

The Sachem's Place

*Cotuit/Santuit
Watershed*



The Mashpee Environmental Coalition (Friends of The Santuit Watershed)

Provides an organization through which forward thinking citizens can work for common goals shared by those who are concerned with the environment of the watershed.

If the current damage to our watersheds remains uncorrected, future generations will never know the natural beauty and tranquility of this historic and ecological pearl. We must not deprive them of the comfort and tranquility provided by a restful and relaxing visit to this serene locale.

We must protect this resource for future generations and ourselves to enjoy. Please support our mutual efforts to protect this living resource of diverse habitats. Membership is open to everyone.

Consider joining your friends at The Mashpee Environmental Coalition. Annual dues are as low \$10.00 for a family membership.

Please make checks payable to " Mashpee Environmental Coalition" or " MEC".

Our address is: Mashpee Environmental Coalition
 P.O. 274
 Mashpee, MA 02649

Web Address www.mashpeemec.us

Membership Options

Family membership (single address)	\$10.00
Silver membership (individual)	\$15.00
Gold Membership (individual)	\$25.00
Sponsor	\$50.00

Cover: A view of the Santuit Pond Public Boat Launch Facility off Timberlane Drive.

Mashpee Environmental Coalition, Inc. is a 501 c. 3 non-profit organization.

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PREFACE

This booklet is respectfully dedicated with sincere appreciation to four distinct assemblages of contributing individuals. Their names are not here due to the vast number involved and the fear of accidentally omitting one or more of these community-minded individuals.

Each group had a role to play in the protection of the watershed's future. They built the backdrops, wrote the script, played their individual parts and by their combined contributions created an ecological jewel for everyone, including generations yet to be.

First came the dual scene-builders, The Historical Society of Santuit and Cotuit and the Mashpee Historical Commission. These organizations are staffed with volunteer civic-minded residents with a respect for the past. Without their efforts, our appreciation of this Sachem's Place would lack the insights provided by knowledge of the past.

First, financially, to arrive on the scene were the taxpayers of Barnstable and Mashpee with their selfless support of a new tax to acquire lands to be placed in conservation for the benefit of all. They made the investment in a grouping of available parcels along the pond/river corridor, banking added funds for future use.

Next came the advocates, with their knowledge of the region's extensive history and ecological value. They conducted an "awareness campaign" aimed at saving a large portion of the watershed's open space from being transformed into a golf course.

Only last because it was part of the logical progression was town and state government. The members of town boards/committees and elected officials championed the cause coordinating with the state where a receptive ear was found at the Executive Office of Environmental Affairs and the Division of Fisheries, Wildlife and Law Enforcement.



The golf tee, pictured to the left, is a souvenir of a visit to area near Santuit Pond's outlet. It is a reminder of what could have happened without the perseverance of these dedicated citizens. It was found on the path that traverses the northern end of Trout Grave. Interestingly, the plans to convert the area to a private 18-hole golf course included Trout Grave as part of the 10th hole.

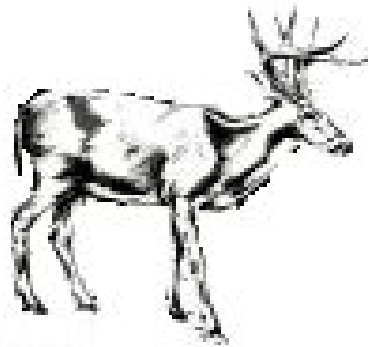
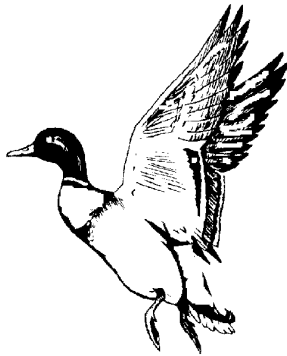
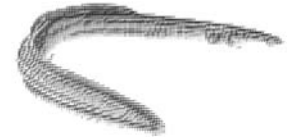




Santuit/Cotuit is rich in historical significance from a time well before the first European settlers arrived in North America.

The current utilization of “Santuit”, by many, as an overall title for the watershed does not reflect the current reality and early colonial history of the area, when the common usage was to view the northern portion as Santuit and the southern portion as Cotuit. The river flowing from Santuit Pond is identified as the Cotuit River on early USGS maps.

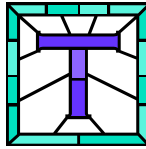
The best lands for agricultural gathering in pre-colonial days appears to have been those around or in proximity to large ponds like Mashpee/Wakeby and Santuit. The area was the location of significant activity for sustenance in the every-day lives of the inhabitants. The soil was loamy sand and was likely as good as any to be found further down the cape. Herring, trout and eels were available from the river and shell and finfish were available in the bay at the river’s end. Game was available. The Bay’s quahog or hard-shell clam was the raw material for much sought after and highly valued wampum.



Local Native American Tribal Leaders and important tribal members met here to discuss items of common interest. It was the marketplace for trade by the tribes of the surrounding area.



Santuit Pond, as a geological feature, was born about 12,000 years ago as the ice sheet that helped to form Cape Cod retreated as conditions warmed. Melt waters from the shrinking ice sheet wore river channels in the newly exposed lands that sloped towards the sea. The downhill flow of the melt water to the sea deposited sand, gravel and similar materials around existing ice deposits. The embedded blocks of ice melted and left behind the kettle-hole ponds that dot the Cape in current times.



The Cotuit/Santuit Watershed begins with the area of Santuit Pond's groundwater source that extends northerly into the Town of Sandwich and northeasterly to Mashpee-Wakeby Pond. This area contributes to the groundwater that ultimately flows beneath the land surface to feed Santuit Pond.

A kettle-hole pond, it lies in Mashpee on the Barnstable border. The major outlet from this groundwater-connected water body is the Santuit River, flowing from its southern end to the Shoestring sub-embayment of nutrient-stressed Popponesset Bay.

