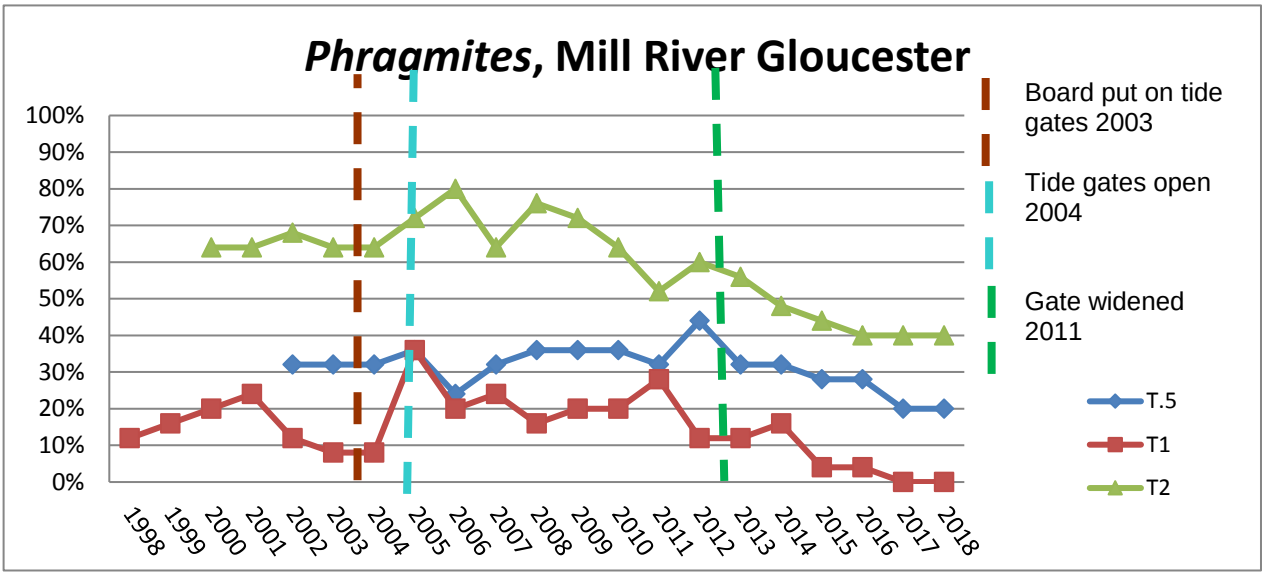
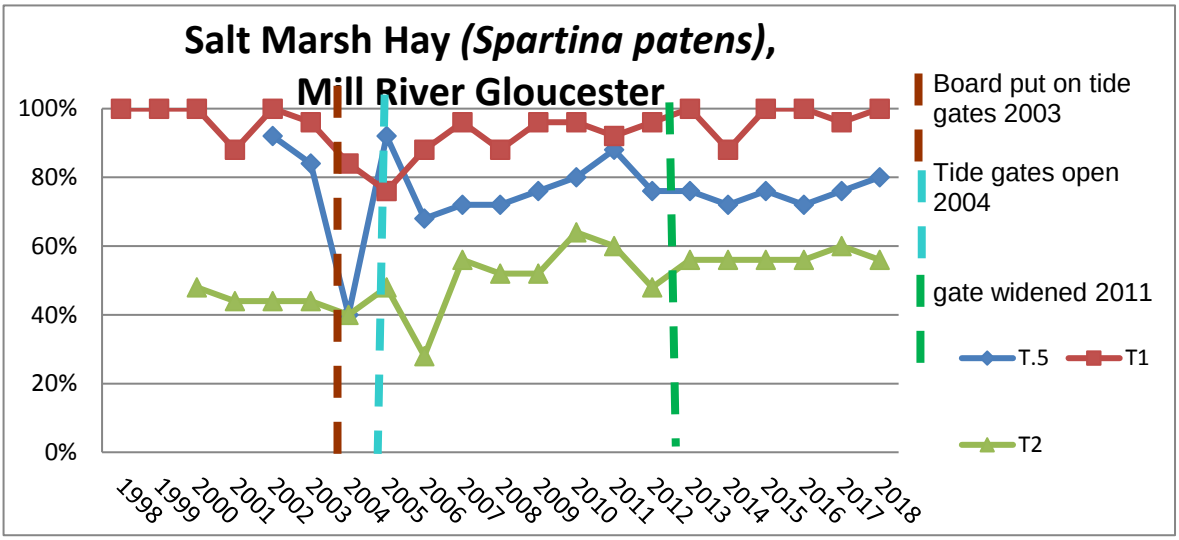
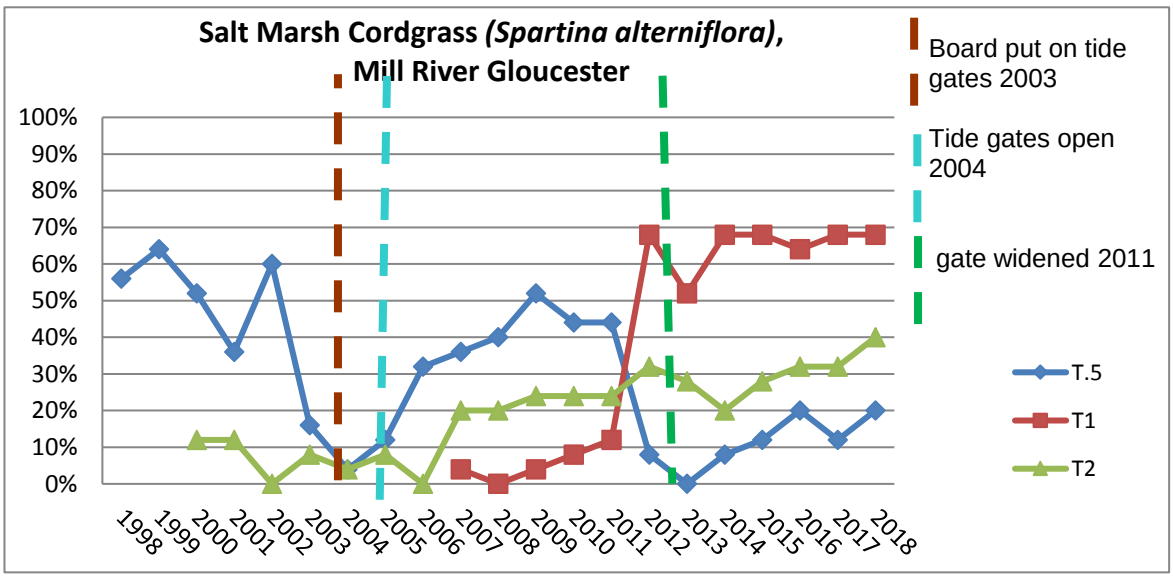
