

TOWN OF CHATHAM

- Town Map
- Chart of Site Characteristics
- Sites 1 to 7

TOWN OF CHATHAM

Location of Selected Salt Marsh Restrictions

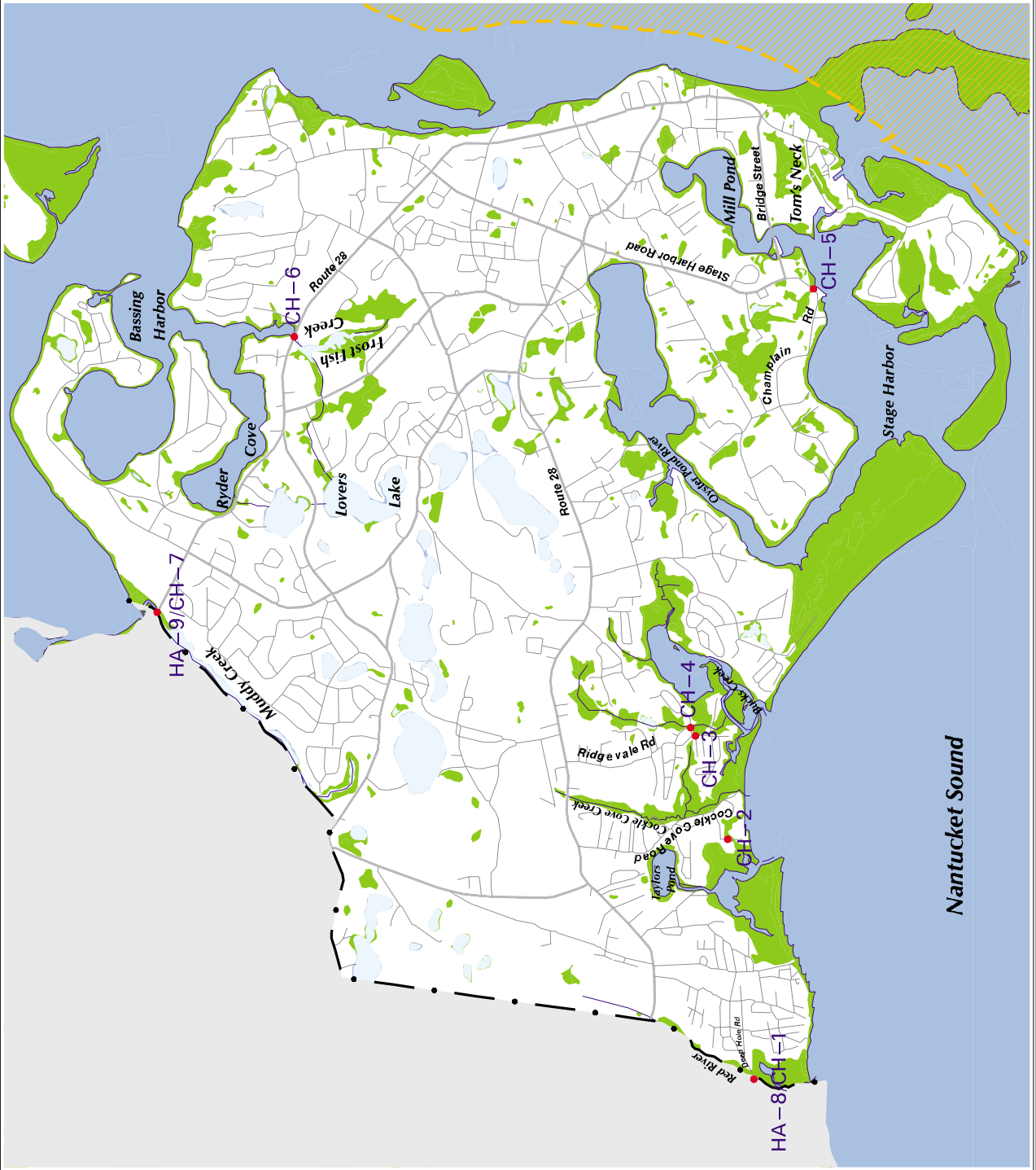
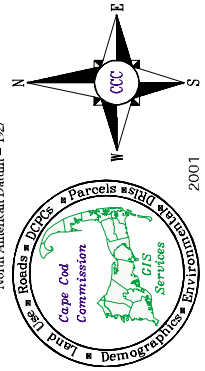
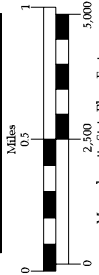
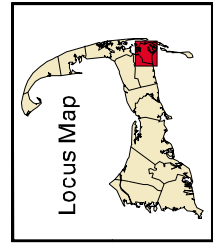
This map was produced by the Cape Cod Commission Geographic Information System office, with digital data from MassGIS and the Cape Cod Commission, 2001.

