

# ***SQUIBNOCKET POND***

## ***Individual System Assessment***

### ***APPENDIX***

Revised 2/24/2023

*Prepared by:*

..... *Martha's Vineyard Commission*



..... *RJS Development Solutions*



..... *Horsley Witten Group*



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MassDEP***



#### ***Acknowledgments:***

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- *Squibnocket Pond Working Group Members*
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- *Chris Murphy for his tireless dedication and contributions as the Chairman of the Up-Island Watershed Management Committee*

***PHOTO CREDIT: OLLIE BECKER, JUNE 2021***

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APPENDIX A:

| Sub-watershed Name | Watershed Area (acres) | Land Area (% of watershed) |
|--------------------|------------------------|----------------------------|
| Black Brook        | 175                    | 10.2%                      |
| Squibnocket East   | 269                    | 15.6%                      |
| Squibnocket Pond   | 1275                   | 74.8%                      |
| Total Watershed    | 1.719                  | 100%                       |

Table 1. Squibnocket Pond Sub-watershed Area (acres)

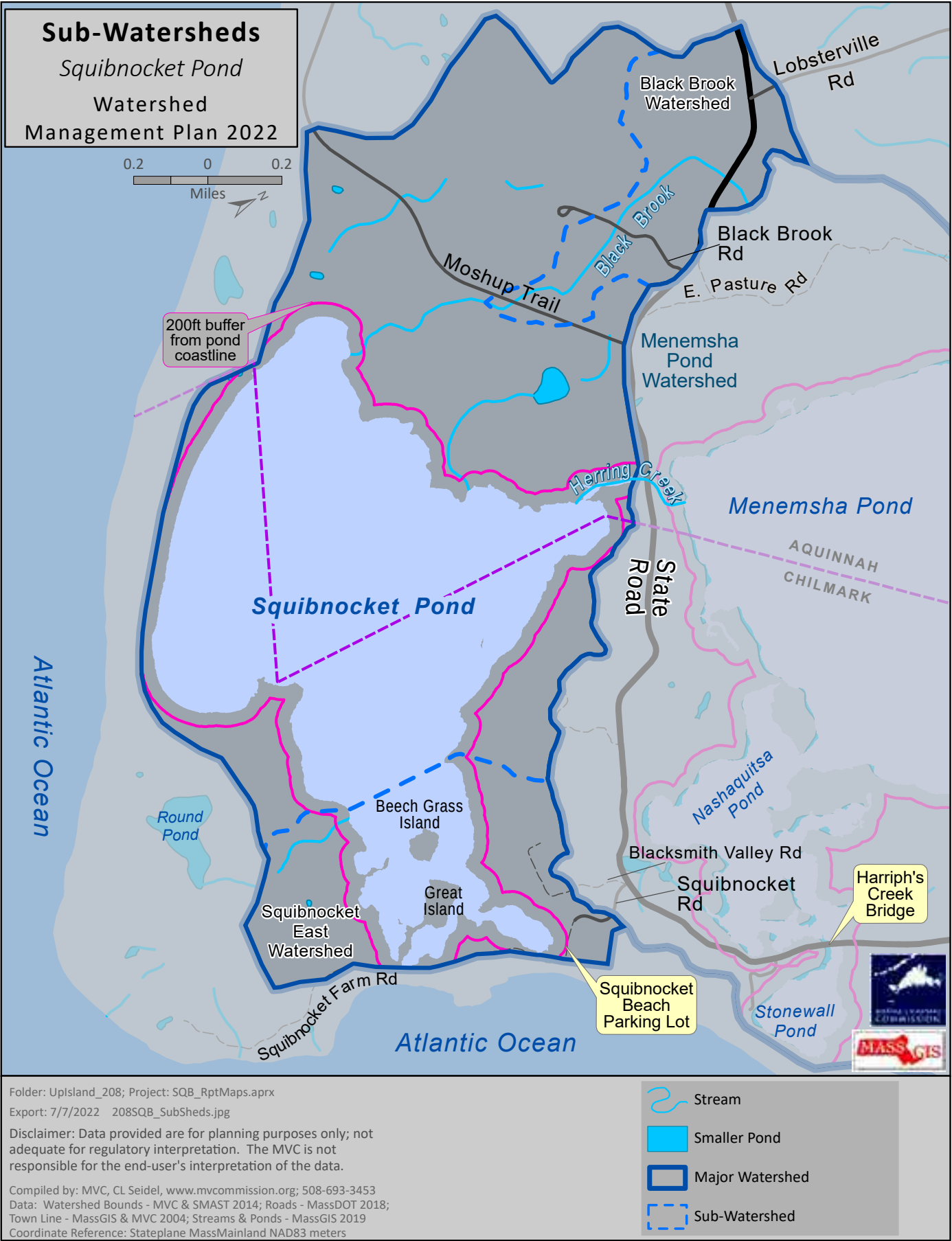
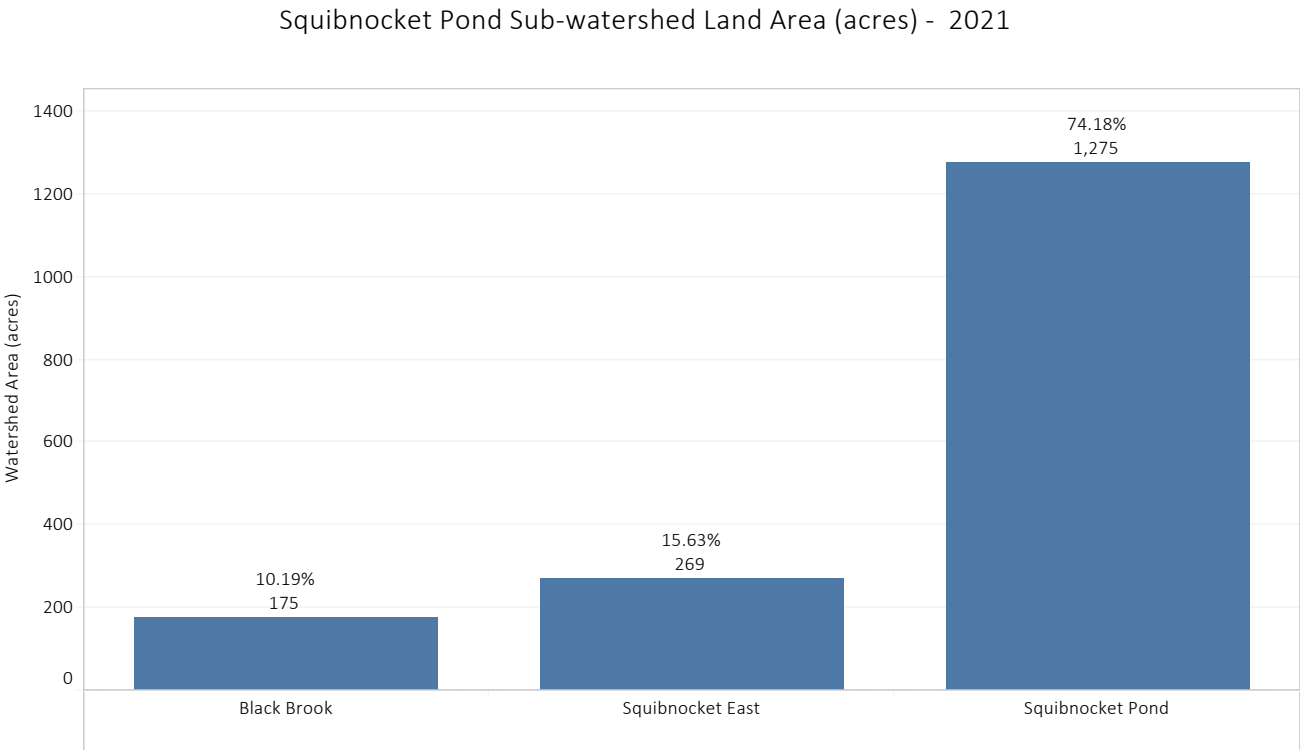