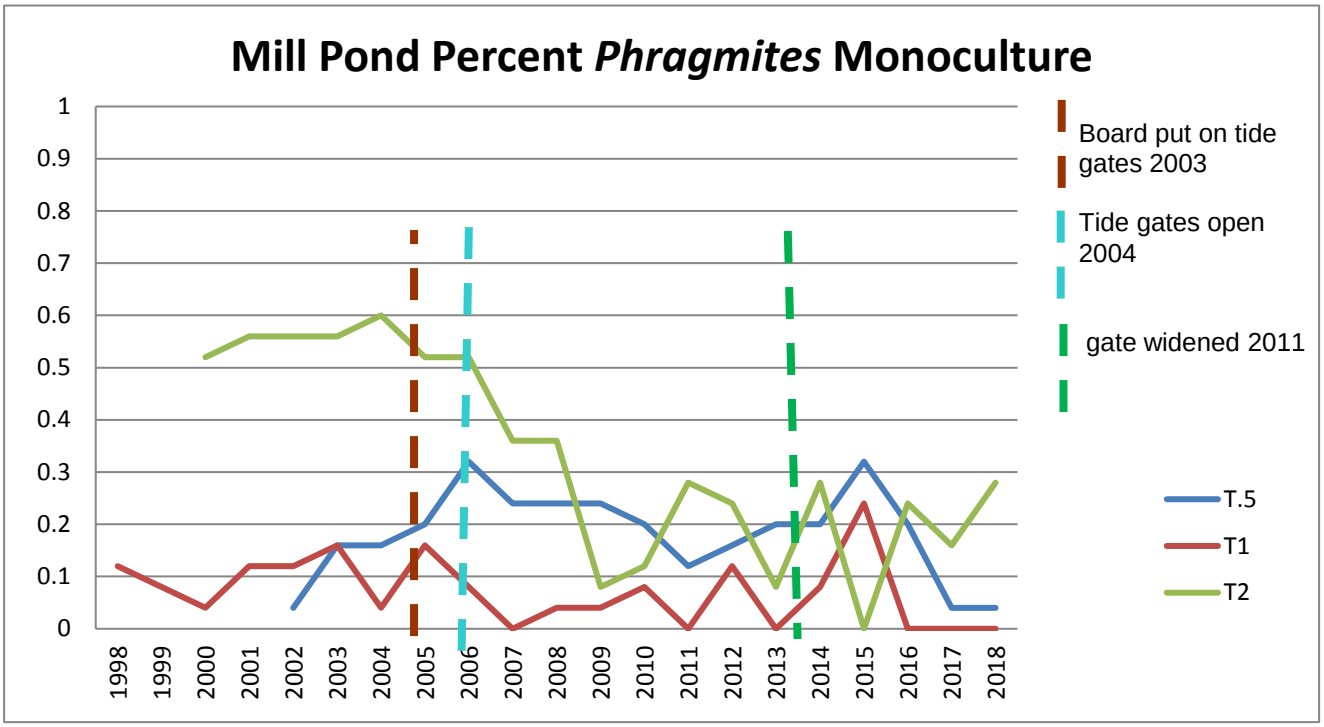
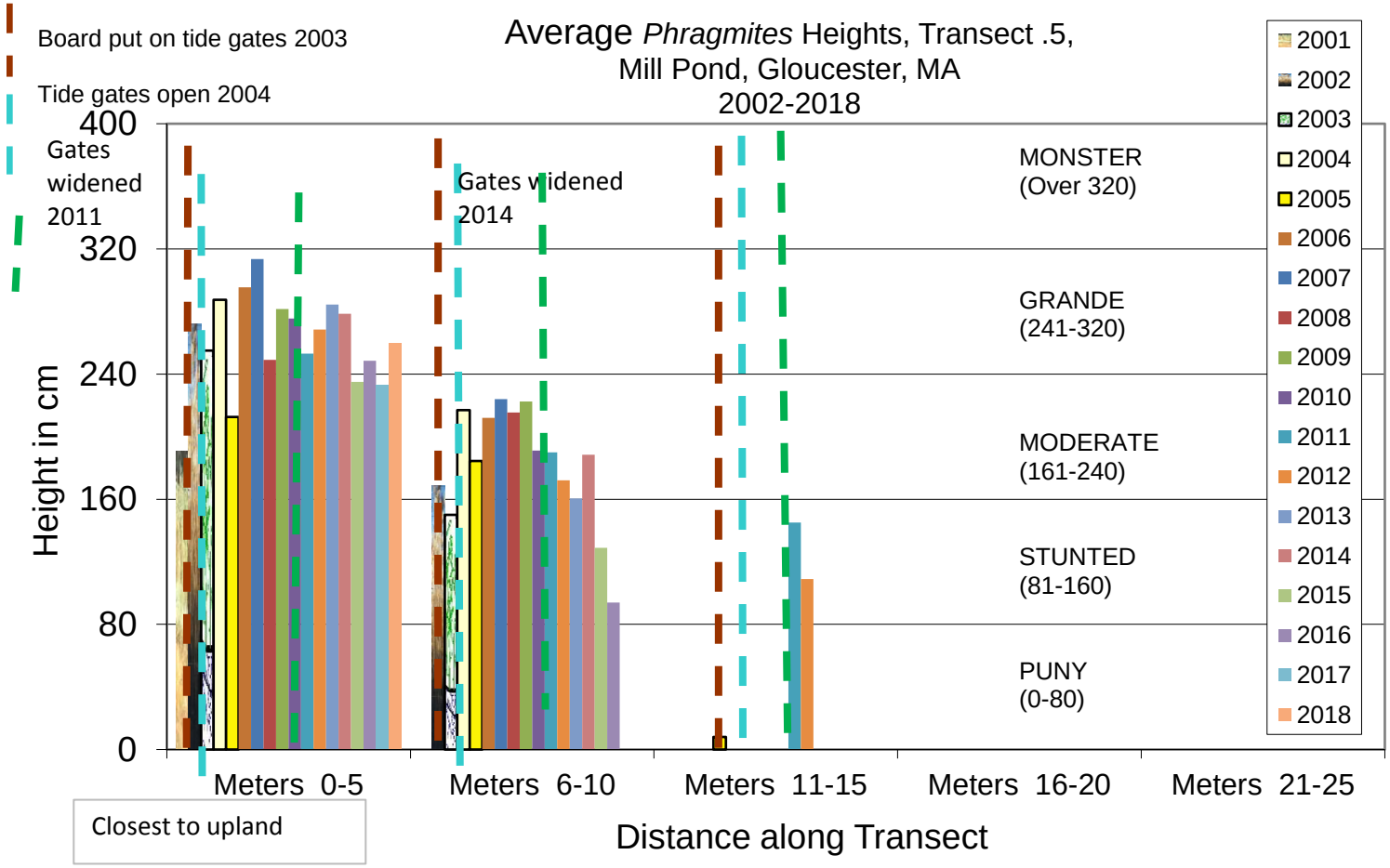
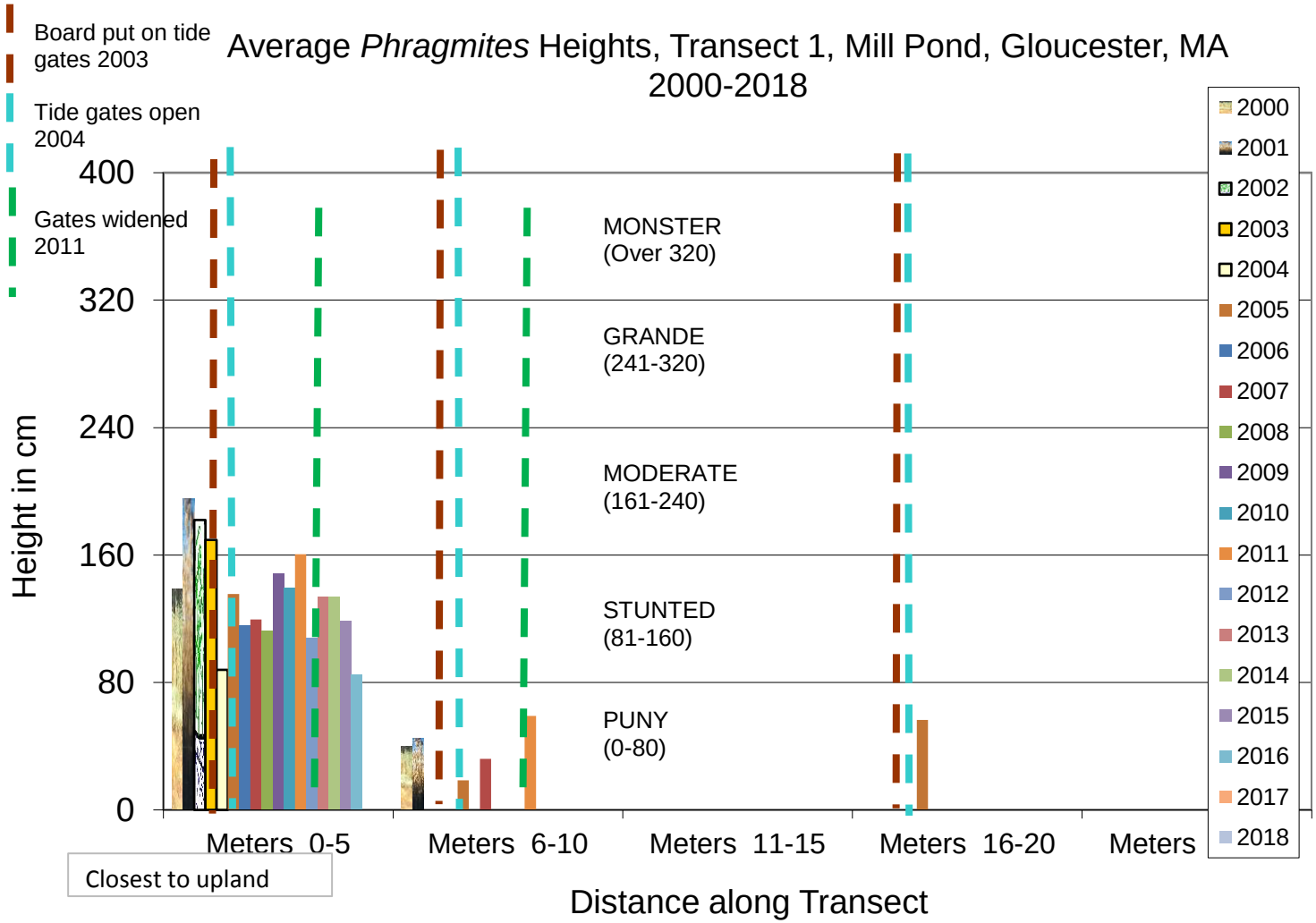

