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Appendix A

Salt Marsh Restriction Field Inspection Sheet (FIS)

Field Inspection Sheet

Date: _____ Time: _____

Tidal Conditions: Low Mid/Low Mid Mid/High High ALSO Incoming Outgoing Change

Weather: Sunny Partly cloudy Overcast Rain

Location	
Town	
Site number	
Map Reference Number	USGS: Ortho: Arial:
Other sites seaward of this? Upstream of this?	
What is visible by photo interpretation? (use of the Wetlands Conservancy Program GIS data layer included)	
Water Body/ Stream name	
Street (in closest proximity)	
Landmark/ location description	
Prox to low-lying developed area	

Crossing Information

Length _____

(from seaward to upstream openings)

Latitude: N _____ - _____ - _____

Longitude: W _____ - _____ - _____

Type of restricting structure:

- Bridge: does span cross entire channel ____?
- Tide gate type: flapper / electric sluice gate / SRT
- Road: # of lanes ____ width ____ paved or dirt
- Railroad
- Other _____

Condition of crossing structure (bridge falling down?)*: _____

Culvert/ Pipe	Seaward	Upstream
Material		
Size of opening (pipe diameter/ box culvert height x width)		
Number		
opening submerged at mean high tide		XXXXXXXX
Invert problem detected (culvert sited higher than low tide level – h2o trapped)	XXXXXXXXXXXX	
Condition*		
Culvert broken		
Culvert clogged with debris		

*Condition key: 1=excellent 2=good 3=fair 4=poor 5=need immediate repair

Channel	Seaward	Upstream
Estimated width of channel (fixed distance from opening)		

Visual Indicators**	Seaward	Upstream
<i>Phragmites australis</i>		
Cattails present		
Scouring Basin		
Bank Erosion		
Low marsh slumping		
Vegetation die back		
Ponded water by restriction		

**If yes, rank its presence: 1. Dominant/Major; 2. Significant; 3. Minor.

Restriction Classification Scheme

	Seaward	Upstream	Channel size vs. Culvert/ Opening
1†			Channel width < opening width
2			Channel width = opening width
3			Channel width up to 2 times opening width
4			Channel width 2 to 5 times opening width
5			Channel width greater than 5 X opening width

†Lowest score to more ideal conditions that would allow free flow.

	Seaward	Upstream	Evidence of Flow Restriction/ Erosion
1♦			Unrestricted/ no pooling
2			Flow detained/ slight erosion
3			Minor pooling/ erosion present
4			Significant pooling/ significant erosion present
5			Major pooling/ major erosion present

♦Lowest score to site that most closely resembles natural stream conditions.

Appendix B

Infrastructure Crossings that do not Restrict Salt Marsh

The sites discussed in this Appendix are locations at which a crossing structure (*i.e.*, culvert, pipe, or bridge) does not cause a tidal flow restriction that leads to the impairment of salt marsh habitat. These sites were given the acronym NTR (for *non-tidally-restrictive* of salt marsh). Inclusion below should not correlate to the conclusion that tidal flow is not restricted at these sites, only that these sites do not meet the criteria for inclusion as a restricted site *in this Atlas*.

The NTR sites were given a letter label for identification (a, b, c, etc.). For each NTR site below, a location description is given along with the reason why it wasn't considered a tidal restriction to salt marsh habitat. In most cases NTR designation was given because a site did not have seaward salt marsh contiguous to the crossing structure, or did not exhibit visual indicators of a restriction. Additionally sites, that ranked well on the Restriction Classification Scheme (or, closely resembled natural free-flowing conditions) were often found to be an NTR site.

Infrastructure crossings identified below may be discussed together if they are part of the same tidal channel or stream system. The locations of these NTR sites are recorded on the USGS quadrangle base maps provided to Executive Office of Environmental Affairs, Massachusetts Wetlands Restoration Program (MWRP) along with the Field Inspection Sheets.

References in this Appendix to delineated wetland types are based upon information from the Massachusetts Department of Environmental Protection, Wetlands Conservancy Program's (WCP) Wetlands Data Coverage. Abbreviations for different wetland types used in this Appendix are:

- "SM" for salt marsh
- "SS" for shrub swamp
- "M" for shallow marsh
- "WS" for wooded swamp
- "U" for upland

TOWN OF BARNSTABLE

BA-a

- Route 6A crossing of Smith Creek in West Barnstable.
- WCP delineated U on the seaward side of this culvert and WS upstream of Route 6A.

BA-b

- Route 6A crossing of tributary to Boat Cove Creek (between the intersections of Maple and Willow Street with Route 6A).

- WCP delineated M to the seaward side of the culvert.
- Boat Cove Creek supports an anadromous fish run.

BA-c

- In the village of Osterville, the road leading to Dowses Beach from East Bay Road crosses a channel that connects East Bay with Phinneys Bay.
- Two concrete culverts carry flow between the bays, each 30 inches in diameter.
- WCP did not delineate any wetland types upstream of the crossing, only open water.

BA-d

- Driveway or a private, unnamed extension off East Bay Road crossing of channel off East Bay, Osterville.
- When viewing the aerial photography there appears to be a driveway or berm crossing the marsh area behind houses on the north side of East Bay Road. No crossing was found during fieldwork.
- WCP delineated DM and SS upstream of the apparent berm and SM to its seaward side.

BA-e

- South Main Street crossing of the Bumps River, Centerville.
- Tidally restricted site BA-12 lies upstream of this bridge. Non-tidally restricted sites BA-f and BA-g lie upstream of this bridge.
- The Bumps River supports both shellfish and anadromous fish.
- WCP has delineated 56.26 acres of salt marsh, 7.48 acres of shrub swamp, and 17.59 acres of shallow marsh upstream of this crossing.
- The bridge span (100 feet long by 40 feet wide) was determined to be wide enough to enable natural free-flowing conditions.

BA-f

- Bumps River Road crossing of the Bumps River, north of Scudder Bay in Centerville.
- WCP delineated SM that ends before reaching the seaward end of the pipe. WS is delineated to the seaward opening. OW is delineated upstream of this 30-inch pipe.

BA-g

- Bumps River Road crossing of a tributary to Bumps River (approximately one-half mile west of BA-f). This tributary connects North Pond and West Pond to the Bumps River.
- WCP delineated SM that ends before reaching the seaward opening of the pipe. OW is delineated to the seaward opening. OW and M are delineated upstream of this 4-foot pipe.

BA-h

- South Main Street crossing of a tributary to Centerville River, near the public landing. This site is 0.4 miles east of NTR site BA-e.
- Houses and yards are present on the upstream side. *Phragmites* dominates the seaward side of the road. A 6-foot channel reaches the roadway.
- WCP delineated SM ending before reaching the seaward opening of the pipe.

BA-i

- Horseshoe Lane crossing of a tributary to the Centerville River.
- The upstream affected area is dominated by *Phragmites*.

- This site lies upstream of restricted site BA-13.
- WCP delineated WS to the seaward side of the culvert. The SM ends well before this culvert.

BA-j

- Driveway off the Broken Dike Way cul-de-sac crossing the Centerville River (private property).
- At the northern extent of the Centerville River (well upstream of restricted site BA-13) a 35-foot long wooden bridge set on pylons crosses the river.
- *Phragmites* dominates the vegetation both seaward and upstream of the bridge.

BA-k

- Estey Avenue crossing of stream connected the upstream affected area of tidal restriction site BA-18.
- USGS map and aerial photography show a crossing, however it could not be found during fieldwork.
- WCP delineated SM to the seaward side of Estey Avenue and OW and SS on the upstream side of the road.