Figure 1. Watershed and Sub-watershed Boundaries for Squibnocket Pond (Martha’s Vineyard Commission, 2021)



APPENDIX B:

Squibnocket Pond Watershed  
Coastal Pond Water Surface Area (acres) - Table 2021

|                  | % of Total Watershed Area<br>(acres) | Watershed Area (acres) |
|------------------|--------------------------------------|------------------------|
| Squibnocket East | 12.73%                               | 80                     |
| Squibnocket Pond | 87.27%                               | 546                    |
| Grand Total      | 100.00%                              | 625                    |

Squibnocket Pond Sub-watershed Coastal Pond Water Surface Area (acres) - 2021

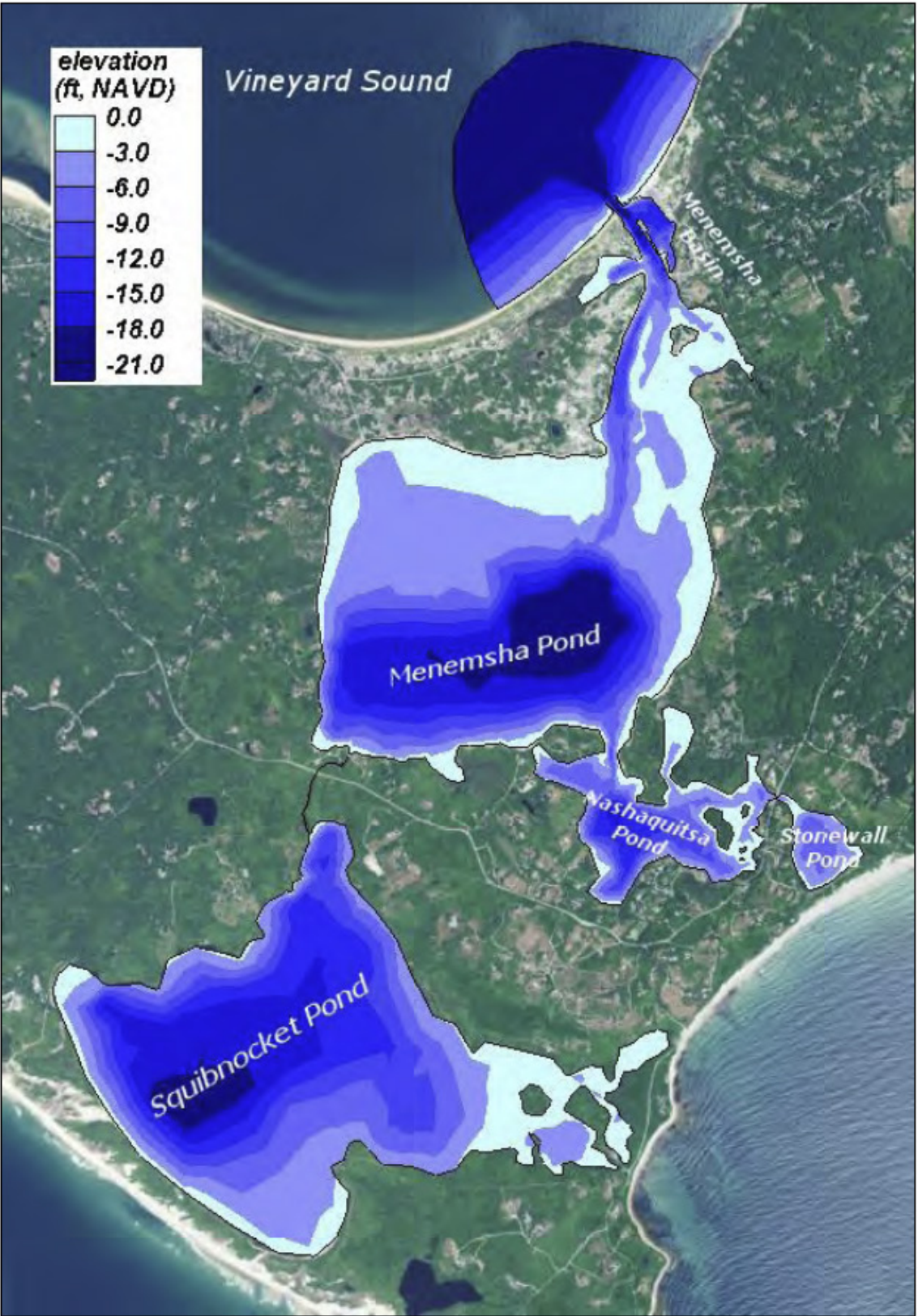
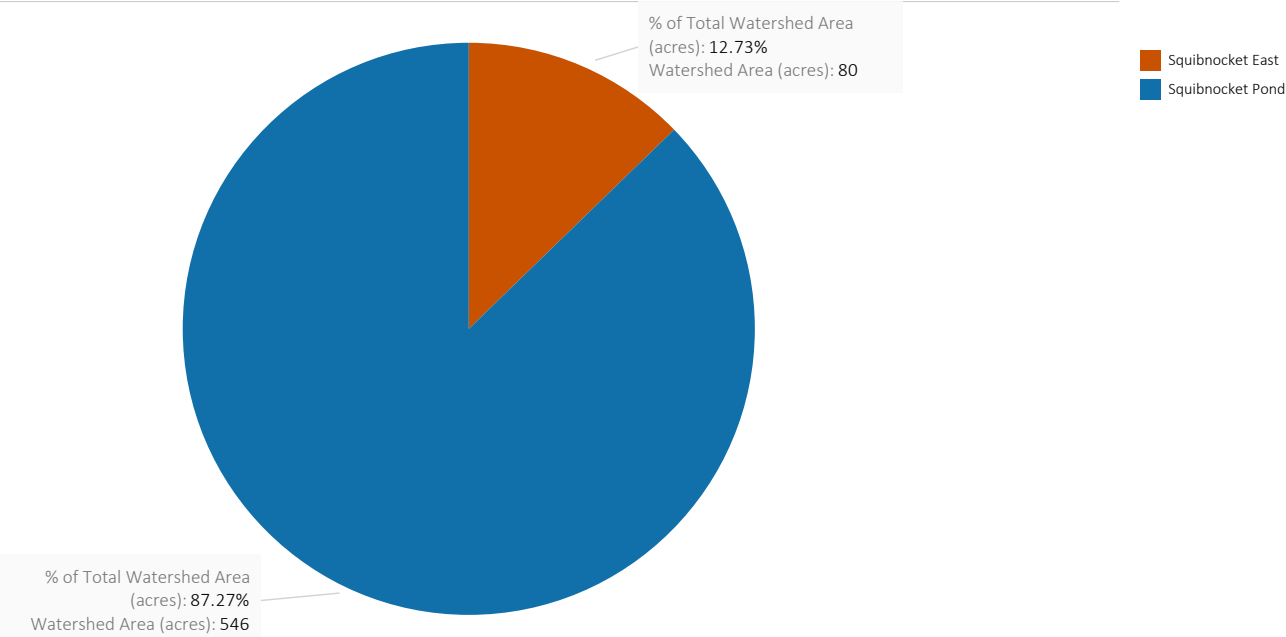


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Figure 2. Squibnocket Pond Bathymetry Map (MEP 2017)

Squibnocket Pond Watersheds Land Cover (acres) - 2021 Table  
Percent of Land Cover within Each Sub-Watershed