Phragmites, Mill River Gloucester
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Board put on tide gates 2003
Tide gates open 2004
Gate widened 2011
T.5
T1
T2

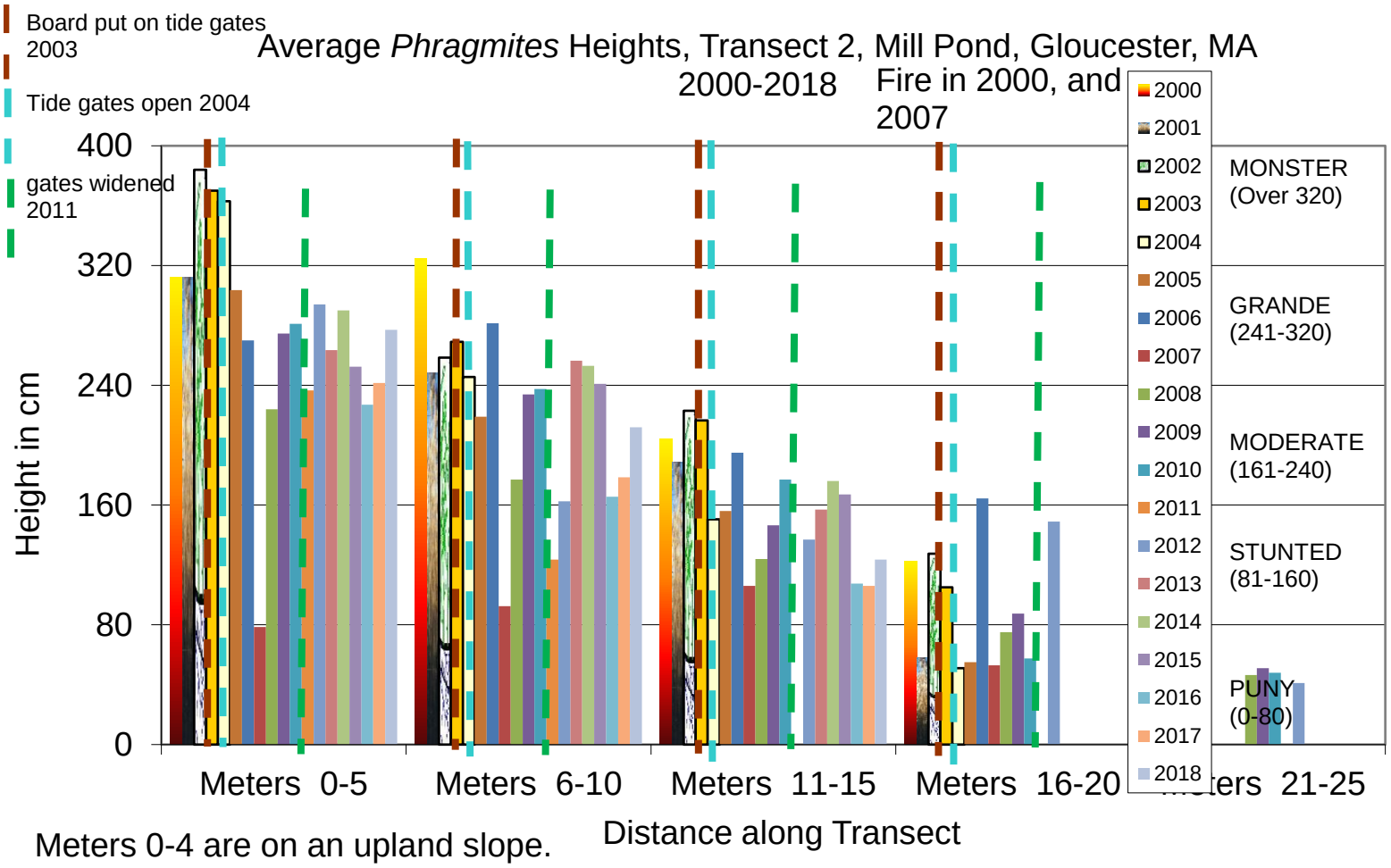

Salt Marsh Hay *(Spartina patens)*, Mill River Gloucester
100%
80%
60%
40%
20%
0%
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Board put on tide gates 2003
Tide gates open 2004
gate widened 2011
T.5
T1
T2