The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel level analysis.

This project was funded, in part, by the Executive Office of Environmental Affairs, Massachusetts Wetlands Restoration Program.

CH-1 Restriction Site

- Wetland
- Ocean
- Pond or Lake
- CC National Seashore
- Local Road
- Major Route
- Stream
- Railroad



Town of Chatham –Site Characteristics

Site Number	Size of upstream affected area (salt marsh acres / total affected acres)	Is the upstream affected area contiguous to protected open space (ownership)?	Does this tidal channel support a shellfish resource area?	Is the channel or system part of an anadromous fish pathway?	Does the culvert/pipe support an engineered flood control structure?	Is the affected area or site within an ACEC boundary?	Does the affected area include Priority Habitat of Rare Species (PH) or Estimated Habitat of Rare Wildlife (WH)?	Are there any restricted sites upstream of this site (site number)?	Ownership of the site (public vs. private)
HA-8/ CH-1	3.0 / 3.0	YES (private)	YES	YES	NO	NO	NO	NO	PUBLIC
CH-2	0.0 / 3.24	NO	YES	NO	NO	NO	NO	NO	PRIVATE
CH-3	Unable to determine	YES (private)	YES	NO	NO	NO	NO	NO	PUBLIC
CH-4	4.77 / 5.51	NO	YES	NO	NO	NO	NO	NO	PRIVATE
CH-5	4.32 / 4.87	YES (municipal, private)	YES	NO	NO	NO	NO	NO	PUBLIC
CH-6	0.0 / 34.58	YES (private)	NO	YES ¹	YES (stoplogs) ²	YES	NO	NO	PRIVATE
HA-9/ CH-7	2.73 / 18.07	YES (municipal)	YES	YES ³	NO	YES	NO	NO	PUBLIC

¹ Frost Fish Creek historically supported an anadromous fish run to Lovers Lake. It is not believed to be currently active.

² The infrastructure is present for stoplogs, however they have not been used for many years and the structure is in disrepair.

³ Muddy River historically supported an anadromous fish run. It is not believed to be currently active.

HARWICH/CHATHAM

Deep Hole Road restriction of the Red River

Site HA-8/CH-1

Site Description

The Red River forms the boundary between Harwich and Chatham and discharges into Nantucket Sound. Deep Hole Road crosses the Red River, passing its flow via a 16-inch corrugated metal pipe set in a concrete headwall. The pipe appears to be in good condition – it is not broken or clogged. The seaward opening is submerged at mean high tide. Tidal restriction sites HA-6 and HA-7 lie on a channel of the Red River that is located seaward of Deep Hole Road, and they are therefore not connected to site HA-8/CH-1. The Red River does support shellfish resources and is used by anadromous fish en route to Skinequit Pond in South Harwich.

General Information

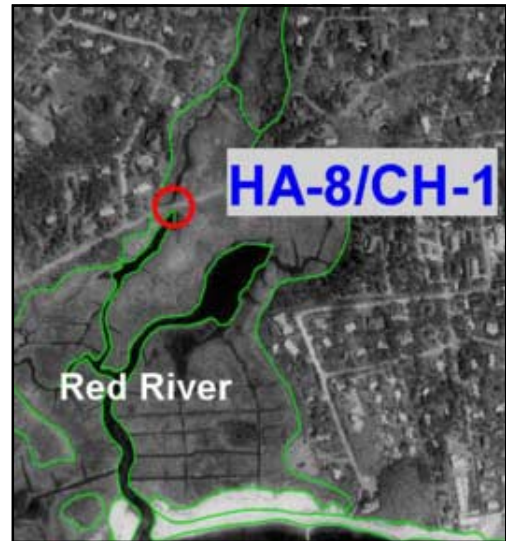
The seaward channel is approximately 10 to 15 feet wide, narrowing upstream to 2 to 5 feet. Visual indicators of a restriction on the seaward side of the road include minor bank erosion and minor vegetation die back. A scour pool is also evident near the upstream pipe opening. Cattails are present seaward of the roadway berm and become more prevalent upstream. *Phragmites* was also observed in the upstream affected area.