APPENDIX C:

|                  | Bare Land | Deciduous Forest | Developed Open Space | Estuarine Wetland | Evergreen Forest | Grassland | Impervious | Palustrine Wetland | Pasture/Hay | Scrub/Shrub | Unconsolidated Shore | Water  |
|------------------|-----------|------------------|----------------------|-------------------|------------------|-----------|------------|--------------------|-------------|-------------|----------------------|--------|
| Black Brook      | 0.12%     | 75.78%           | 1.71%                |                   |                  | 1.16%     | 3.93%      | 12.92%             |             | 4.36%       |                      |        |
| Squibnocket East | 0.18%     | 1.65%            | 5.98%                | 2.77%             | 0.13%            | 11.40%    | 2.49%      | 7.32%              | 6.92%       | 31.14%      | 0.40%                | 29.62% |
| Squibnocket Pond | 0.69%     | 20.83%           | 1.49%                | 1.74%             | 0.02%            | 6.50%     | 1.21%      | 11.08%             | 0.01%       | 13.34%      | 0.00%                | 43.08% |
| Grand Total      | 0.55%     | 23.43%           | 2.22%                | 1.73%             | 0.03%            | 6.72%     | 1.69%      | 10.68%             | 1.09%       | 15.21%      | 0.06%                | 36.58% |