Salt Marsh Cordgrass *(Spartina alterniflora)*, Mill River Gloucester
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Board put on tide gates 2003
Tide gates open 2004
gate widened 2011
T.5
T1
T2

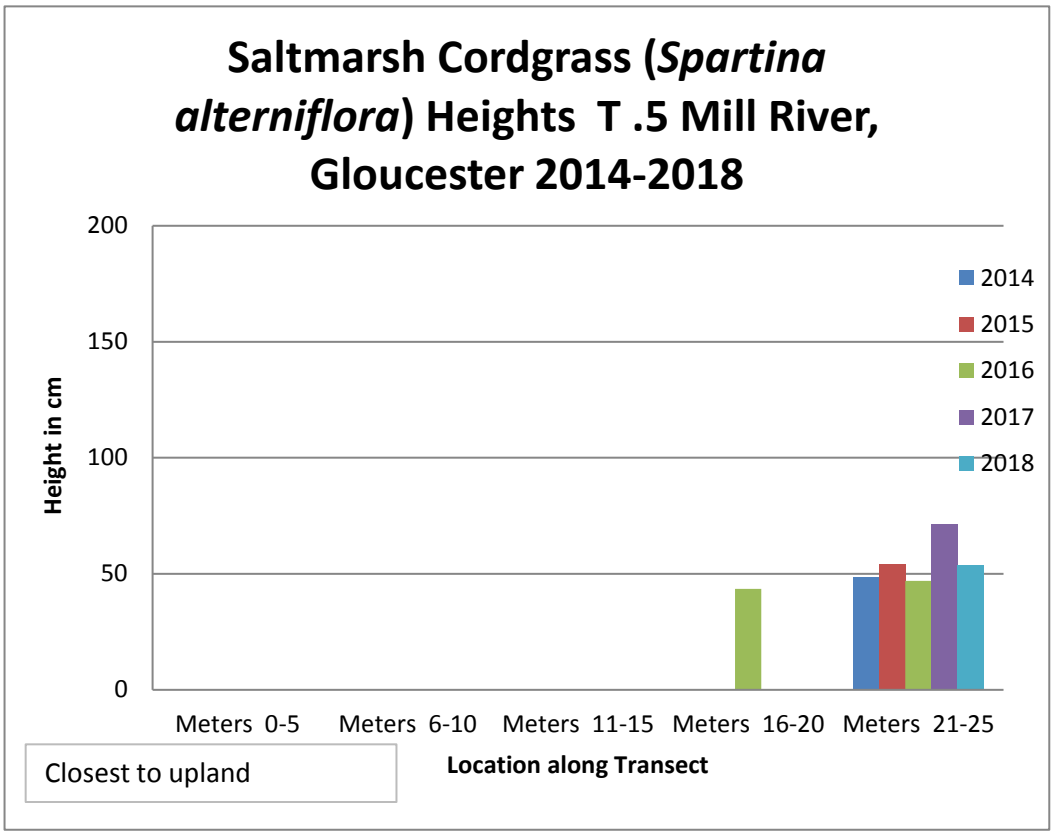

Mill Pond Percent *Phragmites* Monoculture
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Board put on tide gates 2003
Tide gates open 2004
gate widened 2011
T.5
T1
T2

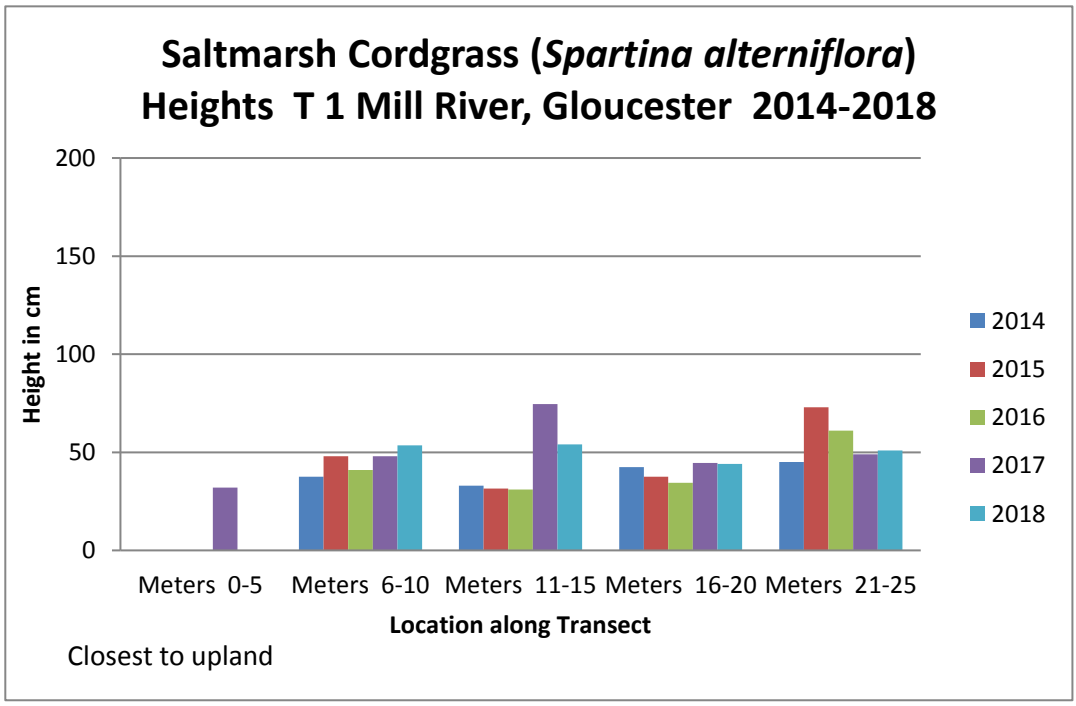

Board put on tide gates 2003
Tide gates open 2004
Gates widened 2011
Average *Phragmites* Heights, Transect .5, Mill Pond, Gloucester, MA 2002-2018
Gates widened 2014
MONSTER (Over 320)
GRANDE (241-320)
MODERATE (161-240)
STUNTED (81-160)
PUNY (0-80)
Height in cm
400
320
240
160
80
0
Meters 0-5
Meters 6-10
Meters 11-15
Meters 16-20
Meters 21-25
Closest to upland
Distance along Transect
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