The pond exchanges surface waters on an agricultural need basis with a grouping of cranberry bogs adjacent to its shoreline. There is a seasonal stream that flows from the pond's eastern shore to Lovells Pond (a Commonwealth trout stocked pond) in Barnstable.

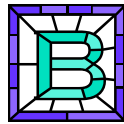
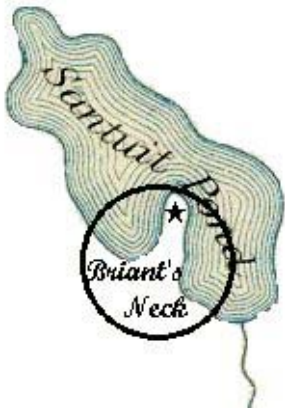
The pond's maximum depth is 9 feet and it is host to an anadromous fish run well as the typical warm water species found in Cape ponds.

The pond is listed as impaired for nutrients and noxious weeds on the Clean Water Act 303(D) list. Although classified for primary contact recreation, a western shore located homeowners association gave up their private beach. The Town of Mashpee now owns the property. Some shoreline resident individuals swim or wade in the pond.

The pond takes on a summer "pea soup green" condition due to a strong continuing algae bloom that is a combination of minute particles and conjoined clumps of varying sizes. There is no explanation for the lack of restorative measures for a pond adjacent to a major conservation land tract.

A visit to this pond during the foliage season provides an attractive display of color significantly different than the typical Cape Cod "Scrub Oak Brown".





Briant's Neck is a small peninsula that extends from the Pond's western shore.

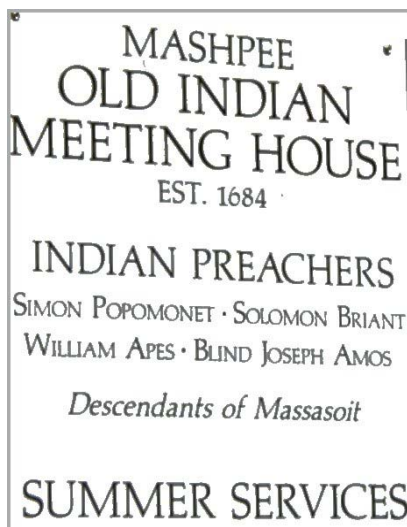
Currently an idyllic location for a few year-round homes and summer cottages, it is the original site of the first Native American church in North America.

Mashpee Archives
Photo of the current
Meeting House on
Meetinghouse Rd.

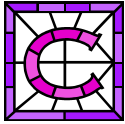
Photo taken before
conversion to a single
entrance door.



The original Meeting House, Briant's Neck construction on the shore of Santuit Pond took place in 1684. It was subsequently moved by oxcart in 1717. The construction of the building was undertaken by Shearjashaub Bourne in conjunction with purchasing from Chief Quitchatassett and others lands just south of Mashpee Pond.



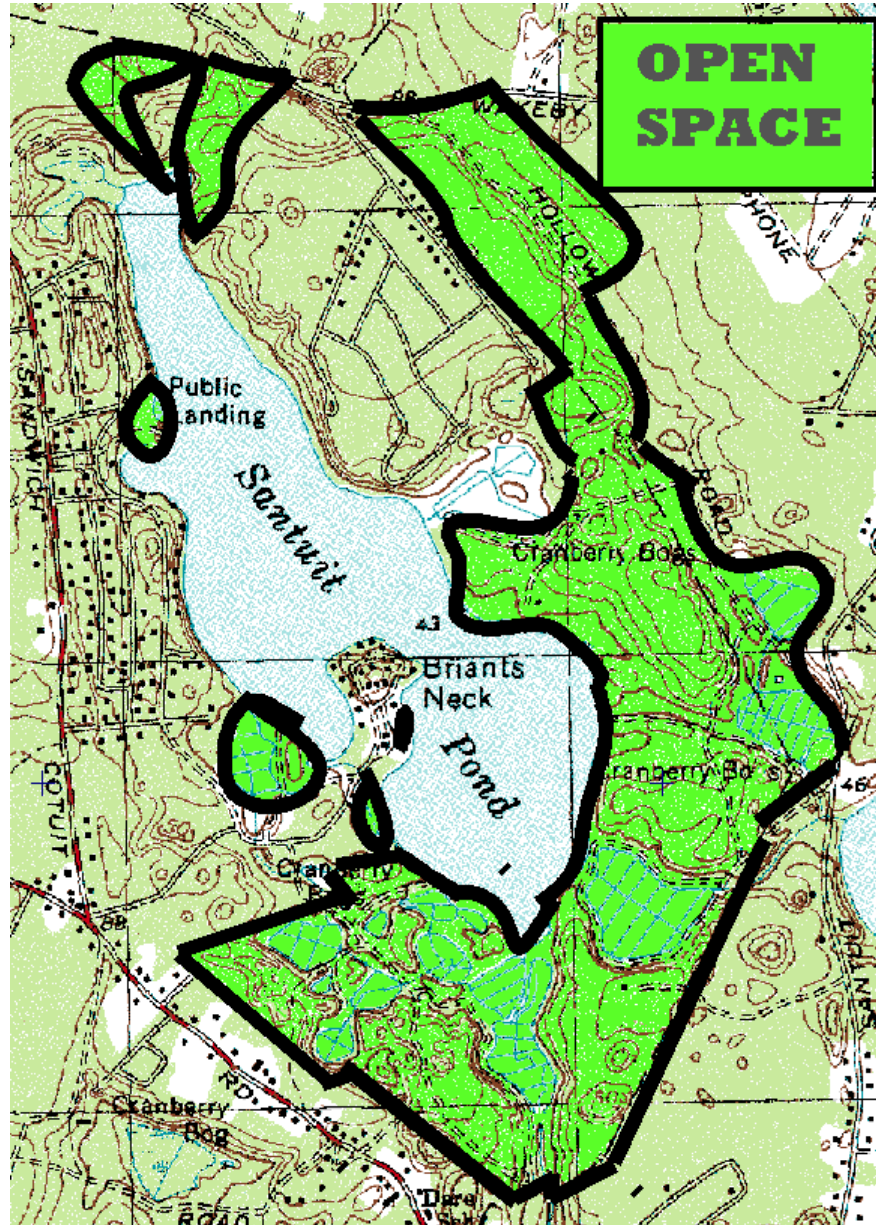
The 1890 "History of Barnstable County", edited by Simeon L. Deyo indicates Solomon Briant ministered to the congregation from 1742 until 1758.