BA-l

- Gosnold Road crossing of wetland between affected areas of restricted sites BA-18 and BA-19, located approximately 0.1 miles west of the Gosnold Road/Ocean Street intersection.
- According to the Barnstable Engineering Division, it is likely that historically this was an open channel that hydrologically connected the upstream affected areas of restricted site BA-18 and BA-19.
- *Phragmites* dominates the vegetation on the south side of Gosnold Road (upper extent of salt marsh affected by BA-18).

TOWN OF BOURNE

BO-a

- The Cape Cod Bike Route and Route 6/Scenic Highway cross the Herring River at its mouth on the Cape Cod Canal. A small box culvert, a fish ladder, and a second, slightly larger box culvert connect the canal with the river upstream of Route 6.
- This watershed of the Herring River comprises the boundary of the Herring River Area of Critical Environmental Concern, supporting one of the most important anadromous fish runs in along the state's coastline.
- No SM was delineated by the WCP within this freshwater system.

TOWN OF BREWSTER

BR-a

- Route 6A crossing of Quivett Creek on the Dennis/Brewster town line.
- *Phragmites* is the dominant type of vegetation on the seaward side of 6A.
- Quivett Creek supports an anadromous fish run that must pass through this culvert.
- A concrete headwall houses a 2-foot concrete pipe that is in good condition, however it is clogged with sand and silt.
- The Wetlands Conservancy Program delineated shallow marsh seaward of this crossing.

- This site lies upstream of tidally restricted site BR-1. Should tidal flow be increased through this upstream site and salt marsh habitat restored, site BR-a may ultimately become restrictive of salt marsh.

BR-b

- Route 6A crossing of a channel extending south off of Quivett Creek, crossing 6A near its intersection with Stony Brook Road.
- A channel appeared on the USGS quadrangle map, however upon field investigation none was found.
- Salt marsh does not extend to the seaward side of this crossing.

BR-c

- Route 6A crossing of a channel extending south off of Quivett Creek, crossing 6A near its intersection with Newcomb Road.
- A channel appeared on the USGS quadrangle map, however upon field investigation non was found.
- Salt marsh does not extend to the seaward side of this crossing.

BR-d

- Lower Road crossing of stream flowing south out of Freemans Pond.
- Restricted site BR-4 lies upstream of Freemans Pond.
- Salt marsh does not extend to the seaward side of this crossing.

TOWN OF CHATHAM

CH-a

- Bridge Street crossing of the Mitchell River.
- The bridge is a 190-feet long and 36-feet wide and is supported on wooden pylons in the riverbed.
- There were no visual indicators of a restriction.
- The WCP delineated SM along the banks of the entire upstream area.

CH-b

- Morris Island Road crossing of channel from Stage Harbor into Toms Neck area.
- According to the Director of the Water Quality Laboratory, this site is not restrictive of salt marsh.
- The box culvert-type structure is constructed to accommodate the placement of water-tight stoplogs. The large stoplogs are kept handy on the side of the road.
- The WCP delineated 1.35 acres of SM upstream of CH-b. Non-tidally restricted sites CH-c and CH-d lie upstream of this salt marsh.
- The structure has been slated for replacement in order to fix the problem of slumping fill clogging the channel. This is not believed to be related to tidal flow, but rather to structural deficiencies. Construction will not change the size of the structure which is believed to be sufficient.

CH-c

- Morris Island Road crossing of channel from Stage Harbor into Toms Neck area. This site

lies upstream of site CH-b and adjacent to CH-d.

- The pipe is a 16-inch metal pipe set in a concrete headwall.
- According to the Director of the Chatham Water Quality Laboratory, the upstream affected area has always been a freshwater system that typically drains from the upstream to seaward side s of Morris Island Road. Therefore any increase in the size of the existing pipe would serve to drain the upstream freshwater system.
- The upstream area is owned and managed by the Chatham Conservation Foundation.
- The WCP delineated M and SS upstream and Dune seaward of this site.

CH-d

- Morris Island Road crossing of channel from Stage Harbor into Toms Neck area. This site lies upstream of site CH-b and adjacent to CH-c.
- The pipe is a 16-inch metal pipe set in a concrete headwall.
- According to the Director of the Chatham Water Quality Laboratory, the upstream affected area has always been a freshwater system that typically drains from the upstream to seaward side s of Morris Island Road. Therefore any increase in the size of the existing pipe would serve to drain the upstream freshwater system.
- The upstream area is owned and managed by the Chatham Conservation Foundation.
- The WCP delineated M and SS upstream and Dune seaward of this site.

CH-e

- Rowland Lane crossing of channel off Frost Fish Creek. Flowing east from the mouth of the creek north of the Route 28 berm.
- According to the Director of the Water Quality Laboratory, this channel only receives flow in a storm or moon tide.
- An estimated 1-foot diameter concrete culvert conveys any flow under Rowland Lane.
- The WCP delineated 0.39 acres of SM upstream of the crossing.

CH-f

- Route 28 crossing of channel from Ryder Cove to Stillwater Pond.
- The channel serves as a herring run and is one of the most active runs in Chatham.
- A stone channel on the seaward side directs flow into a 15 inch opening. It then travels under Route 28 and emerges upstream via a 28-inch metal pipe.
- This pipe is due to be replaced and possibly resized in order to accommodate the herring run and needs of the fish.
- The WCP delineated 0.70 acres of M upstream of Route 28. However, according to local officials there is SM upstream of Route 28.

TOWN OF DENNIS

DE-a

- New Boston Road crossing of Chase Garden Creek.
- The WCP delineated shallow marsh to the seaward side of the 2-foot concrete pipe.
- Cattails dominated the vegetation seaward of the crossing.

DE-b

- Cold Storage Road crossing of unnamed channel off Sesuit Harbor leading into a wetland area.

- The WCP delineated 0.99 acres of salt marsh, 0.78 acres of shrub swamp, and 8.92 acres of shallow marsh upstream of the crossing.
- This site underwent remediation in 1999. Conditions at the site were still indicative of a restriction. However, this is due the short recovery time since reconstruction and conditions are expected to continually improve. To date, town officials have noticed a decrease in the size and density of *Phragmites*.
- This site was selected and studied by the Army Corps of Engineers in 1996.
- Currently, three 30-inch corrugated plastic pipes convey flow under Cold Storage Road.

YA-g / DE-c

- Route 28 crossing of the Bass River on the Yarmouth/Dennis town line.
- Route 28 crosses the river via a 300-foot bridge span supported on pylons in the riverbed.
- There is a significant amount of salt marsh and other wetland type that occurs along the upstream banks of Bass River.
- Non restricted site YA-h/DE-d and restricted site YA-11/DE-13 lie upstream.
- There are no visual indicators of restricted tidal flow at this location. The channel width-to-opening ratio resembles natural, free-flowing conditions.
- A review of aerial photography showed no pooling on either side of the bridge; field work confirmed this analysis.
- The Bass River supports an anadromous fish run and productive shellfish resources.

YA-h / DE-d

- Highbank Road crossing of the Bass River on the Yarmouth/Dennis town line.
- This site lies upstream of YA-g/DE-c and seaward of YA-11/ DE-13.
- The road crosses the river via a 160-foot bridge span supported on pylons in the riverbed.
- The upstream area affected by this crossing includes Priority Habitat of Rare Species and Estimated Habitat of Rare Wildlife.
- The Bass River supports an anadromous fish run and productive shellfish resources.
- Visual indicators of a tidal restriction are limited to minor scouring of the riverbanks.