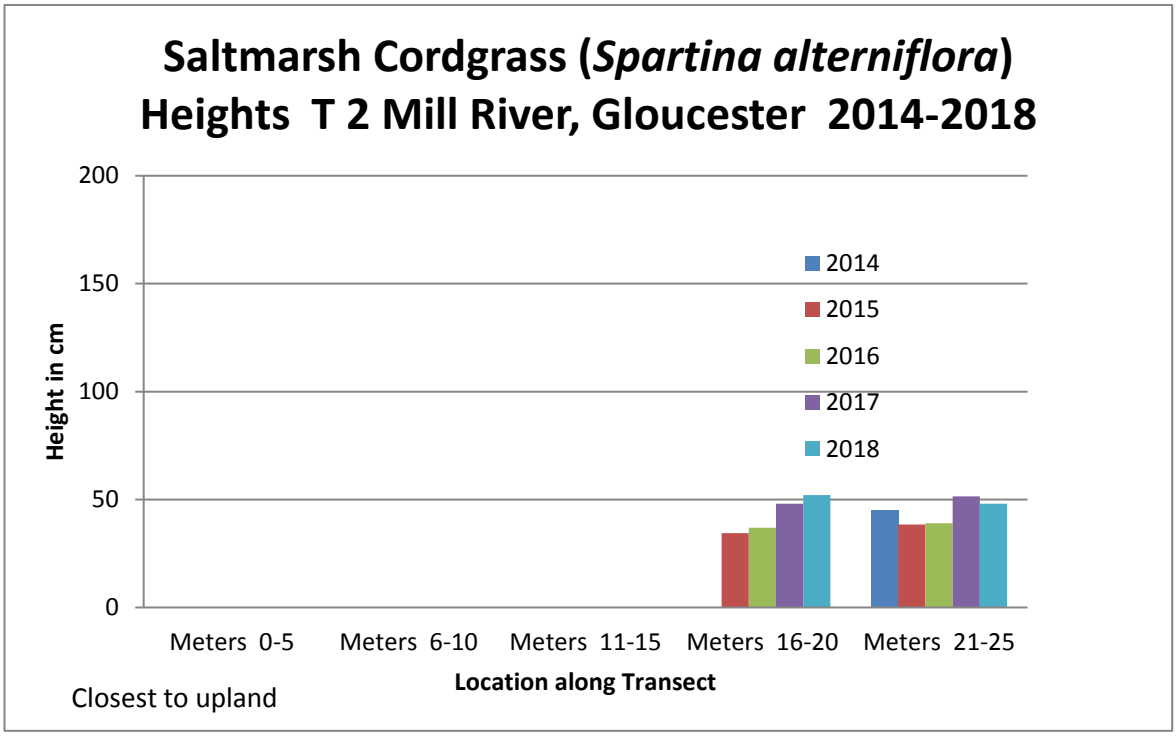

Board put on tide gates 2003
Tide gates open 2004
Gates widened 2011
Average *Phragmites* Heights, Transect 1, Mill Pond, Gloucester, MA 2000-2018
Height in cm
400
320
240
160
80
0
MONSTER (Over 320)
GRANDE (241-320)
MODERATE (161-240)
STUNTED (81-160)
PUNY (0-80)
Meters 0-5
Meters 6-10
Meters 11-15
Meters 16-20
Meters
Closest to upland
Distance along Transect
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018



Meters 0-4 are on an upland slope.


Saltmarsh Cordgrass (*Spartina alterniflora*) Heights T .5 Mill River, Gloucester 2014-2018
200
150
100
50
0
Height in cm
2014
2015
2016
2017
2018
Meters 0-5
Meters 6-10
Meters 11-15
Meters 16-20
Meters 21-25
Location along Transect
Closest to upland


Saltmarsh Cordgrass (*Spartina alterniflora*) Heights T 1 Mill River, Gloucester 2014-2018
200
150
100
50
0
Height in cm
2014
2015
2016
2017
2018
Meters 0-5
Meters 6-10
Meters 11-15
Meters 16-20
Meters 21-25
Location along Transect
Closest to upland


Saltmarsh Cordgrass (*Spartina alterniflora*)
Heights T 2 Mill River, Gloucester 2014-2018
200
150
100
50
0
Height in cm
2014
2015
2016
2017
2018
Meters 0-5
Meters 6-10
Meters 11-15
Meters 16-20
Meters 21-25
Location along Transect
Closest to upland

Mass Audubon Salt Marsh Science Project
Long Range *Phragmites* Study
Location: Gloucester, Mill Pond (River)

Transect .5: Mill Pond

Observers and dates

2002 Duff/Kagle
2003 Duff
2004 Duff/Munson
2005 Duff/Janson
06 Duff & Ess Ag
07 Duff and Wilbur
08 Duff
09 Duff & Hee
2010 Duff/Thompson
2012 Duff/Stewart, Barthelemy
2013 Duff/Cobleigh
2014 MacKelvey/Duff
2015 Duff
2016 Duff
2017 Duff/Drew Essex Tech
2018 Duff & Reddy

N42 37.676'
w070 40.610'

SPECIES

In 2003 Extra boards were put on top of the tide gate, flooding the marsh and killing areas o
Algal mat in 2003 is remnant of this. In 2004 there was a lot of dead grass. Tide gates open 2004 and beyond. Gates widened 2011

1 is immature

	Year	upland end 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	marsh end 25	# of int pres	%
Phragmites australis	2002	1	1	1	1	1	1	1	1																		8	32%
Phragmites australis	2003	1	1	1	1	1	1	1	1																		8	32%
	2004	1	1	1	1	1	1	1	1																		8	32%
	2005	1	1	1					1	1									1	1	1	1					9	36%
	2006	1	1	1	1	1	1																				6	24%
	2007	1	1	1	1	1	1	1	1																		8	32%
1 is immature	2008	1	1	1	1	1	1	1	1	1																	9	36%
	2009	1	1	1	1	1	1	1	1	1																	9	36%
	2010	1	1	1	1	1	1	1	1	1																	9	36%
	2011	1	1	1	1	1	1	1	1																		8	32%
	2012	1	1	1	1	1	1	1	1	1	1	1															11	44%
	2013	1	1	1	1	1	1	1	1																		8	32%
	2014	1	1	1	1	1	1	1	1																		8	32%
	2015	1	1	1	1	1	1	1																			7	28%
	2016	1	1	1	1	1	1	1																			7	28%
	2017	1	1	1	1	1																					5	20%
	2018	1	1	1	1	1																					5	20%
	2019																										0	0%
Salt Marsh Hay	2002			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	23	92%
Spartina patens	2003					1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	21	84%
	2004						1	1	1	1	1		1	1		1							1		1		10	40%
	2005			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	23	92%
	2006							1	1	1	1	1		1	1	1	1	1	1		1	1	1	1	1	1	17	68%
	2007							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		18	72%
	2008								1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18	72%
	2009							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	19	76%
	2010						1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	20	80%
	2011				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22	88%
	2012							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	19	76%
	2013							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	19	76%
	2014								1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18	72%
	2015							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	19	76%
	2016								1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18	72%
	2017							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	19	76%
	2018						1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	20	80%
	2019																										0	0%
Goldenrod	2002			1	1	1	1																				4	16%
Solidago sempervirens	2003																										0	0%
	2004																										0	0%
	2005																		1								1	4%
	2006																										0	0%
	2007																										0	0%
	2008																										0	0%
	2009																										0	0%
	2010																										0	0%
	2011																										0	0%
	2012																										0	0%
	2013																										0	0%
	2014																										0	0%
	2015																										0	0%
	2016																										0	0%
	2017																										0	0%
	2018																										0	0%
	2019																										0	0%
Glasswort	2008																									1	1	4%
(Salicornia europaea)	2009																										0	0%
	2010																										0	0%
	2011																										0	0%
	2012																										0	0%
	2013																										0	0%
	2014																										0	0%
	2015																										0	0%
	2016																										0	0%
	2017																			1	1	1	1				4	16%
	2018													1	1	1	1	1				1	1		1		8	32%
	2019																										0	0%

