

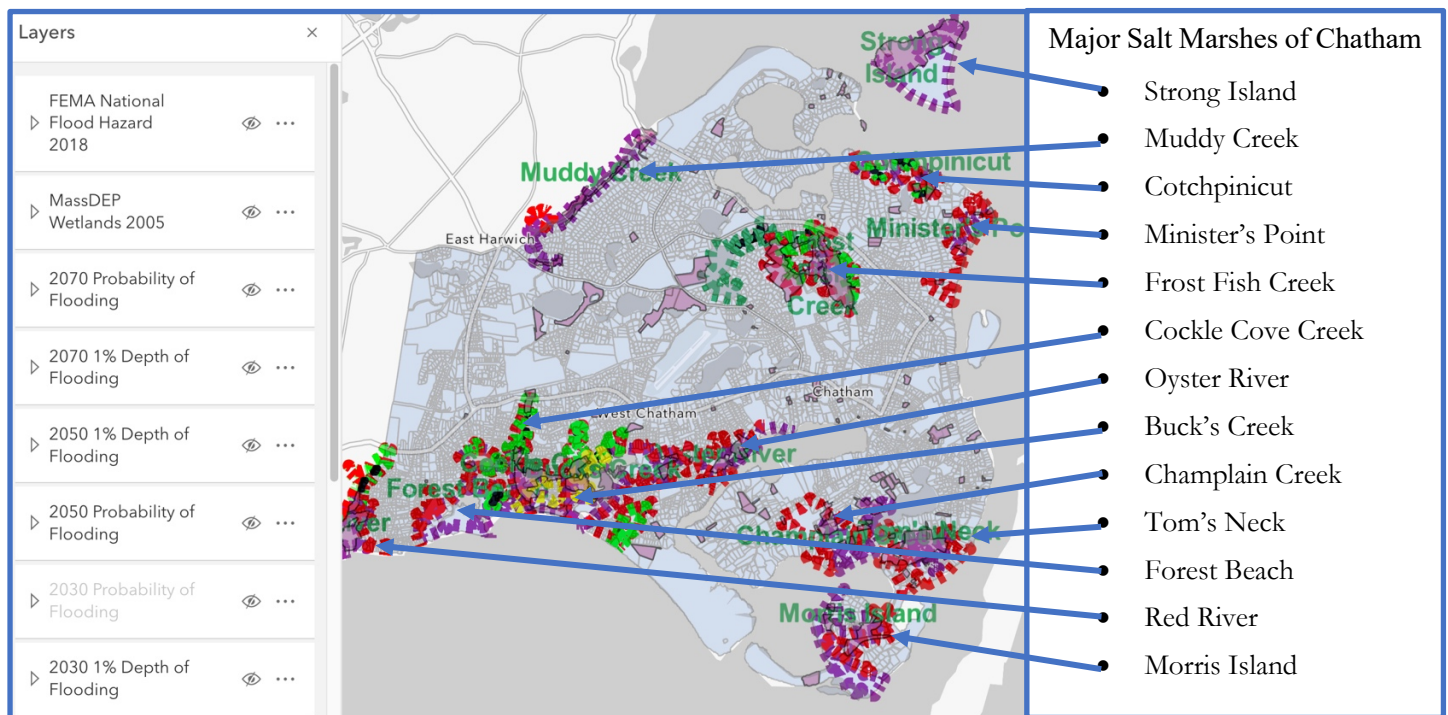
Pathways to Preserving Salt Marshes and Neighborhoods

The future of Chatham in an era of increasing climate change is largely dependent on the strategic management of Chatham’s major salt marshes. There will be a reciprocal relationship between a number of these marshes and the residential neighborhoods abutting them. If preservation actions are allowed access to potential marsh migration paths, healthy marshes may be preserved, which can help to protect and drain surrounding neighborhoods during drastically increasing sea-level rise, storm surge and flooding events.

This is a study by the Energy and Climate Action Committee (ECAC) of potential salt-marsh migration areas in Chatham and the parcels near those areas that could facilitate marsh preservation in the coming decades, assuming there are appropriate conservation restrictions (CRs) in place. The study was conducted in December 2022 using a GIS map system available online at:

<https://ecac.maps.arcgis.com/apps/instant/sidebar/index.html?appid=fb37b3b366894a0bb8809885aa665aee>

This map includes layers from FEMA 2018, MassDEP 2005 and MC-FRM 2017, as well as projections of climate change flooding in 2030, 2050 and 2070. These layers are described separately in “Chatham Salt Marshes Interactive Map” (available at: <https://gerrystahl.net/SMTF/onlinemap.pdf>). It also indicates areas owned by the Chatham Conservation Foundation (CCF) land trust and the boundaries of Chatham real-estate parcels.



To provide an initial indication of marsh expansion and migration in the coming decades, the following boundaries were drawn on the map of Chatham:

- Current marsh boundaries (in **purple** dotted lines) based on the “2017 Probability of Flooding” layer, using the 100% (black) always flooded areas. This was compared with the “MassDEP Wetlands 2005” layer, relying mainly on the salt-marsh areas (bluish green). These two delineations compare roughly with the actual current salt-marsh extents.
- Future marsh boundaries (in **red** dotted lines) based on the “2070 Probability of Flooding” layer, using the 10% (light purple) areas predicted to be flooded every few years.

- Potential marsh-migration areas and migration paths (in **green** dotted lines) for areas between purple and red boundary lines. Specific parcels in these areas may be marked with **green circles** to indicate properties threatened with severe flooding and/or associated with possible marsh migration paths.
- Potential residential inundation areas (in **yellow** dotted lines) for areas also between purple and red boundaries, but densely developed with housing.