DE-e

- Loring Avenue crossing of Weir Creek. Weir Creek has two tributaries – one flowing to Kelleys Pond, the other to Uncle Stephans Pond.
- This sites lies seaward of restricted sites DE-4, DE-5, and DE-6.
- In 1996 the Town replaced a 4-foot culvert with a bridge measuring 22 feet.
- According to the Dennis Department of Natural Resources, this site is no longer restrictive of salt marsh.

DE-f

- Lighthouse Road crossing of tributary from Weir Creek to Uncle Stephans Pond.
- A wood pylon and stone base bridge with a span of 28-feet conveys the flow.
- The Town rebuilt this bridge in 1999 and, according to the Department of Natural Resources, removed a previously existing tidal restriction.
- Visual indicators of a restriction are still present – scour, bank erosion and vegetation die off – however, it is likely that these are old scars still remaining from before the rebuild.

DE-g

- Upper County Road Crossing of the Swan Pond River. The crossing structure is a 68-foot bridge supported by wooden pylons.

- This site lies upstream of restricted sites DE-11 and DE-12. If remediation is done at either of these sites to increase tidal flow, then the Upper County Road bridge may then become insufficient to pass flow unrestricted.
- Work is scheduled for 2001 to include dredging near the bridge and armoring of the river channels.
- Swan Pond River supports shellfish resources and serves as an anadromous fish pathway for whitefish and perch.

TOWN OF EASTHAM

EA-a

- Bridge Road crossing of Boat Meadow Creek.
- This crossing lies within the Inner Cape Cod Bay Area of Critical Environmental Concern.
- A 57-foot open span bridge passes the creek flow under it.
- There are no visual indicators of a restriction present except for very minor scouring and erosion. The tidal flow at this crossing closely resembles natural free-flowing conditions.
- NTR site EA-b, and restricted sites OR-4/EA-3, EA-4, and EA-5 lie upstream of this crossing.

EA-b

- Earthen dike crossing of a channel within the marshes of Boat Meadow River upstream of site EA-a.
- The WCP delineated 0.73 acres of SM, as well as shallow marsh and shrub swamp upstream of the dike.
- This crossing and the upstream affected wetland area is owned by the Eastham Conservation Foundation (ECF) and lies within the Inner Cape Cod Bay Area of Critical Environmental Concern.
- According to the Eastham Director of Natural Resources, approximately nine years ago the ECF decided not maintain the dike. It has since breached.

EA-c

- Governor Prence Road crossing of Abelino's Creek.
- This is the second time the creek crosses Gov. Prence Road. It lies upstream of restricted sites EA-6, EA-7, and EA-8.
- According to the ACOE 1996 study flow passes the road via a 24-inch diameter culvert.
- The WCP delineated 2.85 acres of shallow marsh, 1.97 acres of shrub swamp, and wooded swamp upstream of this crossing site.
- According to the Eastham Director of Natural Resources tidal flow does not reach this crossing. Should remediation be undertaken at all three seaward restriction sites, then this site may need to be considered at some point.

EA-d

- Earthen dike crossing of marsh behind the Coast Guard Station Center at Coast Guard Beach.
- The WCP delineated 0.70 acres of SS upstream of the dike.
- The dike, originally constructed to support a cranberry farm, has been breached and is not approximately 13 feet wide.
- *Phragmites* does dominate the upstream affected area.

TOWN OF FALMOUTH

FA-a

- Bike path crossing of the Trunk River, tidal channel to Oyster Pond. FA-b lies upstream.
- At the time of this writing construction was underway at this site (DEQE file # SE 25-2449) to widen the rock lined channel and to construct two jetty's. A 26' wide bridge spans the 21' wide channel. The length of the crossing is 10 feet.
- Site does appear restricted but conditions are due to change post-construction.
- Oyster Pond supports a herring run.

FA-b

- Surf Drive crossing of the Trunk River as it enters Oyster Pond.
- The pipe was enlarged in 1992 to four feet.
- A concrete and water tight stop log weir was installed to control tidal flow and enable Falmouth officials to select the appropriate salinity in Oyster Pond.
- Oyster Pond and the Trunk River system have been under study for about 20 years; it is believed that Oyster Pond should be "freshened" (See ACOE Wetlands Investigation, June 1996).
- Oyster Pond supports a herring run.

FA-c

- Surf Road crossing of Fresh River to Siders Pond.
- There is no upstream salt marsh, shallow marsh, or shrub swamp.
- FA-c is a 5-foot concrete pipe with a trash grate on the seaward opening intended to keep Eel Grass from flowing into the system on a high tide.
- Both seaward and upstream channels are armored.
- The Fresh River supports a herring run into Siders Pond.
- Historically there was a clapper valve at this site to keep all tidal flow out of the system.

FA-d

- Spring Bars Road crossing of stream at north end of Little Pond.
- Site FA-d lies upstream of site FA-2 (restricted).
- Water was observed flowing seaward (into Little Pond) during an incoming tide cycle.
- The Wetlands Conservancy Program delineated Wooded Swamp (WS1) contiguous to the seaward of this site, therefore, no salt marsh is directly affected.

FA-e

- Route 28 crossing of the Dexter River (north end of Great Pond) just south of where it becomes the Coonamessett River.
- This site is upstream of restricted site FA-3.
- There is no shellfishing available in Dexter River portion of Great Pond, as the tide does not reach the head of the pond this far north. There is, however, a significant herring run that does utilize the Dexter River/Coonamessett River system.

FA-f

- Route 28 crossing at head of Green Pond. Route 28 acts as a dam, forming a Mill Pond just north of the roadway.
- This system historically supported a herring run that is no longer active. The Town of Falmouth and the Massachusetts Highway Department are currently working together to restore fish passage under Route 28, through the Mill Pond and north into Bachus Brook.
- Green Pond is tidally restricted by site FA-6.

FA-g

- Route 28 crossing at the head of Bourne Pond.
- The mouth of Bourne Pond is tidally restricted by site FA-7. Although the Wetlands Conservancy Program GIS mapping layer delineated salt marsh to the seaward side of Route 28, none was observed there.
- Wetland area delineated upstream of FA-g consists of 22.77 acres of cranberry bog.

FA-h

- Route 28 crossing at the head of the western most arm of Eel Pond, near Muriel Lane. Eel pond is an important shellfish resource in Falmouth.
- Salt marsh is not found this far upstream.

FA-i

- Route 28 crossing of Childs River, the eastern arm of the head of Eel Pond.
- The Childs River supports an anadromous fish run and is located within the Waquoit Bay Area of Critical Environmental Concern (ACEC).
- Shellfish resources are found upstream of Route 28, south of Cross Road, that are open to seasonal shellfishing.
- Salt marsh is not found this far upstream.

FA-j

- Route 28 crossing of Moonakiss River, upstream of the tidally restricted site FA-8.
- The Moonakiss River is of high concern in Falmouth because of its poor water quality.
- This site is located in the Waquoit Bay ACEC.
- Salt marsh is not found this far upstream.

FA-k / MA-a

- Meadow Neck Road (at the Falmouth-Mashpee town line) crossing of channel into Hamblin Pond.
- This channel is man-made and was installed to improve the tidal flow between Waquoit Bay and Hamblin Pond. The ponds' natural tidal entrance, the Little River, was not providing sufficient flushing for the pond when it was the only tidal connection with Waquoit Bay.
- The armored channel is 22 feet wide and the pipe is a large, corrugated metal 13-foot by 10-foot pipe.
- There was very minor scour observed near the upstream opening of the pipe.
- Hamblin Pond is a productive shellfish resource area, much of which is open year-round for harvesting.

