

JAMES POND

Individual System Assessment

APPENDIX

February 2023

Prepared by:

Martha's Vineyard Commission



RJS Development Solutions



Horsley Witten Group



**Funding
Provided by:**
MassDEP



Acknowledgments:

The Martha's Vineyard Commission would like to acknowledge all the contributors to this detailed watershed assessment.

- *James Pond Working Group Members*
- *The Town of West Tisbury*
- *The Martha's Vineyard Shellfish Group*
- *The Buzzard's Bay Coalition and The Woods Hole Group*
- *Chris Murphy for his tireless dedication and contributions as the Chairman of the Up-Island Watershed Management Committee*

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Figure 30. James Pond Designated Shellfish Harvest Area

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APPENDIX A:

James Pond Watershed Land Area	Acres
Surface Water Pond Area	50.1
Land Area Only	364.3
Total Watershed Area (Land + Water)	414.4

James Pond Watershed Land Area (acres) - Within and Beyond 200ft from Pond Edge - 2021

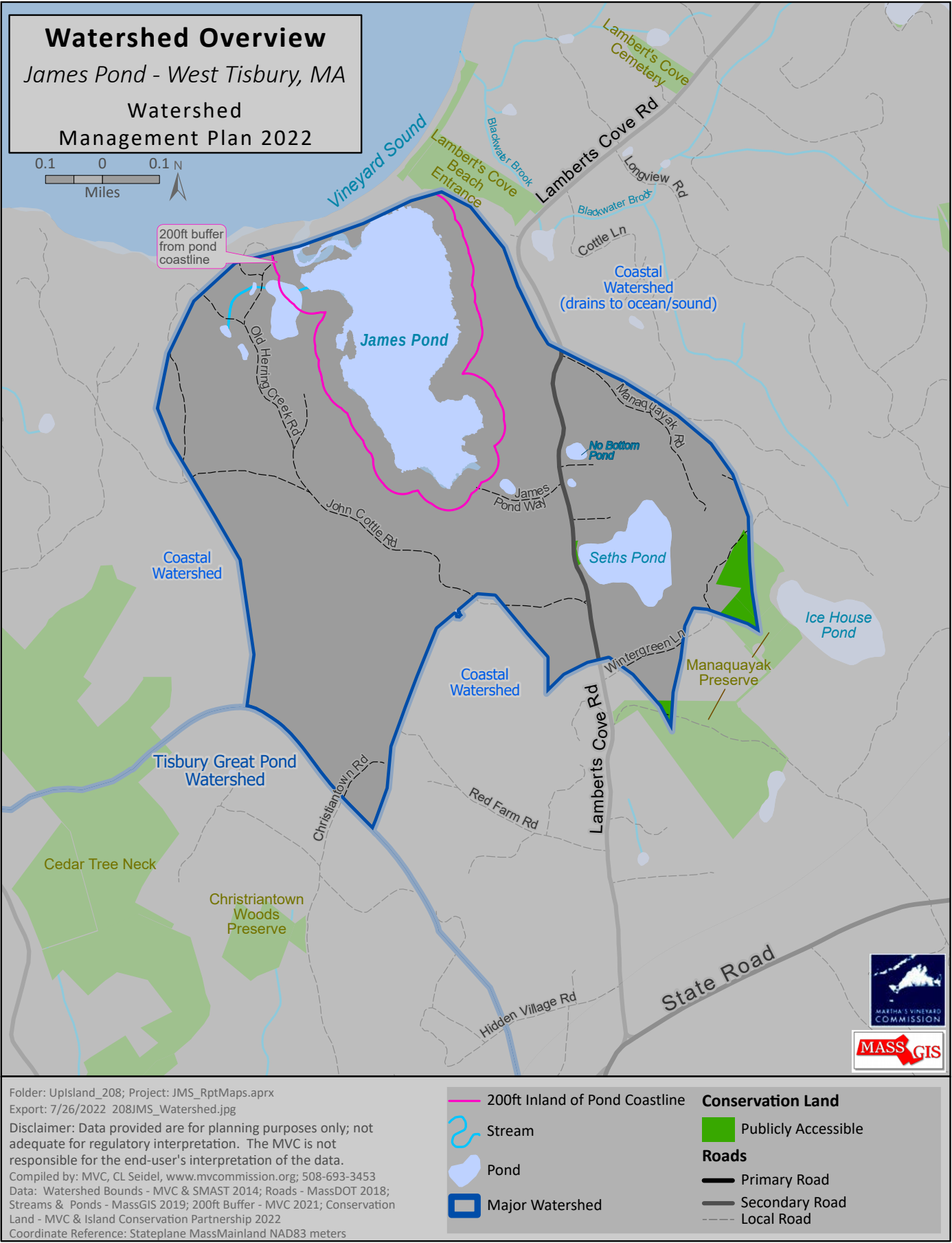
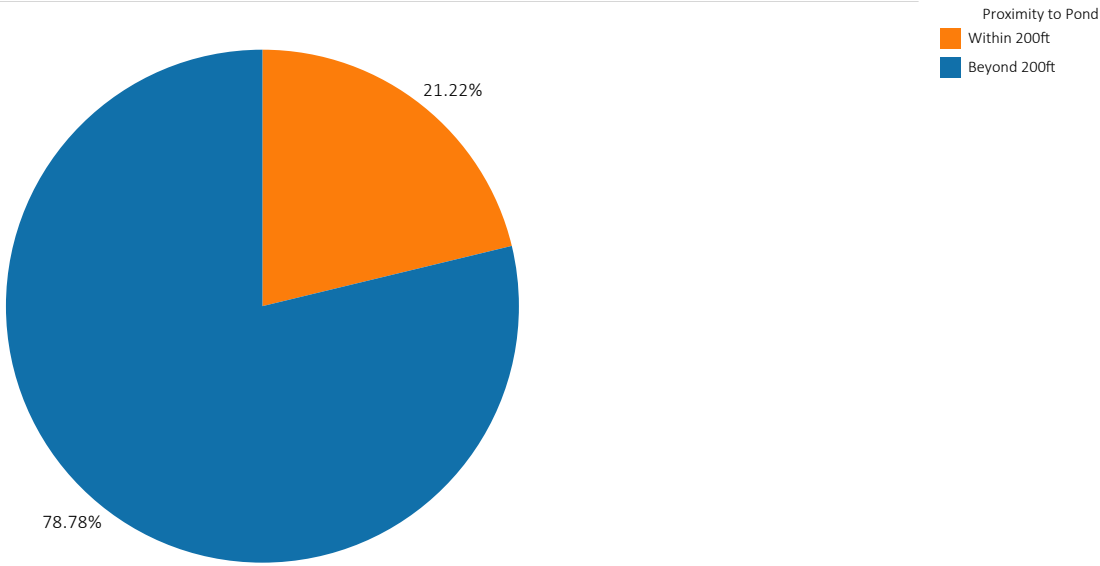
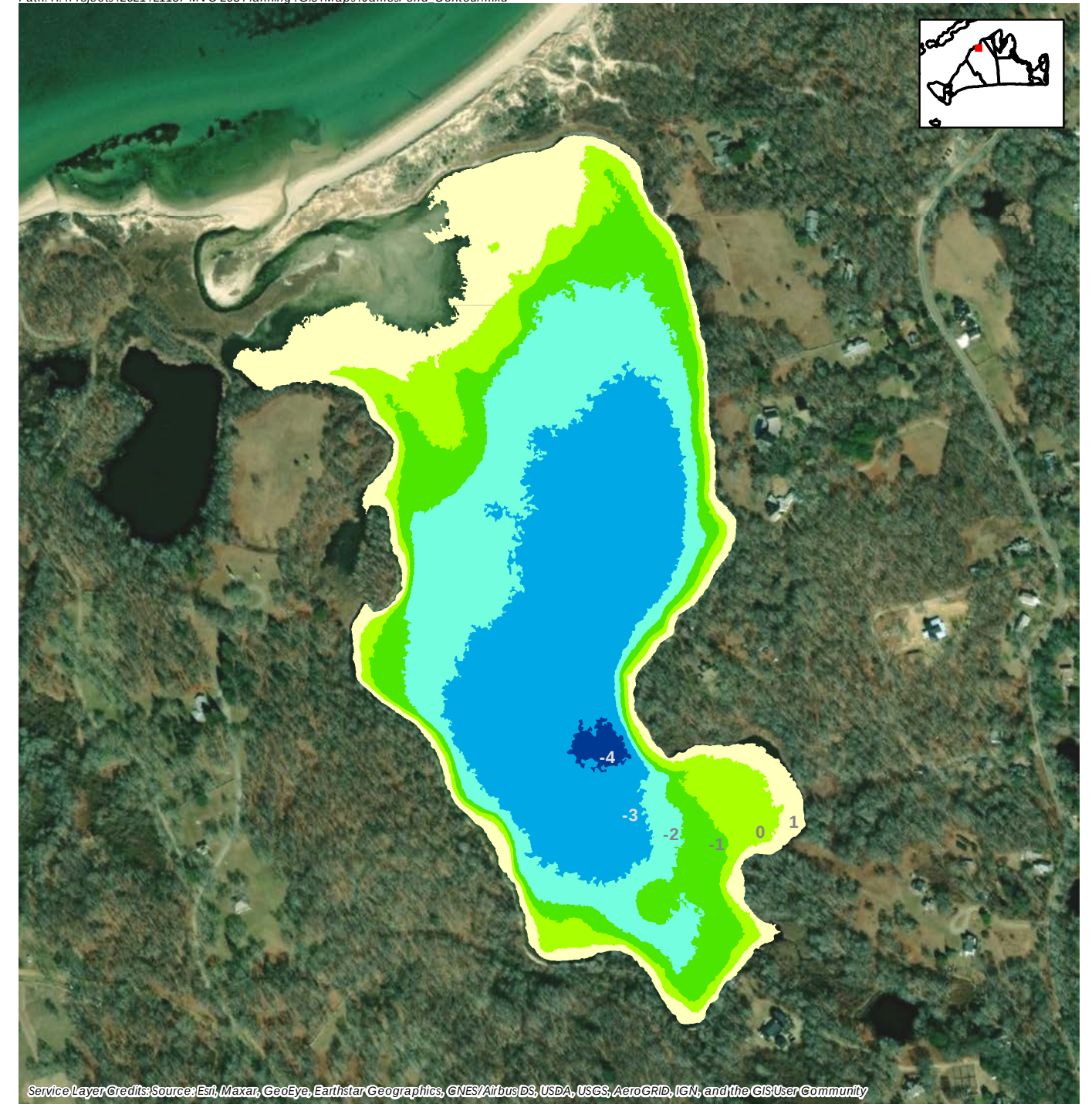


Figure 1. James Pond Watershed and Features (Martha's Vineyard Commission, 2021)

Path: H:\Projects\2021\21137 MVC 208 Planning\GIS\Maps\JamesPond_Contour.mxd



Date: 3/23/2022
Data Sources: ESRI, NOAA, Bureau of Geographic Information (MassGIS)

This map is for informational purposes and may not be suitable for legal, engineering, or surveying purposes.

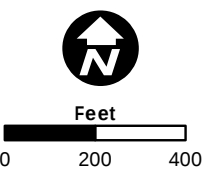
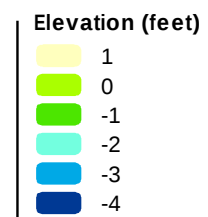


Figure 2
James Pond with 1 Foot Contours.
Figure 2. James Pond Bathymetry Map (Horsley Witten Group 2021)

APPENDIX B

James Pond Watershed Land Cover (acres) - 2021

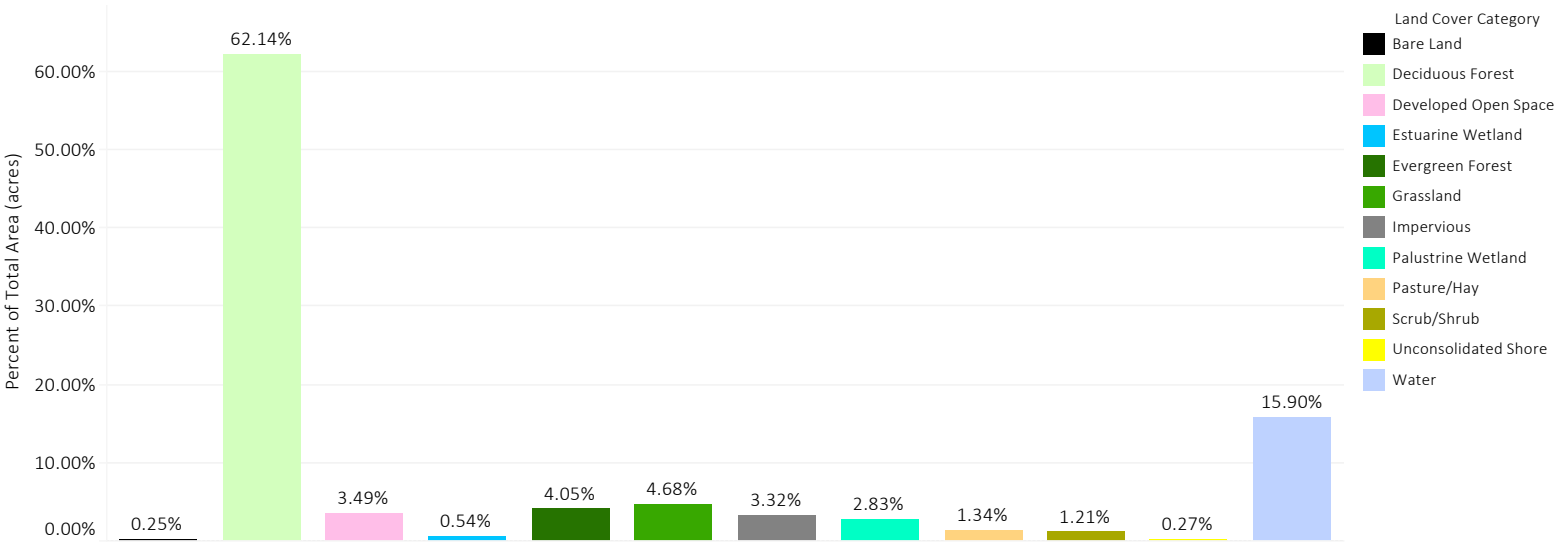


Figure 4. James Pond Land Cover Area (acres)

James Pond Watersheds Land Cover (acres) - 2021 Table

	% of Total Area	Area (acres)
Bare Land	0.25%	1.0
Deciduous Forest	62.14%	257.5
Developed Open Space	3.49%	14.4
Estuarine Wetland	0.54%	2.2
Evergreen Forest	4.05%	16.8
Grassland	4.68%	19.4
Impervious	3.32%	13.8
Palustrine Wetland	2.83%	11.7
Pasture/Hay	1.34%	5.5
Scrub/Shrub	1.21%	5.0
Unconsolidated Shore	0.27%	1.1
Water	15.90%	65.9
Grand Total	100.00%	414.4

