

## THE PROBLEM WITH CATTAIL IN BERMUDA

By David Wingate

The Common cattail, *Typha angustifolia*, is a tall strap-like leaved plant which grows submergent in *freshwater* marshes and ponds. It provides great cover and some food value for a variety of waterfowl ranging from gallinules and rails to bitterns. Although most Bermudians are probably unaware of this, it also has food value for humans in many parts of the world. Dried leaves can also be woven for chair covers and mats, or used for waterproof stuffing for bedding, life jackets etc.

The botanist N. L. Britton (Flora of Bermuda, 1918) reported it as “common in marshes, often forming large patches,” and he considered it native. It took me nearly a lifetime, however, to realize that it was not universally distributed and was absent from one or two freshwater marshes, especially in the western sector of Bermuda. A case in point was Warwick pond where I first noticed it as a small colony at the northern end of the pond in 1950 and gradually, over the decades watched it spread around the entire perimeter of the pond in an ever- widening belt which ultimately blocked the view of the pond from all sides about 2010.

Lack of universal distribution in suitable habitat - especially if the species concerned is still spreading into that habitat - is a typical indication that it is *recently* introduced. Is it possible that Britton was wrong, or is some other factor involved? It is highly unlikely that Britton was wrong, because cattail seed, dispersed from the brown catkins, is minute and borne on downy parachutes which can disperse in the wind for hundreds of miles, enabling it to reach Bermuda readily downwind from the American continent. So, what else might hinder its colonization and slow its spread on Bermuda? I think I found one explanatory cause when I oversaw the excavation of an extension to Somerset Long Bay East pond (known as Pitman’s pond) for Buy Back Bermuda in 2006, following its purchase from Joffre Pitman in 2004. Up until 2004 he had allowed a farmer to graze cows on the property, and they kept the pond edge bare and muddy – good for sandpipers.

At that time, the nearest colony of cattail was in Warwick West marsh at Tivoli South. (The former Southampton cattail marsh was already filled completely as a garbage dumpsite). Nevertheless, within the next half year the first seedlings of cattail began to appear and once they were well established with sturdy rhizomes they could hold their own amidst the other recovering marsh edge vegetation.

It seems obvious now that the pre-existing dominance of other marsh plants had an inhibiting effect, preventing its establishment. Even where cows have continued to graze on pond edges, leaving the shoreline muddy, they prevent cattail from establishing so long as they continue grazing. It was only in that short period of time after the removal of the cows in 2004 and before other pond edge plants could establish, that the cattail was able to colonize the bare, water saturated ground from wind dispersed seed. Fortunately, by this time I was aware of the problems caused by excessive growth of cattail (see below) and noticed what was happening in time to nip it in the bud. But it required a major contract with an excavating firm in June 2010 to remove what had already established in five or six years.

Cattail probably failed to colonize our freshwater marshes in pre-colonial time, then, because there were no large grazing animals – indeed there were no mammals at all - and all the *freshwater* marshes were filled with peat to above water table level and very densely vegetated with peat marsh “hammock” dominated by cedar, palmetto, wax-myrtle, doc-bush and saw grass, (much as the relatively undisturbed Paget marsh remains today).

It was only after human settlement that periodic grazing of marsh edges by cattle made cattail colonization possible by exposing the muddy substrate. Other human-induced activities which removed pre-existing vegetative cover, enabling cattail to colonise were:

1. The marsh ditching program initiated by the Health Dept. to maintain open water for the introduced mosquito larvae-eating top minnow, *Gambusia holbrookii*. – now abandoned.
2. Filling of the marshes with garbage and rubble as a convenient means of garbage disposal.

Both were initiated in the late 1930's and 1940's.

Of course, when marsh filling was taken to the limit, the marsh was eliminated and cattail died out, but in a few cases, in marshes of sufficient peat depth (40' – 80') where the filling was prematurely terminated, an interesting phenomenon occurred: The filling with rubble caused the peat to compress. Rubble fill from the excavation of Black Watch pass and the south side of the hills on the Government House property caused the peat in Pembroke marsh east to compress so much that the substrate surface sank up to 8' below the water surface, creating an open freshwater pond instead of the horse racing track that it was supposed to become. That pond has survived ever since! Cattail rhizomes are only capable of encroaching over fresh water to a depth of 6', so it is only at Pembroke marsh, where the water depth got to be greater than 6', that any open freshwater habitat has been retained naturally in Bermuda's freshwater marshes. Cattail control in the much shallower freshwater ditches made the mosquito control ditch maintenance program so labour intensive to maintain, that it was eventually abandoned, eliminating a lot of human-maintained open water habitat in the freshwater peat marshes.