- Two tidally restricted sites are found at the upper reaches of Hamblin Pond, MA-1 and MA-2.

FA-1 / MA-b

- Cranberry bog berm crossing at the mouth of Red Brook (east of Ostrom Road, Falmouth and west of Bayshore Drive, Mashpee).
- Red Brook forms the town line between Falmouth and Mashpee.
- Cranberry bogs were created in the Red Brook just north of its confluence with Hamblin Pond.
- These bogs are no longer in production, however the berms created are still in place.
- Although salt marsh is delineated to the seaward side of this site, it is not considered a restriction in this Atlas because the berm was naturally breached allowing tidal flow to return to the bog. However, the breach may not be large enough to resemble natural free-flowing conditions for Red Brook. 2.06 acres of shallow marsh is delineated upstream of this site.

TOWN OF HARWICH

HA-a

- Channel off the Herring River terminating at the North Road roadway berm, just north of the intersection of North Road and Smith Lane (south of HA-b).
- According to local officials, there has never been a culvert under North Road at this location.
- There is a 10-foot wide channel terminating at the western side of North Road that is dominated by *Phragmites*. Because there is no flow under North Road, this marsh area is actually fed by a channel off the Herring River located upstream of non-restricted site HA-b.

HA-b

- North Road, a stone and dirt walking trail, crosses the Herring River (north of HA-a) via a 45-foot wooden board bridge supported on pylons in the riverbed.
- The Wetlands Conservancy Program delineated salt marsh both seaward and upstream of this crossing.
- The rivers' width is approximately 40 to 50 feet seaward and 50-60 feet upstream of this crossing.
- There are no visual signs of a restriction at this location, except for minor bank erosion seaward of the bridge.

HA-c

- Bells Neck Road, a public, dirt road, crosses the Herring River via a 55-foot long wooden board bridge suspended on pylons in the riverbed.
- The Wetland Conservancy Program delineated shallow marsh both seaward and upstream of this crossing.
- Cattails appear to be the dominant type of vegetation visible in both the seaward and upstream marsh areas. *Phragmites* is also dominant near the seaward side of the bridge.

HA-d

- The dam of the Great Western Reservoir at the Herring River.
- The Wetland Conservancy Program delineated shrub swamp and upland reaching to the seaward side of this crossing.
- Set in the wall of the dam there is a 3-foot spill over pipe and a fish ladder.

HA-e

- Lothrop Road crossing of Coys Brook, a tributary to the Herring River, north of the Lothrop Road crossing at restricted site HA-4.
- The Wetland Conservancy Program delineated shallow marsh to the seaward side of this crossing as well as 23.61 acres of shallow marsh and 4.47 acres of shrub swamp upstream.
- Cattails are the dominant type of vegetation visible in the seaward marsh area.

HA-f

- Lower County Road crossing of Doanes Creek at the north end of Allens Harbor, near the Allens Harbor Yacht Club marina in Harwich Port.
- Restricted site HA-5 lies upstream of this crossing.
- A 50-foot bridge span supported by wooden pylons passes tidal flow under Lower County Road into upstream salt marsh and tidal flats. The upstream channel is approximately 50 feet wide. Therefore, the channel to opening ratio is reflective of natural stream conditions.
- Visual indicators of a restriction do not occur here, except for minor bank erosion in the channel upstream of the bridge and a small amount of *Phragmites* growing on the edges of the upstream salt marsh area.
- This bridge was not considered to be a restriction by the Army Corps of Engineers (ACOE, *Cape Cod Wetlands Investigation*, June 1996, p. 85).

HA-g

- Route 28 crossing of channel north of Allens Harbor, Harwich Port.
- This crossing is upstream of restricted site HA-5 at Kildee Road.
- No salt marsh was delineated by the Wetlands Conservancy Program to the seaward side of this site.
- This site was studied by the Army Corps of Engineers (ACOE, *Cape Cod Wetlands Investigation*, June 1996). The estimated length of this crossing from the seaward side of Kildee Road to the upstream side of this site is 210 feet. Findings indicated that very little restriction was caused by either Kildee Road or this site at high tide. No further study was recommended at that time.

HA-h

- Carding Machine Brook flows under Route 28 into Saquattucket Harbor via a 4-foot concrete box culvert set below a large rock retaining wall.
- No wetland was delineated by the Wetlands Conservancy Program abutting Route 28. Salt marsh fringes the Harbor but does not extend to the seaward side of Route 28. Cranberry Bogs are delineated upstream of Route 28.

HA-i

- Route 28 crossing of unnamed stream flowing into the northeastern corner of Saquattucket Harbor.
- The Wetlands Conservancy Program delineated salt marsh along this channel south of Route 28, but it does not extend to the crossing. Shallow marsh and shrub swamp were delineated upstream.
- The seaward side of the pipe is not accessible. Upstream of Route 28 a 3-foot opening is visible within a concrete headwall that does not appear to be broken or clogged.

TOWN OF MASHPEE

MA-a/FA-k

- Meadow Neck Road (at the Falmouth-Mashpee town line) crossing of channel into Hamblin Pond.
- This channel is man-made and was installed to improve the tidal flow between Waquoit Bay and Hamblin Pond. The ponds' natural tidal entrance, the Little River, was not providing sufficient flushing for the pond when it was the only tidal connection with Waquoit Bay.
- The armored channel is 22 feet wide and the pipe is a large, corrugated metal 13-foot by 10-foot pipe.
- There was very minor scour observed near the upstream opening of the pipe.
- Hamblin Pond is a productive shellfish resource area, much of which is open year-round for harvesting.
- Two tidally restricted sites are found at the upper reaches of Hamblin Pond, MA-1 and MA-2.

MA-b/FA-l

- Cranberry bog berm crossing at the mouth of Red Brook (east of Ostrom Road, Falmouth and west of Bayshore Drive, Mashpee).
- Red Brook forms the town line between Falmouth and Mashpee.
- Cranberry bogs were created in the Red Brook just north of its confluence with Hamblin Pond.
- These bogs are no longer in production, however the berms created are still in place.
- Although salt marsh is delineated to the seaward side of this site, it is not considered a restriction in this Atlas because the berm was naturally breached allowing tidal flow to return to the bog. However, the breach may not be large enough to resemble natural free-flowing conditions for Red Brook. 2.06 acres of shallow marsh is delineated upstream of this site.

MA-c

- Crossing of channel off of Jehu Pond.
- Private resident access only – fieldwork could not be done at this site.
- According to the Mashpee Harbormaster, tidal access may have been restricted to salt marsh during construction of the town homes that now exist.
- The WCP delineates affected area as 3.43 acres of shallow marsh (M) and 2.99 acres of shrub swamp (SS).

MA-d

- Access road (Great Oak Road) to parking area for the South Cape Beach State Park crossing of unnamed tidal channel.
- The road and Park are owned and managed by the Massachusetts Department of Environmental Management.
- A 20-inch clay pipe passes under the access road enabling flow to move between Sage Lot Pond and Flat Pond.
- This site lies upstream of restricted sites MA-4 and MA-5.
- The WCP delineated upland on both side of this access road.
- No salt marsh exists upstream of MA-d, but the wetland system does continue and is delineated by the WCP as 27.24 acres of shallow marsh.
- This site is not restrictive of salt marsh, though flow is certainly restricted by the undersized culvert.