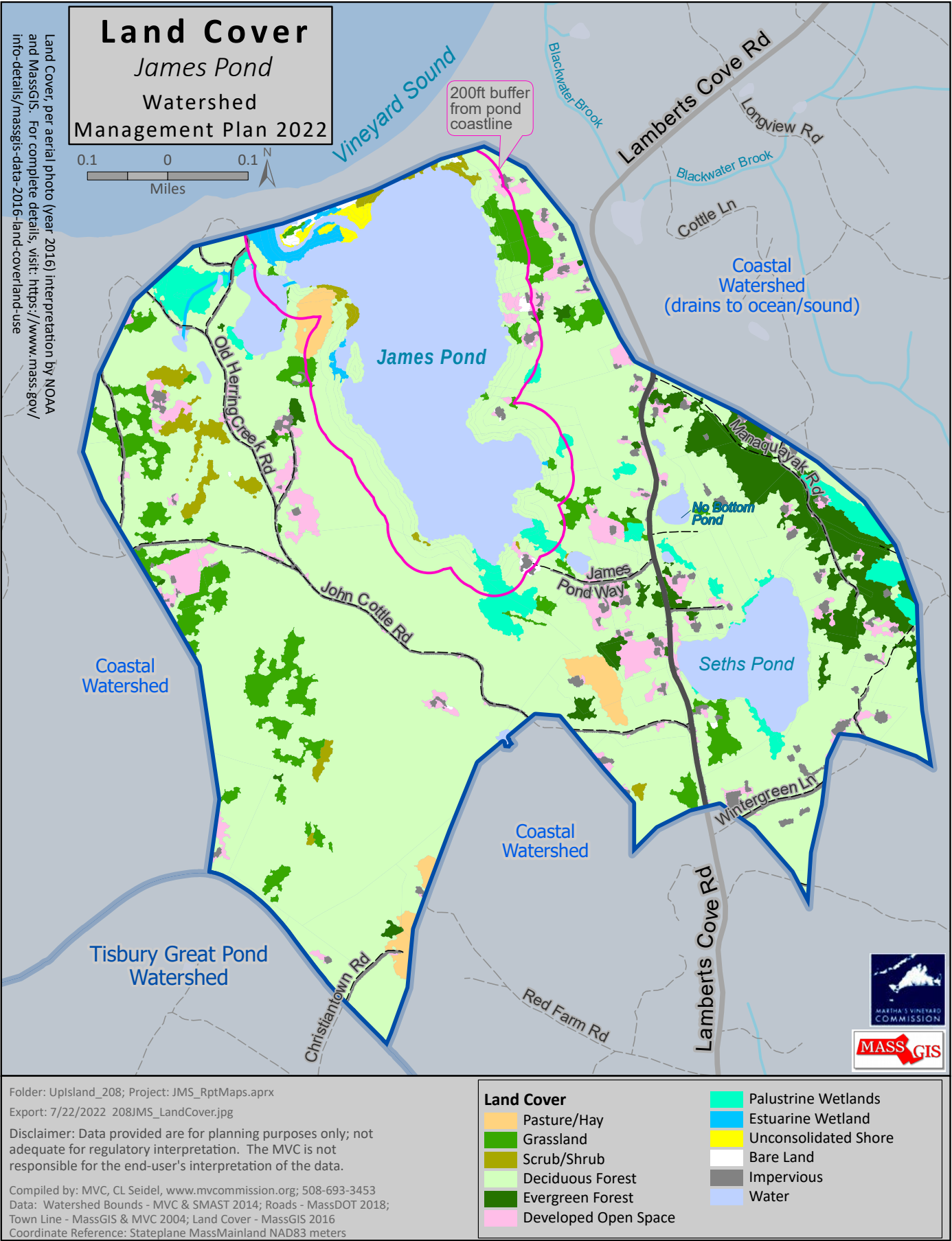


Figure 3. Land Cover Pond Land Cover Types

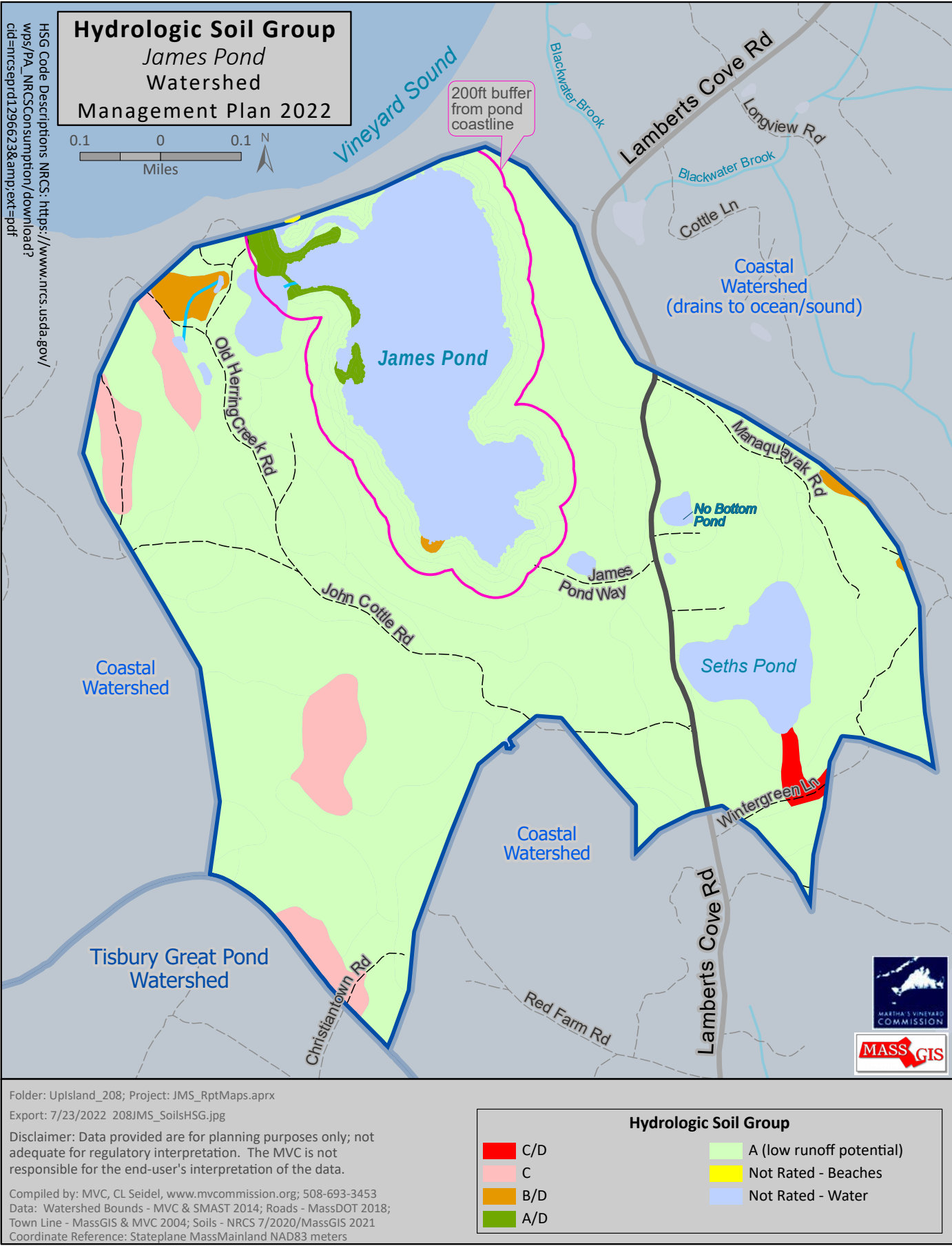
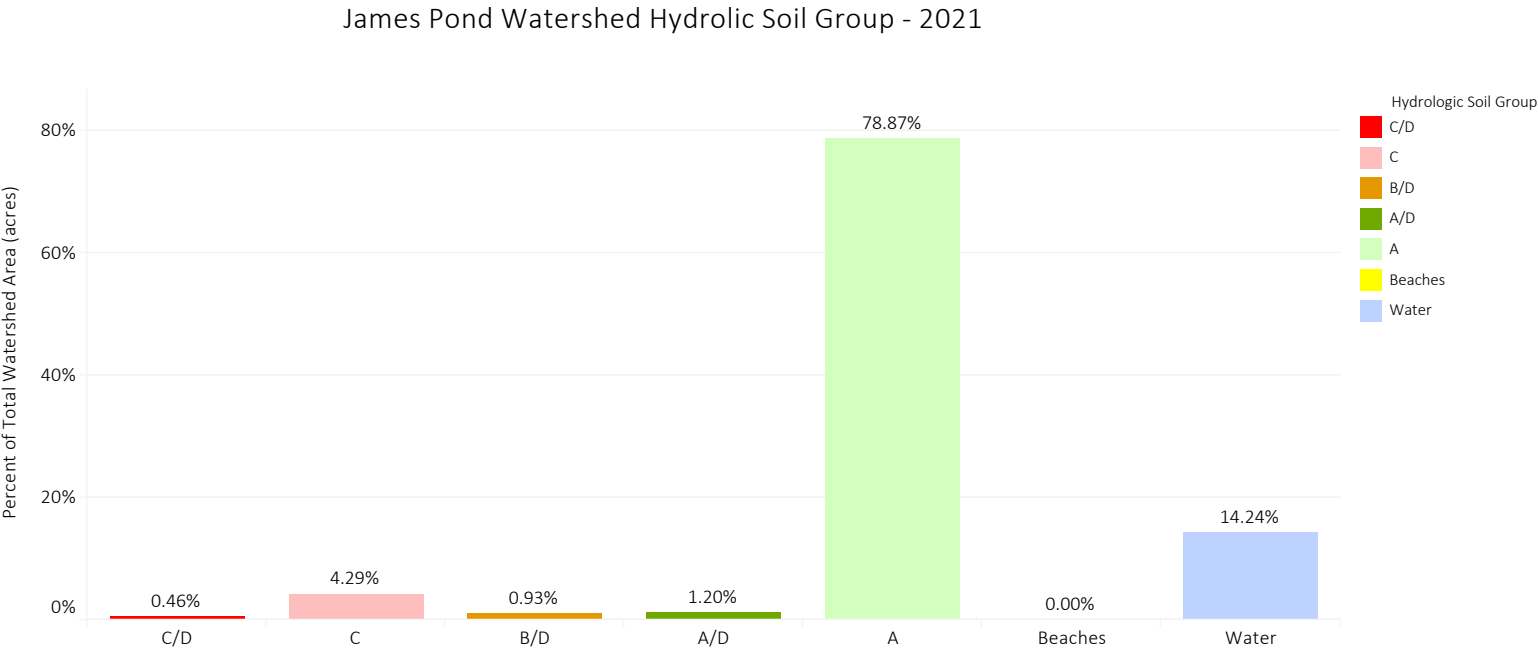


Figure 5. James Pond Hydrologic Soil Groups

James Pond Watershed Soil Type and Nitrate-Nitrogen Leaching Potential (acres) Entire Watershed - 2021 Table

Nitrate-Nitrogen Leaching Potential	Component Name	Area (acres)	Percent of Total Watershed Area (acres)
High	Eastchop	320.0	77.23%
	Hooksan	6.8	1.65%
Low	Freetown	3.8	0.93%
	Ridgebury Variant	1.9	0.46%
Moderate	Chilmark	17.8	4.29%
Not rated	Pawcatuck	5.0	1.20%
	Beaches	0.0	0.00%
	Water	59.0	14.24%

James Pond Watershed Soil Type and Nitrate-Nitrogen Leaching Potential (acres) - 2021

Note: Areas representing less than 1% of the sub-watershed are not labeled.

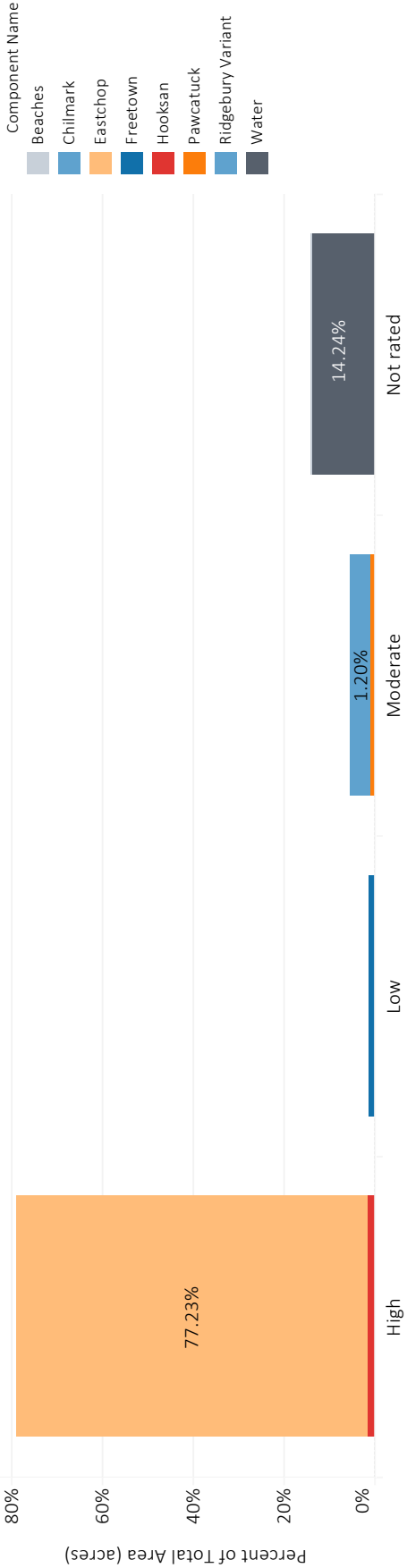


Figure 6. Soil Type and Nitrate-Nitrogen Leaching Potential

James Pond Watershed Nitrogen Leaching Potential of All Soil (% of total acres) - 2021

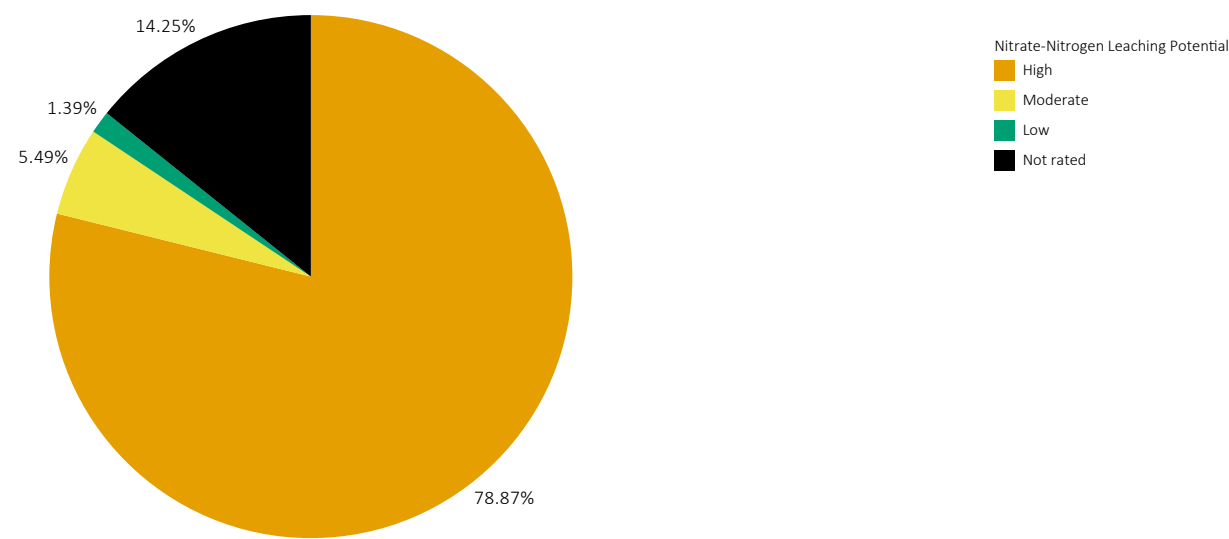


Figure 7. James Watershed Nitrogen Leaching Potential

James Pond Watershed Nitrogen Leaching Potential of All Soil (% of total acres) - 2021 Table

% of Total Area (acres) with Nitrate-Nitrogen Leaching Potential		Area (acres)
Low	1.39%	5.8
Moderate	5.49%	22.7
High	78.87%	326.8
Not rated	14.25%	59.0

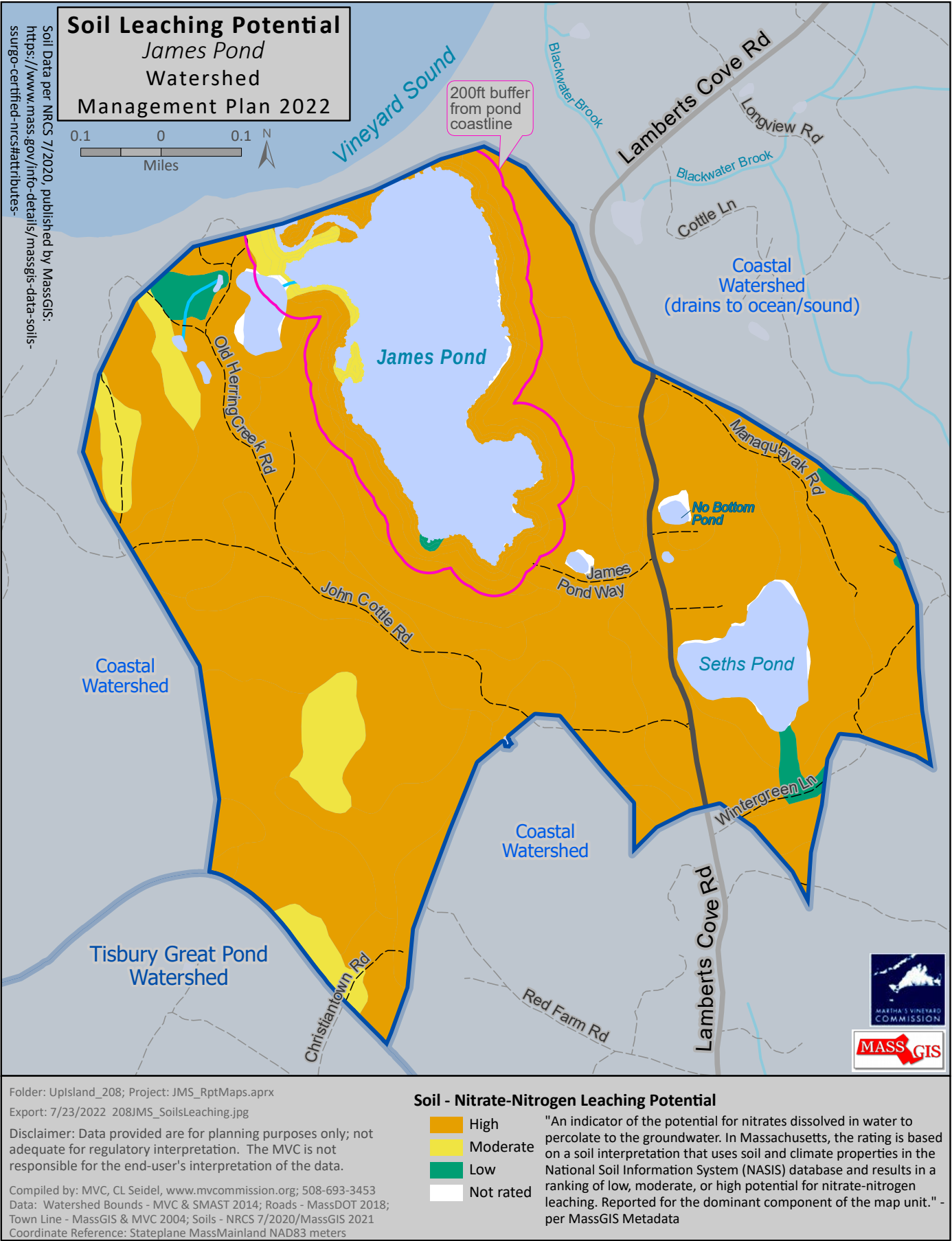


Figure 8. James Pond Soil Leaching Potential

APPENDIX C:

Water Quality Parameters	Regulatory Standards	MVC Average (2017-2021)	Standard Sources
Temperature	<85°F/29.4°C (At one time)	Meets Standard Requirements (76.1°F (24.5°C))	Massachusetts Surface Water Quality Standards (314 CMR 4.00)
	<80°F/26.7°C (Max daily mean)		
Dissolved Oxygen	6.0 mg/L	Range between 3.3 and 10.2mg/L	Massachusetts Surface Water Quality Standards (314 CMR 4.00)
Total Pigment Gradient	10.0 µg/L	All sampling sites exceed requirements	2020 Martha's Vineyard Water Quality Technical Report

Table 1. James Pond Water Quality Standards and Thresholds



Figure 9. James Pond Water Quality Sampling Stations (2017-2021)

James Pond Watershed - Salinity (2017-2021)

The BLUE LINE in the upper area of the graph represents average offshore/Atlantic Ocean salinity (ppt). The average salinity In the waters off Martha's Vinyard is 33 (ppt).