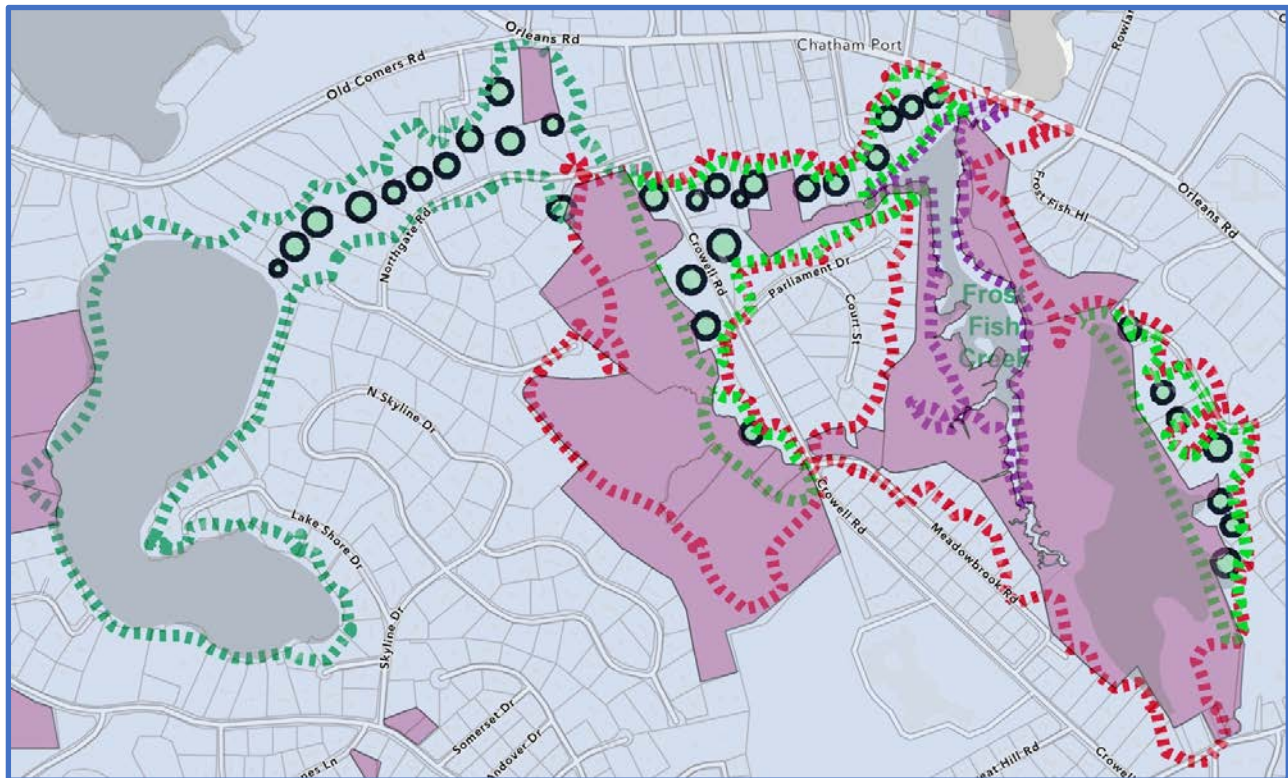
The following study lists about 130 parcels associated with 13 major salt marshes in Chatham. This analysis from the map should guide more detailed other approaches to predicting probable or possible migration areas and paths, as well as field studies of the targeted parcels. This list of specific parcels involved is very rough and speculative, requiring investigation through site visits and further analysis of potential marsh evolution and migration.

Frost Fish Creek salt marsh

Current status of marsh

This large marsh and wetlands complex has a number of tidal restrictions. MassDOT and several local and state agencies are working to remove the major restriction at Rt 28. Decisions must be made by CCF on the restrictions at the dam and the weir at the two ends of the existing marsh. The two creeks leading from Frost Fish across Crowell Rd and the creek from there to Lover’s Lake need to be investigated and probably cleared. This could open tidal flow to substantial migration areas that are already largely under CRs (owned by CCF or the Town). Restoration of tidal flow and creeks could re-establish historic fish runs, linking to restoration efforts underway at Stillwater Pond.

Predictive map



Map of Frost Fish Creek salt marsh area including migration areas and paths. Parcels currently owned by Chatham Conservation Foundation are coloured mauve. The current extent of the marsh is outlined in purple. The projected extent in 2070 is outlined in red. Four potential migration areas and the paths for marsh migration to there are outlined in green: (a) The industrial park to the east. (b) The Crowell Rd southern culvert leading to the wetlands near the middle school. (c) The Crowell Rd northern culvert and the creek leading to it. (d) The historic fish run from Lover’s Lake to Frost Fish Creek.

Parcels relevant to preservation of these areas and paths are suggested with green circles and are listed below.

East side: industrial park

14H-1-5: 79 Stony Hill Rd. – esp. 1 acre at northern end
14H-71-E22: 85 Enterprise Dr – esp. 5,000 sf at western end
14H-72-E21: Enterprise Dr – esp. half at western end
14H-14C-E3: 111 Enterprise Dr – esp. half at western end
13H-3-ND3: MISTY MEADOW LN -- whole parcel
13H-1-NE: 81 MISTY MEADOW LN -- half at northern end
13I-1-NF: 109 MISTY MEADOW LN –whole parcel

South side: Crowell lower culvert

12H-18-4: 569 CROWELL RD -- SW half.

North side: Crowell upper culvert

12I-3-16: 619 CROWELL RD -- western 90%
12I-4-20: 641 CROWELL RD -- whole parcel
12I-5-1: 3 NORTH GATE RD -- southern 90%
12I-25-15A: 654 CROWELL RD -- whole parcel
12I-23-21: 678 CROWELL RD -- whole parcel
12I-15-2: 693 ORLEANS RD -- southern half
12I-12A-4A: 675 ORLEANS RD -- southern half
12I-10-6: 643 ORLEANS RD -- southern third
12I-9D-GB41: WELLS HOLLOW -- whole parcel
12I-9DA-GB53; WELLS HOLLOW -- whole parcel
12I-9E-GB42; 43 WELLS HOLLOW -- whole parcel
12I-7-8; 597 ORLEANS RD -- whole parcel
12I-9H-45: WELLS HOLLOW -- whole parcel
13I-9-GC: 561 ORLEANS RD -- whole parcel