MA-e

- Popponeset Island Road crossing Popponeset Creek and connecting with the northern end of Popponeset Island.
- Tidal flow is heavy into Popponeset Creek around the southern tip of the island.
- Local officials believe that the bridge itself is not restricting tidal flow.
- The area near the bridge is very shallow; with low tide water depth at approximately six inches.
- The land on the western shore of the island and western shore of Popponeset Creek now supports 6.97 acres of salt marsh scattered in seven small patches. According to local officials this is a fraction of what existed historically; much of the area was filled to enable housing development.

TOWN OF ORLEANS

OR-a

- Private driveway crossing of channel off Rachel's Cove.
- The WCP delineated 0.54 acres of SM upstream of this unpaved driveway.
- A 3-foot corrugated metal pipe set in a concrete headwall passes tidal flow. It appears to be in good condition.
- There were no visual indicators of a restriction at this site other than minor scouring on the seaward side. Flow closely resembled natural free-flowing conditions.

OR-b

- Weston Taylors Lane crossing of a channel off The River.
- Site is located on private property on Barley's Neck, within the Pleasant Bay Area of Critical Environmental Concern.
- The WCP delineated 3.59 acres of SM upstream of the crossing.
- A 3-foot pipe was installed in 1997 by the homeowner, which replaced a previously restrictive pipe that measured 15-inches in diameter.
- Visual indicators of a restriction were observed by the project staff, however according to the homeowner the damage observed is a result of the previously undersized pipe that has yet to heal.

OR-c

- Route 28 crossing of channel off Little Pleasant Bay.
- Site is located north of the Route 28 intersection with Tar Kiln Road and the Brewster/Orleans town line and is within the boundary of the Pleasant Bay Area of Critical Environmental Concern.
- A 46-foot open bridge span is supported on wooden pylons.
- There are only minor visual indicators of a restriction observed, including minor upstream bank erosion and *Phragmites* on the fringes of the upstream affected area.
- The WCP delineated 8.89 acres of SM upstream of the crossing.

OR-d

- Dirt berm crossing of channel off Pleasant Bay. The channel's inlet is located east of the entrance to Quanset Pond and west of The Narrows (Latitude 41-44-20/ Longitude 69-58-47).
- This crossing is located within the boundary of the Pleasant Bay Area of Critical Environmental Concern.

- Flow passes under the berm via an 8 inch (estimated) clay pipe with a concrete sluiceway on the upstream side that allows for the placement of water-tight stoplogs.
- The pipe appears to be partially blocked by debris.
- Vegetation on either side of the berm appears to be the same. A small area of salt tolerant grasses was observed upstream of the dirt berm. Deciduous trees upstream of the berm are dying off – possibly a result of salt water flow.
- Visual indicators of a restriction were minor.
- Before reaching the berm, tidal flow travels through a 3 to 5-foot wide channel off of the Bay that remains at approximately the same width upstream of the crossing.
- The WCP delineated 0.63 acres of SS extending inland from the Bay with WS upstream of that. There is no SM lying seaward of the berm.
- Field staff were lead to the site by Vince Ollivier, a member of the Orleans Conservation Trust who is very knowledgeable about this location.

OR-e

- Continuing east past the end of the paved section of Quanset Road, the roadway berm crosses a small tidal channel with its mouth on The Narrows, Little Pleasant Bay. Another branch of this channel flows to restricted site OR-7.
- This crossing is located within the boundary of the Pleasant Bay Area of Critical Environmental Concern.
- The crossing is a 2-foot corrugated metal pipe that appears to be in good condition.
- The WCP delineated 1.83 acres of SM upstream.
- Visual indicators of a restriction were minor, including only minor scour and upstream erosion.

TOWN OF PROVINCETOWN

There are no NTR's identified in Provincetown.

TOWN OF SANDWICH

SA – a

- Town Neck Road crossing of the north branch of Mill Creek.
- Two 16-inch pipes convey flow under Town Neck Road.
- The WCP delineated SS to the seaward side of this crossing.

SA - b

- River Street crossing of Mill Creek.
- The WCP delineated SM that ends before reaching this crossing. Upland is delineated around the crossing itself and WS is delineated upstream of River Street.
- Mill Creek flows under River Street via two 5-foot diameter semi-circular culverts. Flow continues into Shawme and Upper Shawme Pond.
- Mill Creek does support an anadromous fish run into these ponds.

SA-c

- Route 6A crossing of Dock Creek.
- This site lies upstream of tidally restricted sites SA-4 and SA-5.
- Tidal flow and SM are restricted at site SA-5 by a tide gate allowing flow to pass upstream

- through only a 6-inch opening.
- The WCP delineated M seaward of this site.

SA -d

- Penn Central Railroad bed crossing of Spring Hill Creek. This crossing is approximately 30 yards west of the railroads' intersection with Spring Hill Road.
- The WCP delineated SM to the seaward opening and 1.97 acres of SS upstream.
- Flow passes under the railroad via a 30-inch stone box culvert.
- *Phragmites* dominates the vegetation to the seaward side of the crossing indicating that flow is restricted before reaching this site. Upstream vegetation consists of SS. *Phragmites* was not observed in the upstream affected area.

SA -e

- Abandoned road crossing of Mill Creek, a tributary to the Scorton River.
- The abandoned road is located on the Massachusetts State Game Farm and is a continuation of Pine Terrace. It is gated to prevent vehicle access.
- A concrete box structure acts to dam water upstream of this road and a 2-foot pipe passes flow under it.
- The WCP delineated SM to the seaward opening but only deep marsh is delineated upstream.
- Sandwich Conservation Officer stated that the town is interested in allowing the upstream deep marsh to become a freshwater pond in order to enhance the anadromous fish run in this system.

SA-f

- Torrey Road crossing of easterly channel of Scorton Creek (Sandwich).
- Torrey Road is a private, paved road through Scorton Neck that terminates at a small beach parking lot on the south side of the Scorton Neck barrier beach.
- Scorton Creek's mouth is at Scorton Harbor, a man-made tidal entrance. Historically, Scorton Creek flowed in from Cape Cod Bay near what is today the Torrey Road beach parking lot.
- The WCP delineated 0.3 acres of SM upstream of Torrey Road and SM extending to the seaward side of the road.
- Field conditions observed were as follows: a one-foot diameter, metal pipe set in a stone embankment was in place to convey flow under the road; no channels or water was visible either reaching the seaward side of Torrey Road or continuing upstream of the crossing; no scour or erosion was visible near the culvert; and, only a minor amount of *Phragmites* was visible in the upstream affected area.

TOWN OF TRURO

TR-a

- Earthen dike (inaccessible) and Fisher Road crossings of unnamed tidal channel flowing south from Pamet Harbor.
- According to local officials the dike (lying approximate 1/2 mile seaward of the Fisher Road crossing) was built to protect Fisher Road from flooding.
- The WCP delineated 4.09 acres of SM between Fisher Road and the earthen dike and 0.53 acres of SS upstream. Fieldwork did not identify any flow reaching Fisher Road.

TR-b

- Abandoned railroad bed crossing of Eagle Neck Creek in the marsh area south of Pamet Harbor.
- The railroad bed was breached in 1991 by Hurricane Bob and has intentionally not been reconstructed.
- Fieldwork determined that the breach was wide enough so as not to restrict tidal flow.

TR-c

- Abandoned railroad bed crossing of channel to Mill Pond in the marsh area south of Pamet Harbor.
- The railroad bed was breached in 1991 by Hurricane Bob and has intentionally not been reconstructed.
- Fieldwork determined that the breach was wide enough so as not to restrict tidal flow.