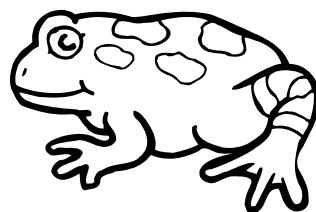
Conservation lands have been acquired via public investment in areas tangent to Santuit Pond.

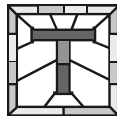
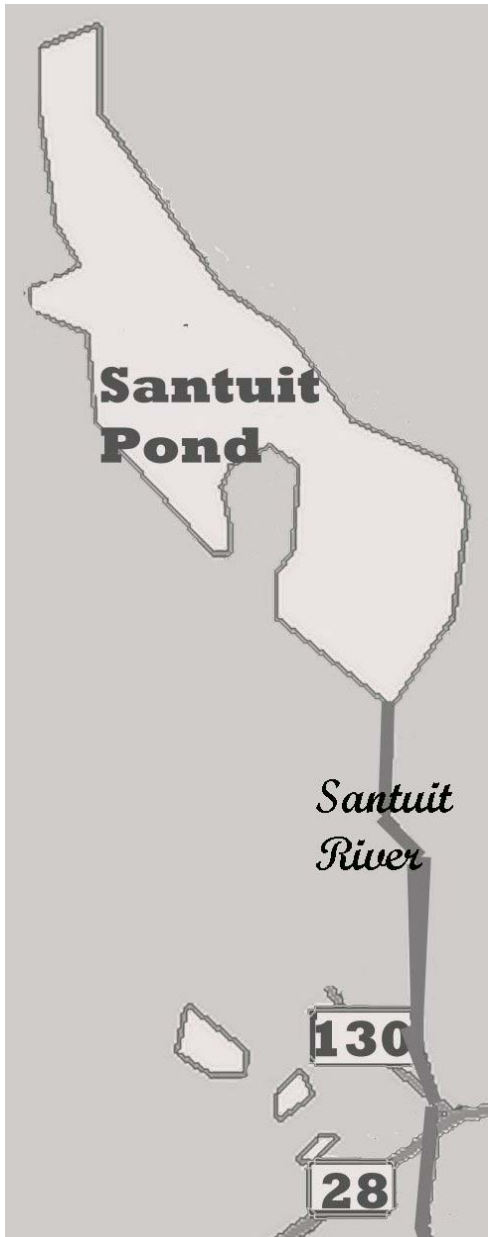
The Commonwealth and the Towns of Barnstable and Mashpee undertook a joint conservation purchase of lands on the eastern and southern shores of the pond. This 290 plus acre purchase was completed for slightly more than \$9 million by utilizing funds from each Town's Land Bank and from the Division of Fisheries Wildlife and Environmental Law Enforcement.

Additional Town of Mashpee "Open Space" parcels are also delineated on the rough outline sketched on the USGS map cutout to the right side of this page.



Mashpee and Barnstable are considering the potential for reinstatement of a limited commercial Cranberry growing operation on the now fallow bogs in the acquired lands. An addition possibility is conversion to wetlands.





The northern reach of the river begins at the outflow dam/fish ladder combined structure flowing southward under Routes 130 and 28 towards the Shoestring Bay section of Popponesset Bay.

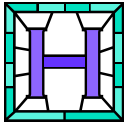
This northern portion traverses conservation lands and several residential areas until it approaches Rt. 130.



Cranberry bogs predominate along the western side of the river in this area while the eastern side is predominately uplands starting immediately adjacent to the pond outlet at the "Great Trout" burial mound.



The river in this area is shallow and has a low canopy of branches. Old pieces of tree limbs and similar woody debris proliferate.



erring find their way, on their annual spawning run, through Popponeset Bay and up the Santuit River to Santuit Pond via the “fish ladder”. The main ladder is located at the dam where the river starts its journey to the bay.



The northeast’s anadromous river herring family consists of the blueback herring and the alewife. As you travel along the Atlantic coast northward to Maine and Canada, the title gaspereau tends to replace herring as the common name.



The Santuit run is alewives and bluebacks and normally made up of fish ranging from roughly 8 to 14 inches long. The youngest will be about two years old with the odds-beating elders occasionally reaching ten. Alewives will loiter near the mouth of the river they will climb to spawn until conditions signal it is time to start. Typically, when the water temperature starts to approach 50 degrees in mid-April and there is a high tide on a bright sunny day, the migration begins.

The journey to Santuit Pond, while closed to human harvest, is a gauntlet of pitfalls and predators for the migrating fish.

At times, especially when water levels are below normal in the river, mortality from exhaustion may be high and the danger of impassible obstructions increases. A river herring can traverse shallow sections if it can propel itself as it does in deeper water. Unlike the salmon, familiar in TV and movie clips, the herring can’t jump. Gulls, cormorants, ospreys, raccoons and Great Blue Herons prey heavily during the annual run.

This Santuit Pond wooden fish ladder is commonly described as a “Denil” design.

It is narrow and has closely spaced baffles on both sides and bottom and set at an angle to the fish-way. The ladder extends from the river to the pond surface.

The baffles cause energy to be dissipated by intense mixing. This type is frequently utilized in new or refurbished construction where the obstacle distance is relatively short.

“Steep Pass” design is found where distances are longer and is similar to the Denil with a different baffle configuration.