West side: path to Lover's Lake

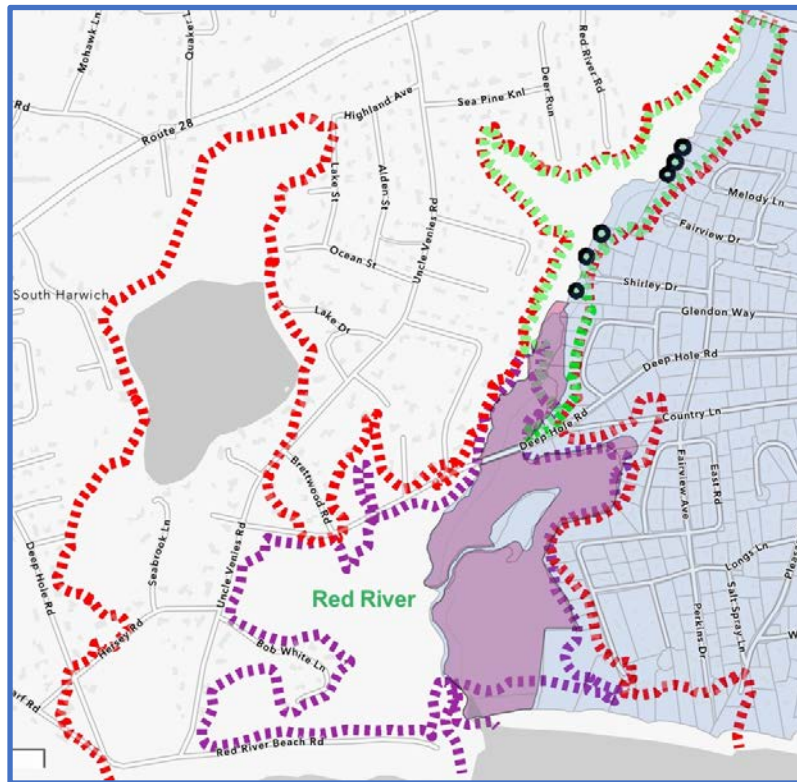
11I-4-5: 35 NORTH GATE RD -- thin northern strip -- Cn Part Wetland Deeded Beach Rights
11I-7-2B: 725 CROWELL RD -- western half
11I-44-G32: 20 LORDS POND LN -- whole parcel
11I-46-G34: 64 NORTH GATE RD -- whole parcel
11I-47-G35: 29 LORDS POND LN -- whole parcel
11I-48-G36: 35 LORDS POND LN -- whole parcel
11I-49-G37: 39 LORDS POND LN -- whole parcel
11I-50-G38: 106 NORTH GATE RD -- whole parcel
11I-41-G40: 122 NORTH GATE RD -- whole parcel
11I-40-G41: 134 NORTH GATE RD -- whole parcel
11I-39-G27: 148 NORTH GATE RD -- whole parcel
11I-CA-G26: 0 LOVERS LAKE CIR -- NORTHGATE HOMEOWNERS ASSOCIATION INC -- UNDEV LAND -- whole parcel

Red River salt marsh

Current status of marsh

The Red River defines the border between Chatham and Harwich to the west. There is a tidal restriction at Deep Hole Rd. Although there may be migration potential in Harwich, the primary migration area in Chatham is up-river from the current salt marsh through existing wooded marsh, eventually up to Rt 28.

Predictive map



Map of Red River salt marsh area including migration area. Parcels currently owned by Chatham Conservation Foundation are coloured mauve. The Town already owns some of the parcels at the northern end. The current extent of the marsh is outlined in purple. The projected extent in 2070 is outlined in red. A potential migration area for marsh migration is outlined in green. The parcels associated in this area are indicated with green circles and are listed below.

Parcels for possible CRs

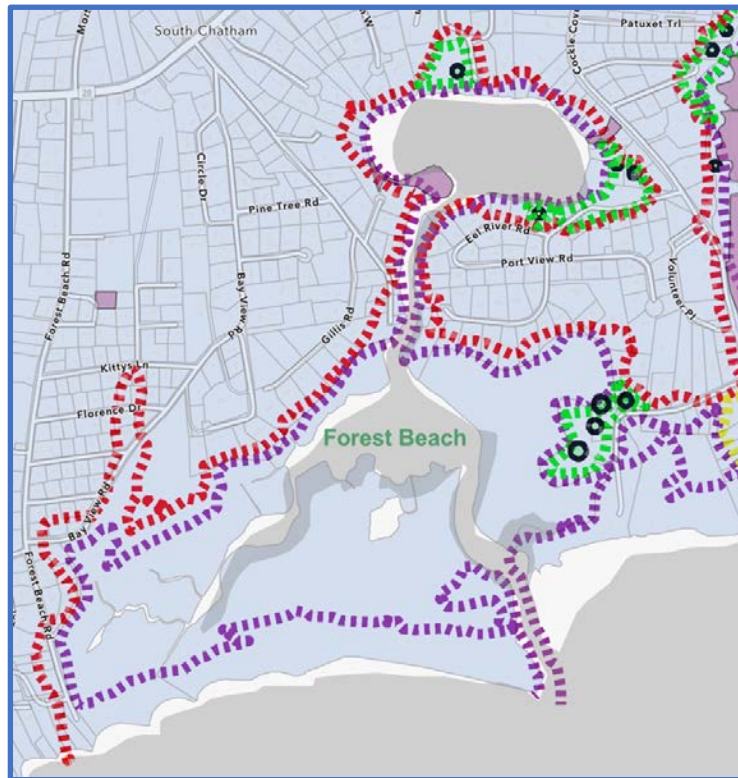
- 1B-12-N17: 59 SHIRLEY DR
- 1C-4-N16: 60 SHIRLEY DR
- 1C-5-W11: FAIRVIEW DR
- 2C-16-F10: 93 MELODY LN
- 2C-17-F9: 97 MELODY LN
- 2C-18-F8: 105 MELODY LN

Forest Beach salt marsh

Current status of marsh

The salt marsh is connected to Taylor Pond by a channel. It is also connected to a marsh area south of Chatharbor Ln and north of a barrier beach. There is a small culvert connecting them under the southern extension of Chatharbor Ln. This connected area is the largest potential migration area for Forest Beach, in addition to some eventual broadening of Taylor Pond.

Predictive map



Map of Forest Beach salt marsh area including migration areas and paths. The current extent of the marsh is outlined in purple. The projected extent in 2070 is outlined in red. Three potential migration areas are outlined in green: (a) north of Taylor Pond, (b) east of Taylor Pond, (c) west of Chatharbor Rd. The parcels relevant to preservation of these areas are indicated with green circles and are listed below.