TR-d

- High Head Road (extension) crossing of the channel from Pilgrim Lake into Salt Meadow/Head of the Meadow.
- This site lies upstream of restricted sites TR-6 and TR-7, and is seaward of TR-e.
- The WCP delineated 1.81 acres of M and 2.62 acres of SS between this site and TR-e.
- According to John Portnoy of the Cape Cod National Seashore, Salt Meadow was historically a vast salt marsh ecosystem.

TR-e

- Earthen dike crossing of the channel from Pilgrim Lake into Salt Meadow/Head of the Meadow. This crossing lies just upstream of site TR-d.
- The WCP delineated 49.13 acres of M and 91.90 acres of SS upstream of this site.
- According to John Portnoy of the Cape Cod National Seashore, Salt Meadow was historically a vast salt marsh ecosystem.

TOWN OF WELLFLEET

WE-a

- Blue Heron Road crossing of channel off Fresh Brook, which flows north and crosses under the road to the west of Route 6.
- A 3-foot diameter concrete culvert passes flow, however the channels were dry at the time of the site visit.
- The WCP delineated 0.57 acres of SM upstream of the crossing.
- *Phragmites* growth was significant on the seaward side of Blue Heron Road, however there was none observed in the patch of upstream affected salt marsh.

WE-b

- Earthen dike crossing of an unnamed creek flowing to the north of Fresh Brook, and bounded on the west by Route 6 and on the north by Lieutenant Island Road.
- This site was identified by the Commission project staff as a potential salt marsh restriction site. It seems likely that this is a site that should be considered tidally restrictive of salt marsh. However, after many attempts project staff was unable to locate this site in the field.
- The WCP delineated SM to the seaward side of the berm. The vegetation appears to change just upstream of the dike and was delineated as 21.02 acres of SS and 2.87 acres of M.

- This area was originally diked to support cranberry farming, however no bogs are actively farmed today.
- The Wellfleet Shellfish Department believes that there is a clapper gate restricting flow under this dike and that there is a healthy fresh water wetland upstream of this crossing.

WE-c

- Lieutenant Island Road crosses, via an 80-foot wood pylon bridge, a channel connecting Loagy Bay to the Wellfleet Harbor area on the south side of Lieutenant Island.
- The bridge is in good condition. It was constructed low, at marsh level, to enable extreme high and storm tides to simply flood the roadway.
- There were no visual indicators of a restriction observed.

WE-d

- Two, 4-foot diameter concrete culverts pass the flow of Blackfish Creek under the Cape Cod Rail Trail.
- This crossing is upstream of restricted site WE-3.
- Under the present conditions at site WE-3, WE-d is not considered tidally restrictive of salt marsh because it is adequately sized to pass the quantity of tidal flow that reaches it. Should work to improve tidal flow at site WE-3 ever be undertaken, then the size of site WE-d should be re-evaluated.
- The WCP delineated 2.20 acres of SM upstream of this crossing.

WE-e

- Railroad embankment crossing of Duck Creek to the north of the Shirttail Point parking lot.
- The embankment is breached and no visual indicators of a restriction were observed.
- According to a study intended to elucidate the processes of circulation and sedimentation in Duck Creek, “it may well be that [this] railroad embankment across Duck Creek has hindered the development of salt marsh in the upper part of the system and that its removal would stimulate increased marsh development there” (Giese, 1994).

TOWN OF YARMOUTH

YA – a

- Walking path at end of Ancient Way, over unnamed stream
- Upland vegetation on both sides of culvert

YA - b

- Route 6A (near Weir Rd.) crossing of Whites Brook
- Salt marsh does not extend to seaward side of road

YA - c

- Cranberry bog berm north of Highland St. crossing of unnamed stream, between restricted site YA-5 and abandoned cranberry bogs upstream
- Stream not accessible or visible from road; upland vegetation

YA - d

- Route 28 crossing of west arm of Mill Creek flowing into Mill Pond (West Yarmouth)
- Baxter Grist Mill on upstream end; flow controlled for bogs and historic consistency
- Although salt marsh extends to seaward culvert opening, upstream is all open water

YA - e

- Route 28 crossing of Thornton Brook — east arm of Mill Creek in West Yarmouth
- Wooded-swamp (WS1) on upstream end

YA – f

- Along western edge of Colonial Acres beach, berm between Mill Creek (connected to Lewis Bay) and unnamed tributary to the creek.
- Relatively new corrugated metal pipe, 6-foot diameter.
- 7.41 acres of salt marsh were delineated upstream by the Wetlands Conservancy Program but no visual indicators of a restriction occur near the site.

YA-g / DE-c

- Route 28 crossing of the Bass River on the Yarmouth/Dennis town line.
- Route 28 crosses the river via a 300-foot bridge span supported on pylons in the riverbed.
- There is a significant amount of salt marsh and other wetland type that occurs along the upstream banks of Bass River.
- Non restricted site YA-h/DE-d and restricted site YA-11/DE-13 lie upstream.
- There are no visual indicators of restricted tidal flow at this location. The channel width-to-opening ratio resembles natural, free-flowing conditions.
- A review of aerial photography showed no pooling on either side of the bridge; fieldwork confirmed this analysis.
- The Bass River supports an anadromous fish run and productive shellfish resources.

YA-h / DE-d

- Highbank Road crossing of the Bass River on the Yarmouth/Dennis town line.
- This site lies upstream of YA-g/DE-c and seaward of YA-11/ DE-13.
- The road crosses the river via a 160-foot bridge span supported on pylons in the riverbed.
- The upstream area affected by this crossing includes Priority Habitat of Rare Species and Estimated Habitat of Rare Wildlife.
- The Bass River supports an anadromous fish run and productive shellfish resources.
- Visual indicators of a tidal restriction are limited to minor scouring of the riverbanks.

YA – i

- North Dennis Road crossing of Weir Creek, which connects Follins Pond with Mill Pond at northern end of Bass River system.
- The Wetlands Conservancy Program delineated upland seaward of, and wooded swamp upstream of, this crossing.

Appendix C

Latitude and Longitude of Identified Salt Marsh Restriction Sites

At each site, a hand-held Global Positioning System (GPS) receiver was used to determine the latitude and longitude. The receiver used was the “GPS-12 Personal Navigator” made by Garmin International, Inc., based in Olathe, Kansas.

Where practical, readings were taken approximately half way between the seaward and upstream opening of a pipe or culvert. Most often, the GPS position was recording while standing on top of the seaward opening of the site. If a site was particularly long, two GPS positions were recorded. The first at the seaward opening, and the second at the upstream opening. Both readings are recorded below and the location of the reading is indicated. The horizontal accuracy of the position recorded is 7 to 15 meters (21 to 45 feet). The position is given in the standard Latitude/Longitude units of degrees (°), minutes (’), seconds (”). The receiver gave the seconds reading to three decimal places, which was rounded in the field to two digits.