- Restriction width – 16 inches
- Restriction length – 26 feet
- Upstream salt marsh – 3 acres (estimate)

Comments

According to the Director of the Chatham Water Quality Laboratory, the area upstream of Deep Hole Road is a natural low point that collects significant fresh water drainage and is therefore a transition zone. An increase in the size of the pipe would likely not change the area affected by tidal flow, but could serve to make the existing salt marsh healthier.

¹ The Wetland Conservancy Program delineated salt marsh lying both seaward and upstream of Deep Hole Road as one continuous area, totaling 45.63 acres. The road does sever this salt marsh, which should have been delineated as two polygons. The area upstream of Deep Hole Road, estimated at 3.0 acres, could not be highlighted independently of the seaward area for this image.



Upstream Affected Area (acres): SM – 3.0.¹



This 16-inch corrugated metal pipe set in the concrete headwall passes the flow of the Red River under Deep Hole Road.



Visual indicators in this upstream affected marsh include a small scour pool near the pipe opening and significant growth of *Phragmites* and cattails.

CHATHAM

Chatharbor Lane restriction of unnamed channel off Mill Creek

Site CH-2

Site Description

Mill Creek flows north from Cockle Cove in Nantucket Sound. Near the mouth of Mill Creek a channel branches off in an easterly direction, flowing nearly parallel to the Cockle Cove Beach. This unnamed channel flows under Chatharbor Lane (a dirt road) via a 10-inch diameter metal pipe. The pipe appears to be in poor condition and is visibly blocked by debris and detritus. The seaward opening is consistently submerged at mean high tide. Low-lying development around the upstream affected area is subject to flooding during storm and extremely high tides under present conditions. Mill Creek does support shellfish resources.

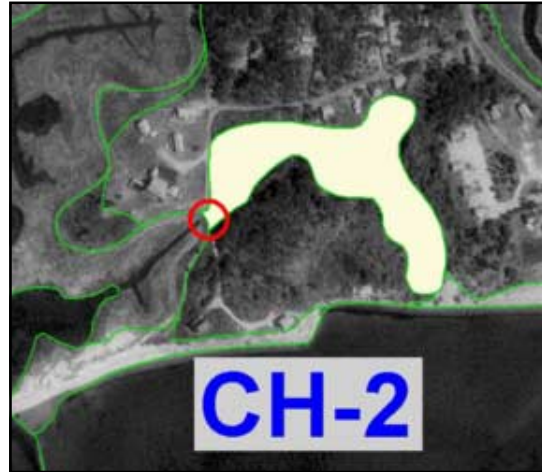
General Information

The seaward channel is approximately 5 to 10 feet wide, narrowing upstream to 3 to 4 feet. Visual indicators of a restriction include major seaward scouring and erosion, and significant vegetation die off. Upstream conditions included minor scouring with major erosion of the berm behind the pipe opening. A significant number of dead and dying shrubs were observed within the upstream affected area. *Phragmites* was not observed near this site.

- Restriction width – 10 inches
- Restriction length – 78 feet
- Upstream salt marsh – 0.0 acres

Comments

What is now considered the upstream affected area of site CH-2 was historically connected with tidal flow in Nantucket Sound via two locations. First, at the location of site CH-2, and second, at a natural opening in the barrier beach between the mouths of Mill Creek and Cockle Cove Creek. This second opening no longer exists and beach nourishment projects at Cockle Cove Beach will prevent its re-opening in the future.



Upstream Affected Area (acres): SS – 3.24.



Water trickling out of a mound of dead seaweed near the seaward opening enabled field staff to dig out the opening of the 10-inch pipe. Erosion is a serious problem near the opening.



This 10-inch metal pipe passes tidal flow under Chatharbor Lane. Erosion is eating away at the roadway berm.

CHATHAM

Ridgevale Road restriction of channel between Cockle Cove Creek and Bucks Creek

Site CH-3

Site Description

Bucks Creek (or Sulphur Springs) and Cockle Cove Creek share the same discharge point into Nantucket Sound, located near Cockle Cove Beach and Ridgevale Beach. After branching near their mouth, Bucks Creek flows northeast and Cockle Cove Creek flows northwest. A 77-foot long culvert under Ridgevale Road, at its intersection with Cranberry Lane, connects the marshes of Cockle Cove Creek (to the west) with Bucks Creek (to the east). Tidal flow passes under the road via a 25-inch diameter corrugated metal pipe. The pipe appears to be in good condition – it is not visibly broken or clogged. The creeks' shared discharge area creeks supports shellfish resources.