Orach	2005																1				1					2	8%
Atriplex patula	2006																									0	0%
	2007																								1	1	4%
	2008																									0	0%
	2009																									0	0%
	2010																									0	0%
	2011																									0	0%
	2012																									0	0%
	2013																									0	0%
	2014																									0	0%
	2015																									0	0%
	2016																									0	0%
	2017																									0	0%
	2018																									0	0%
	2019																									0	0%
Saltmarsh Aster	2006												1		1	1	1		1	1	1	1	1	1	1	11	44%
(Aster subulatus)	2007																									0	0%
	2008																									0	0%
	2009																									0	0%
T.5: Mill Pond	2010																									0	0%
	2011																									0	0%
	2012																									0	0%
	2013																									0	0%
	2014																									0	0%
	2015																									0	0%
	2016																									0	0%
	2017																									0	0%
	2018																									0	0%
	2019																									0	0%
Salt Marsh Fleabane	2007										1						1									2	8%
Pluchea purpurascens	2008						1	1	1																	3	12%
	2009						1	1			1															3	12%
	2010					1																				1	4%
	2011					1	1	1	1																	4	16%
	2012						1	1	1																	3	12%
	2013					1	1			1																3	12%
	2014					1																				1	4%
	2015																									0	0%
	2016																									0	0%
	2017			1	1																					2	8%
	2018		1	1	1	1		1	1	1	1															8	32%
	2019																									0	0%
Saltmarsh Cordgrass	2007																								1	1	4%
Spartina alterniflora	2008																									0	0%
	2009																								1	1	4%
	2010																							1	1	2	8%
	2011																						1	1	1	3	12%
	2012																							1	1	2	8%
	2013																									0	0%
	2014																							1	1	2	8%
	2015																						1	1	1	3	12%
	2016																	1	1				1	1	1	5	20%
	2017																						1	1	1	3	12%
	2018																				1	1	1	1	1	5	20%
	2019																									0	0%
Spike Grass	2003									1	1	1														3	12%
Distichlis spicata	2004																									0	0%
	2005																									0	0%
	2006																									0	0%
	2007									1	1	1	1	1	1	1	1	1	1	1	1	1				13	52%
	2008																									0	0%
	2009																									0	0%
	2010																									0	0%
	2011																									0	0%
	2012																									0	0%
	2013																									0	0%
	2014																									0	0%
	2015																									0	0%
	2016																									0	0%
	2017																									0	0%
	2018																									0	0%
	2019																									0	0%

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25		
Algal Mat	2002																										0	0%
	2003												1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	56%
	2004																										0	0%
	2005																										0	0%
Dead	2004																										0	0%
*see file for % dead	2005							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	19	76%
each meter	2006																										0	0%
	2007																						50%				0.5	2%
	2008																										0	0%
	2009																										0	0%
	2010																										0	0%
	2011																										0	0%
	2012																										0	0%
	2013																										0	0%
	2014																										0	0%
	2015																										0	0%
	2016																										0	0%
	2017																										0	0%
	2018																										0	0%
	2019																										0	0%
Fruit Tree (Apple)	2002	1																									1	4%
	2003																										0	0%
	2004	1																									1	4%
	2005																										0	0%
	2006																										0	0%
	2007																										0	0%
	2008																										0	0%
	2009																										0	0%
	2010																										0	0%
	2011																										0	0%
	2012	1	1																								2	8%
	2013																										0	0%
	2014	1																									1	4%
	2015																										0	0%
	2016	1	1																								2	8%
	2017	1	1																								2	8%
	2018	1																									1	4%
	2019																										0	0%
Bare + Wet	2017						1	1		1																	2.4	10%
	2018																										0	0%
	2019																										0	0%

upland end — 1 METER SEGMENTS — marsh end

Mass Audubon Salt Marsh Science Project **Transect 1: Mill Pond**
Long Range *Phragmites* Study
Location: Gloucester, Mill Pond
Soft Peat Soil
Tide gates widened 2011
Boards on gate
Tide gates opened 2004 and beyond

Observers and dates
1998 Liz, Teachers
1999 Liz/Cindy
2000
2001 LD, NS
2002 Duff and Kagle
2003 Duff
2004 Duff/Munson
2005 Duff/Janson
2006 Duff
2007 Duff and Wilb
2008 Duff
2009 Duff & Hee
2012 Duff, Stewart, Barthelemy
2013 Duff & Cobleigh
2014 MacKelvey/Duff
2015 Duff
2016 Duff
2017 Duff and Drew/ Essex Tech
2018 Duff & Reddy

Boards were placed above the tide gate in 2003, raising the pond level. This killed vegetation on the marsh.
* In 2004 this transect ends at the edge of the pond at meter 22. Meters 23-25 are mud, no vegetation.

1 METER SEGMENTS

SPECIES	Year	1 (upland end)	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25 (marsh end)	# of intervals
Pragmites	1998	1	1	1																							3
Phragmites australis	1999	1	1	1	1																						4
	2000	1	1	1	1	1																					5
	2001	1	1	1	1	1	1																				6
	2002	1	1	1																							3
	2003	1	1																								2
Tide Gates opened----	2004	1	1																					*	*	*	2
	2005	1	1	1					1	1									1	1	1	1					9
1 *0 is immature*	2006	1	1	1	1	1																					5
	2007	1	1	1	1	1	1																				6
	2008	1	1	1		1																					4
	2009	1	1	1	1	1																					5
	2010	1	1	1	1	1																					5
	2011	1	1	1	1	1	1	1																			7
	2012	1	1	1																							3
	2013	1	1	1																							3
	2014	1	1	1	1																						4
	2015	1																									1
	2016	1																									1
	2017																										0
	2018																										0
	2019																										0
Salt marsh Hay	1998	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	25
Spartina patens	1999	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	25
	2000	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	25
	2001				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22
	2002	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	25
ALL DEAD	2003		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
Tide Gates opened----	2004		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	*	*	*	21
	2005				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	*	*	*	19
	2006			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		22
	2007	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		24
	2008				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22
	2009		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
	2010		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
	2011			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	23
	2012		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
	2013		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
	2014		1			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22
	2015	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	25
	2016	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	25
	2017		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
	2018	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	25
	2019																										0
Glasswort	2008			1	1		1		1	1	1	1	1	1		1	1	1	1	1	1	1	1		1		18
(Salicornia europaea)	2009									1	1	1	1	1	1	1	1	1	1	1	1	1		1			14
	2010			1	1							1	1	1	1	1	1								1		9
	2011																										0
	2012																										0
	2013																										0
	2014					1																					1
	2015																				1						1
	2016																					1			1		2
	2017							1			1				1	1	1	1	1	1		1	1				10
	2018	1	1										1							1	1						5
	2019																										0