Parcels for possible CRs

- 4D-16-23: 108 BEACH PLUM RD
- 5C-31-J6: 32 TAYLORS POND RD
- 5C-32-J5: 22 TAYLORS POND RD
- 4C-50-S1: 74 TAYLORS POND RD
- 5B-2-2: 94 CHATHARBOR LN
- 5B-3B-1B: 84 CHATHARBOR LN
- 5B-3A-1A: 78 CHATHARBOR LN
- 5B-4-3: 74 CHATHARBOR LN

Cockle Cove salt marsh

Current status of marsh

Much of this marsh is healthy according to a 2021 field study. There is a crushed culvert connecting Cockle Cove to Bucks Creek at Ridgevale and Cranberry Lane that could provide tidal flow between the two marshes. There is also an underwater dam near there that may be restricting flow. There may be road run-off into the marsh encouraging phragmites spread. Most of this marsh, including migration areas, is largely under CRs (owned by CCF).

Predictive map



Map of Cockle Cove Creek salt marsh area including migration area. The current extent of the marsh is outlined in purple. The projected extent in 2070 is outlined in red. A potential migration area upstream along the creek to Rt 28 is outlined in green. The parcels relevant to preservation of this area are indicated with green circles and are listed below. Other areas threatened with flooding inundation but fully developed with residential communities are outlined in yellow.

Parcels for possible CRs

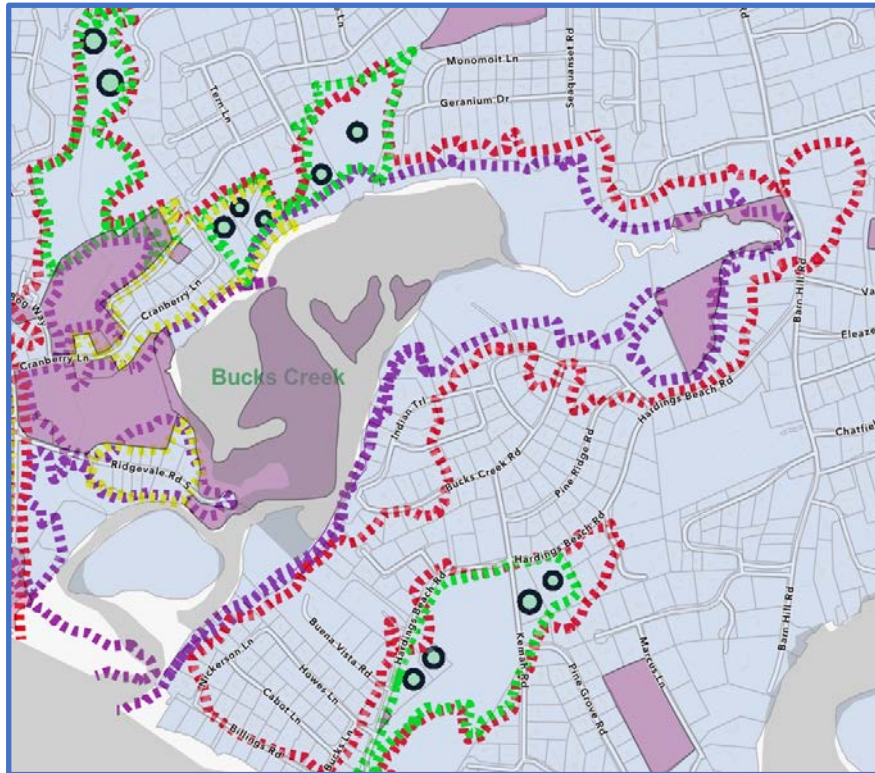
- 5C-48A-16: PINE KNOLL AVE
- 5C-13-13: COCKLE COVE RD TE
- 5D-13-48: COCKLE COVE BOG
- 5D-12-MIS6: 67 COCKLE DR
- 5D-71-M10: 77 PATUXET TRL
- 5D-13F-C15: 11 CREST CIR
- 5D-13G-C14: 3 CREST CIR
- 5D-13E-C16: 12 CREST CIR – western half
- 5D-13H-C13: 93 CHATHAM CREST DR – western half
- 5D-13I-C12: 105 CHATHAM CREST DR -- western half
- 5D-13J-C26: 123 CHATHAM CREST DR
- 5D-52C-H18: 17 SHANNON LN -- western half
- 5D-13-48: COCKLE COVE BOG
- 5D-52F-H21: 45 SHANNON LN
- 5D-52J-H25: 77 SHANNON LN

Bucks Creek salt marsh

Current status of marsh

Much of this marsh is healthy according to a 2021 field study. There is a crushed culvert connecting Cockle Cove to Bucks Creek at Ridgevale and Cranberry Lane that could provide tidal flow between the two marshes. Most of this marsh, including migration areas, is largely under CRs (owned by CCF). Future connections between currently separate marshes might generally be helpful in promoting tidal flushing and improving marsh health as marshes expand toward each other.

Predictive map



Map of Bucks Creek salt marsh area including migration areas and paths. The current extent of the marsh is outlined in purple. The projected extent in 2070 is outlined in red. Three potential migration areas are outlined in green. The parcels relevant to preservation of these areas are indicated with green circles and are listed below. Other areas threatened with flooding but fully developed with residential communities are outlined in yellow