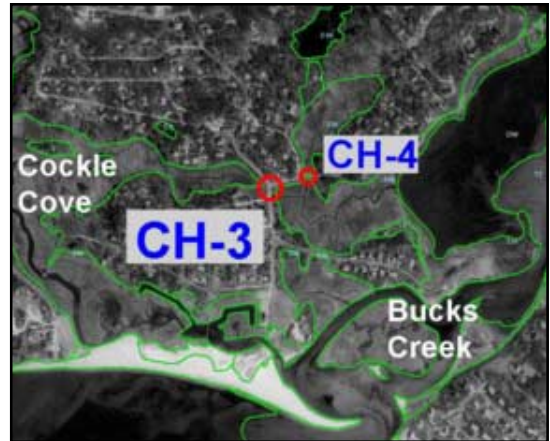
General Information

Tidal flow may reach this site from either the east or west, therefore, seaward and upstream “sides” are not appropriate labels for this site. The channel approaching the site from the east (Bucks Creek side) is approximately 5 feet wide. The channel to the west (Cockle Cove Creek side) is approximately 1-foot wide. Scouring is significant to the east and minor to the west. Minor bank erosion was also observed to the east. The Wetlands Conservancy Program delineated salt marsh adjacent to both sides of this site. Vegetation observed to the east included shrubs and salt marsh, while *Phragmites* dominated the view to the west of Ridgevale Road.

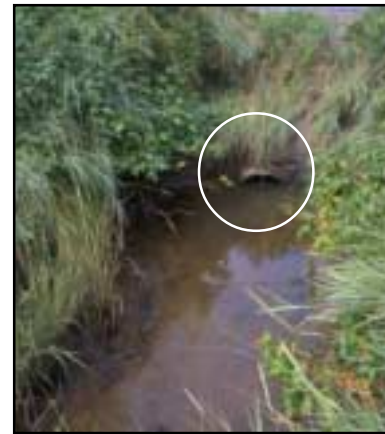
- Restriction width – 25 inches
- Restriction length – 77 feet
- Upstream salt marsh – unable to determined

Comments

The Director of the Chatham Water Quality Laboratory believes that a nominal amount of flow actually reaches either side of this pipe and, therefore, if this pipe did not exist conditions would be similar to con-



Upstream Affected Area (acres): SM – unable to determine.



The metal pipe, barely visible above the water line, is set in the steep berm of Ridgevale Road.



The pipe to the west of the road sits in this scour-pool of stagnant water. *Phragmites* dominates the vegetation around it.

CHATHAM

Cranberry Lane restriction of unnamed channel off Bucks Creek

Site CH-4

Site Description

Bucks Creek, or Sulphur Springs, supports a large area of salt marsh. One channel travels north through the marshes and crosses under Cranberry Lane (a gravel road) to the east of Ridgevale Road at site CH-3. Flow passes under Cranberry Lane via an 18-inch diameter metal pipe. The seaward side of the pipe appears to be in poor condition. The upstream side was inaccessible. Cranberry bogs are still active upstream of Cranberry Lane and farmers use flow in this system to support their operations. Bucks Creek supports shellfish resources.

General Information

The seaward channel is approximately 2 to 4 feet wide, narrowing to 1 to 2 feet upstream. Visual indicators of a restriction include significant seaward scouring and bank erosion, with water pooled by the pipe opening. Minor scouring was visible upstream, however the area adjacent to the pipe opening was largely blocked by dense shrubs. What appeared to be the upstream channel bed was dry. Vegetation changed significantly from the seaward to upstream sides of Cranberry Lane – with some areas covered by cattails and with *Phragmites* dominating the upstream affected area.

- Restriction width – 18 inches
- Restriction length – 31 feet
- Upstream salt marsh – 4.77 acres

Comments

According to the Director of the Chatham Water Quality Laboratory, the health of the salt marsh upstream of Cranberry Lane is mainly dependent upon the management of the water resource by the cranberry farmers using this system.



*Upstream Affected Area (acres):
SM – 4.77; SS – 0.74.*



This pool of water submerged the 18-inch opening on the seaward side of Cranberry Lane.