Spike Grass	2003					1	1	1																		3
Distichlis spicata	2004														1	1							*	*	*	2
	2005																									0
	2006																									0
	2007																									0
	2008																									0
	2009																									0
	2010																									0
	2011																									0
	2012																									0
	2013																									0
	2014																									0
	2015																									0
	2016	1	1	1	1	1	1		1																	7
	2017																									0
	2018																					1				1
	2019																									0
Saltmarsh Cordgrass	1998									1	1	1	1	1			1	1	1	1	1	1	1	1	1	14
Spartina alterniflora	1999			1	1			1			1	1	1	1	1	1	1	1	1		1	1		1	1	16
	2000				1									1	1	1	1	1	1	1	1	1	1	1	1	13
	2001														1	1		1	1	1	1	1	1	1		9
	2002										1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15
	2003																1						1	1	1	4
Tide Gates opened----	2004																	1					*	*	*	1
	2005																1		1			1	*	*	*	3
	2006														1	1	1	1	1	1			1	1	*	8
	2007															1	1	1	1	1	1	1	1	1		9
	2008															1	1	1	1	1	1	1	1	1	1	10
	2009										1	1			1	1	1	1	1	1	1	1	1	1	1	13
	2010														1	1	1	1	1	1	1	1	1	1	1	11
	2011														1	1	1	1	1	1	1	1	1	1	1	11
	2012									1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	17
	2013													1		1	1	1	1	1	1	1	1	1	1	12
	2014									1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	17
	2015								1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	17
	2016									1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
	2017		1								1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	17
	2018									1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	17
	2019																									0

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Quack Grass?	1998																		1								1
Agropyron pungens	1999																										0
	2000																										0
T1: Mill Pond	2001																										0
	2002																					1			1		2
	2003																										0
Salt Marsh Fleabane	2006						1																				1
Pluchea purpurascens	2007	1	1	1	1																						4
	2008		1	1	1																						3
	2009	1	1	1																							3
	2010																										0
	2011	1	1	1	1	1	1																				6
	2012	1																									1
	2013		1	1	1	1																					4
	2014		1																								1
	2015																										0
	2016																										0
	2017																										0
	2018	1	1																								2
	2019																										0
	2003																										0
Orach	2004							1								1					1	1	1	*	*	*	5
Atriplex patula	2005				1		1																	*	*	*	2
	2006																							*	*	*	0
	2007																										0
	2008																										0
	2009																										0
	2010																										0
	2011																			1							1
	2012																										0
	2013																										0
	2014																										0
	2015																										0
	2016																										0
	2017																										0
Saltmarsh Aster	2004																			1				*	*	*	1
Aster subulatus	2005				1		1			1		1				1	1	1	1	1	1	1	1	*	*	*	12
	2006				1						1													*	*	*	2
	2007																										0
	2008			1																							1
	2009	1																					1	1	1	1	5
	2010																										0
	2011																										0
	2012																										0
	2013																										0
	2014																										0
	2015																										0
	2016																										0
	2017																										0
Seaside Goldenrod	2004					1																		*	*	*	1
Solidago sempervirens	2005																			1				*	*	*	1
	2006																							*	*	*	0
	2007																										0
	2008																										0
	2009																										0
	2010																									1	1
	2011																									1	1
	2012																								1	1	2
	2013																								1		1
	2014																										0
	2015																										0
	2016																										0
	2017																										0
Black Grass	2009																					1	1				2
Juncus gerardi	2010																				1	1		1			3
	2011																										0
	2012																										0
	2013																										0
	2014																										0
	2015																										0
	2016																										0
	2017																								1		1
	2018																										0
	2019																										0
Mud	2004																							1	1	1	3
	2005																							1	1	1	3
	2006																										0
Dead	2004			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	*	*	*	19
*see file for % dead	2005																										0
Algal Mat	2003													1	1	1	1										4
	2004																										0
Unknown Leaf	2017																			1							1
	2018																										0

upland end — 1 METER SEGMENTS — marsh end

Transect 1 Mill Pond

Ma Mass Audubon Salt Marsh Science Project
Long Range *Phragmites* Study
Location: Gloucester, Mill Pond
Soft Peat Soil
B=burnt spring 2000

Transect 2: Mill Pond

This was burned Spring 2000
burned Fall 2007
(before 11/13 after Sept)

Observers and dates	tide gates open 2004 and beyond
2000	03
2001 11/6/00 Lodge	4
2002 10/8/01, LD, NS	4
2003 Duff	3
2004 9/7/04, Duff/Munson	04
2005 8/29/05, Duff/Janson	
2006 Duff 2010 Duff & Thompson	
2017 Duff/ Drew Essex Tech	

2007 Duff and Wilbur 2018 Duff & R
2008 Duff
Boards on gate 2003
Tide gates opened 2004
Tide gates widened 2011
2009 Duff and Hee
2010 Duff, Stewart, Barthelemy
2013 Duff, Cobliegh
2014 MacKelvey/Duff
2015 Duff
2016 Duff 2017 Duff and Drew

SPECIES

tide gates open 2004 and beyond.

1 METER SEGMENTS

upland end — marsh end

Spring 2000	Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	# of intervals present in	%
		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	0	
Phragmites	2000	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1										16	64%
Phragmites australis	2001	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1										16	64%
	2002	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1									17	68%
	2003	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1										16	64%
	2004	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1										16	64%
is immature	2005	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1								1	1	18	72%
	2006	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1						20	80%
Fire in 2007	2007	1	1	1	1	1	1	1	1	1	1	1	1	1	1								1	1			16 Whole	64%
	2008		1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1		1	1	1				19	76%
	2009		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1						1	1		18	72%
	2010		1	1	1	1	1	1	1	1	1	1		1	1	1			1		1					1	16	64%
	2011		1	1	1	1	1	1	1	1	1	1	1	1	1												13	52%
	2012	1		1		1	1	1	1	1	1	1	1	1	1	1	1						1				15	60%
	2013	1	1	1	1	1	1	1	1	1	1	1	1	1	1												14	56%
	2014	1		1	1	1	1	1	1	1	1	1	1	1													12	48%
	2015			1	1	1	1	1	1	1	1	1	1	1													11	44%
	2016			1	1	1	1	1	1	1	1	1	1														10	40%
	2017		1	1	1	1	1	1	1	1	1	1															10	40%
	2018																										0	0%
	2019																										0	0%
Salt Marsh Hay	2000														1	1	1	1	1	1	1	1	1	1	1	1	12	48%
Spartina patens	2001															1	1	1	1	1	1	1	1	1	1	1	11	44%
	2002															1	1	1	1	1	1	1	1	1	1	1	11	44%
	2003															1	1	1	1	1	1	1	1	1	1	1	11	44%
1	2004																1	1	1	1	1	1	1	1	1	1	10	40%
	2005														1	1	1	1	1	1	1	1	1	1	1	1	12	48%
	2006																			1	1	1	1	1	1	1	7	28%
	2007												1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	56%
	2008													1	1	1	1	1	1	1	1	1	1	1	1	1	13	52%
	2009													1	1	1	1	1	1	1	1	1	1	1	1	1	13	52%
	2010							1		1	1			1	1	1	1	1	1	1	1	1	1	1	1	1	16	64%
	2011											1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	60%
	2012														1	1	1	1	1	1	1	1	1	1	1	1	12	48%
	2013	Data Missing											1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	56%
	2014												1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	56%
	2015												1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	56%
	2016												1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	56%
	2017											1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	60%
	2018																										0	0%
	2019																										0	0%
Glasswort	2008																										0	0%
(Salicornia europaea)	2009												1	1	1	1	1	1	1		1						8	32%
	2010																										0	0%
	2011																										0	0%
	2012														1												1	4%
	2013	Data Missing																									0	0%
	2014																										0	0%
	2015																										0	0%
	2016																										0	0%
	2017										1	1			1			1	1		1						6	24%
	2018																										0	0%
	2019																										0	0%

Why Two Glassworts?