Parcels for possible CRs

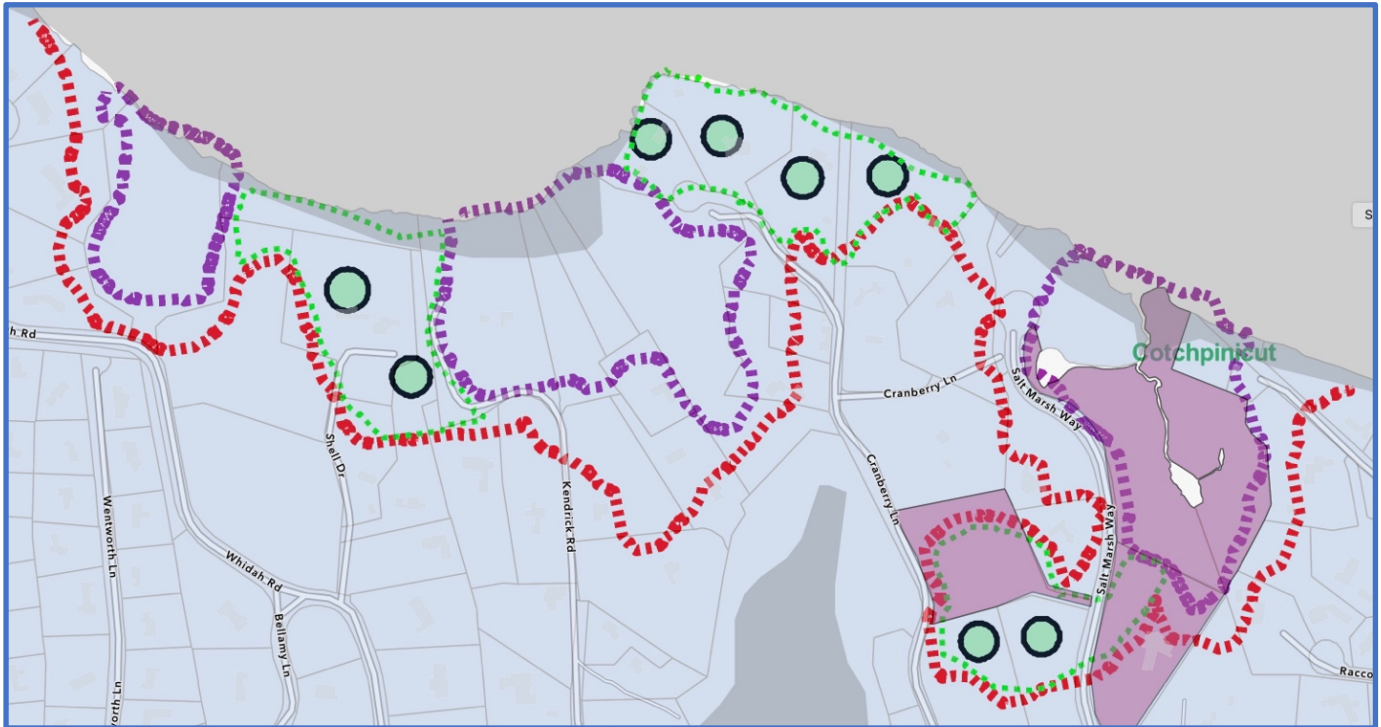
- 7D-1-BOG: 79 RALPH ST -- western three-quarters
- 7D-45-M14: 26 SULPHUR SPRINGS RD -- southeast sector
- 7C-18B-M39: 65 OVERLOOK DR
- 7D-70-M40: 45 OVERLOOK DR
- 7C-18-W1: 140 SULPHUR SPRINGS RD
- 7D-38-M7: 98 SULPHUR SPRINGS RD
- 8D-20-7: 101 GERANIUM DR
- 8B-24-10A: 333 HARDINGS BEACH RD
- 8B-23A-10B: 311 HARDINGS BEACH RD
- 8B-6-H44: KEMAH RD
- 8B-5-9: 209 HARDINGS BEACH RD

Cotchpinicut salt marsh

Current status of marsh

There are currently three separate salt marshes along the northern coast of North Chatham. By 2070, they are likely to expand until they merge into one continuous marsh, including three migration areas.

Predictive map



Map of Cotchpinicut salt marsh area including migration areas and paths. The current extent of the marsh is outlined in purple. The projected extent in 2070 is outlined in red. Three potential migration areas are outlined in green. Parcels currently owned by Chatham Conservation Foundation are coloured mauve. The additional parcels relevant to preservation of these areas are indicated with green circles and are listed below.

Parcels for possible CRs

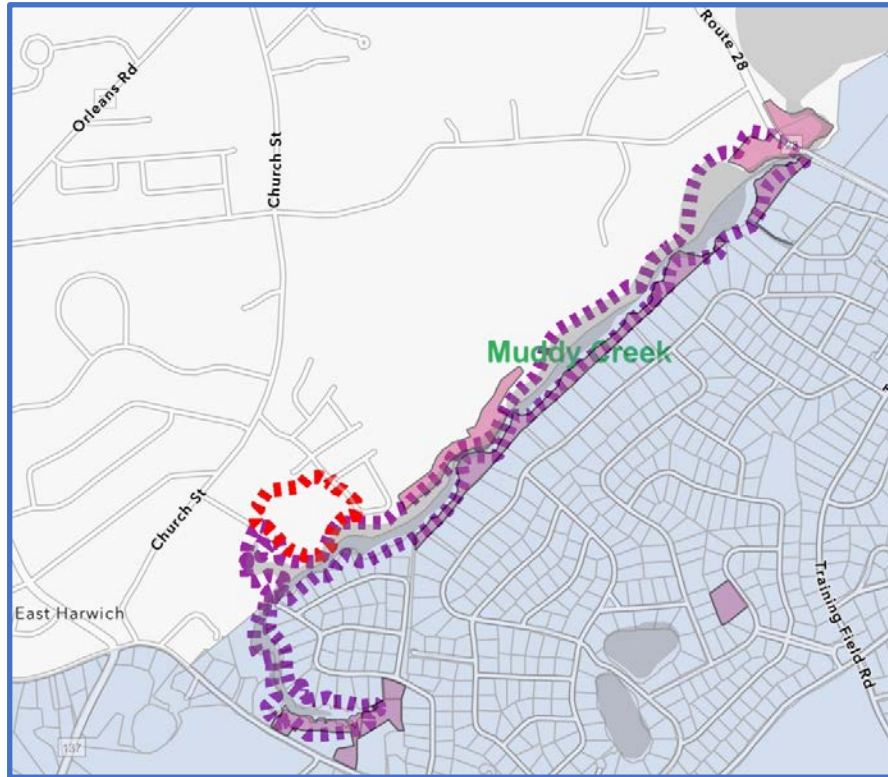
- 14K-7-W50: 68 SHELL DR
- 14K-14B-W2B: 52 SHELL DR
- 15K-6B-6: 64 FAR END LN
- 15K-6A-7A: 30 FAR END LN
- 15K-7-7: 299 CRANBERRY LANE
- 15K-8-F1: 294 CRANBERRY LANE
- 15J-11-SA3: 108 CRANBERRY LANE -- northern quarter
- 15J-15-W20: SALT MARSH WAY -- northern half

Muddy Creek salt marsh

Current status of marsh

Muddy Creek salt marsh was recently restored by building a bridge along Rt 28, which removed a major tidal restriction. Muddy Creek defines the northern border of Chatham, with Harwich.