*The Wetlands Conservancy Program delineated salt marsh upstream of Cranberry Lane, but shrubs, *Phragmites*, cattails, and a dry creek channel were observed.*

CHATHAM

Stage Harbor Road restriction of Champlain Creek

Site CH-5

Site Description

Champlain Creek runs northwest from its mouth on the Mitchell River, near the intersection of the Mitchell River with Stage Harbor. The creek flows under Stage Harbor Road via a 20-inch (estimated) metal pipe. The pipe is in serious disrepair – it is broken in several places. The seaward opening was buried under rocks in the channel bed. Champlain Creek does not serve as an anadromous fishway. Stage Harbor does support shellfish resources.

General Description

The seaward channel is approximately 10 to 15 feet wide and 20 yards long with a parking lot retaining wall serving as one of its banks. The channel narrows slightly upstream of the road to approximately 10 feet wide. Visual indicators of a restriction include major scouring and significant erosion both seaward and upstream of the pipe. Vegetation die back was observed around the edges of both channels. Both salt marsh and *Phragmites* were observed between the road and the Mitchell River. The vegetation changes upstream of Stage Harbor Road where *Phragmites* and cattails were mixed amongst shrubs and salt marsh.

- Restriction width – 20 inches
- Restriction length – 55 feet
- Upstream salt marsh – 4.32 acres

Comments

The marsh area further upstream of the area considered the upstream affected area of site CH-5 is a transition zone, where cedar swamp has taken hold and there is a significant amount of fresh water input. Therefore, the Director of the Chatham Water Quality Laboratory believes that the upstream affected area is not likely to benefit from any increase in tidal flow in Champlain Creek.



Upstream Affected Area (acres): SM – 4.32; SS – 0.55.



The 20-inch pipe lies partially buried under rocks at the base of the roadway berm where the channel appears to end abruptly. The pipe is broken into several segments.



It was possible to measure the pipe on this upstream side, were it protrudes from the berm jutting into this severely scoured and eroded pool.

CHATHAM

Route 28 and Earthen Dike restriction of Frost Fish Creek

Site CH-6

Site Description

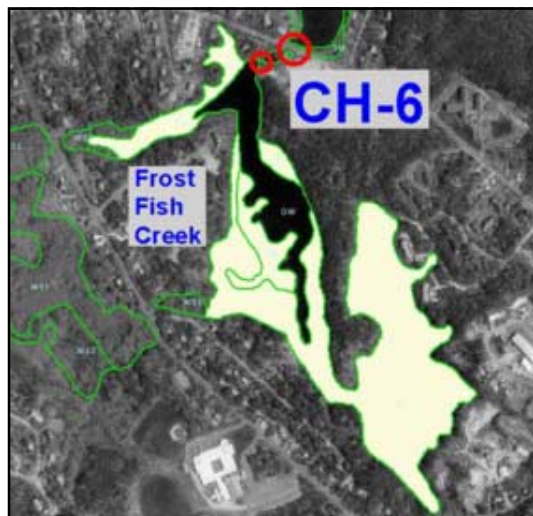
Frost Fish Creek, a sub-embayment of Pleasant Bay, flows south from its connection with Ryder's Cove and Bassing Harbor. Just off of Ryder's Cove, Route 28 crosses the mouth of the creek. Flow passes under the road via three 18-inch pipes, which are set low in the roadway berm. None of the pipe openings were observed above the water line. The three pipes are far apart, located approximately 60 feet and 15 feet apart.

Upstream of Route 28, the Wetlands Conservancy Program delineated a small pool of open water. An earthen dike crosses the Creek upstream of this open water, causing an even smaller second tidal restriction of Frost Fish Creek. This dike was inaccessible, however according to local officials it is either an 18 or 24-inch diameter pipe set within a concrete weir. Historically the weir enabled the placement of water-tight stoplogs, but it has not been used for many years and is in disrepair. This control structure was installed in order to regulate tidal flow for the benefit of upstream cranberry farming operations.

Frost Fish Creek historically supported an anadromous fish run to Lovers Lake. It is not active today. The portion of the creek that extends from Ryder's Cove to the Route 28 berm does not support significant shellfish resources – the creek bed is too muddy to provide shellfish habitat.

General Description

The Wetlands Conservancy Program did not delineate any wetland vegetation around the small pool of open water between Route 28 and the dike. Upstream of the dike however, shrub swamp and shallow marsh were delineated. Because the pipes were submerged and the upstream site was not accessible, visual indicators of a restriction were not easily observed. Water was surging and bubbling up at three distinct spots where the submerged pipes were assumed to be. Scour pools were visible at these locations. *Phragmites* was not observed on either side of Route 28.



Upstream affected area (acres): SS – 31.69; M – 2.89.