Spike grass	2000																											0	0%
Distichlis spicata	2001																											0	0%
	2002																											0	0%
	2003															1	1	1	1	1	1	1	1					7	28%
	2004																											0	0%
	2005																											0	0%
T2: Mill Pond	2006																											0	0%
	2007																											0	0%
	2008																											0	0%
	2009																											0	0%
	2010																											0	0%
	2011																											0	0%
	2012																											0	0%
	2013																									1		1	4%
	2014																										1	1	4%
	2015																											0	0%
	2016																			1	1			1			1	4	16%
	2017																									1		1	4%
	2018																											0	0%
	2019																											0	0%
Glasswort	2008														1	1	1	1			1		1	1				7	28%
(Salicornia europaea)	2009											1	1	1	1	1	1	1			1							8	32%
	2010									1		1	1										1					4	16%
	2011																											0	0%
	2012													1														1	4%
	2013																											0	0%
	2014																											0	0%
	2015																											0	0%
	2016																											0	0%
	2017																											0	0%
	2018																											0	0%
	2019																											0	0%
Salt Marsh Cordgrass	2000																							1	1	1	1	3	12%
Spartina alterniflora	2001																						1		1	1		3	12%
	2002																											0	0%
	2003																								1	1	1	2	8%
	2004																										1	1	4%
	2005																								1	1	1	2	8%
	2006																											0	0%
	2007																				1		1	1	1	1	1	5	20%
	2008																					1	1	1	1	1	1	5	20%
	2009																				1	1	1	1	1	1	1	6	24%
	2010																				1	1	1	1	1	1	1	6	24%
	2011																					1	1	1	1	1	1	5	20%
	2012																	1	1	1	1	1	1	1	1	1	1	8	32%
	2013																					1	1	1	1	1	1	5	20%
	2014																	1	1	1	1	1		1	1	1	1	7	28%
	2015																		1	1	1	1	1	1	1	1	1	7	28%
	2016															1	1	1				1	1	1	1	1	1	8	32%
	2017																	1	1	1	1	1	1	1	1	1	1	8	32%
	2018																											0	0%
	2019																											0	0%
Salt Marsh Fleabane	2004																											0	0%
	2005																											0	0%
Pluchea purpurascens	2006		1																									1	4%
	2007						1	1		1	1																	4	16%
	2008																											0	0%
	2009						1	1	1	1	1	1																6	24%
	2010									1	1	1																3	12%
	2011							1	1	1	1	1																5	20%
	2012										1		1	1														3	12%
	2013							1	1	1	1	1	1															6	24%
	2014																											0	0%
	2015																											0	0%
	2016																											0	0%
	2017																											0	0%
	2018																											0	0%
	2019																											0	0%

Why Two Glassworts?

Goldenrod	2007																					1				1	1	3	12%
Solidago sempervirens	2008																									1	1	2	8%
	2009																								1	1	1	3	12%
	2010																									1	1	2	8%
	2011																								1	1	1	3	12%
	2012																											0	0%
	2014																										1	1	4%
	2015																											0	0%
Orach	2004																									1	1	2	8%
Atriplex patula	2005																				1							1	4%
	2006																											0	0%
	2007																											0	0%
T2: Mill Pond	2008																											0	0%
	2009										1																	1	4%
	2010																											0	0%
	2011																											0	0%
	2012																											0	0%
Purple Loosetrife	2009		1	1																								2	8%
(Lythrum salicaria)	2010		1	1																								2	8%
	2011			1																								1	4%
	2012																											0	0%
	2013	1	1																									2	8%
	2014																											0	0%
	2015																											0	0%
	2016																											0	0%
	2017																											0	0%
	2018																											0	0%
	2019																											0	0%
Staghorn Sumac	2008		1	1																								2	8%
Rhus typhina	2009	1	1																									2	8%
	2010		1		1	1																						3	12%
	2011		1	1																								2	8%
	2012	1	1	1	1																							4	16%
	2013	1	1	1	1	1																						5	20%
	2014	1	1	1	1	1																						5	20%
	2015	1	1																									2	8%
	2016	1	1	1	1																							4	16%
	2017	1	1	1	1																							4	16%
	2018																											0	0%
	2019																											0	0%
Lady's Thumb	2008	1	1																									2	8%
Polygonum persicaria	2009																											0	0%
	2010																											0	0%
	2011																											0	0%
	2012																											0	0%
	2013																											0	0%
	2014																											0	0%
	2015																											0	0%
	2016																											0	0%
	2017																											0	0%

Rosa sp.	2008		1																							1	4%
	2009																									0	0%
	2010																									0	0%
T2: Mill Pond	2011																									0	0%
	2012																									0	0%
	2013	1	1	1		1	1																				
	2014	1	1	1	1	1																				5	20%
	2015	1	1	1																						3	12%
	2016		1			1																				2	8%
	2017																									0	0%
	2018																									0	0%
	2019																									0	0%
Blackberry	2008	1	1																							2	8%
Rubus sp.	2009	1	1																							2	8%
	2010																									0	0%
	2011	1																								1	4%
	2012	1	1	1	1	1																				5	20%
	2013																									0	0%
	2014	1																								1	4%
	2015	1	1	1																						3	12%
	2016																									0	0%
	2017																									0	0%
Pokeweed	2008		1																							1	4%
Phytolacca americana	2009																									0	0%
Saltmarsh Aster	2005																1	1	1	1	1	1	1	1	1	10	40%
Aster subulatus	2006															1	1	1	1	1	1	1	1	1		9	36%
	2007																									0	0%
	2008																									0	0%
	2009						1																			1	4%
	2010																									0	0%
	2011																									0	0%
	2012																									0	0%
	2013																									0	0%
	2014																									0	0%
	2015																									0	0%
	2016																									0	0%
	2017																									0	0%
Uknown Upland Grass	2010			1	1																					2	8%
	2011																									0	0%
	2012																									0	0%
	2013																									0	0%
	2014																									0	0%
	2015																									0	0%
	2016	1																								1	4%
	2017																									0	0%
Dead	2004																1	1	1	1	1	1	1	1	1	9	36%
**see file for % dead*	2005																									0	0%
Grape Vine	2017			1	1	1																				3	12%
	2018																									0	0%

Mill Pond Transect 2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	upland end								1 METER SEGMENTS														marsh end		