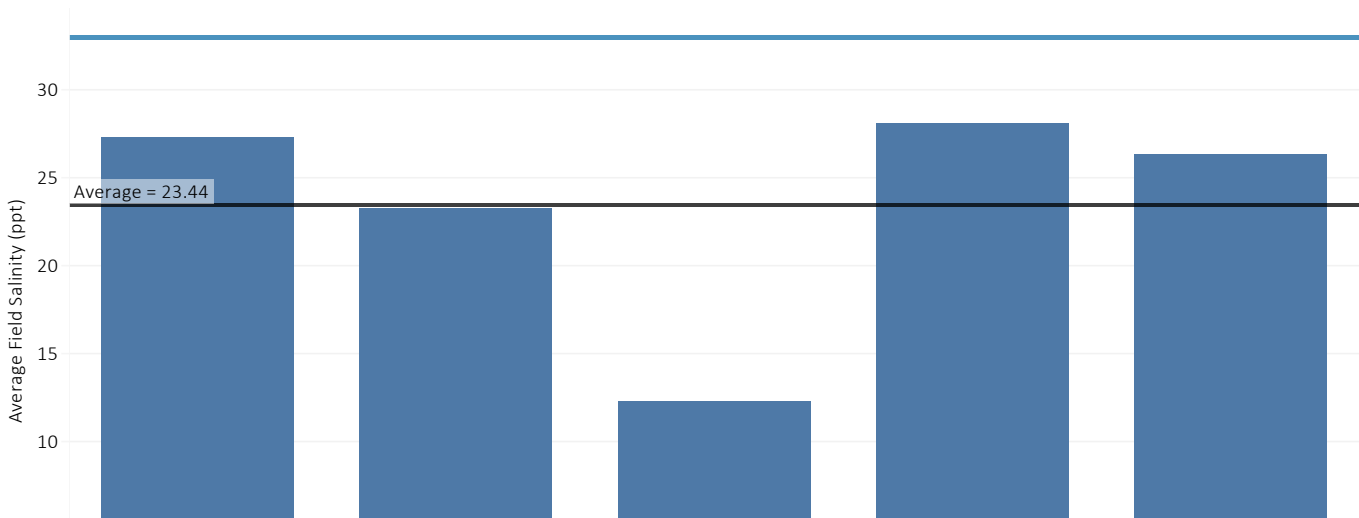
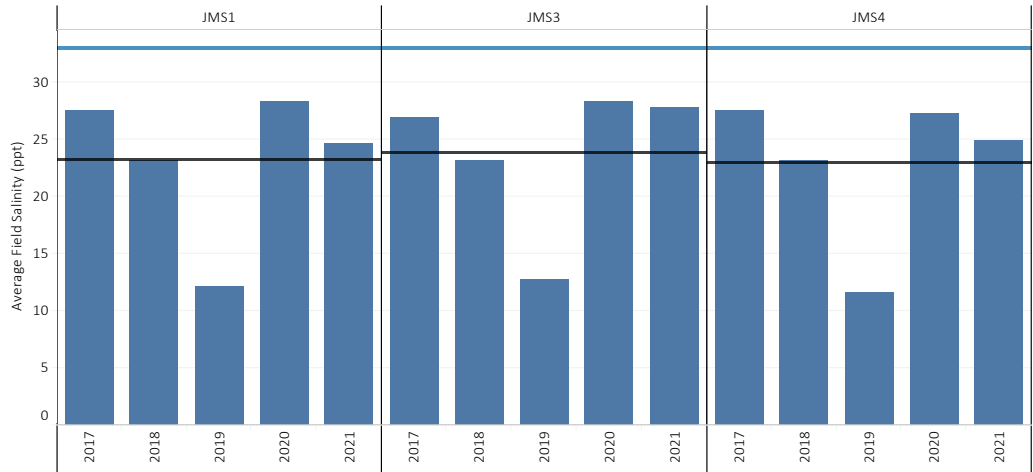


Figure 10. James Pond Salinity Data (2017-2021)

James Pond Watershed Stations - Salinity (2017-2021)

The BLUE LINE in the upper area of the graph represents average offshore/Atlantic Ocean salinity (ppt). The average salinity In the waters off Martha's Vinyard is 33 (ppt). The BLACK LINE within the sub-watershed pane indicates the average salinity value over a five year period (2017-2021).



James Pond Watershed - Salinity (2017-2021) - Table

Station ID	2017	2018	2019	2020	2021	Five Year Average
JMS1	27.64	23.23	12.19	28.28	24.66	23.20
JMS3	26.94	23.25	12.83	28.35	27.85	23.84
JMS4	27.62	23.20	11.69	27.30	24.96	22.95
Annual Average	27.40	23.23	12.23	27.97	25.82	23.33

James Pond Watershed - Water Temperature (2017-2021)

Massachusetts surface water quality standards state that coastal water temperature shall not exceed 85°F (29.4°C) nor a maximum daily mean of 80°F (26.7°C). The RED LINE indicates the 85°F (29.4°C) limit. <https://www.epa.gov/sites/default/files/2014-12/documents/mawqs-2006.pdf>

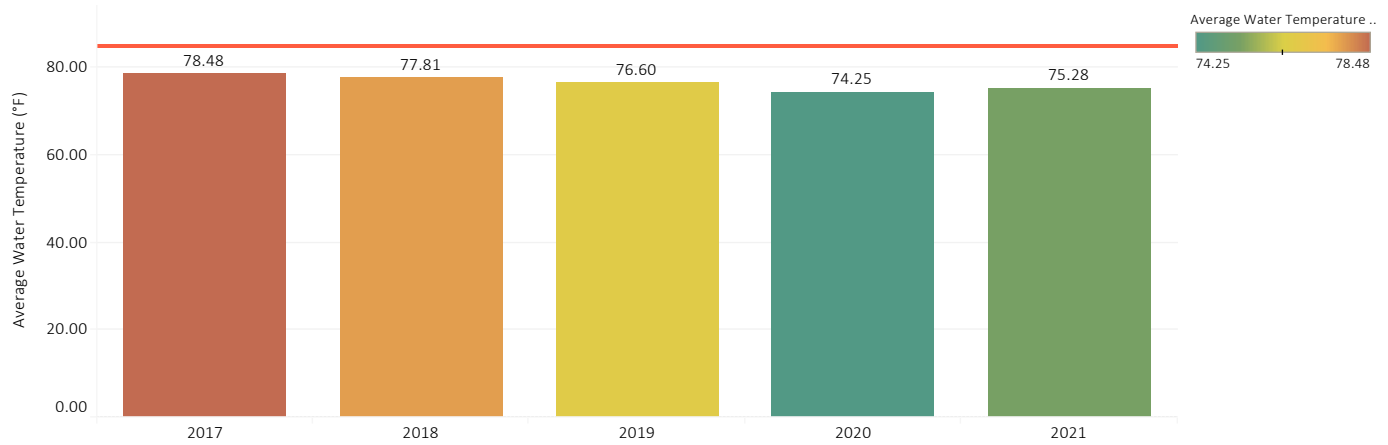
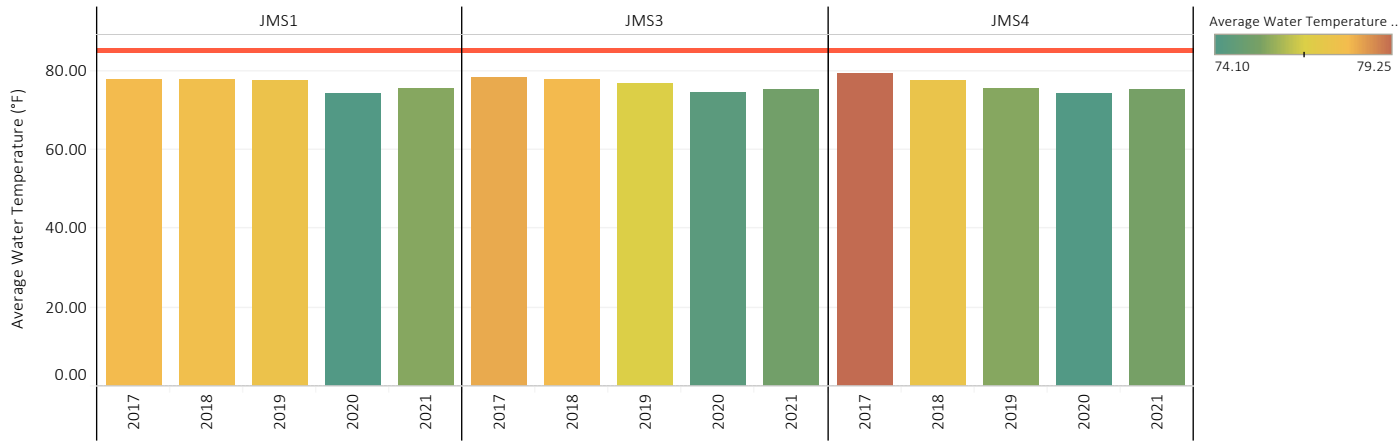


Figure 11. James Pond Temperature Data (2017-2021)

James Pond Watershed Stations - Water Temperature (2017-2021)

Massachusetts surface water quality standards state that coastal water temperature shall not exceed 85°F (29.4°C) nor a maximum daily mean of 80°F (26.7°C). The RED LINE indicates the 85°F (29.4°C) limit. <https://www.epa.gov/sites/default/files/2014-12/documents/mawqs-2006.pdf>



James Pond Watershed - Water Temperature (°F) (2017-2021) - Table

Massachusetts surface water quality standards state that coastal water temperature shall not exceed 85°F (29.4°C) nor a maximum daily mean of 80°F (26.7°C). <https://www.epa.gov/sites/default/files/2014-12/documents/mawqs-2006.pdf>

	2017	2018	2019	2020	2021	Five Year Average
JMS1	77.99	77.81	77.57	74.10	75.56	76.29
JMS3	78.25	78.00	76.74	74.42	75.18	76.20
JMS4	79.25	77.48	75.56	74.12	75.29	75.91
Annual Average	78.48	77.81	76.60	74.25	75.28	76.14

Sampling Station	2017-2021 Average Total Nitrogen Concentration (mg/L)	2021 Observed Total Nitrogen Concentration (mg/L)
JMS1	0.78	0.75
JMS3	0.76	0.75
JMS4	0.75	0.74
Total System	0.78-0.75	0.75-0.74

Table 2. James Pond Total Nitrogen Data Comparison

James Pond Watershed - Total Nitrogen (mg/L) (2017-2021) - Table

	2017	2018	2019	2020	2021	Five Year Average
JMS1	0.73	0.63	1.20	0.63	0.75	0.78
JMS3	0.57	0.81	1.15	0.68	0.75	0.76
JMS4	0.56	0.74	1.22	0.65	0.74	0.75
Annual Average	0.61	0.73	1.19	0.66	0.75	0.76

James Pond Watershed Stations - Total Nitrogen Concentration (mg/L) (2017-2021)

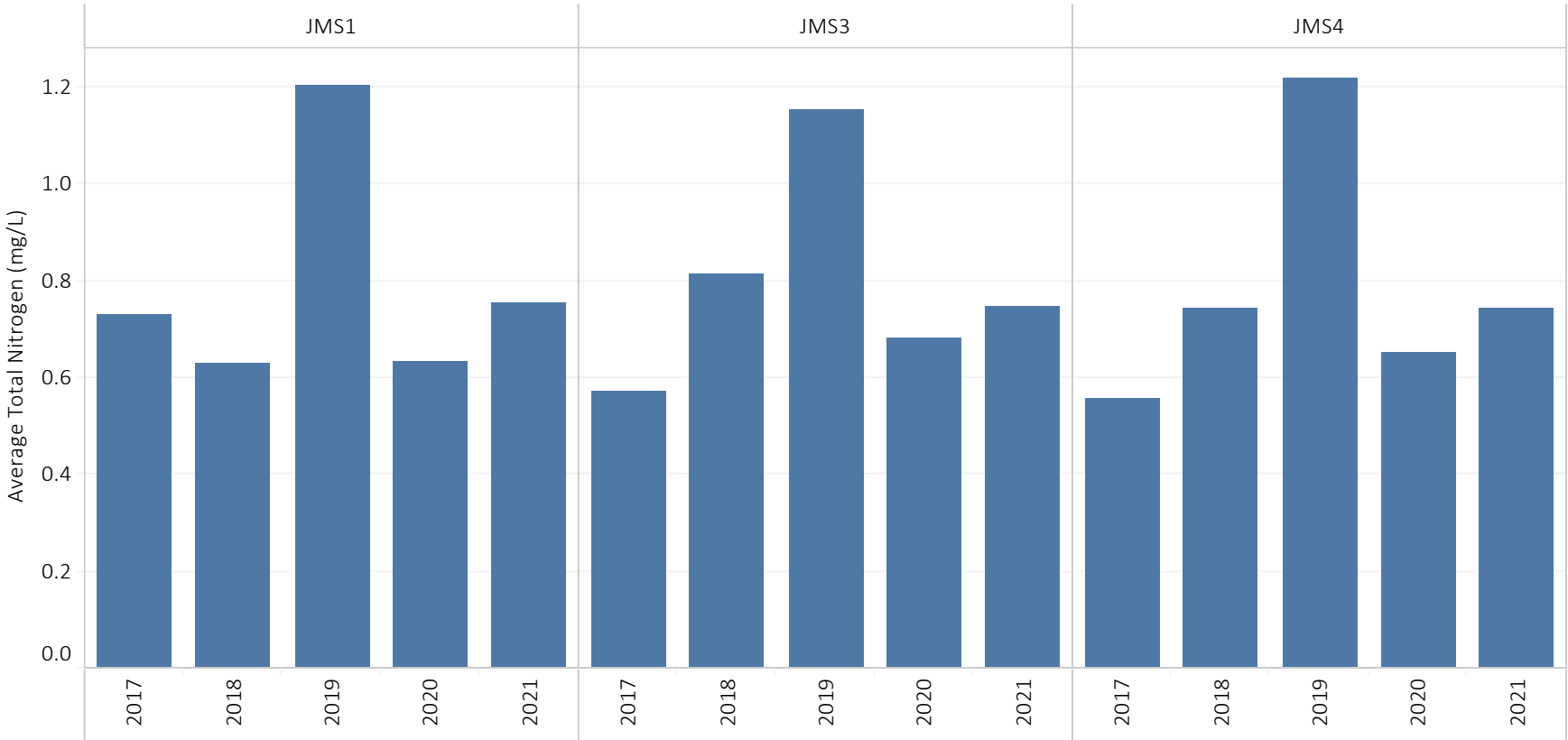


Figure 12. James Pond Total Nitrogen by Sub-watershed (2017-2021)

James Pond Watershed Stations - Dissolved Oxygen (2019)

*All values represent dissolved oxygen levels taken at the BOTTOM surface of the pond.

Year of Date	Month of Da..	Day of Date	JMS1	JMS3	JMS4
2017	June	21			
	July	5	10.16	6.60	6.08
		19	6.41	7.12	5.25
		27			
	August	3	6.02	6.06	5.31
		16	5.27	6.85	5.85
		24			
2018	September	27		7.45	
	July	10	5.58	4.66	6.78
		30	3.97	6.72	4.96
	August	7	6.85	5.32	5.28
		21	4.69	4.92	5.12
2019	July	10	8.01	8.02	
		24	5.10	5.75	4.59
	August	8	7.47	6.46	6.76
		28	5.32	5.30	5.43
2020	June	30	5.71	5.71	7.00
	July	15	6.23	6.47	5.78
		29	4.40	6.43	6.46
	August	16	3.28	4.07	3.76
	September	15	7.13	6.96	6.93
2021	June	24	7.62	7.05	8.30
	July	7	7.73	6.60	7.65
		20	6.95	5.16	6.44
	August	26			
Five Year Average			6.16	6.01	5.98

James Pond Watershed Stations - Dissolved Oxygen (2017-2021)

The RED LINE indicates the threshold dissolved oxygen level, values below this line are associated with stressful conditions in which aquatic species fail to thrive.

*All values represent dissolved oxygen levels taken at the BOTTOM surface of the pond.