This bubbling pool of water marks the spot where one of the three pipes discharges seaward of Route 28.

- Restriction width – three 18-inch pipes (under Route 28); 18 or 24-inch pipe with structure for stoplogs (under the dike)
- Restriction length – 75 feet (estimated for Route 28); 20 feet (estimated for dike)
- Upstream salt marsh – 0.0 acres

(continued on page C9)

**Route 28 and Earthen Dike
restriction of Frost Fish Creek
Site CH-6**

Comments

Frost Fish Creek has been studied as part of Chatham's comprehensive wastewater management study, a search for ways to improve the quality of the water in local embayments and prevent further degradation from pollution. This sub-embayment suffers from poor flushing, which makes the creek vulnerable to pollution (particularly from nutrients). In fact, Frost Fish Creek has a system residence time of 422.3 days, caused mainly by the under-sized culverts at site CH-6.¹ According to the Director of the Chatham Water Quality Laboratory, Frost Fish Creek has been considered for conversion into a fresh water system by installing dikes in the upper reaches of the estuary. However, due to the low point at which it crosses under Route 28 and other factors this is not likely to be considered a feasible alternative. Further studies need to be done to determine the benefits and detriments of conversion.



Water pools between the Route 28 berm and the upstream earthen dike – both infrastructure crossings severely restrict the flow of Frost Fish Creek.

¹ Wood, 2000, p. 5.

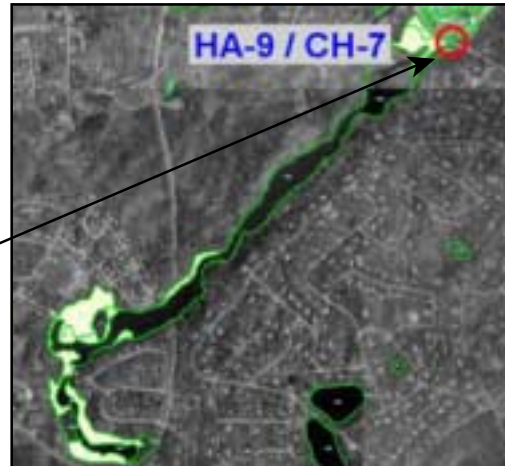
HARWICH/CHATHAM

Route 28 restriction of the Muddy River

Site HA-9/CH-7

Site Description

The Muddy River, a sub-embayment of Pleasant Bay, runs generally in a southwesterly direction from its mouth to the west of Nickersons Neck in Chatham on Pleasant Bay. The river forms the town boundary between Harwich and Chatham who share responsibility for the rivers' upstream affected area. Muddy Creek flows under Route 28 via two box culverts that are approximately 2.6 feet in height and 3.7 feet in width. These culverts are set into stone slab retaining walls and placed far below the road surface. The culverts are owned and maintained by the Massachusetts Highway Department. The Muddy River historically supported an anadromous fish run – it is not active today – and does support shellfish resources near its discharge area in Pleasant Bay.



Upstream affected area (acres): SM – 2.73; SS – 13.37; M – 1.97.

General Description

The Muddy River is approximately 75 feet wide seaward of Route 28, widening to approximately 100 feet upstream of the roadway berm. Visual indicators of a restriction include major seaward scouring, minor bank erosion, and minor vegetation die back. *Phragmites* fringes the upstream affected area.

- Restriction width – two, 2.6 by 3.7-foot box culverts
- Restriction length – 75 feet (estimate)
- Upstream salt marsh – 2.73 acres

Comments

Muddy River has been studied as part of Chatham's comprehensive wastewater management study, a search for ways to improve the quality of the water in local embayments and prevent further degradation from pollution. Chatham is currently working on a Restoration Management Plan for the Muddy River through the Pleasant Bay Alliance. Muddy River has been considered for conversion into a fresh water system as one way to address its poor water quality. This system's conversion would be easier than that of Frost Fish Creek because of the high embankment of Route 28 between Pleasant Bay and the river. To accomplish this, tide gates could be placed on the existing culverts. A significant environmental drawback of this option would be the loss of the existing 2.73 acres of salt marsh along the northern portion of the river upstream of the road. To avoid this loss but still achieve partial conversion, a dike could be installed upstream of the existing salt marsh.¹



These 2 box culverts pass the flow of the Muddy River under Route 28. The stone slab retaining wall supporting the culverts appears to be in poor condition.



Upstream of Route 28 salt marsh exists along the banks of the Muddy River.

¹ Wood, 2001, p. 5.