(Fish Ladder viewed looking downstream from Dam)

Alewives apparently no longer popular as a smoked or salted element of local diets but are still harvested for their roe or as bait for other species. Adult and juvenile alewives feed on free-floating tiny plants and animals (plankton). Adults will also ingest aquatic insects, small fish and shrimp as well as their own eggs.

Herring, unlike some species of salmon that undergo physical changes during the reproductive portion of their lives and die after spawning, are capable of making the migration up to about eight times.

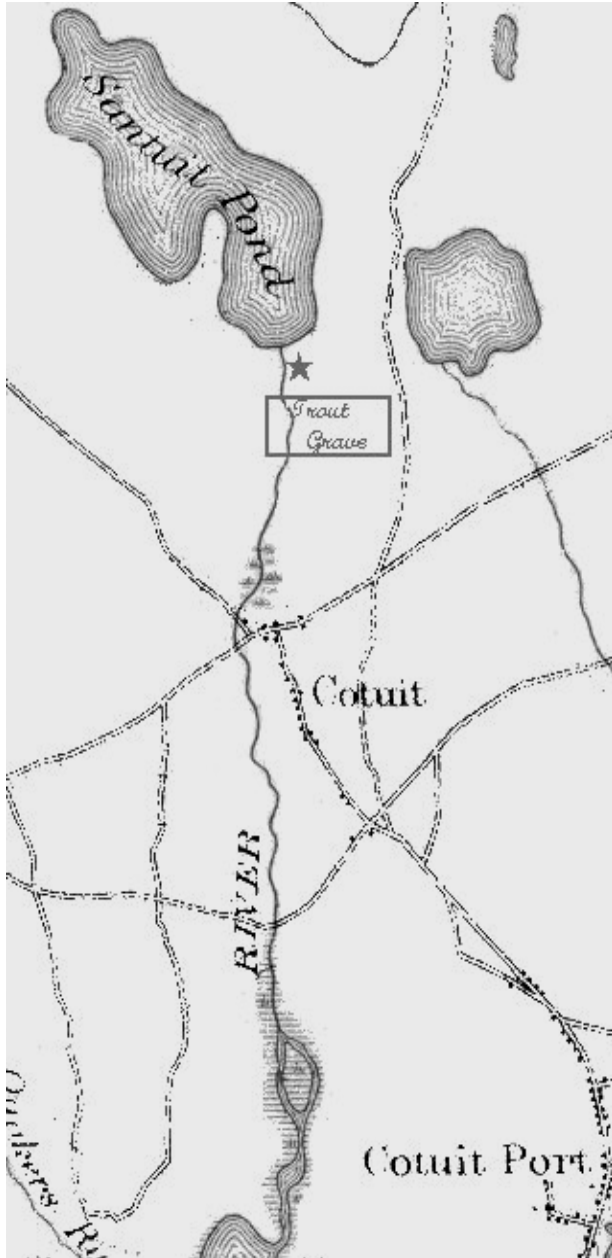
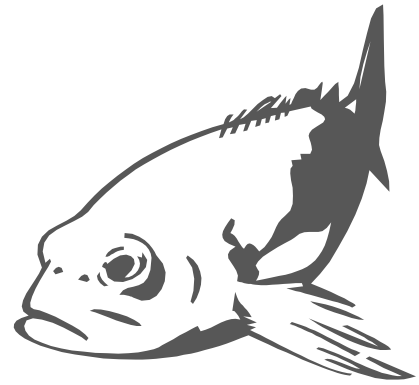
A Roe’s (female) egg production ranges from 50,000 to 500,000 eggs on each of 7 or 8 annual visits to the pond. The Milters (males) release huge volumes of sperm into the water. The eggs and sperm released into the pond each spring not only provide for the continuation of the annual spawning run but are also a high quality food source for aquatic animals such as zooplankton, freshwater mussels and insect larvae.

The adults normally return to the sea within a week or so of spawning although it is typical for a few individuals to linger into November. The young of the year face significant predation from the pond’s warm-water fishery as they wait for cooler water temperatures in the fall to signal it is time to start the mass exodus to salt water where they become a significant prey of Cod.

Trout Grave

The legend of Trout Grave that appears to be the most widely repeated and accepted is recounted in “Son of Mashpee” by Earl Mills Sr.

Mr. Mills, a Wampanoag, is also known as Chief Flying Eagle.



Chief Flying Eagle’s version of the legend begins with the introduction of a Great Trout, as big as a man that lives in the South Sea.

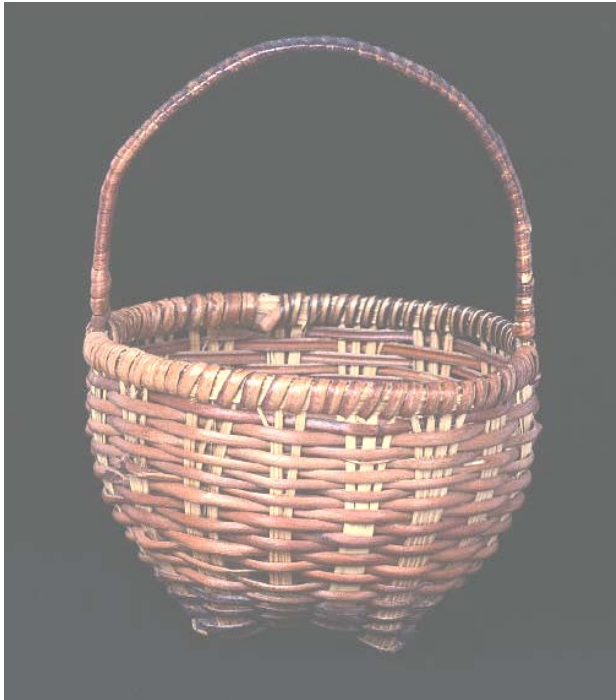
The legend continues with the description of a Wampanoag Maiden, totally lacking in physical charms, although gifted with a beautiful voice. The maiden is alone and lonely. She spends her evenings singing by the shore of Santuit Pond.