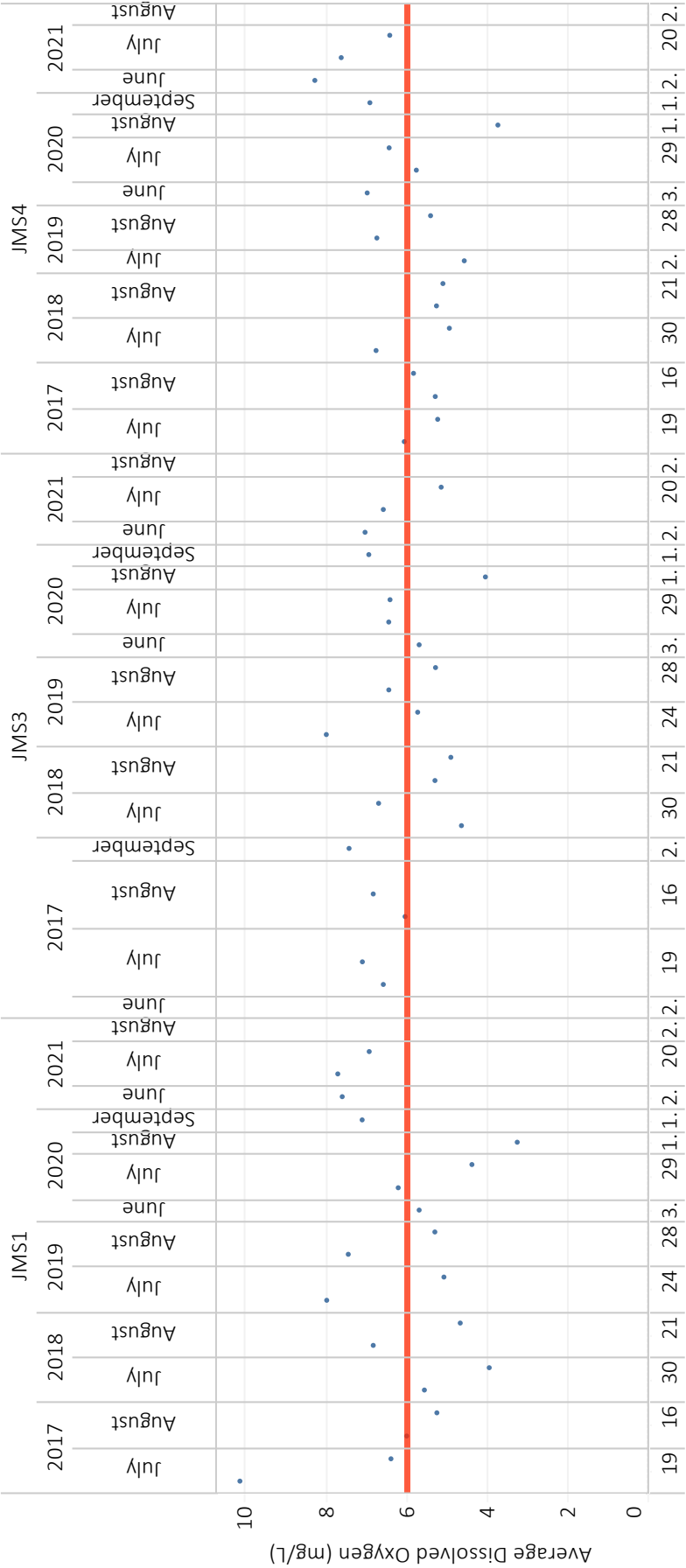


Figure 13. James Pond Dissolved Oxygen by Sub-watershed (2017-2021)

James Pond Watershed - Chlorophyll-a (2017-2021) - Table

	2017	2018	2019	2020	2021	Five Year Average
JMS1	5.14	5.42	18.24	1.79	11.04	8.33
JMS3	7.23	11.18	18.49	2.11	7.99	9.40
JMS4	7.26	7.02	29.90	2.20	9.72	11.22
Annual Average	6.55	7.87	22.21	2.04	9.58	9.65

James Pond Watershed - Total Pigment (2017-2021) - Table

	2017	2018	2019	2020	2021	Five Year Average
JMS1	6.75	13.00	19.75	2.80	11.75	10.81
JMS3	10.13	19.20	20.75	3.33	10.75	12.83
JMS4	9.00	17.00	29.67	3.00	13.00	14.33
Annual Average	8.63	16.40	23.39	3.04	11.83	12.66

James Pond Watershed Watershed - Chlorophyll-a (2017-2021)

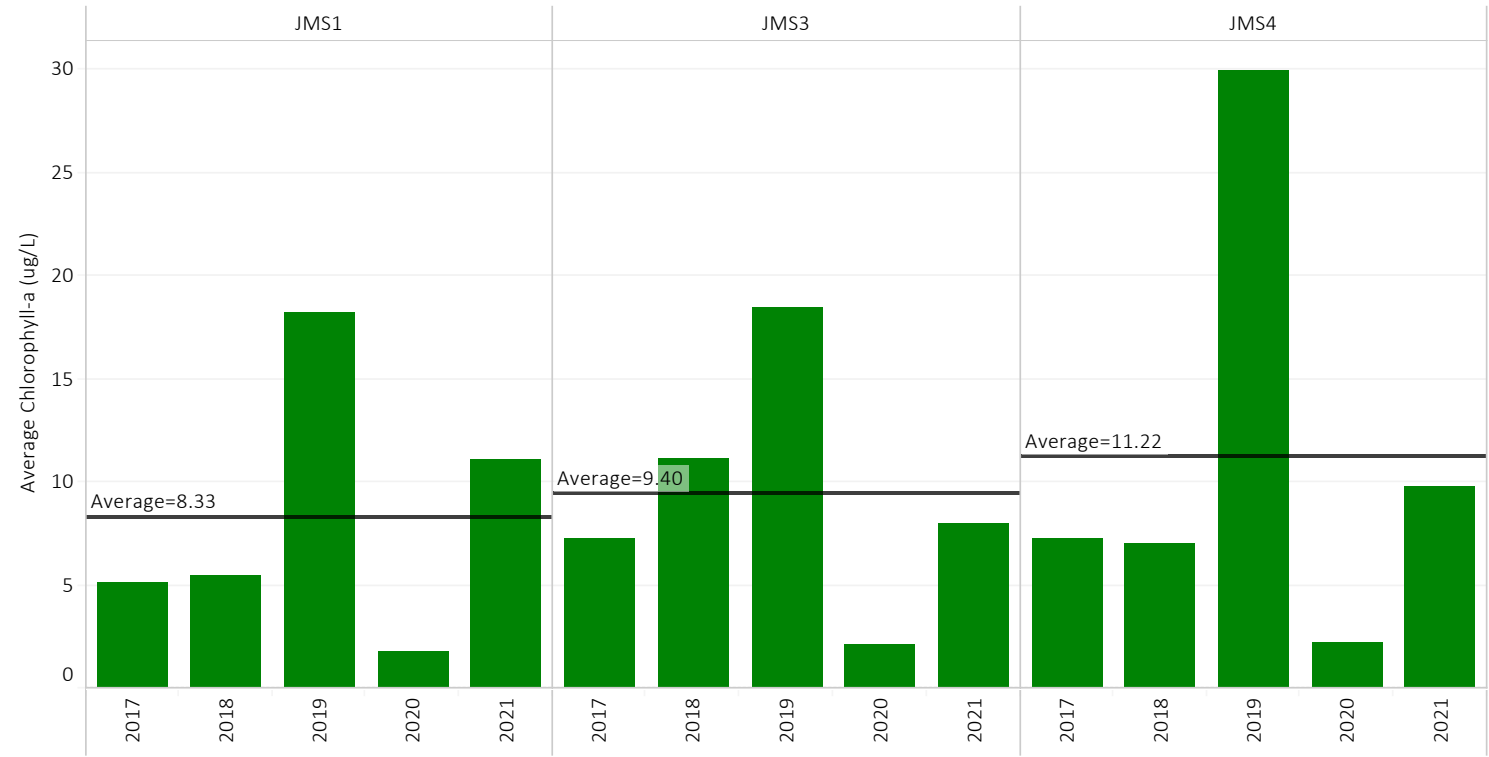


Figure 14. James Pond Chlorophyll-a (2017-2021)

James Pond Watershed Stations - Total Pigment (2017-2021)

The RED LINE represents 10 ug/L total pigment threshold. Total pigment values that exceed 10 ug/L indicate an impaired aquatic environment.

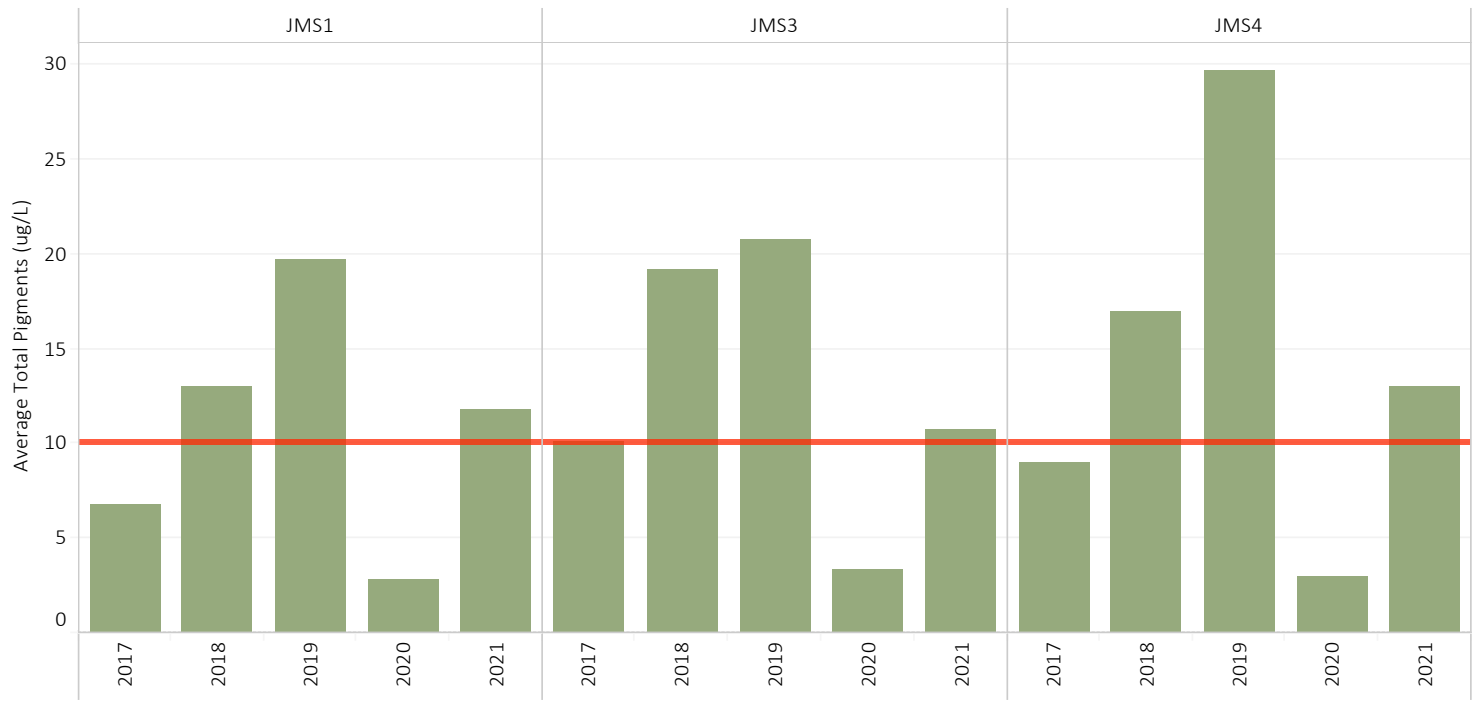
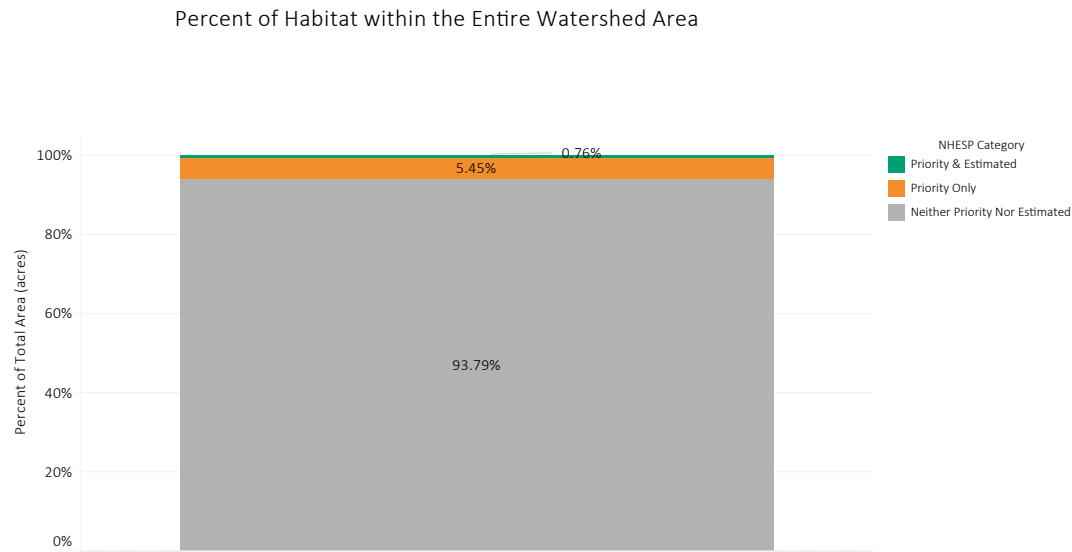


Figure 15. James Pond Total Pigment (2017-2021)

APPENDIX D:

James Pond Watershed Natural Heritage & Endangered Species Habitats - 2021



James Pond Sub-watershed Natural Heritage & Endangered Species Habitats Within and Beyond 200ft from Pond Edge - 2021

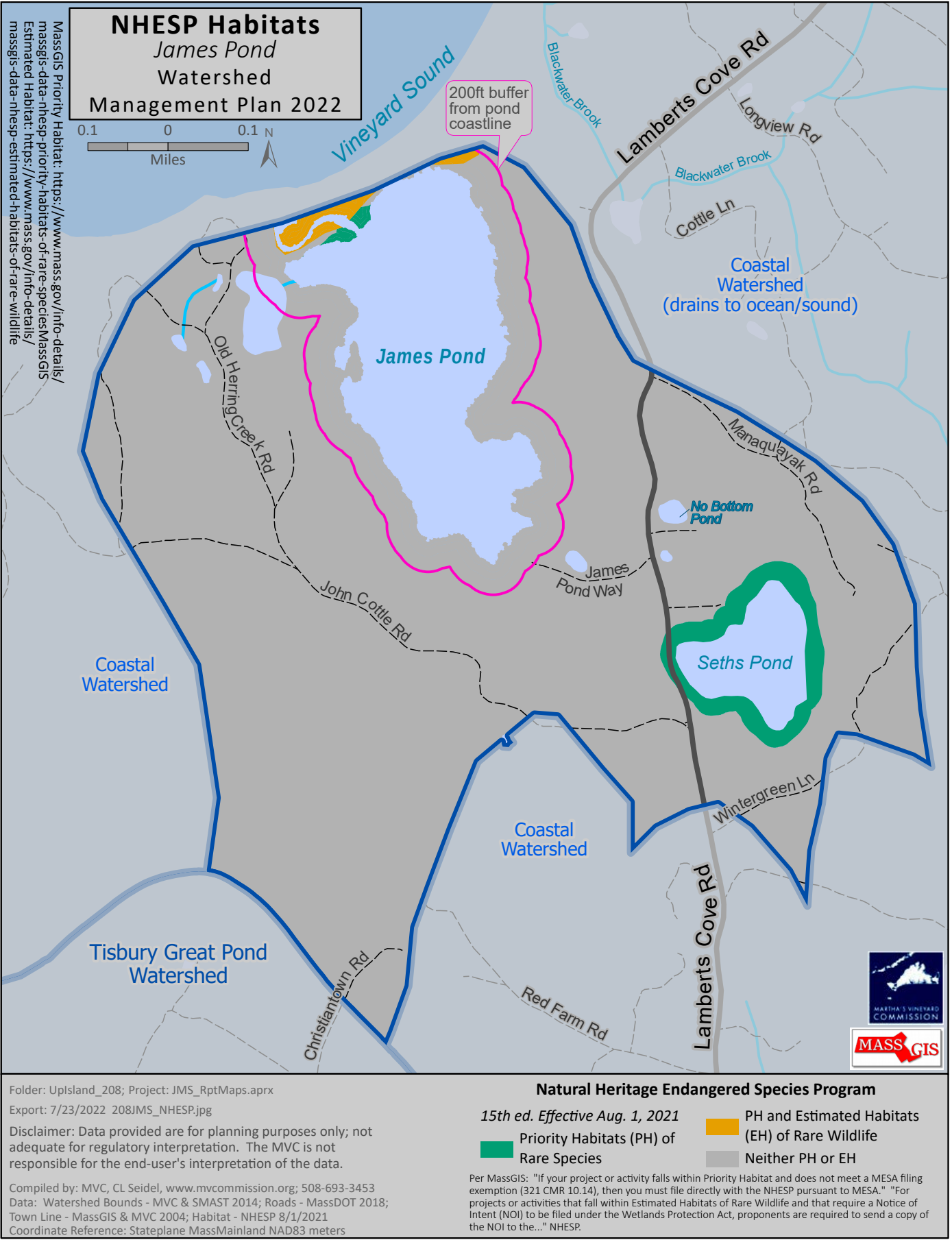
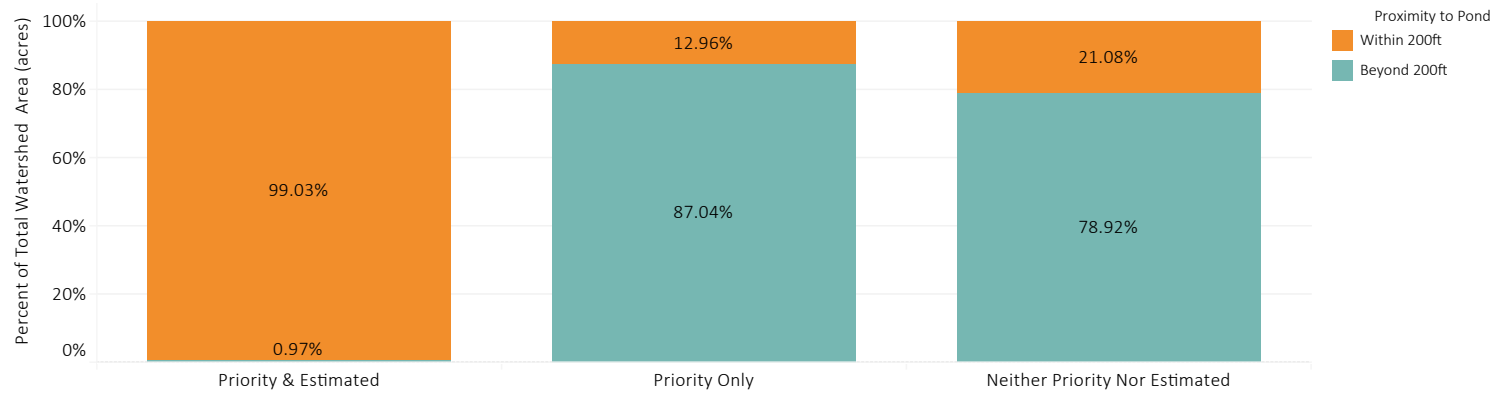