Site No.	Latitude (N)	Longitude (W)
BARNSTABLE		
BA-1/ SA-13	41° 43’ 58”	70° 23’ 80”
BA-2	41° 42’ 19”	70° 21’ 74”
BA-3	41° 42’ 16”	70° 21’ 78”
BA-4	41° 42’ 07”	70° 21’ 14”
BA-5	41° 42’ 38”	70° 17’ 91”
BA-6	41° 42’ 20”	70° 17’ 29”
BA-7	41° 43’ 86”	70° 19’ 70”
BA-8/ YA-1	41° 42’ 45”	70° 15’ 73”
BA-9/ MA-6	41° 37’ 00”	70° 27’ 02”
BA-10	41° 35’ 96”	70° 26’ 54”
BA-11	41° 38’ 16”	70° 21’ 50”
BA-12	41° 38’ 35”	70° 21’ 66”
BA-13	41° 38’ 36”	70° 20’ 67”
BA-14	41° 38’ 33”	70° 20’ 20”
BA-15	41° 38’ 00”	70° 18’ 62”
BA-16	41° 38’ 12”	70° 18’ 55”
BA-17	41° 38’ 13”	70° 17’ 58”
BA-18	41° 38’ 15”	70° 16’ 89”
BA-19	41° 38’ 57”	70° 16’ 77”

Site No.	Latitude (N)	Longitude (W)
BREWSTER		
DE-2/ BR-1	41° 44’ 82”	70° 08’ 61”
BR-2	41° 45’ 29”	70° 07’ 44”
BR-3	41° 45’ 25”	70° 07’ 46”
BR-4	41° 45’ 66”	70° 06’ 83”
BR-5	41° 45’ 24”	70° 06’ 86”
BR-6	41° 45’ 28”	70° 06’ 77”
BR-7/ OR-1	41° 46’ 86”	70° 00’ 68”
Site No.	Latitude (N)	Longitude (W)
CHATHAM		
HA-8/ CH-1	41° 40’ 33”	70° 02’ 23”
CH-2	41° 40’ 39”	70° 00’ 95”
CH-3	41° 40’ 55”	70° 00’ 38”
CH-4	41° 40’ 56”	70° 00’ 32”
CH-5	41° 40’ 03”	69° 57’ 98”
CH-6	41° 42’ 13”	69° 58’ 16”
HA-9/ CH-7	41° 42’ 72”	69° 59’ 66”

Site No.	Latitude (N)	Longitude (W)
DENNIS		
DE-1	41° 44' 70"	70° 09' 75"
DE-2/ BR-1	41° 44' 82"	70° 08' 61"
DE-3	41° 40' 28"	70° 10' 11"
DE-4	41° 39' 40"	70° 10' 40"
DE-5	41° 39' 38"	70° 10' 10"
DE-6	41° 39' 35"	70° 09' 97"
DE-7	41° 39' 18"	70° 09' 48"
DE-8	41° 39' 17"	70° 09' 52"
DE-9	41° 39' 17"	70° 09' 57"
DE-10 seaward	41° 39' 17"	70° 09' 61"
DE-10 upstream	41° 39' 18"	70° 09' 68"
DE-11	41° 39' 33"	70° 09' 27"
DE-12	41° 40' 03"	70° 08' 79"
DE-13/ YA-11	41° 41' 60"	70° 10' 17"
Site No.	Latitude (N)	Longitude (W)
EASTHAM		
EA-1	41° 48' 13"	70° 00' 15"
EA-2	41° 48' 07"	69° 59' 94"
OR-4/ EA-3	41° 48' 10"	69° 59' 20"
EA-4	41° 48' 04"	69° 59' 01"
EA-5	41° 48' 34"	69° 59' 14"
EA-6	inaccessible	inaccessible
EA-7	41° 49' 04"	69° 58' 03"
EA-8	41° 49' 03"	69° 58' 10"
EA-9	41° 52' 58"	70° 00' 02"

Site No.	Latitude (N)	Longitude (W)
FALMOUTH		
FA-1	41° 32' 39"	70° 37' 82"
FA-2	41° 32' 75"	70° 35' 34"
FA-3	41° 32' 72"	70° 34' 80"
FA-4	41° 33' 03"	70° 34' 63"
FA-5	41° 33' 92"	70° 34' 97"
FA-6	41° 33' 18"	70° 34' 22"
FA-7	41° 32' 98"	70° 33' 34"
FA-8	41° 34' 71"	70° 30' 88"
Site No.	Latitude (N)	Longitude (W)
HARWICH		
HA-1	41° 39' 65"	70° 06' 78"
HA-2	41° 40' 16"	70° 06' 53"
HA-3	41° 40' 24"	70° 06' 46"
HA-4	41° 40' 66"	70° 05' 90"
HA-5	41° 40' 12"	70° 05' 16"
HA-6	41° 40' 07"	70° 02' 59"
HA-7	41° 40' 07"	70° 02' 68"
HA-8/ CH-1	41° 40' 33"	70° 02' 23"
HA-9/ CH-7	41° 42' 72"	69° 59' 66"
Site No.	Latitude (N)	Longitude (W)
MASHPEE		
MA-1	41° 34' 68"	70° 30' 02"
MA-2	41° 34' 54"	70° 30' 02"
MA-3	41° 34' 49"	70° 29' 47"
MA-4	41° 33' 15"	70° 30' 39"
MA-5	41° 33' 15"	70° 30' 30"
MA-6/ BA-9	41° 37' 00"	70° 27' 02"

Site No.	Latitude (N)	Longitude (W)
ORLEANS		
BR-7/ OR-1	41° 46' 86"	70° 00' 68"
OR-2	41° 46' 89"	70° 00' 57"
OR-3	41° 47' 44"	70° 00' 61"
OR-4/ EA-3	41° 48' 10"	69° 59' 20"
OR-5	41° 45' 38"	69° 58' 18"
OR-6	41° 45' 42"	69° 58' 18"
OR-7	41° 44' 32"	69° 58' 30"
Site No.	Latitude (N)	Longitude (W)
PROVINCETOWN		
PR-1	42° 02' 41"	70° 12' 21"
Site No.	Latitude (N)	Longitude (W)
SANDWICH		
SA-1	41° 45' 75"	70° 29' 72"
SA-2	41° 45' 66"	70° 29' 73"
SA-3	41° 45' 74"	70° 29' 39"
SA-4	41° 45' 48"	70° 29' 36"
SA-5	41° 45' 47"	70° 29' 43"
SA-6	41° 45' 19"	70° 28' 91"
SA-7	41° 45' 09"	70° 28' 60"
SA-8	41° 45' 33"	70° 27' 35"
SA-9	41° 44' 95"	70° 26' 41"
SA-10	41° 44' 19"	70° 25' 53"
SA-11	41° 44' 15"	70° 25' 69"
SA-12	41° 43' 82"	70° 24' 37"
SA-13/ BA-1	41° 43' 58"	70° 23' 80"
Site No.	Latitude (N)	Longitude (W)
TRURO		
TR-1	41° 59' 06"	70° 04' 03"
TR-2	41° 59' 39"	70° 04' 03"
TR-3	41° 59' 62"	70° 03' 02"

Site No.	Latitude (N)	Longitude (W)
TRURO		
TR-4 seaward	41° 59' 61"	70° 02' 93"
TR-4 upstream	41° 59' 61"	70° 02' 85"
TR-5	41° 59' 92"	70° 03' 96"
TR-6 seaward	inaccessible	inaccessible
TR-6 upstream	42° 02' 04"	70° 07' 02"
TR-7	42° 03' 17"	70° 07' 10"
Site No.	Latitude (N)	Longitude (W)
WELLFLEET		
WE-1	41° 53' 43"	69° 59' 28"
WE-2	41° 54' 64"	69° 59' 20"
WE-3	41° 54' 88"	69° 59' 25"
WE-4	41° 55' 01"	70° 01' 22"
WE-5	41° 55' 84"	70° 01' 78"
WE-6	41° 55' 87"	70° 03' 87"
Site No.	Latitude (N)	Longitude (W)
YARMOUTH		
YA-1/ BA-8	41° 42' 45"	70° 15' 73"
YA-2	41° 42' 28"	70° 15' 50"
YA-3	41° 42' 44"	70° 14' 98"
YA-4	41° 42' 97"	70° 14' 23"
YA-5	41° 38' 85"	70° 16' 40"
YA-6	41° 38' 54"	70° 16' 21"
YA-7	41° 38' 40"	70° 14' 95"
YA-8	41° 38' 47"	70° 14' 32"
YA-9	41° 38' 95"	70° 13' 41"
YA-10 seaward	41° 38' 72"	70° 11' 84"
YA-10 upstream	41° 38' 75"	70° 12' 04"
DE-13/ YA-11	41° 41' 60"	70° 10' 17"