The Trout is enthralled by her singing and falls in love with her voice.

Working tirelessly, night and day, without stopping to rest, the great trout forces his way through and around obstacles to find the source of his love. Unfortunately, upon reaching the pond and having built the Santuit River, as it exists today, Great Trout succumbs to the impacts of his enormous efforts and dies. He is buried near where his river path meets the pond.

If you read the more detailed story in “Son of Mashpee” know that both the River and the Mound that is Trout Grave exist as geological features. In an earlier time tourists by the thousands went on excursion to see the Trout Grave.

Marshpee Manufacturing Company



Industry in the area never was able to gain a foothold. The economy generally revolved around farming, woodcutting and the harvest of nature's bounty such as Herring and Oysters. There was an activity associated with visiting sports that provided for a few guides, river keepers and inns. Many of the local men made their living by going to sea.

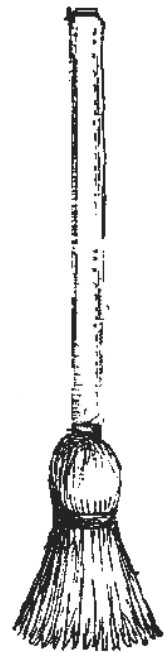
There was a creative spirit and attempts to start businesses were undertaken. The Reverend John E. Wood, together with Solomon and Benjamin Attaquin, Mathias Amos, Oaks Coombs, G. Sewall and Samuel Godfrey formed the Marshpee Basket and Broom Manufacturing Company in May of 1866.

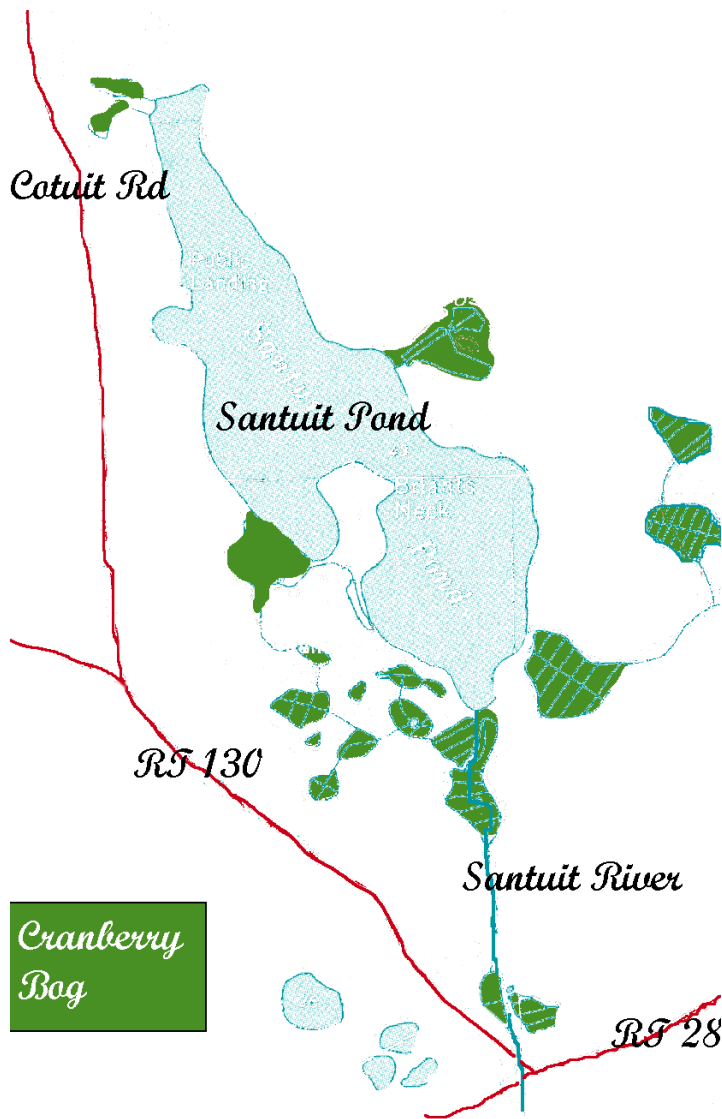
The newly formed company purchased land along the Santuit River at the pond outlet from Naomi Amos \$30 and Mary Jones \$5 in August of that same year.

The newly started business venture made purchases locally and records of some activity are recorded in the account books of Baxter's Store. It is interesting to note that a broom handle machine sold for \$5 in 1867 and wages paid for labor were 30 cents/hour for a 10-hour day.

Although the final conclusion of the manufacturing company is not listed here, mortgages are recorded for shares in the company with values listed as \$165 for 1 share and \$500 for 2 shares.

The basket and broom manufacturing venture evidently did not prove successful over time. Deyo's history of Barnstable County indicates the company had an influx of newer owners and became mostly involved in cranberry agriculture, where it prospered.





Cranberry Bogs

The Santuit's cranberry bogs are numerous with the major portion of them capable of being placed back into production with relative ease, if they are not the few still in continuous use.



An adequate supply of water is critical to successful cranberry agriculture.