Figure 16. Natural Heritage & Endangered Species Program Map

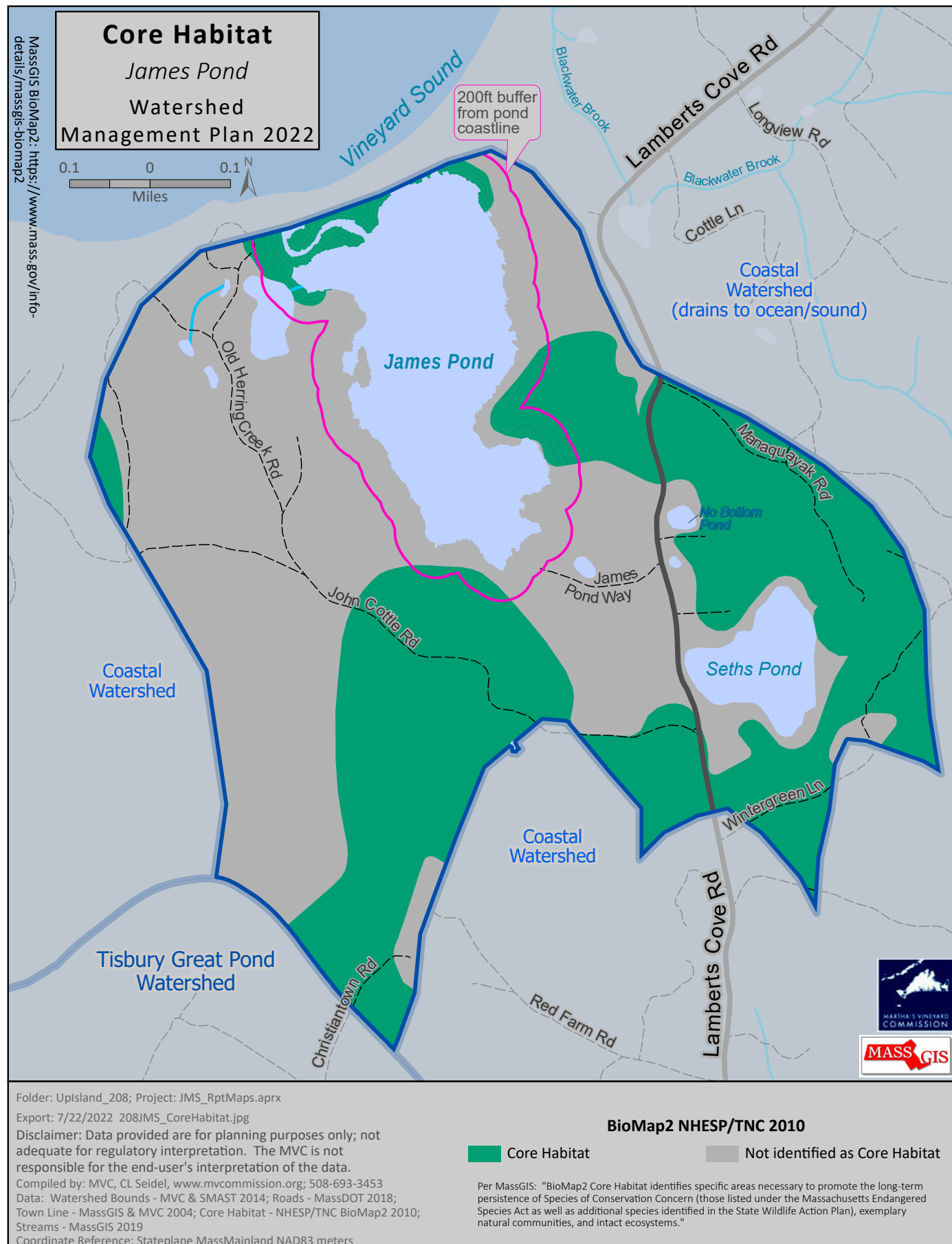


Figure 17. BioMap2 Core Habitat Landscapes
(Note Core IDs correspond with elements list)

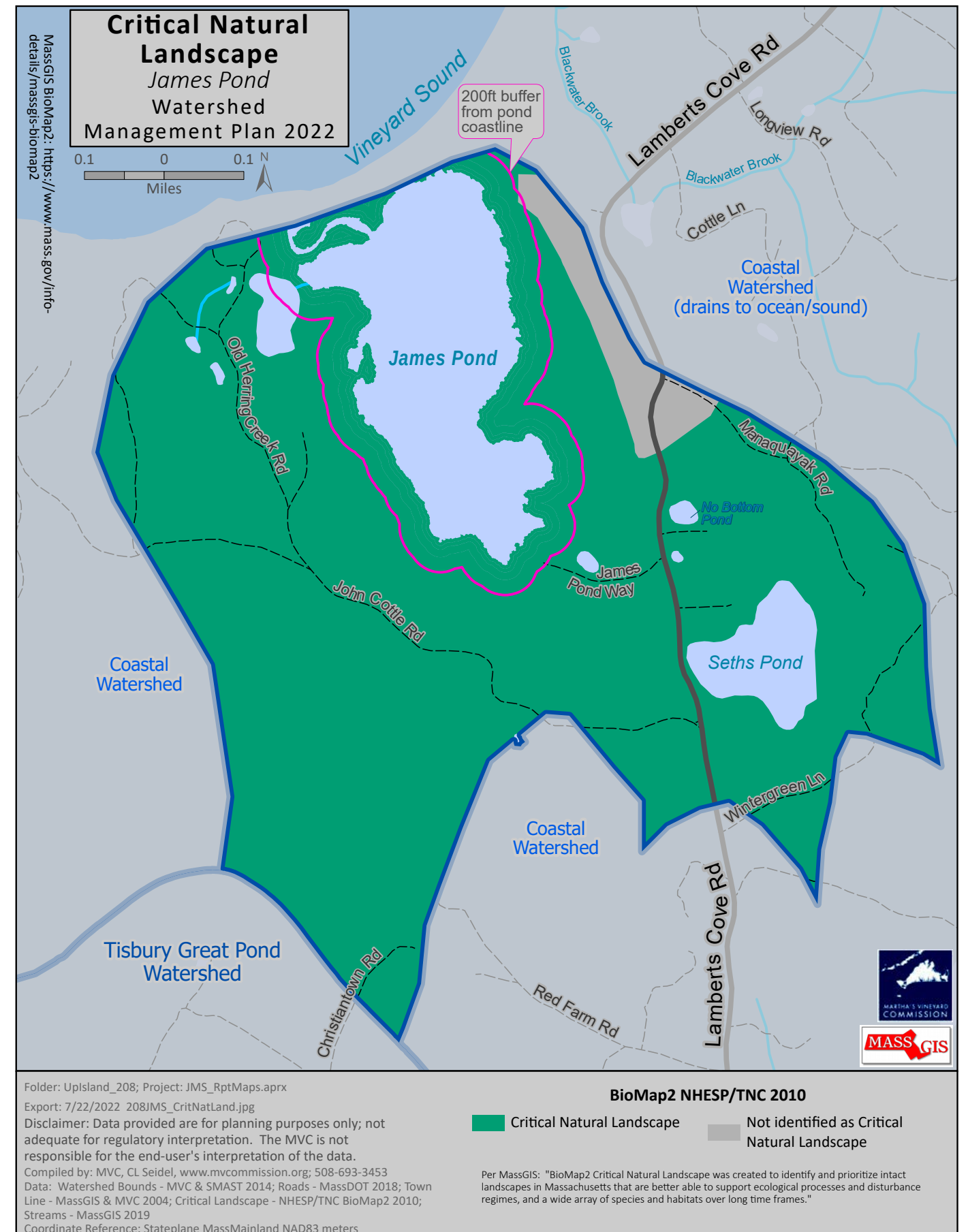
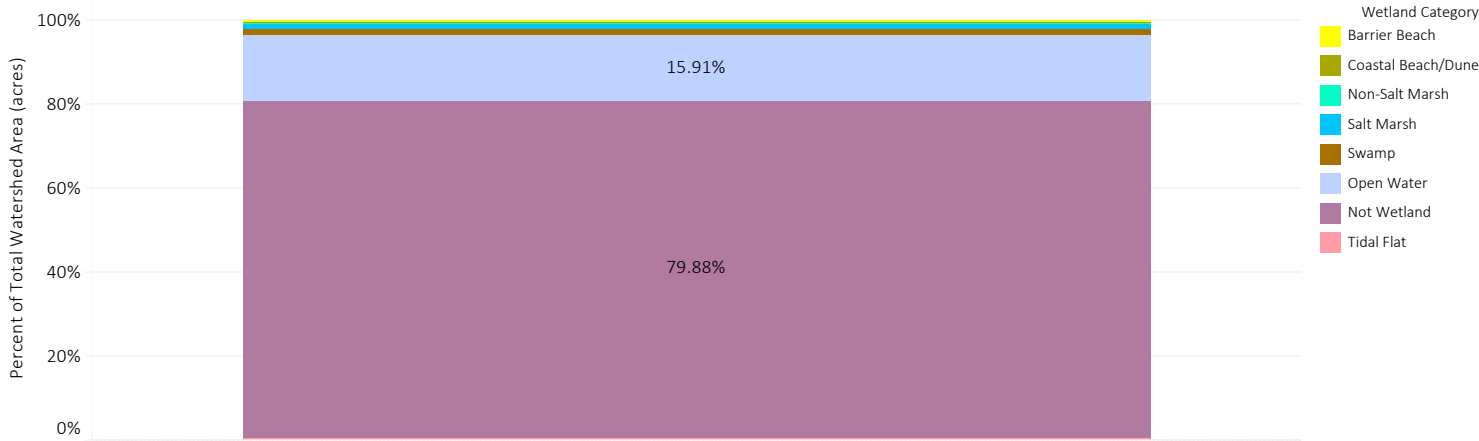


Figure 18. Critical Natural Landscape Map

James Pond Watershed Wetland Area (acres) - 2021

Note: Areas representing less than 2% of the total area (acres) are not labeled.



James Pond Watershed Wetland Area (acres) - 2021 Table

Barrier Beach	0.40%
	1.6
Coastal Beach/Dune	0.00%
	0.0
Non-Salt Marsh	0.72%
	3.0
Not Wetland	79.88%
	331.0
Open Water	15.91%
	65.9
Salt Marsh	0.82%
	3.4
Swamp	1.43%
	5.9
Tidal Flat	0.84%
	3.5

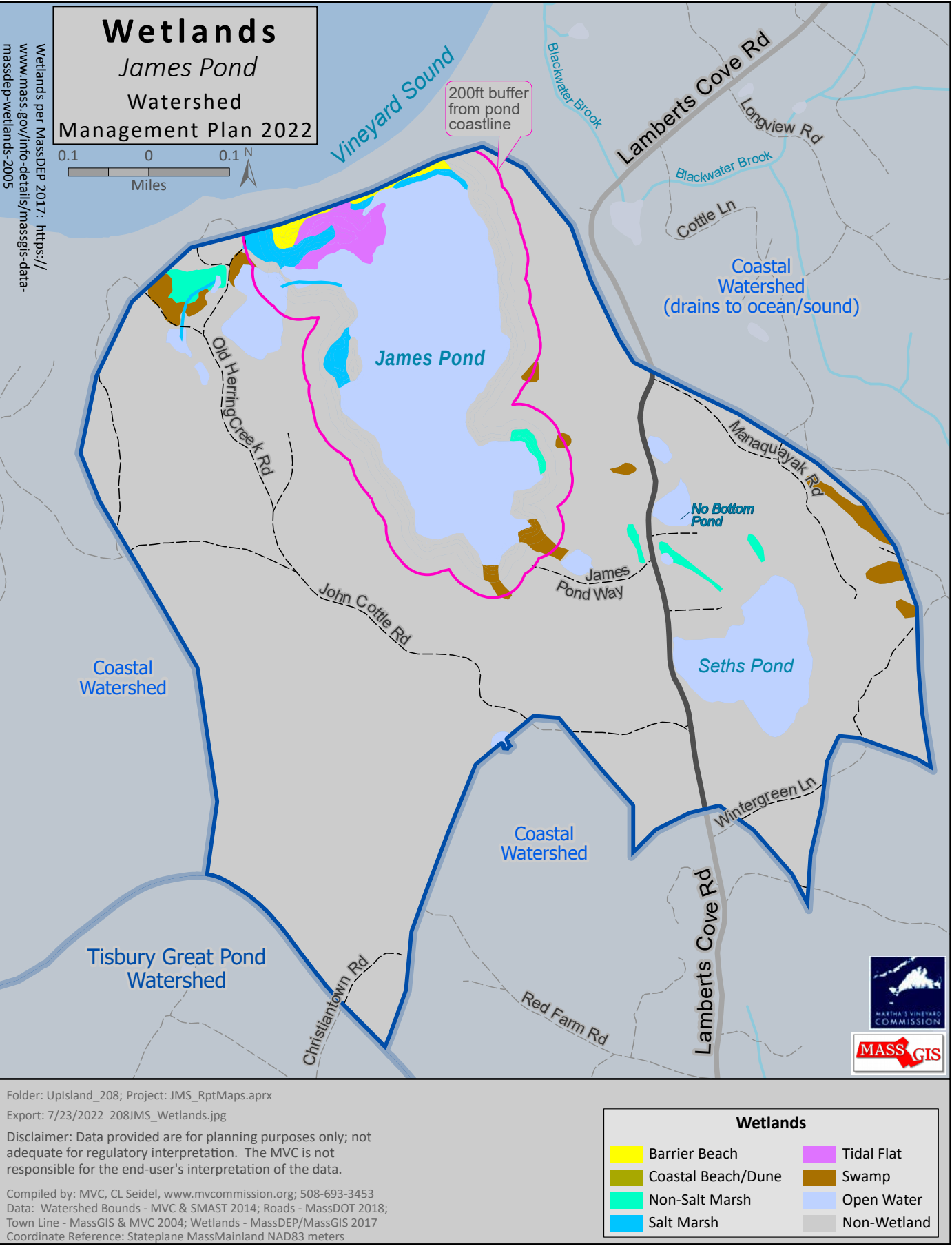


Figure 19. James Pond Watershed Wetlands Map

APPENDIX E:

Town	Year-round Population 1950	Year-round Population 2020	Total Population % Increase 1950 - 2020	Peak In- season Population 2020
West Tisbury	347	3,555	92%	8,723

Table 3. James Pond Watershed Population

James Pond Watershed Residency Status (parcel count) - 2021

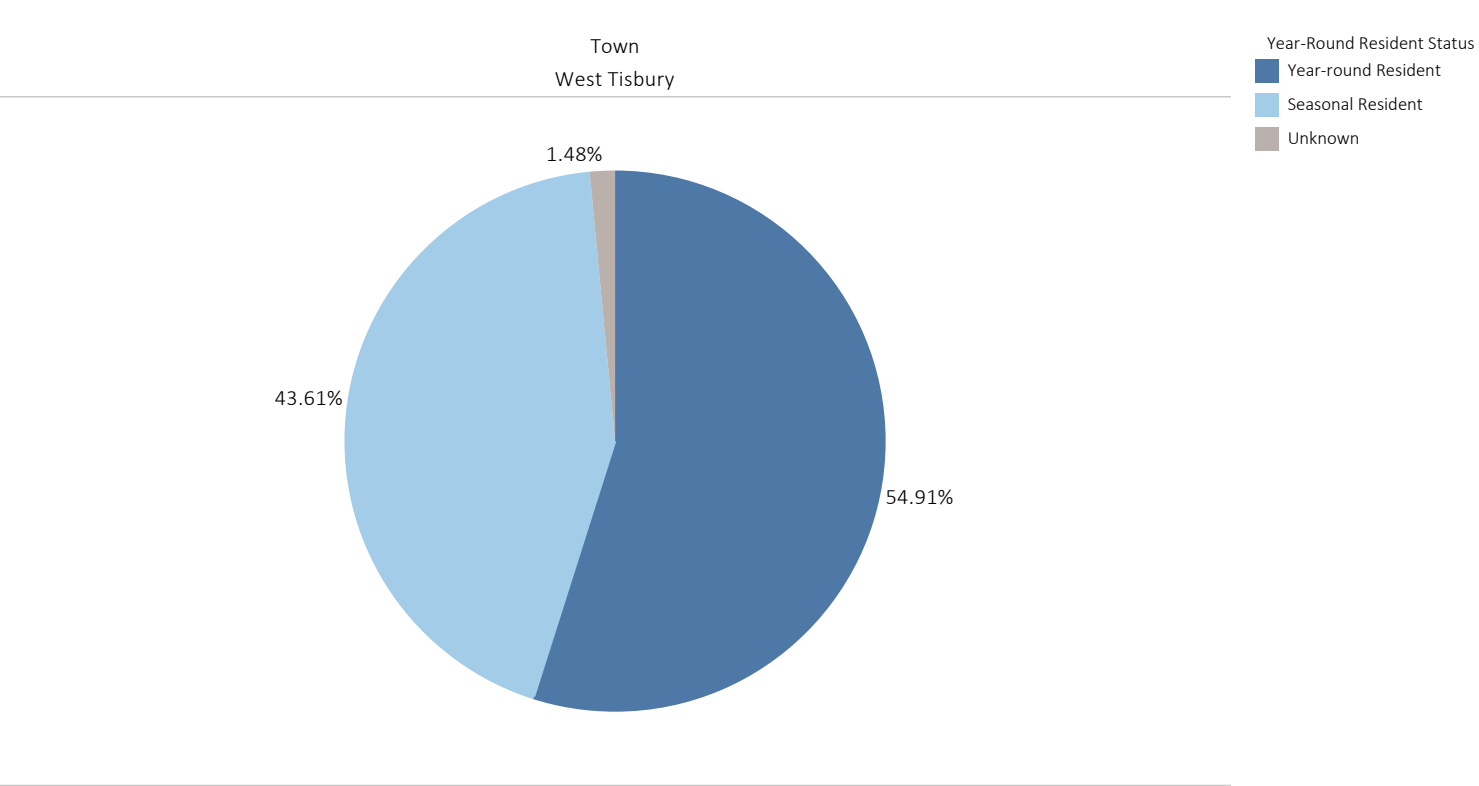


Figure 20. Housing and Residency Status (2021)