Before I realised any of the foregoing, I was inspired to create a freshwater pond by means of an impermeable liner within the Nonsuch Island Living Museum project to increase the habitat diversity. That pond was only 5' deep in the center and one of the marsh plants that I introduced was the cattail. It took less than 15 years for it to close in over the center of the pond, eliminating the open water and blocking the view from the observation hide built on one side. By eliminating the open water area, the pond was no longer attractive to wild ducks, herons, sandpipers and snipe, but rails and bitterns continue to visit it.

Cattail spread out on to mudflats has been particularly disadvantageous to that mudflat feeding family of birds known as sandpipers of which 16 species are regularly transient through Bermuda between July and October. I used to see all 16 species at once on the big mudflat at the north end of Warwick Pond, but cattail has completely covered that mudflat as of 2020 and shorebirds are virtually absent there today.

All the other open-water ponds and mudflats on Bermuda today are either saltwater and slightly tidal (as at Mangrove Lake and Trott's Pond); Subject to sea flooding like Spittal Pond; partly brackish as at Seymour's Pond; or recently excavated by man like the very

recently excavated Eve's pond, Shelly bay. Mangroves replace cattail as the primary cause of open water loss in tidal saltwater ponds, creating mangrove swamps.

Spittal Pond is unique as the only brackish pond to be maintained by spillover flooding from ocean in storms. It has a highly variable salinity. With continued sea level rise it is gradually being invaded by black mangrove, *Avicennia nitida*, and will eventually become a bay of the sea, at which point Red mangrove, *Rhizophora mangle*, will also colonize, and it will become a mangrove swamp just like the one at Hungry bay.

Due to cattail colonization, the diversity of waterfowl which can overwinter in *all* of Bermuda's *freshwater* marshes has been greatly reduced. As mentioned above no Order of waterbirds has been more greatly affected than the Charadriiformes, which includes all of the sandpipers, stilts, plover, curlews and snipe that are regular fall transients through Bermuda. Their favourite habitat is pond edge mudflats and rain flooded short-grass peat marsh pasture fields, respectively.

Mudflats and short-grass flooded fields can only be sustained now by grazing cattle or horses, as for example at the SW corner of Devonshire marsh on Jubilee road, or by artificial mechanical means such as dredging and mowing, as presently demonstrated at the newly restored Eve's pond at Shelly Bay and the low-lying part of the adjacent west Green Bay condo property when it floods after rain.

In the interest of comprehensive coverage of this topic, there is one other type of freshwater pond and mudflat that is not confined to water table level. These are the ephemeral farm ponds that can form in depressions between hills, wherever cows are kept at high density within holding pens. The combination of rainfall with their constant trampling of the mud and manure mix creates an impermeable barrier to quick soak-away into the bedrock. These small but extremely nutrient rich ponds are especially attractive to sandpipers because the high density of cattle prevents cattail colonization. Many new species for Bermuda were first recorded in them. They have existed temporary at Tudor Farm and Wadson Farm in Southampton; Tivoli Farm in Warwick, the Amaral farm in St. George's, and they still occur periodically at Spittal Pond and Outerlea Dairies in Smith's.

#### **WHAT CAN BE DONE ABOUT IT? HERE ARE SOME IDEAS FOR VOLUNTEERS TO HELP, LEARN AND HAVE FUN TOO.**

The need for Cattail control is not confined to Bermuda. Various Conservation agencies in the U.S. offer suggestions for control or use. The most effective control for large scale implementation is herbicide spray. A couple, like Glyphosphate, are registered as safe for use in aquatic environments, but I would be wary of their use in Bermuda except on a limited trial basis, say at Warwick pond north end. Apart from herbicide, the only option is mechanical control such as regular cutting, uprooting by hand, or digging out of the rhizomes.

Jeremy Madeiros, who replaced me as Government Conservation Officer, has given me *carte blanche* to try and restore the pond on Nonsuch island, because the view from the bird hide is now completely blocked by cattail, and this pond is small enough to be manageable for mechanical control with a few husky volunteers hand-pulling from the open water, working outwards to the pond edge. (I used to do this annually with the students attending the Audubon summer camp on Nonsuch). We would need both cutters and draggers, to drag the cattail to a stockpile for mulching down.

This could be a real fun get together, combined with a tour and swim from the beaches. We could even broaden it further in scope by inviting interested parties from the Bda Nat. Trust or St. David's Carter House museum to collect and take ashore cut leaves for drying and plaiting for baskets and mats; or chefs from Bda College Hotel School or the hotels to prepare some of the many food dishes that can be made from cattail. As this would be an outdoor activity it should be permissible during the Covid crisis.

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