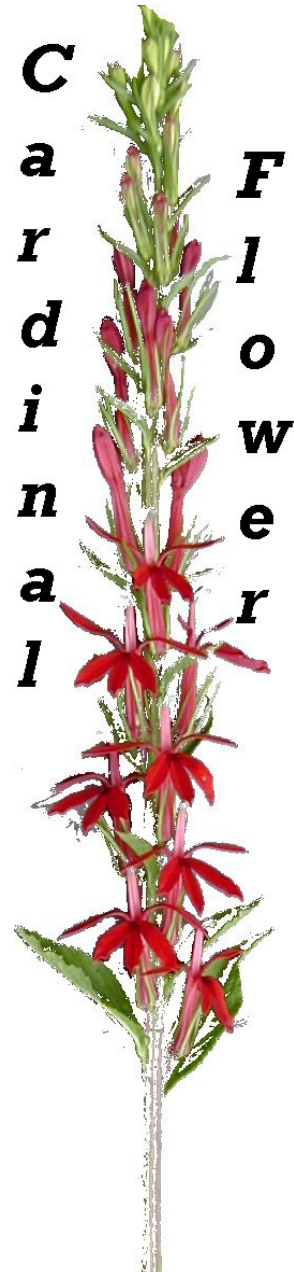
Water is important for achieving optimum cranberry crop production. Bog flooding is utilized for many purposes. It can aid in the control of disease such as fruit rot, control insects especially red mite and cranberry fruit worm and for frost protection.

It is essential for wet harvest techniques and is the basic agent utilized for frost protection.

Many cranberry growers will protect against nighttime frosts, prior to harvest by leaving their sprinkler heads activated. Ice that forms on the crop is not cold enough to harm the berries and provides in addition to its protection against Mother Nature the possibility of a spectacular display. The fall morning sun can illuminate the ice crystals that formed overnight into an apparent field of sparkling diamonds.

Flora

Seasonally, the bog ditches and edges produce an array of plants that include sedges, reeds, wildflowers and grasses that rival a jeweler's showcase with an impressive display of Mother Nature's art.



Old Man's Beard



A common sight on local deciduous trees is “Old Man’s Beard”. This is not a plant related to the vine of the same name. A vine that can grow 40 feet in a year and smother other vegetation by carpeting it with sun blocking leaves. This is a mixture of two distinct individuals. It is a Lichen composed of a fungus (a mushroom is a fungus) and an algae growing together in a mutually beneficial, symbiotic, relationship. The combination is so different structurally from either of its partners that microscopic examination is necessary to distinguish the fungus and the alga. The fungus obtains water and minerals from the air and the host plant

while algae provides carbohydrates and vitamins. Some algae fix nitrogen that is used by both the alga and the fungus.

Route 130 Fish passage



(Mass Div. Of Marine Fisheries Photo)

The fish passage at the Route 130 bog dam is of the notched weir and pool design with a spillway height of approximately 1-½ feet. It was not in the best condition when surveyed by the State in 2004 and is an inefficient passageway. This structure provides an irrigating and flooding/drainage for the adjacent bogs. Over the years rapid bog discharges combined with silt have widened the river and made it shallower.

Route 28 Homes

The oldest known area home that has survived the ravages of time is located at the northeast corner of Routes 130 and 28. The Ebenezer Crocker House was moved to its present site, circa 1739, from West Barnstable by a team of 17 oxen. It is currently featured as the “Sow’s Ear”.

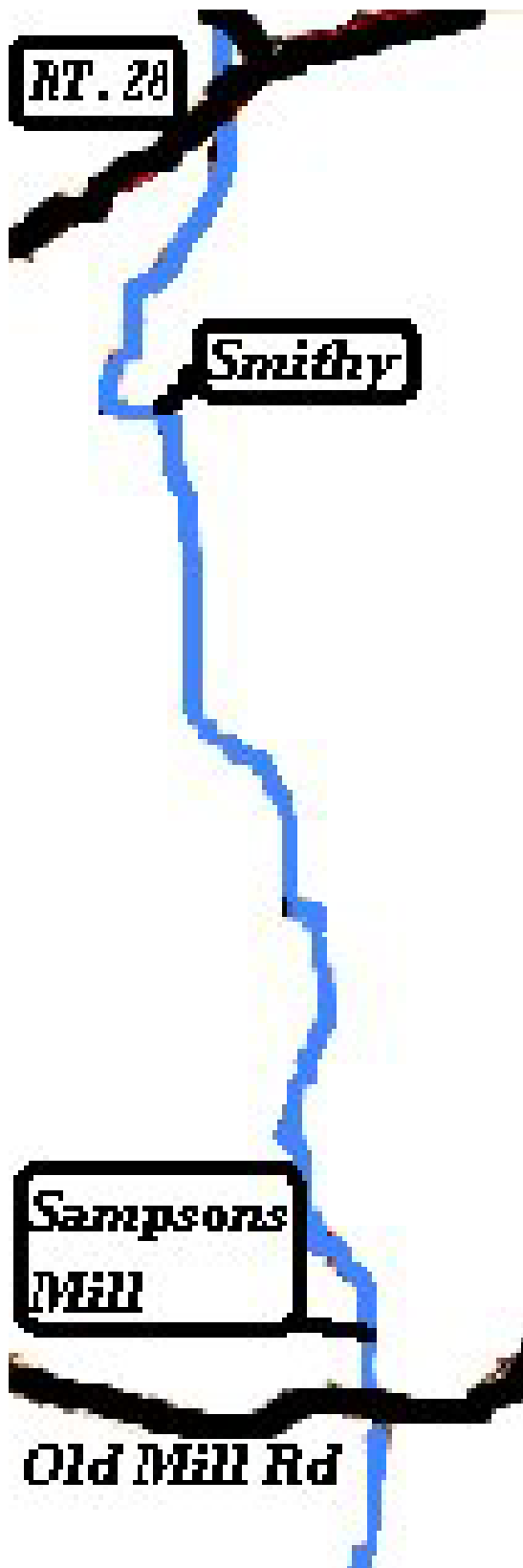


From the arrival of the original Crocker home at this junction up to 1796 a grouping of a half dozen Crocker children homes were constructed along Rte 28. One of the Crocker homes houses the Regatta Restaurant. The tavern at the Regatta was a favored spot of Daniel Webster and also Grover Cleveland when they fished the Santuit River.



Regatta at the Crocker House

Route 28 to Old Mill Road



The waters of the Santuit River were an important element in the region's economy.

The annual river herring migration to the pond provided food for immediate consumption as well as a store to supplement future needs in the salted or smoked form.