Predictive map



Map of Muddy Creek salt marsh area. The current extent of the marsh is outlined in purple. The projected expanded extent in 2070 is outlined in red. No potential migration areas were identified on the Chatham side of the creek. Parcels currently owned by Chatham Conservation Foundation are coloured mauve.

Parcels for possible CRs

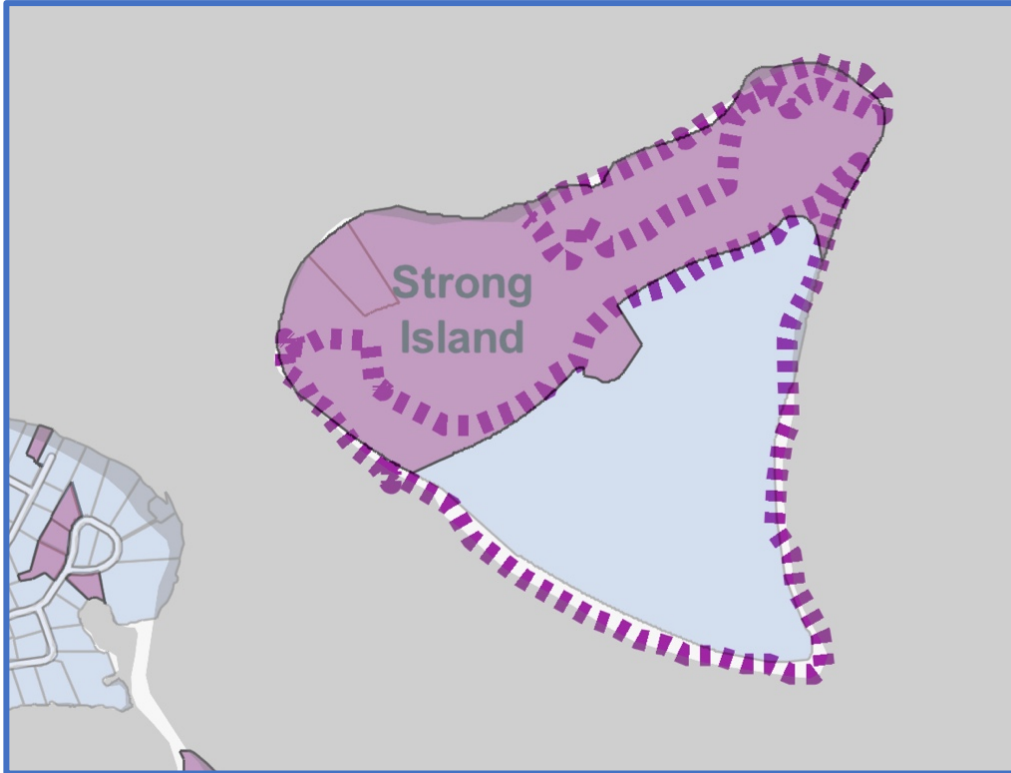
None.

Strong Island salt marsh

Current status of marsh

The salt marsh associated with Strong Island is contiguous with the open water of Pleasant Bay. There are no tidal restrictions, and the marsh appears to be healthy.

Predictive map



Map of Strong Island salt marsh area. The current extent of the marsh is outlined in purple. The island's upland is currently owned by Chatham Conservation Foundation and is coloured mauve. The marsh in the Bay is currently owned by the Town of Chatham. The entire area is already under conservation restriction.

Parcels for possible CRs

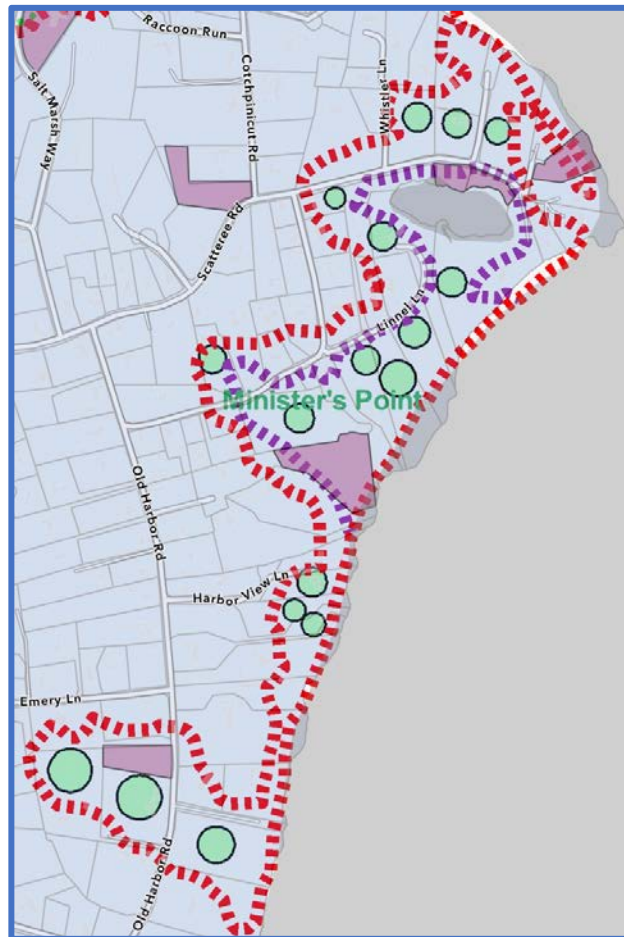
None

Minister's Point salt marsh

Current status of marsh

There are currently some problems with this marsh according to local residents, who are trying to take some actions. The marsh is likely to spread along the shoreline and then into some private properties. Closer investigation and discussion with local residents are needed in order to determine possible future developments.

Predictive map



Map of Minister's Point salt marsh area including migration areas and paths. The current extent of the marsh is outlined in purple. The projected extent in 2070 is outlined in red. Parcels currently owned by Chatham Conservation Foundation are coloured mauve. Some limited migration area may be available, although the area is densely developed. Some parcels that might be relevant to preservation of these areas are indicated with green circles.

