base of the Phragmites is now above the level of high tide in Lewis Bay, so even if the tide in

Stewart's Creek matched that level, salt water would not inundate the Phragmites. Phragmites also has an extensive tuber/root system, so that plants near shore that receive fresh ground water can nourish plants some distance into the marsh. The 2021 WH Group report lays out possible strategies for Phragmites removal and restoration of natural vegetation, including mechanical methods (mowing, ditching, burning, marsh plain excavation), chemical methods (herbicide, deemed unacceptable by the Town during report writing and not recommended), and saltmarsh planting. The expense of excavation depends on disposal options for the removed material; rough estimates are about \$1 million if disposed on site, perhaps \$4 million if disposed offsite.

The Army Corps of Engineers and Town are currently exploring funding to replace the upstream grate, which would likely improve water flow and flushing of Stewart's Creek. They are also considering the options laid out in the WH Group 2021 report for the next steps in restoring Stewart's Creek, including Phragmites removal.

The 35 Scudder Group should continue to monitor and support efforts to improve the Stewart's Creek ecosystem.