The native trout attracted sport fishermen with their attendant need for sustenance and lodging in a similar fashion to today's tourist.

This area of the river, downstream from the cranberry bogs and Route 28, experienced a change in use from irrigation to waterpower.

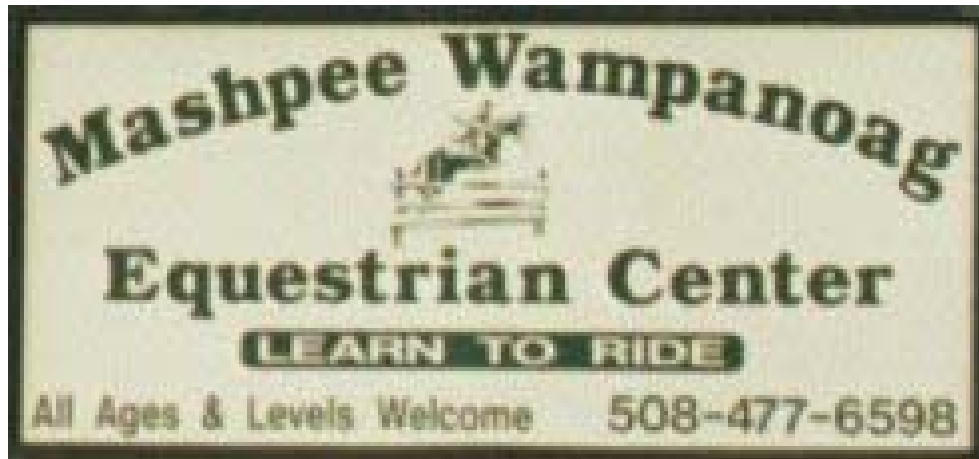
In the 1800's the section of the river between Route 28 and Old Mill Road was home to two enterprises that harnessed the power of the River.



Sampson's Mill, ©:courtesy, Historical Society of Santuit and Cotuit

Baxter's Smithy utilized the river's flow to operate his water wheel. Downstream from the smithy, Sampson's Mill ground corn and grains for Wampanoag and other local growers. The "groundwater fed" nature of the river becomes apparent with a measurable decrease in water temperature as it travels from Rte 28 to Old Mill Rd

Old Mill Road other features of interest



Next to the river on Old Mill /Old Kings Road is the Mashpee Wampanoag Equestrian Center.



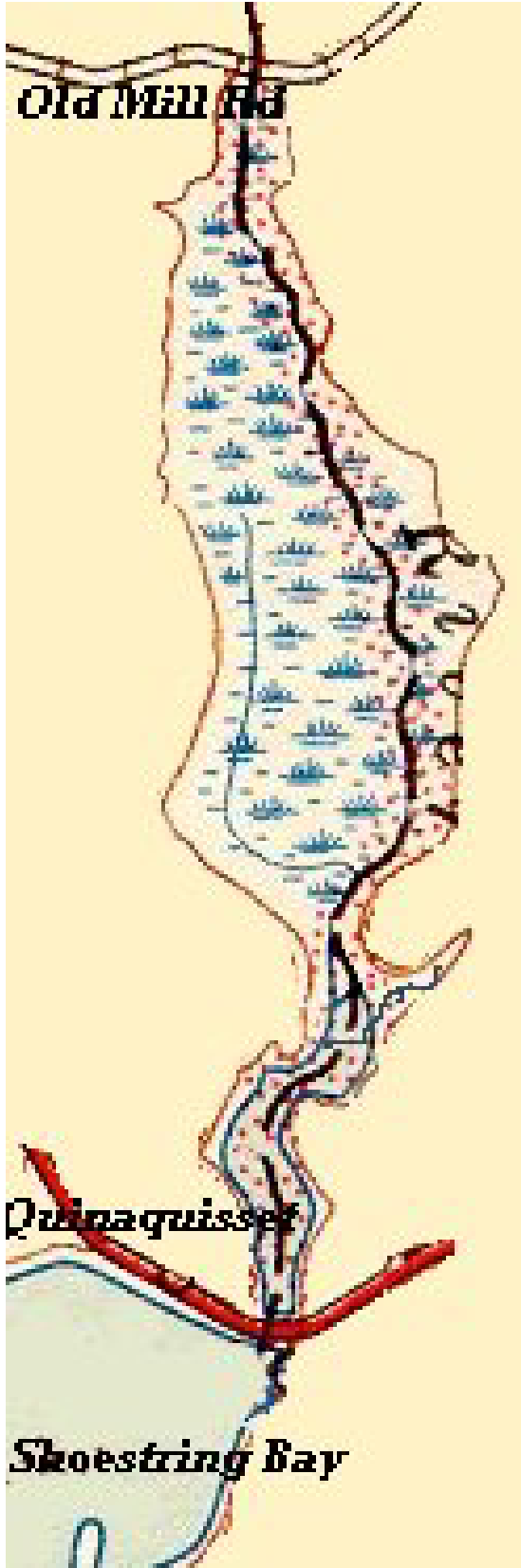
©:courtesy, Historical Society of Santuit and Cotuit, Photo of Sampson House

Close by and a short distance easterly from the river is the Josiah Sampson House.

English businessman Josiah Sampson built a federal-style house was built in 1793. It vastly exceeded the surrounding Cotuit/Santuit domiciles in its elegance. The local inhabitants referred to the house "Sampson's Folly."

The Josiah Sampson House of today provides guest accommodations with modern conveniences in a relaxed Colonial atmosphere to be anticipated with a six guest-room facility.