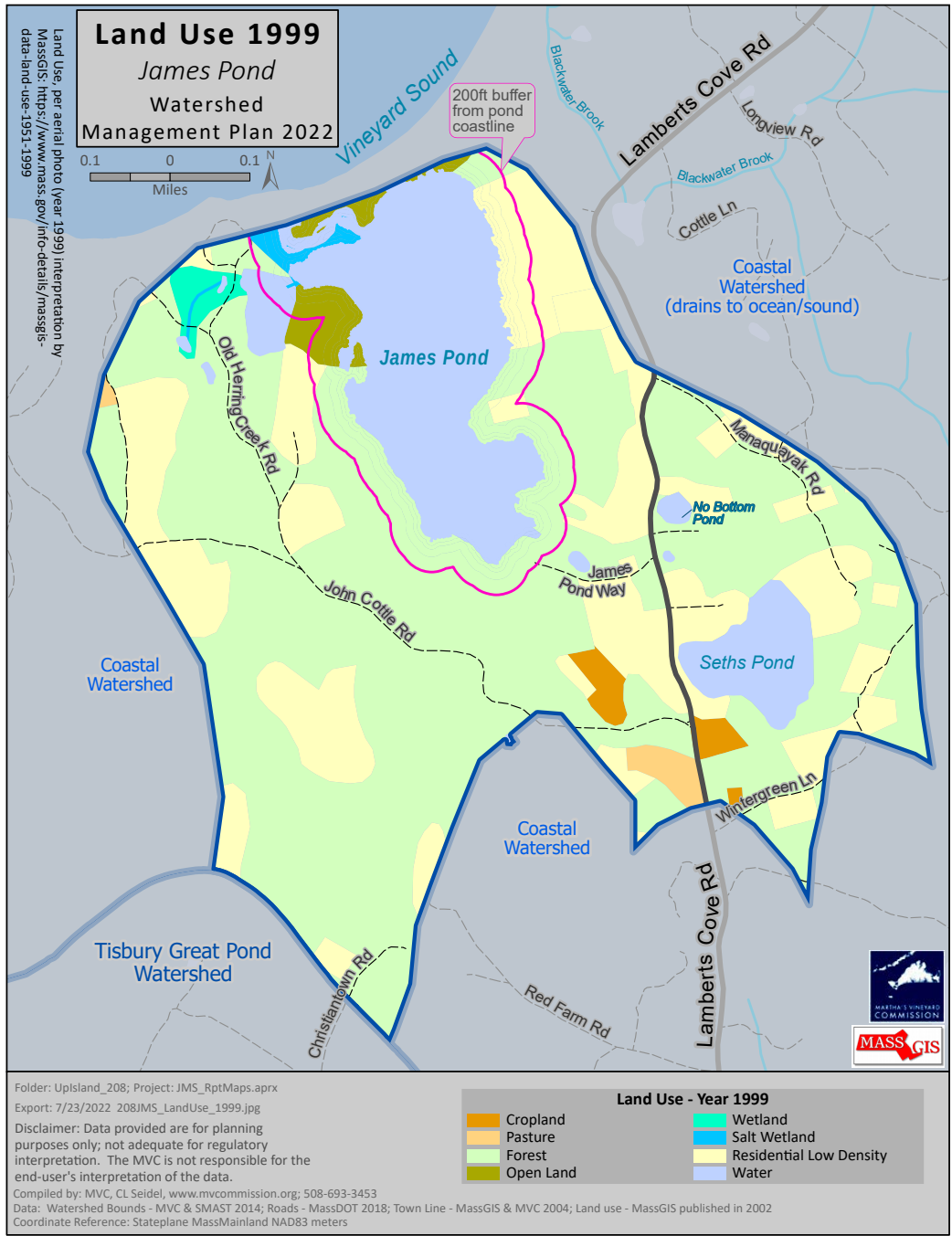
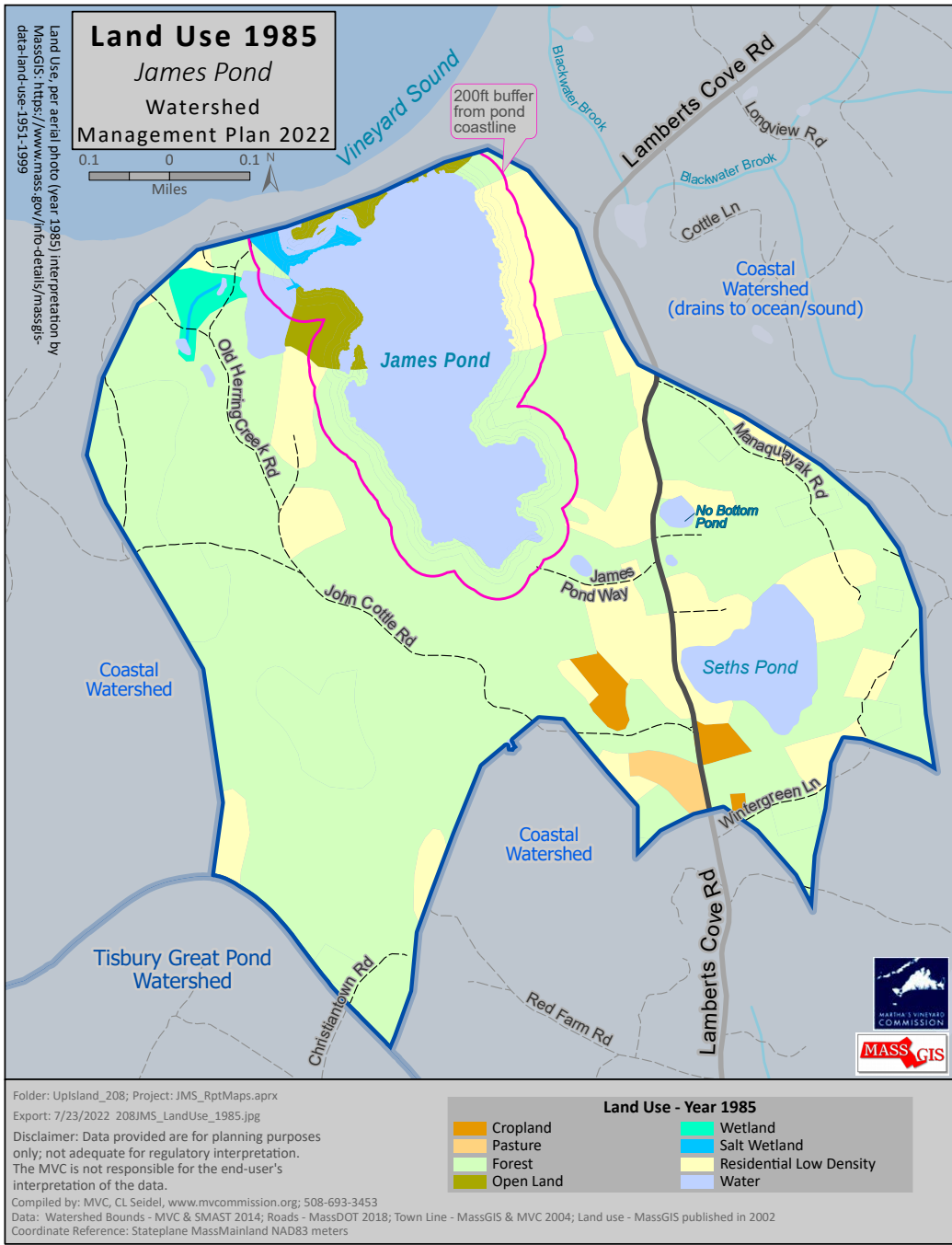
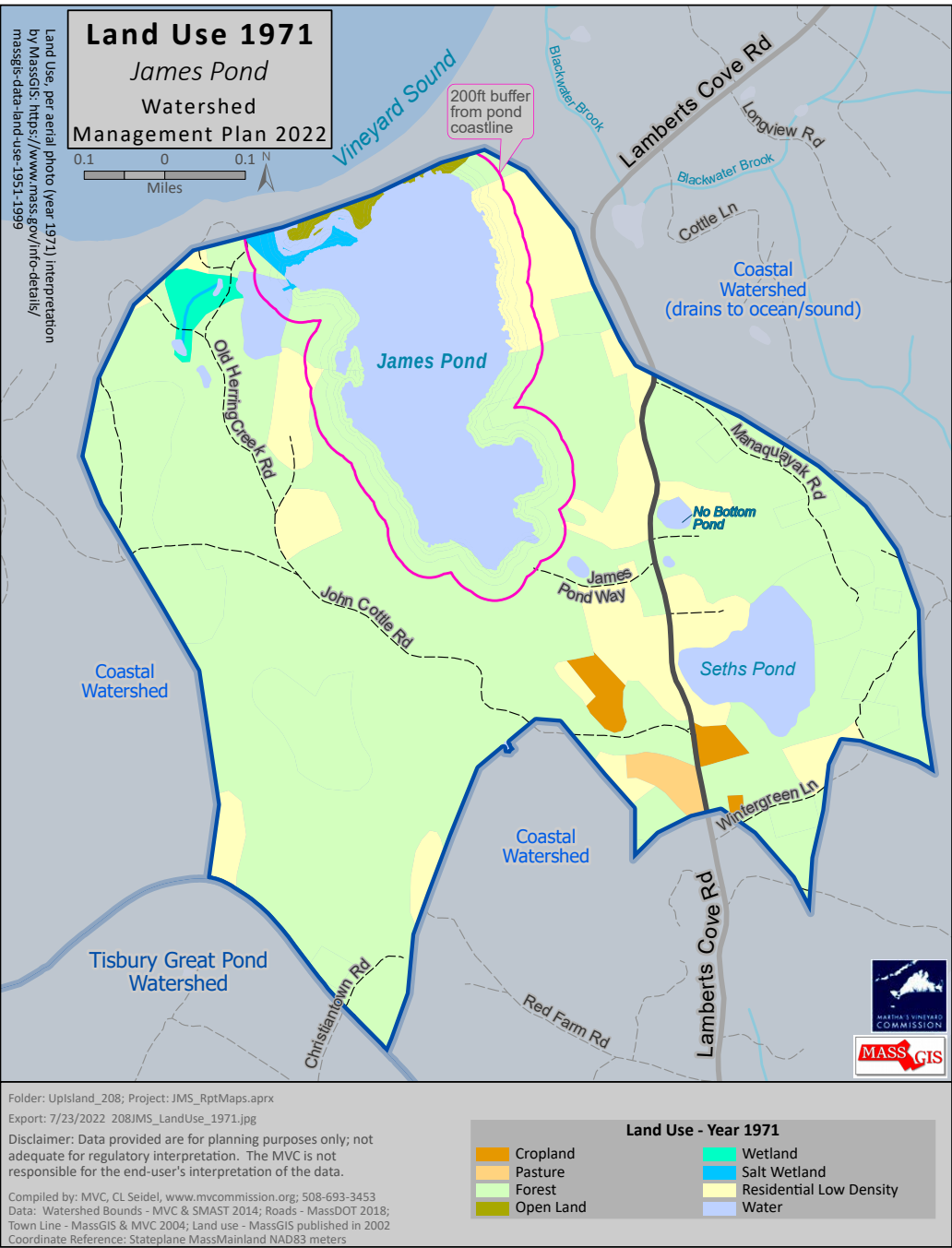


Figure 21. Land Use Map Comparison - 1971, 1985, 1999

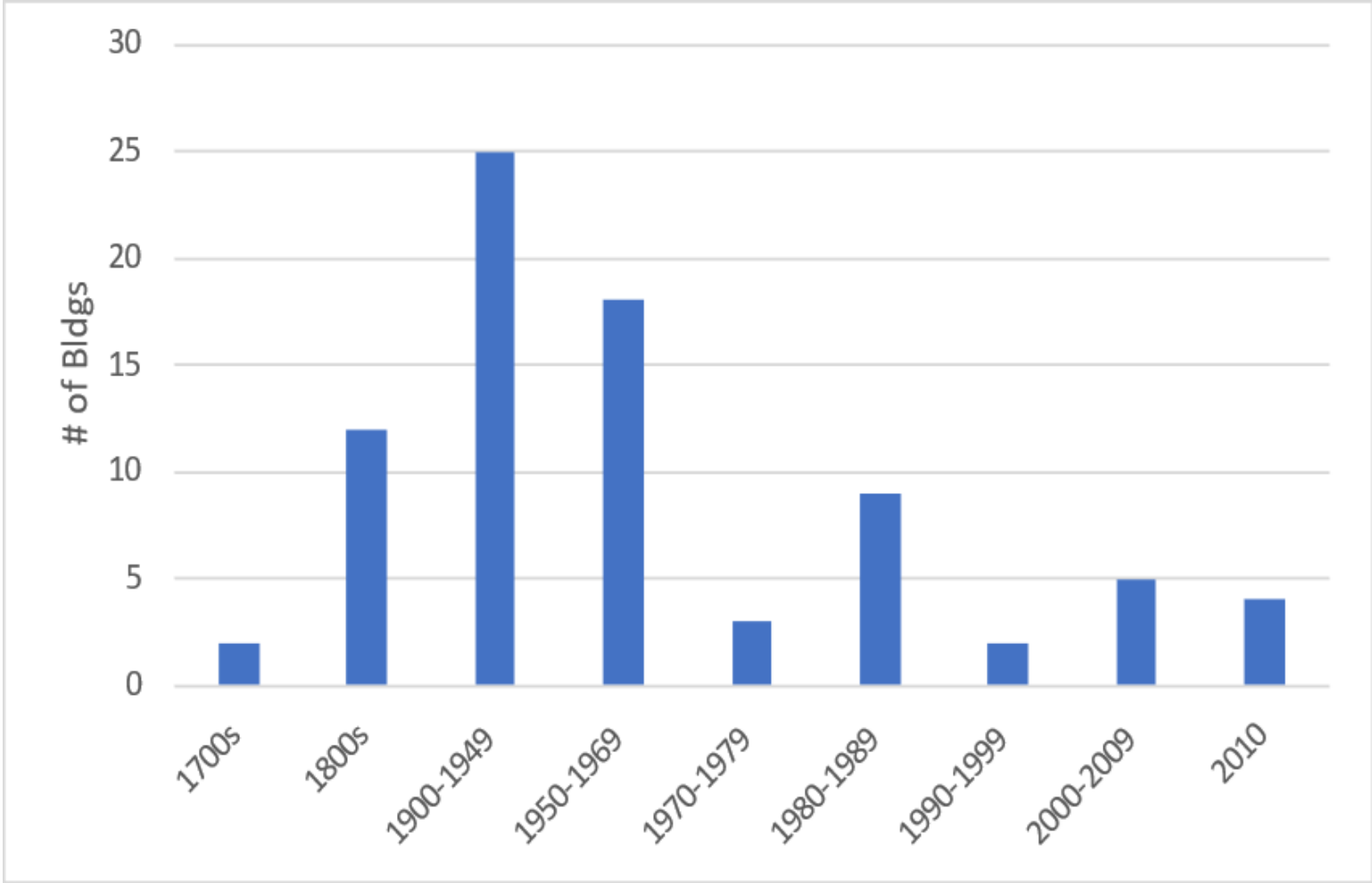


Figure 22. Construction Year of Oldest Building on a Given Parcel In James Pond Watershed

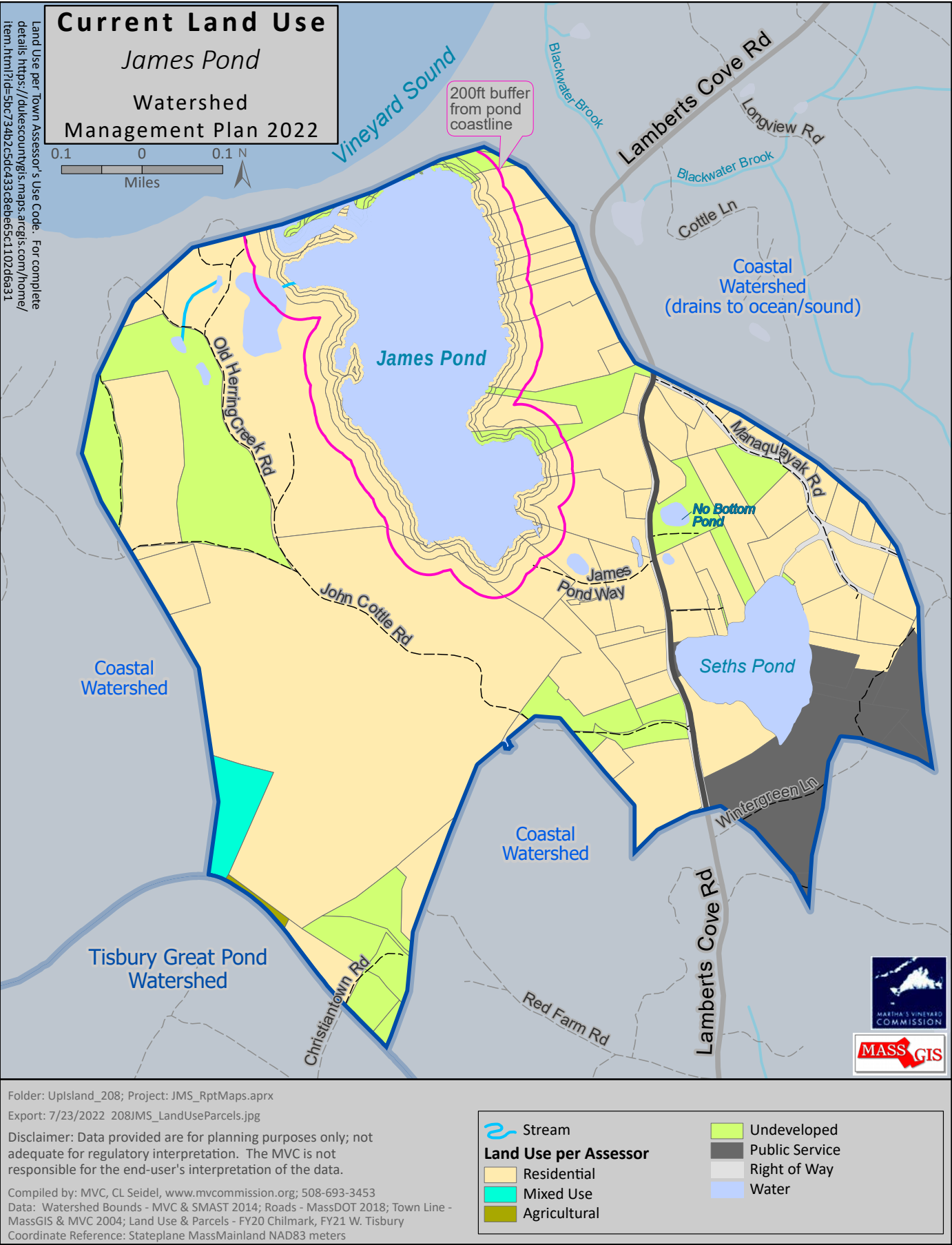


Figure 23. James Pond Watershed Land Use Map (2021)

James Pond Watershed Land Use - 2021 Table

	% of Total Area (acres)	Area (acres)
Agricultural	0.17%	0.6
Mixed Use	1.26%	4.5
Public Service	6.33%	22.5
Residential	76.17%	270.4
Right of Way	1.38%	4.9
Undeveloped	14.69%	52.1