Parcels for possible CRs

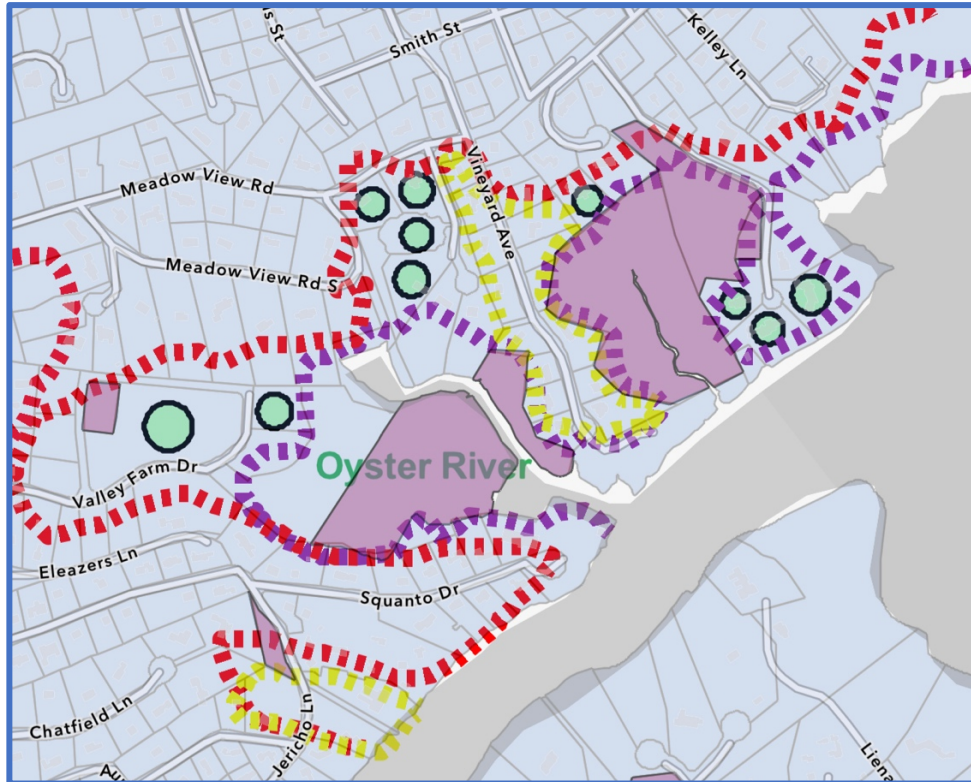
About 17 parcels marked with green circles.

Oyster River salt marsh

Current status of marsh

Most of the current marsh area is already owned by CCF. Expansion or migration of this marsh is likely to run into residential development.

Predictive map



Map of Oyster River salt marsh area including migration areas and paths. The current extent of the marsh is outlined in purple. The projected extent in 2070 is outlined in red. Some potential migration areas are outlined in yellow, indicating residential development threatened by flooding. Parcels currently owned by Chatham Conservation Foundation are coloured mauve. Suggested parcels relevant to preservation of extended marsh areas are indicated with green circles.

Parcels for possible CRs

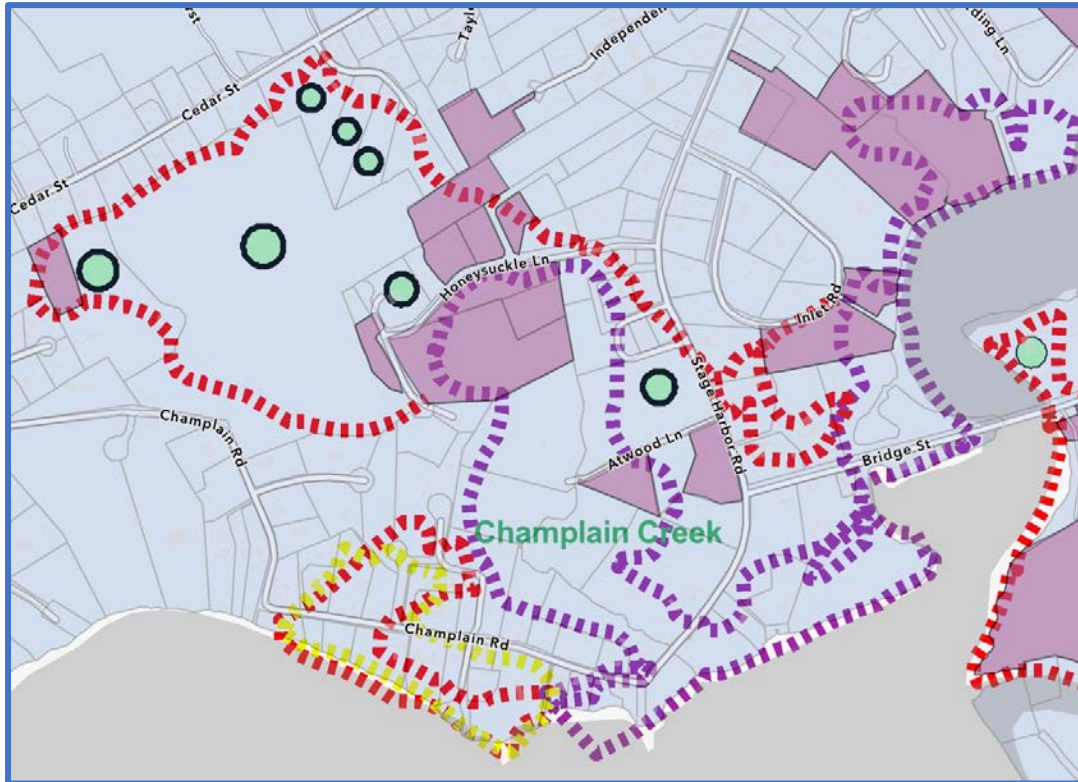
About 9 parcels marked with green circles.

Champlain Creek salt marsh

Current status of marsh

A tidal restriction had been identified by DER in the past on the creek. There may be some room for migration, both into areas owned by CCF and elsewhere.

Predictive map



Map of Champlain Creek salt marsh area including migration areas and paths. The current extent of the marsh is outlined in purple. The projected extent in 2070 is outlined in red. Parcels currently owned by Chatham Conservation Foundation are coloured mauve. Additional parcels relevant to preservation of potential migration areas are indicated with green circles. A threatened residential area is indicated with a yellow border.