Old Mill Road to Shoestring Bay



By whatever name you prefer for it, Old Mill Road or Sampson's Mill Road west of the river or Old Kings Road to the river's east, the road itself passes above the river on a foundation of stone appropriated from the mill remains. The only vestige of the mill is a raised area of land that once was the road section that led to the mill



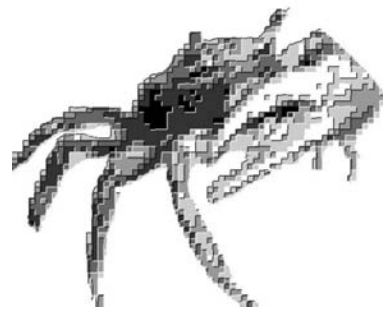
After the river traverses through a concrete culvert beneath the road it begins to widen and take on an estuarine character as the influence of the ocean tidal cycle becomes apparent.



The Marsh



The estuarine marsh near the river's terminal point provides an extensive and pleasing scenic view with its combination of a large surface coupled with a small feeder stream framed with surrounding uplands.



The Marsh plane narrows to a smaller passage for the river through the bordering woodlands for a brief transition to a broader estuary as it reaches out for the bridge crossing at Quinaquisset Ave/School St.

River's End

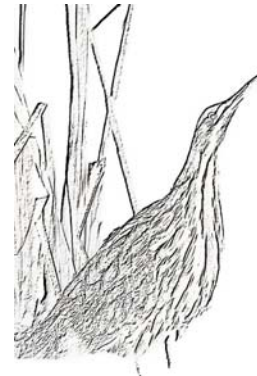


©:courtesy, Historical Society of Santuit and Cotuit,
Photo of School St/Quinaquisset old Bridge

The bridge where Quinaquisset Ave in Mashpee becomes School Street in the Village of Cotuit marks the conversion of the Santuit River to Shoestring Bay.



A hundred or so feet east of the bridge on School Street is a small stone-paved parking area open to general use. It is adjacent to the 25 acre Hovey Conservation Area that abuts the river.



This area is a popular spot for a lunch for a few liverymen and temporary solitude seekers. It is strange the things a person notices. The lack of litter either speaks highly of the visitors or someone who comes behind them. We hope it is the caliber of the people who share this place.

Maushop's Smoke

On occasion, when cold air develops overnight at the outflow of the Santuit River into Shoestring Bay and the Bay's waters are warm, a cloudy formation is generated.

This may be a form of fog that occurs when water evaporates into cold air, at times called steam fog or Sea Smoke or, then again, it may be something else.

Although there have been no recent reported sightings of Maushop. This phenomenon may be smoke from his pipe.



Maushop was a giant, who lived among the Wampanoag helping them in many ways.

We know that, from legend, he was a diligent protector of infants and small children against the attacks of predatory birds. He waded into the South Sea and trailed a huge bird to its tree-top perch on an island that was possibly Nantucket or Martha's Vineyard. During his return from the Island, Maushop enjoyed a smoke of pokeweed using it as a substitute for tobacco. It was the smoke from his pipe that created Maushop's smoke or sea smoke to the non-believers. Pokeweed is listed as a harmful plant by Poison Control Organizations and should not be used as a tobacco substitute by people less than 52 feet tall.

We also know that many of today's geologic features exist thanks to this great legend. One easily discernable feature is the Elizabeth Island chain formed by dottle from his pipe.



Pokeweed

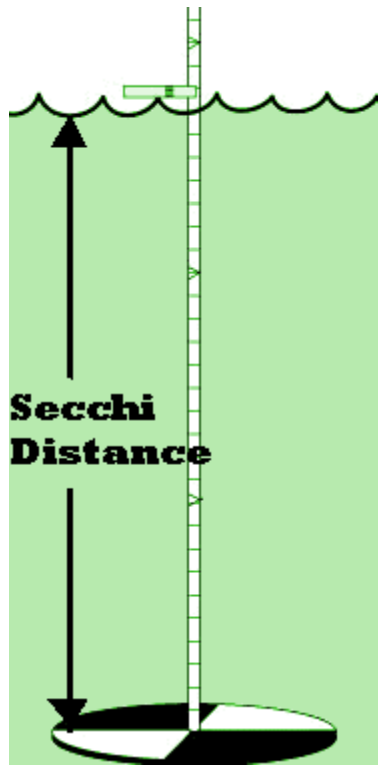
Unfortunately for us all, although the evidence of his presence remains, Maushop sightings have not been reported since the arrival of Europeans to America's Shores.

Perhaps he has gone to visit Gluskap, another giant hero who lived among the Algonquinian tribes of Maine and Eastern Canada, modeled on the right by 62 foot tall Skowhegan Man, holding his fishing weir.

It is less possible he is visiting Ironwood, Michigan's 52-foot tall giant in the land of Longfellow's Hiawatha pictured above left.



The Problem



Santuit Pond

Annually, a snapshot of three (3) selected parameters commonly used to evaluate Santuit Pond's trophic state is developed. Secchi depth is the distance an 8" diameter black/white disc remains visible under water and is a measure of transparency. Chlorophyll a provides a measure of the amount of algae in the water column, while total phosphorus identifies the amount of this element in the water directly usable or convertible to a plant/algae fertilizer.

A trophic state is normally classified into one of three broad categories, with oligotrophic having little organic deposits, mesotrophic having moderate organic enrichment from natural processes and eutrophic being highly enriched with an accumulation of organic sediments.

The Cotuit Waders, a volunteer group sponsored by the Cotuit-Santuit Civic Association, and the Mashpee Environmental Coalition have joined in a cooperative program to baseline and trend monitor these three categories. The program-developed data is shared with the scientific community.

Water bodies naturally age and develop the changes associated with organic enrichment over many centuries. Centuries shrink to decades and/or years with the growth of uncontrolled nutrients associated with human activities.

Recent Santuit Pond snapshots are all in the eutrophic category. Transparency readings run below 2 feet and several were less than 1 foot. Chlorophyll a and Total Phosphorus measurements are similarly disheartening.

Shoestring bay



Nutrients from the watershed that includes the pond and the river flow to Shoestring Bay.

The nutrients are a fertilizer for the algae that discolor the water, form muck; create odors, low oxygen levels in the water column and form floating mats.

Floating Algae Mats on Shoestring Bay