Appendix D ---

GROWetlands Restoration Project Nomination Form

Wetlands Restoration & Banking Program **GROWetlands**

Wetlands Restoration Project Nomination Form

Thank you for your interest in restoring Massachusetts' wetlands. If you wish to sponsor a wetland restoration project and would like to propose that it be considered part of the statewide wetlands restoration initiative called **GROWetlands** (Groups Restoring Our Wetlands) under the Massachusetts Wetlands Restoration & Banking Program, please fill out this form and return to the address below.

Project Name: _____

Project Location: City/Town _____ Watershed _____

Please attach a USGS quad sheet or other map on which the site location has been marked.

If available, please attach current and historic photos and aerial photos of the project site.

Project Sponsor: _____

Designated Representative: _____

Telephone: _____ FAX _____ EMail _____

Address: _____

Project Co-Sponsors: _____

Landowner: _____

Has landowner expressed support for wetland restoration at the site? Yes ___ No ___

Explain:

Is all or part of the wetland totally destroyed or does it exist in a degraded condition? Explain:

Briefly describe the current condition of the wetland to be restored.

Wetlands Restoration Project Nomination Form (page 2)

Is the wetland part of an agricultural facility or was it farmland in the past?

Is in agricultural use now. Was never farmed. Was formerly agricultural land.

Explain:

What caused the impact to the wetland?

Is the wetland area under an outstanding enforcement order? Yes No

If yes, explain:

What is the approximate size of the area proposed to be restored?

What is the approximate size of adjacent wetland areas, if any?

Please attach a sketch of the area showing the wetland to be restored, adjacent wetlands and waterbodies, roads and buildings in the immediate vicinity, and other pertinent information to describe the site. If possible, indicate different wetland types that are present (Phragmites swamp, wet meadow, forested wetland, etc.).

If known, what was the wetland type(s) prior to impact?

If known, what restoration activity would be required to restore the wetland?

If known, what is the approximate cost of the restoration?

Has any funding been identified for this project? Yes No

If yes, describe:

Would you like WRBP to arrange a site visit and project evaluation? Yes No

Signed: _____ Date: _____

Please send this form with attachments to:

Steve Block
Wetlands Restoration & Banking Program
One Winter Street – 5th Floor
Boston, MA 02108
Phone: (617) 292-5743 • FAX: (617) 292-5850
Email: steve.block@state.ma.us

A representative of WRBP will contact you as soon as possible. Please call us if you have any questions.

Appendix E

List of Officials and Others Consulted

Several local and regional officials were consulted during the creation of this Atlas and asked to provide general information about their local salt marsh resources and about specific sites that were identified as a potential salt marsh restriction sites, and to suggest additional sites for project staff to investigate. They were also given a draft of their local area and asked to edit and comment on that draft. All of the edits and suggestions provided to project staff were incorporated into this Atlas. The following individuals were consulted:

■ BARNSTABLE

Darcy Karle, Conservation Agent
Dale Saad, Coastal Health Resource Coordinator
Stephen Seymour, Supervisory Project Engineer

■ BOURNE

Matt Boulanger, Conservation Agent

■ BREWSTER

All members of the Conservation Commission

■ CAPE COD NATIONAL SEASHORE

John Portnoy, Ecologist, National Park Service

■ CHATHAM

Kristin Andres, Conservation Agent
Dr. Robert Duncanson, Director,
Water Quality Laboratory

■ DENNIS

Alan Marcy, Shellfish Constable
George MacDonald, Director of
Natural Resources

■ EASTHAM

Henry Lind, Director of Natural Resources

■ FALMOUTH

Peggy Emslie, Conservation Agent
Paul Montigue, Shellfish Warden
Mark Patton, Director of Natural Resources

■ HARWICH

John Chatham, Conservation Agent
Tom Leach, Harbormaster
Heinz Proft, Natural Resources Officer

■ MASHPEE

Perry Ellis, Harbormaster
Jim Hanks, Chairman, Waterways Committee
Robert Sherman, Conservation Agent
Rick York, Shellfish Officer

■ ORLEANS

Dawson Farber, Harbormaster
Jenny Wood, Conservation Agent
Vince Ollivier, Orleans Conservation Trust

■ PROVINCETOWN

John Bennett, Chair, Conservation Commission
Roger Dias, Building Inspector/Conservation Agent
Anthony Jacket, Shellfish Warden

■ SANDWICH

Mark Galkowski, Conservation Officer

■ TRURO

Robert Bednarek, Secretary, Conservation Commission
Howard Irwin, Chair Conservation Commission
Anthony Jacket, Shellfish Warden
Paul Morris, Director, Dept. of Public Works

■ WELLFLEET

Paul Lindberg, Assistant Harbormaster
James McGrath, Assistant Shellfish Constable
Bill Walton, Shellfish Constable

■ YARMOUTH

Bradford Hall, Conservation Administrator
Karl Von hone, Director of Natural Resources

Appendix F

Distribution List for the FINAL DRAFT ATLAS (dated 11/20/01)

The following individuals were given an opportunity to comment on a Final Draft Atlas. Their comments were incorporated into this Final Atlas as appropriate:

■ **Bruce Carlisle**

Massachusetts Coastal Zone Management
251 Causeway Street
Suite 500
Boston, MA 02114-2136

■ **Hunt Durey**

Watershed Wetlands Planner
Massachusetts Wetlands Restoration Program
1 Winter Street, 5th Floor
Boston, MA 02108

■ **Christy Foote-Smith**

Director
Massachusetts Wetlands Restoration Program
1 Winter Street, 5th Floor
Boston, MA 02108

■ **Truman Henson**

Cape & Islands Regional Coordinator
Massachusetts Coastal Zone Management
Barnstable Superior Court Building
Barnstable, MA 02630

■ **Eric Hutchins**

National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930

■ **Patti Kellogg**

Cape Cod Watershed Leader
Waquoit Bay NERR
P.O. Box 3092
Waquoit, MA 02536-3092

■ **Don Liptack**

District Conservationist
USDA/ Natural Resources Conservation Services
P.O. Box 709
Barnstable, MA 02630

■ **Katie Lund**

Massachusetts Coastal Zone Management
193 Oyster Pond Rd., MS #2
Woods Hole, MA 02543

■ **John Portnoy**

Cape Cod National Seashore
99 Marconi Site Road
Wellfleet, MA 02667

■ **Ed Reiner**

Senior Wetland Scientist
US Environmental Protection Agency, Region 1
One Congress Street
Boston, MA 02114-2023

■ **Jan Smith**

Director, Mass Bays NEP
c/o MCZM
251 Causeway Street, Suite 500
Boston, MA 02114-2136

■ **Elizabeth Sorenson**

Coastal Coordinator, ACEC Program
Department of Environmental Management
251 Causeway St., Suite 700
Boston, MA 02114-2104