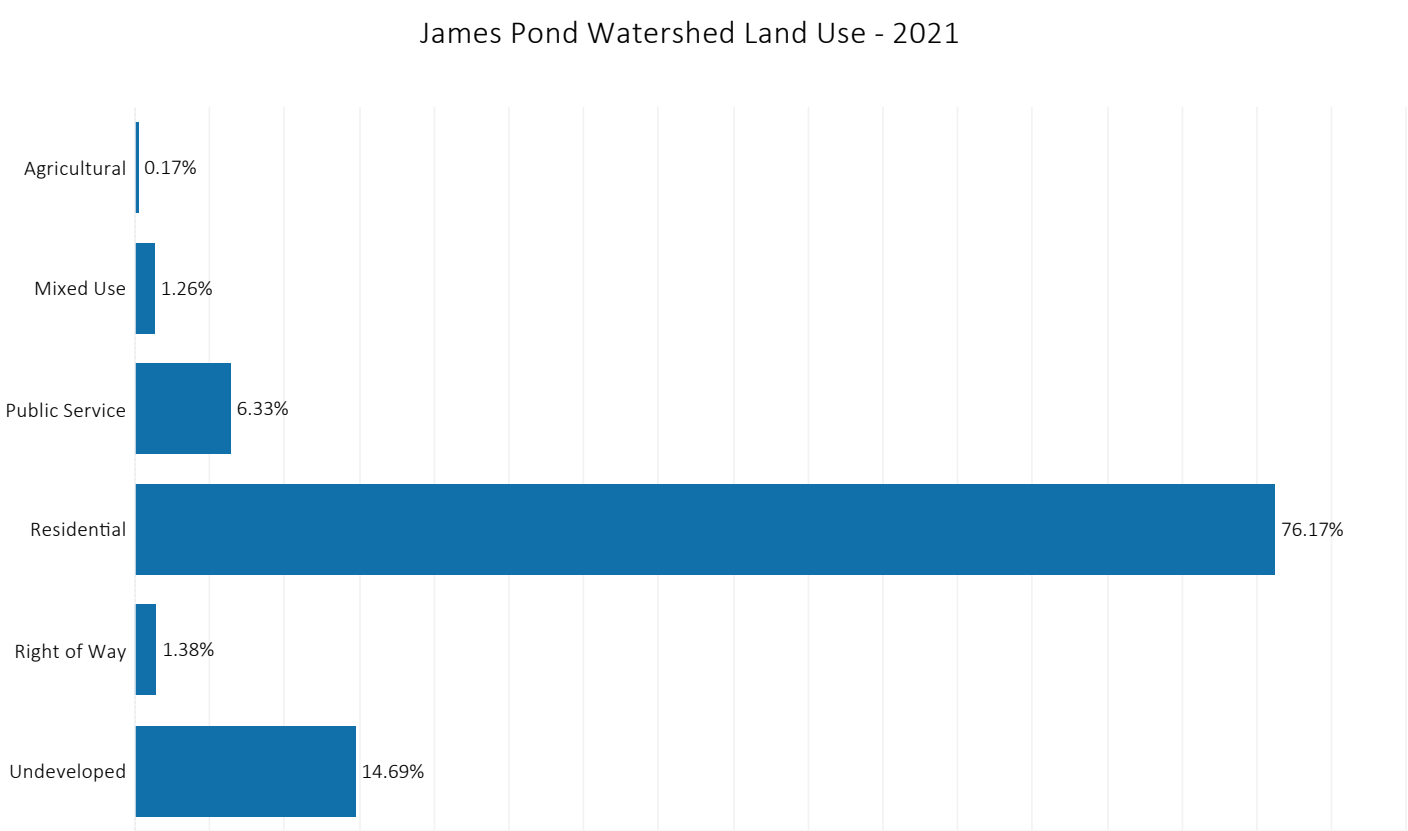
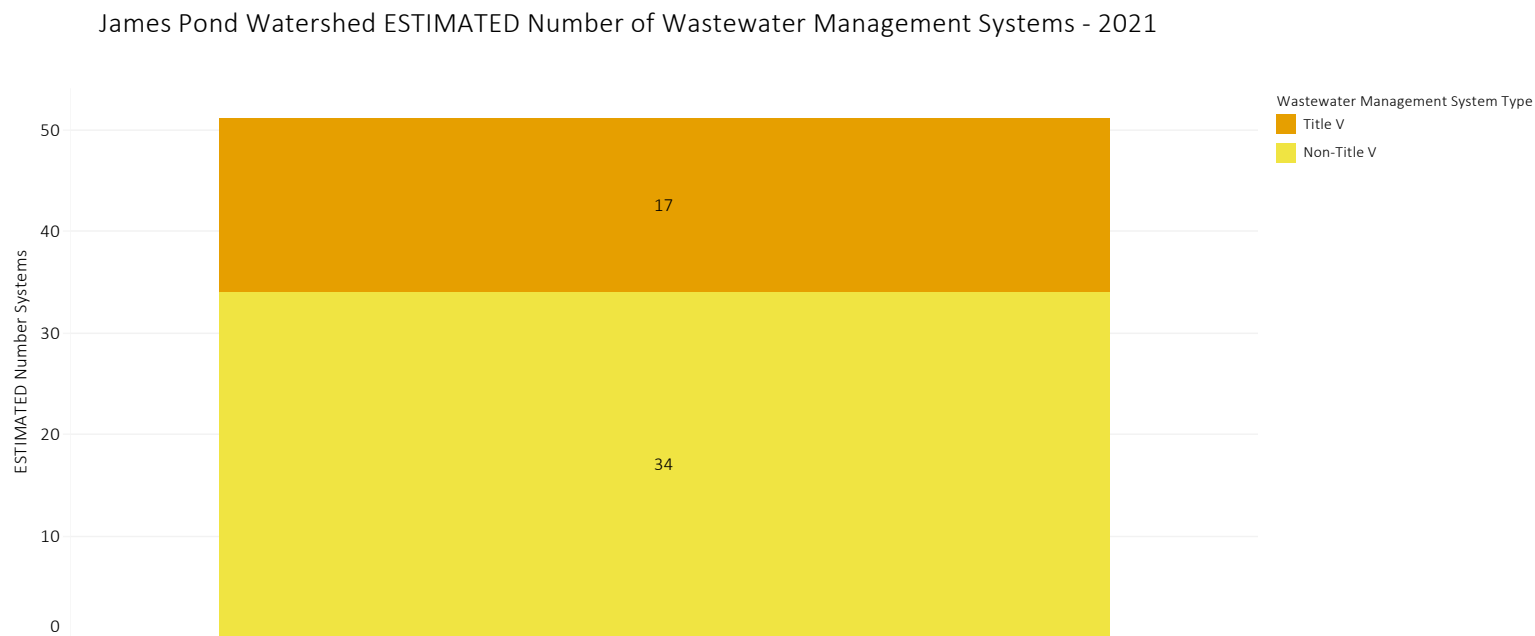


Figure 24. Current (2021) Land Use in James Pond Watershed



James Pond Watershed ESTIMATED Number of Wastewater Management Systems Within and Beyond 200ft from Pond Edge - 2021 Table

	(Approximate) Count of Wastewater Systems		% of Total (Approximate) Count of Wastewater Systems	
	Title V	Non-Title V	Title V	Non-Title V
Within 200ft	3.00	1.00	5.88%	1.96%
Beyond 200ft	14.00	33.00	27.45%	64.71%

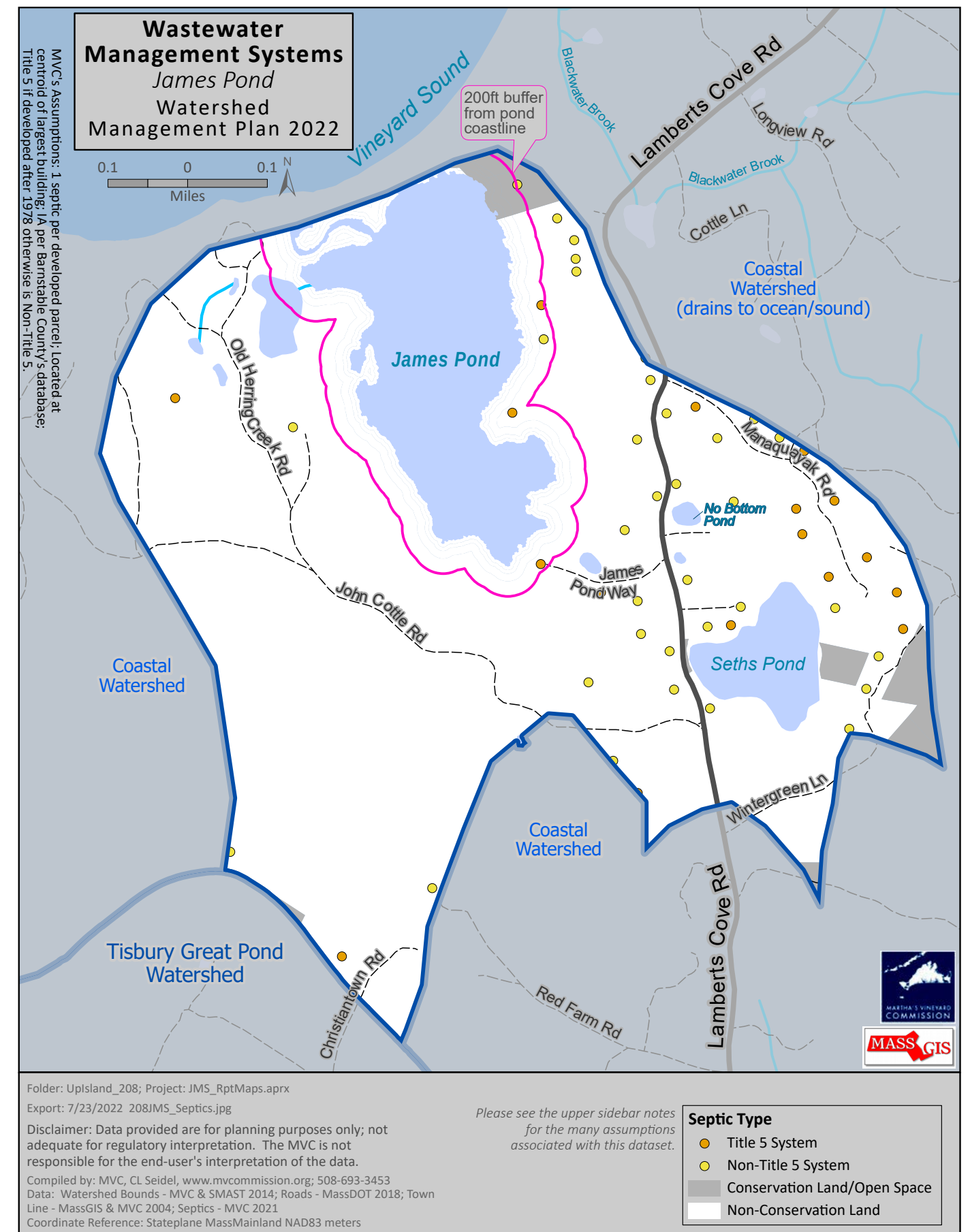


Figure 25. Wastewater Management Systems in James Pond Map

James Pond Watershed Development Status (% of total acres) - 2021

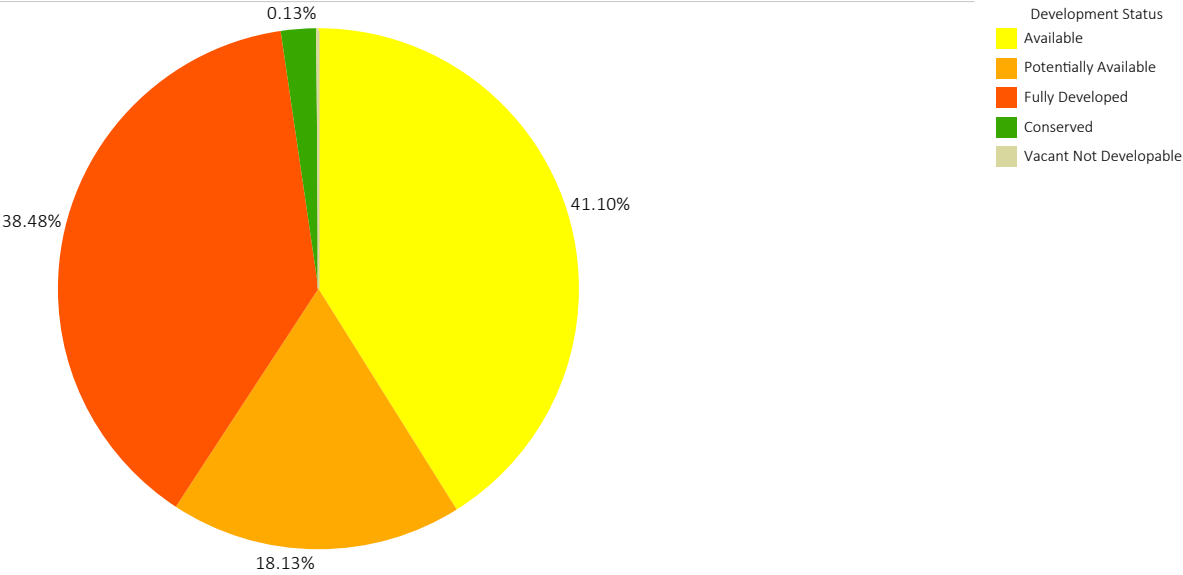


Figure 26. James Pond Watershed Development Status/Land Availability

James Pond Watershed Development Status (% of total acres) - 2021 Table

	Percent of Total Area (acres)	Area (acres)
Available	41.10%	145.9
Potentially Available	18.13%	64.4
Fully Developed	38.48%	136.6
Conserved	2.17%	7.7
Vacant Not Developable	0.13%	0.4
Grand Total	100.00%	355.0

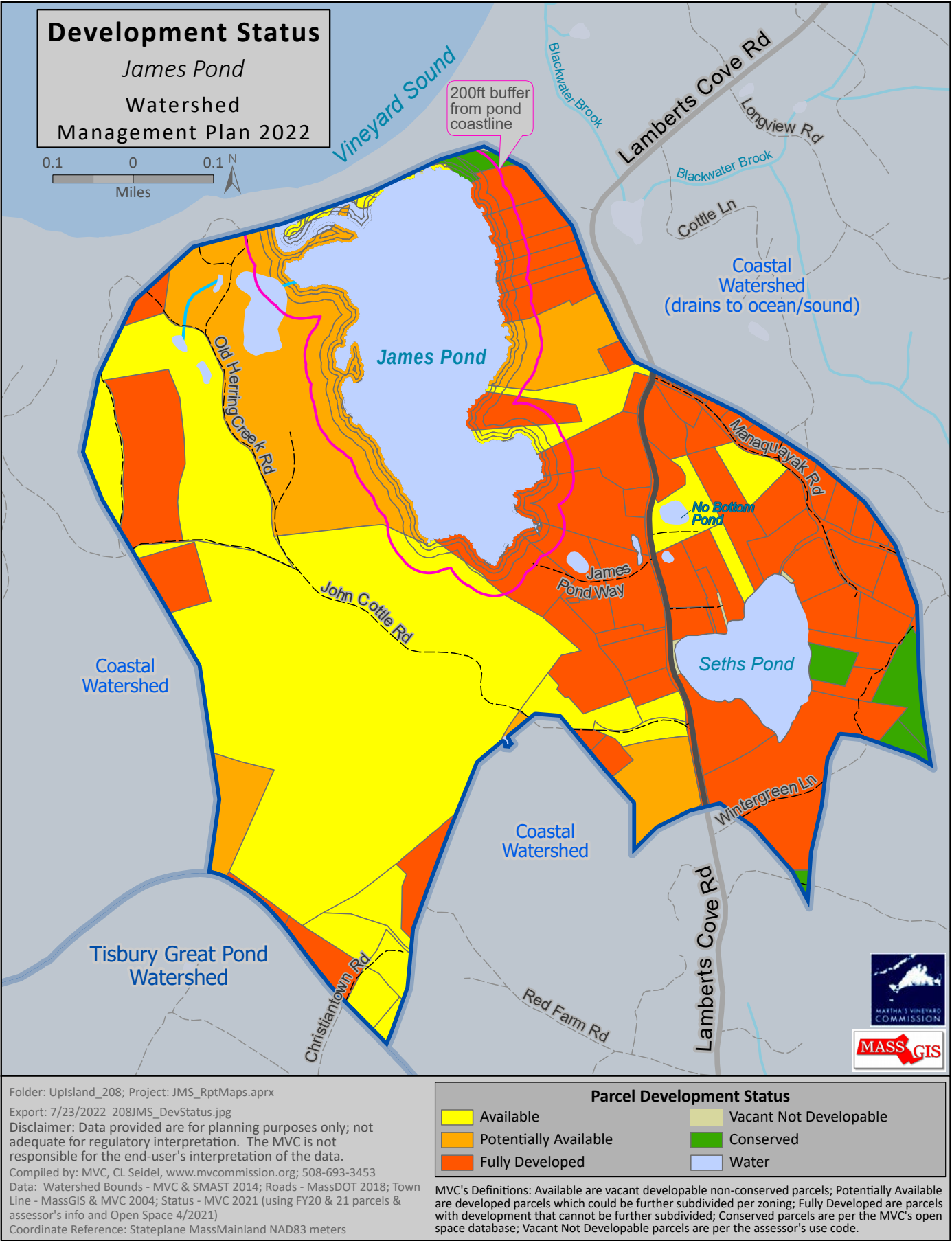
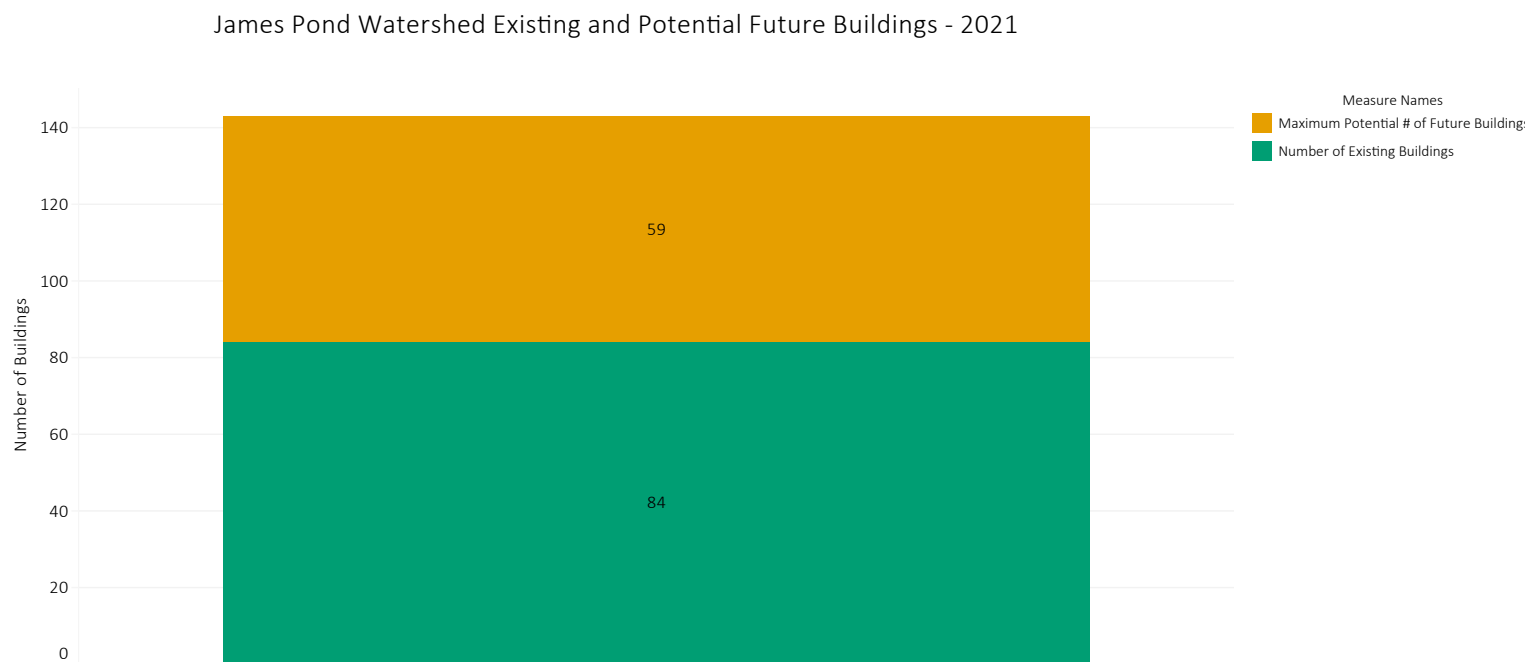