Parcels for possible CRs

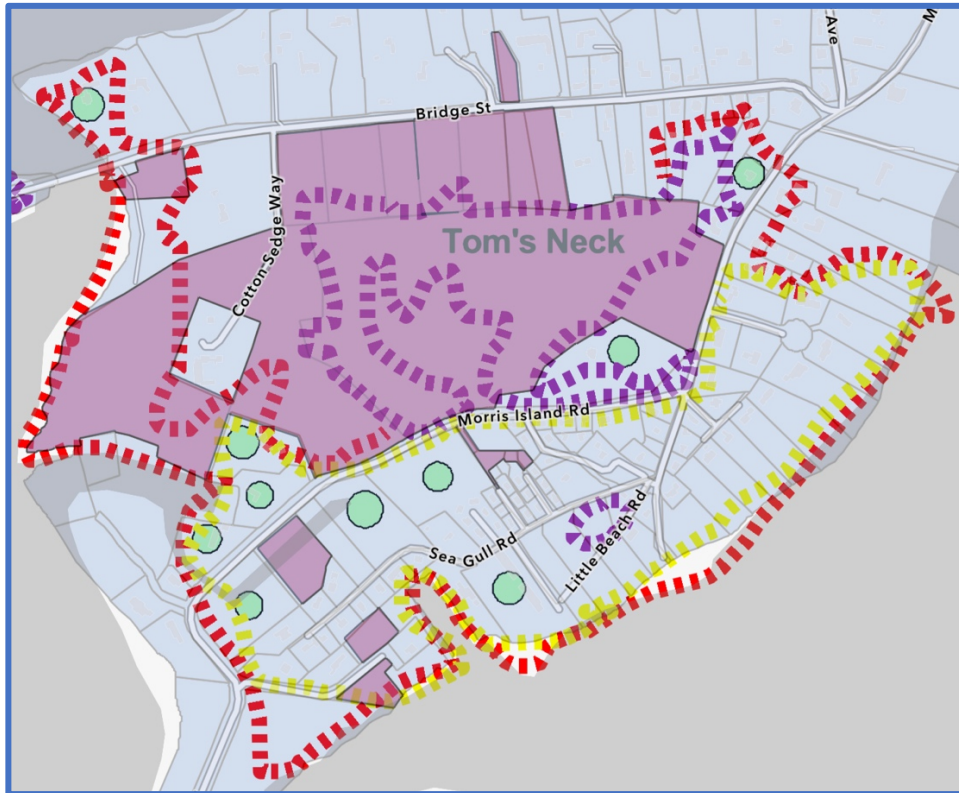
About 7 parcels marked with green circles.

Tom's Neck salt marsh

Current status of marsh

The existing marsh is on part of a large CCF area. However, a large residential area is critically threatened with flooding. This area, including Little Beach Rd, has already experienced significant flooding. It is not clear how the CCF marsh can function to aid the residential area or whether this residential area is viable in the long term.

Predictive map



Map of Tom's Neck salt marsh area including migration areas and paths. The current extent of the marsh is outlined in purple. The projected extent in 2070 is outlined in red. Parcels currently owned by Chatham Conservation Foundation are coloured mauve. Parcels particularly relevant to preservation of future marsh or residential areas are indicated with green circles.

Parcels for possible CRs

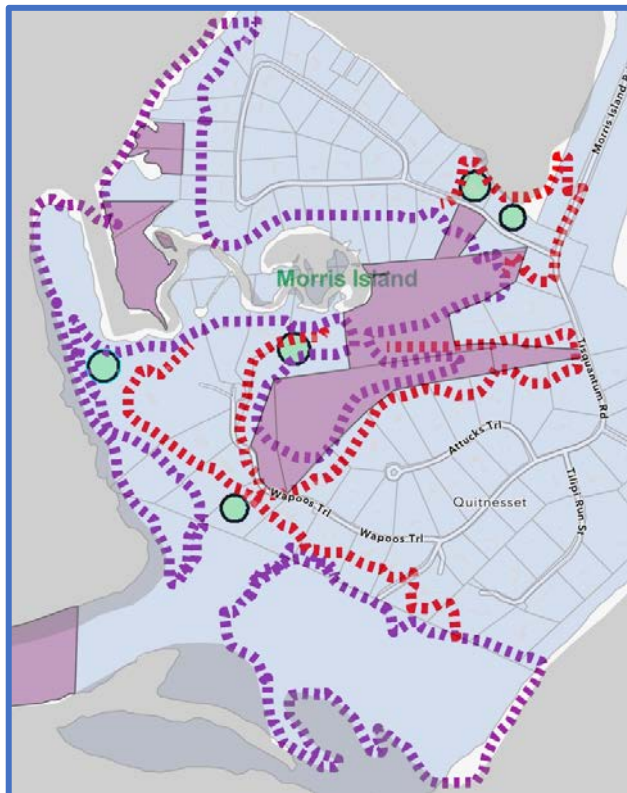
About 10 parcels marked with green circles.

Morris Island salt marsh

Current status of marsh

Morris Island is surrounded by water and has already experienced significant flooding – including the submerging of its only connection to the mainland via Morris Island Rd. There is already a marsh in the center of the island, which is likely to expand.

Predictive map



Map of Morris Island salt marsh area including migration areas and paths. The current extent of the marsh is outlined in purple. The projected extent in 2070 is outlined in red. Parcels currently owned by Chatham Conservation Foundation are coloured mauve. The additional parcels relevant to preservation of residential and marsh areas are indicated with green circles.

Parcels for possible CRs

About 5 parcels marked with green circles.

Conclusions

Thirteen major salt marshes in Chatham have been identified and roughly mapped in this study. Some have significant potential for future marsh migration in the next 40 to 50 years in response to climate change, involving sea-level rise and increased storm surge. Others have little or no potential for future marsh migration. Where there are areas for marsh migration and paths to those areas, private ownership in parcels present potential obstacles to preservation efforts that would facilitate marsh migration. This study has begun to identify those privately owned parcels. These parcels are generally themselves under severe threat of flooding; several residential neighborhoods are particularly threatened. Strategic management of the marsh areas can help to protect some of the abutting residential parcels. It may be important that marsh preservation efforts have access to the migration areas, such as through agreements negotiated with owners of the involved privately owned parcels.

In addition to the areas mapped in this study, other areas of salt marsh in and around Chatham do not appear to have major potential for migration. Most of the coastline is subject to sea-level rise and increased flooding, but generally without much opportunity for salt-marsh formation.