Figure 27. James Pond Development Status Map



James Pond Watershed Number of Buildings and Density (Number of Existing Buildings/Acre) - 2021

	Number of Existing Buildings	Maximum Potential # of Future Buildin..	Existing Building Density
James Pond	84.00	59	0.20

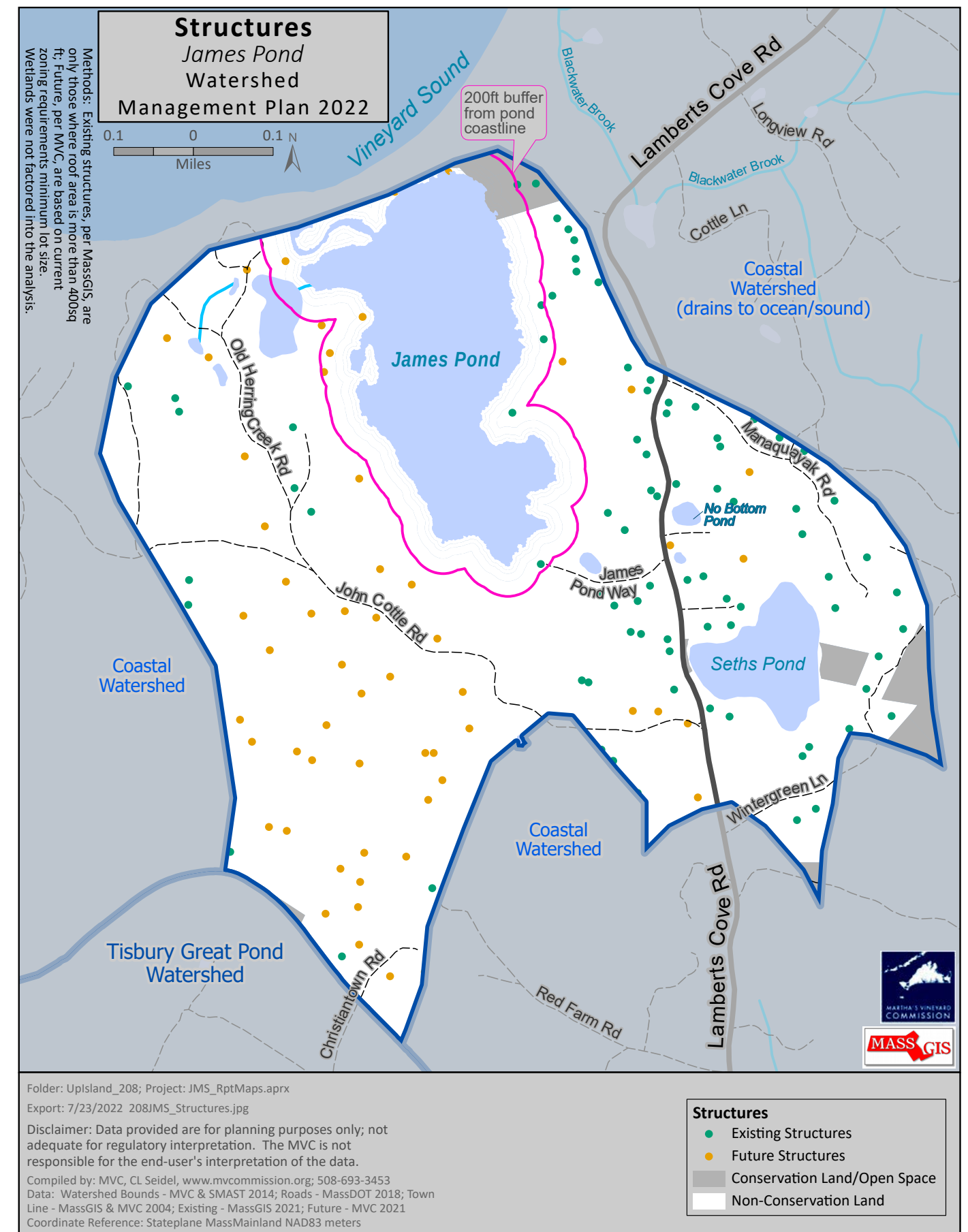
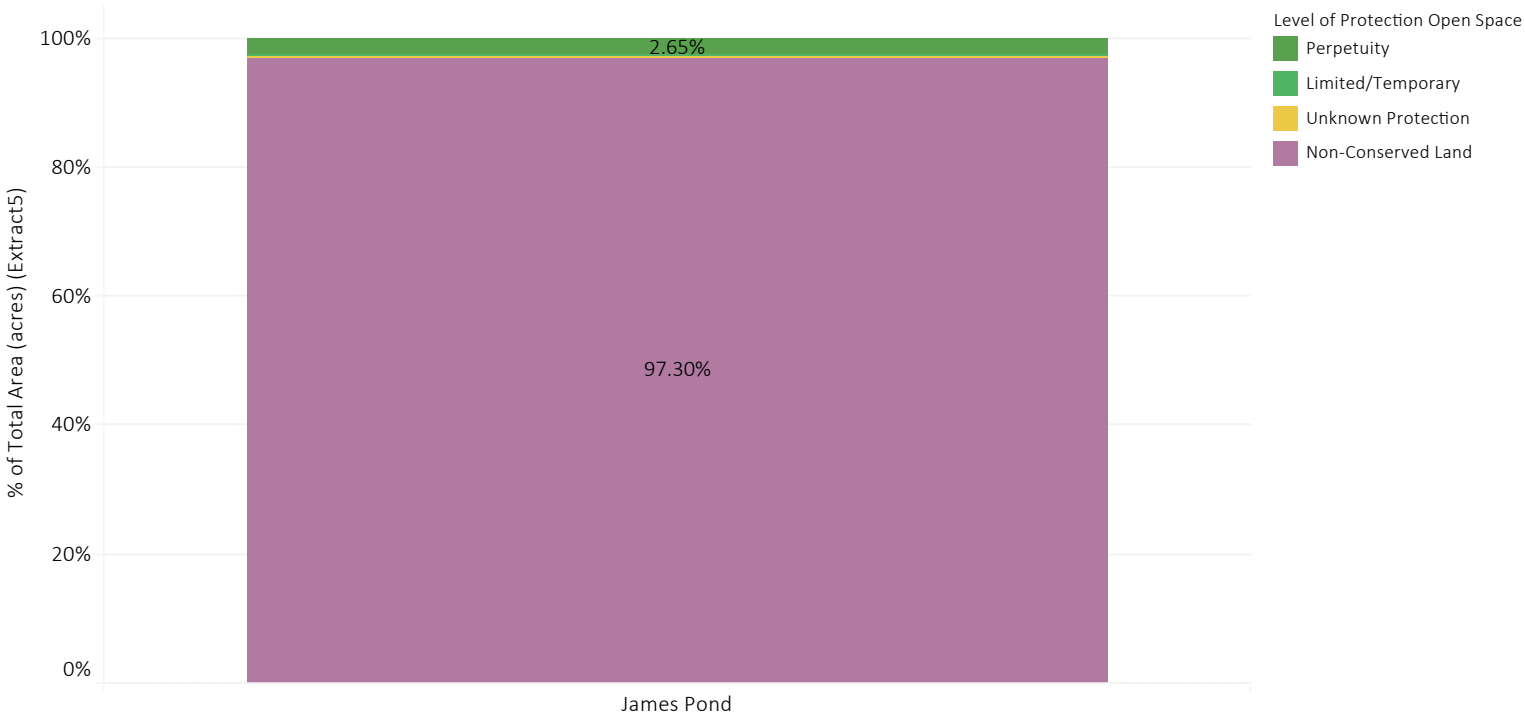


Figure 28. Existing and Potential Structures in James Pond Watershed

APPENDIX F:

James Pond Watershed Conservation Land (Legal Restriction Category) - 2021



James Pond Watershed Conservation Land (Legal Restriction Category) - 2021 Table

	Percent of Total Sub-watershed Area (acres)	Area (acres)
Perpetuity	2.65%	11.0
Limited/Temporary	0.03%	0.1
Unknown Protection	0.02%	0.1
Non-Conserved Land	97.30%	403.2

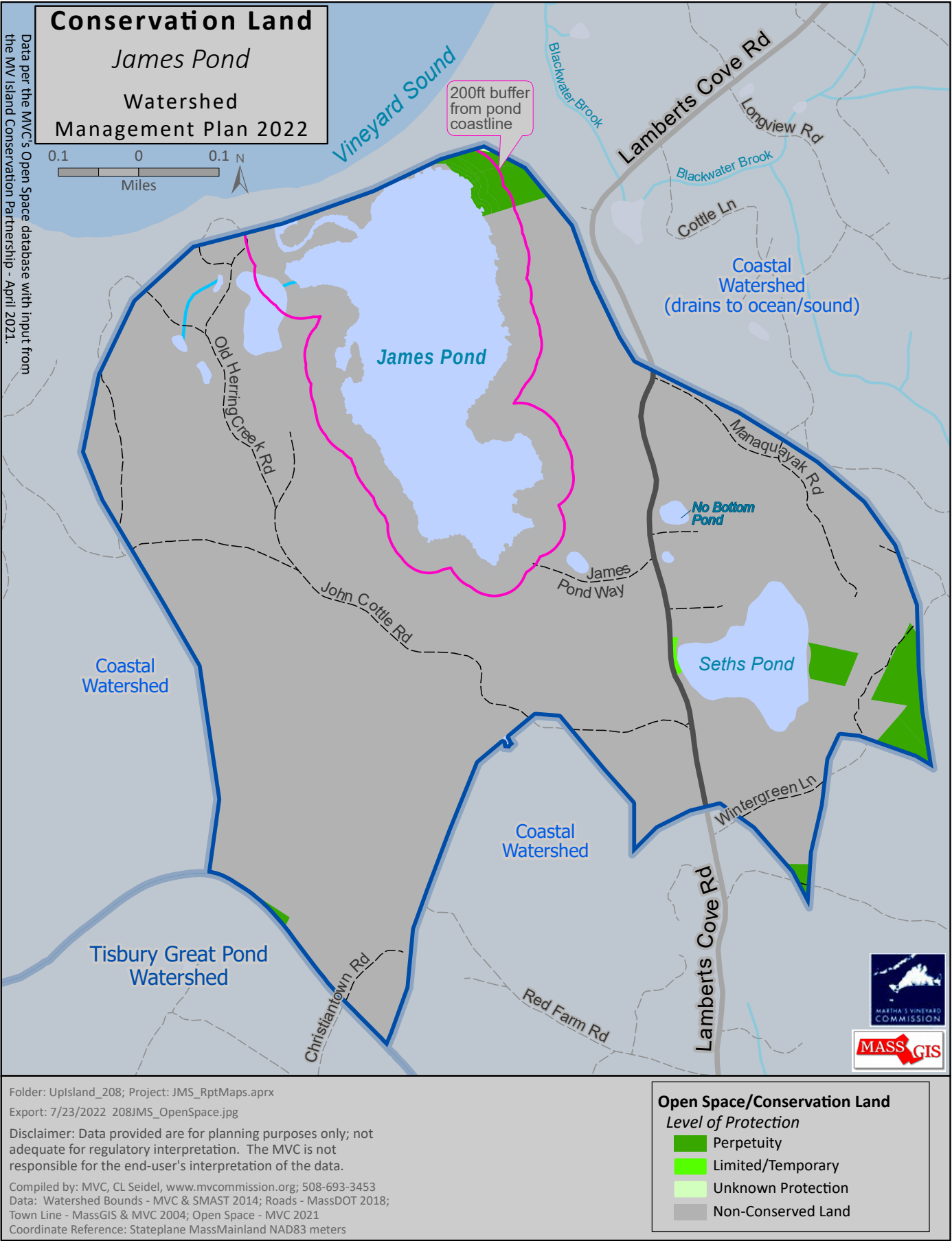


Figure 29. James Pond Watershed Conservation Land Map

APPENDIX G

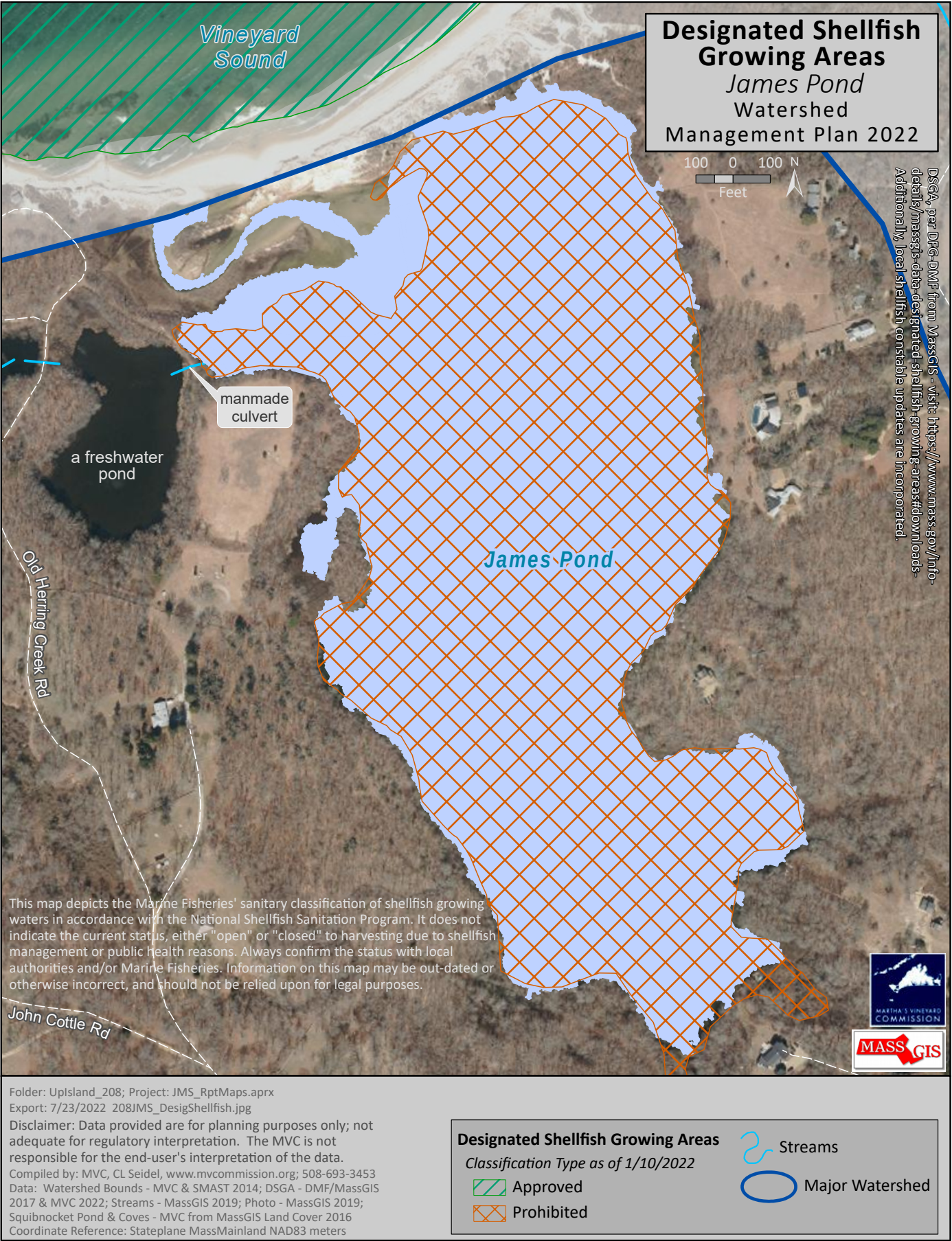


Figure 30. James Pond Designated Shellfish Harvest Area