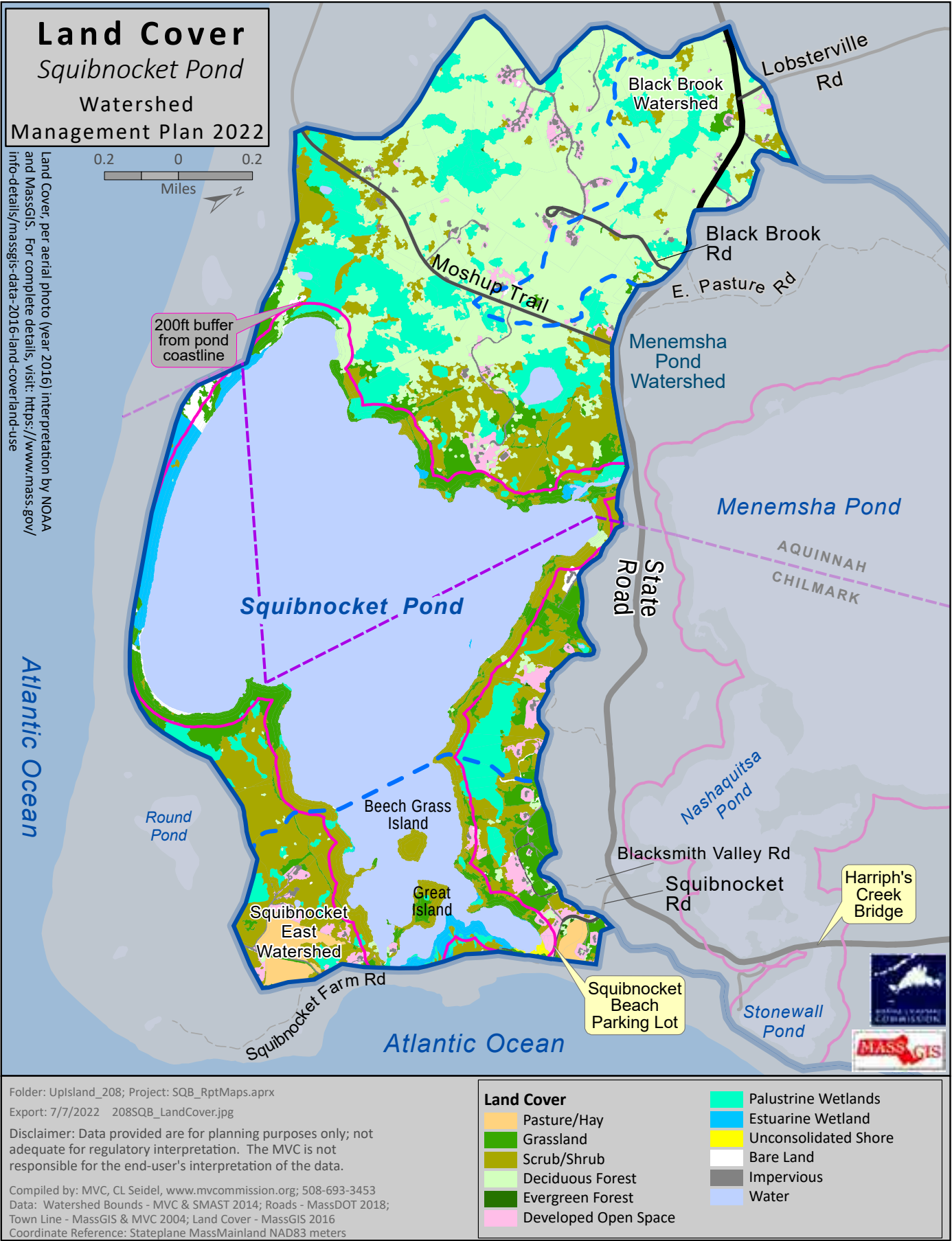


Figure 3. Squibnocket Pond Land Cover Types



Squibnocket Pond Watershed Land Cover (acres) - 2021

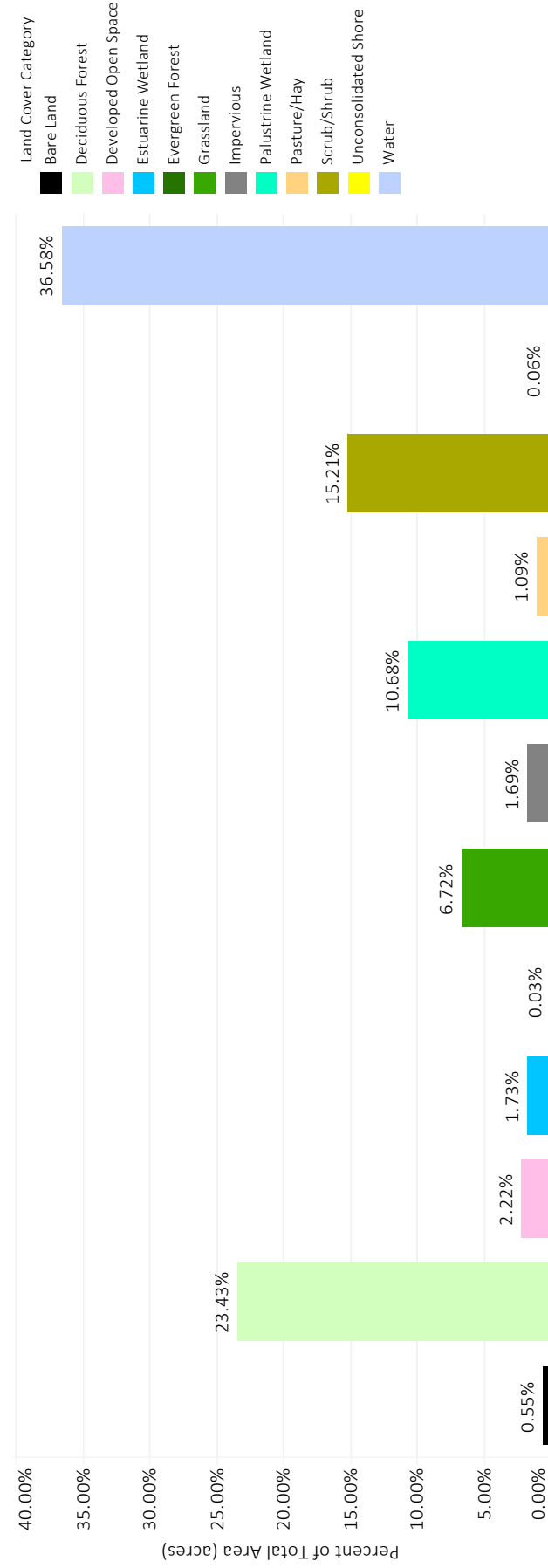
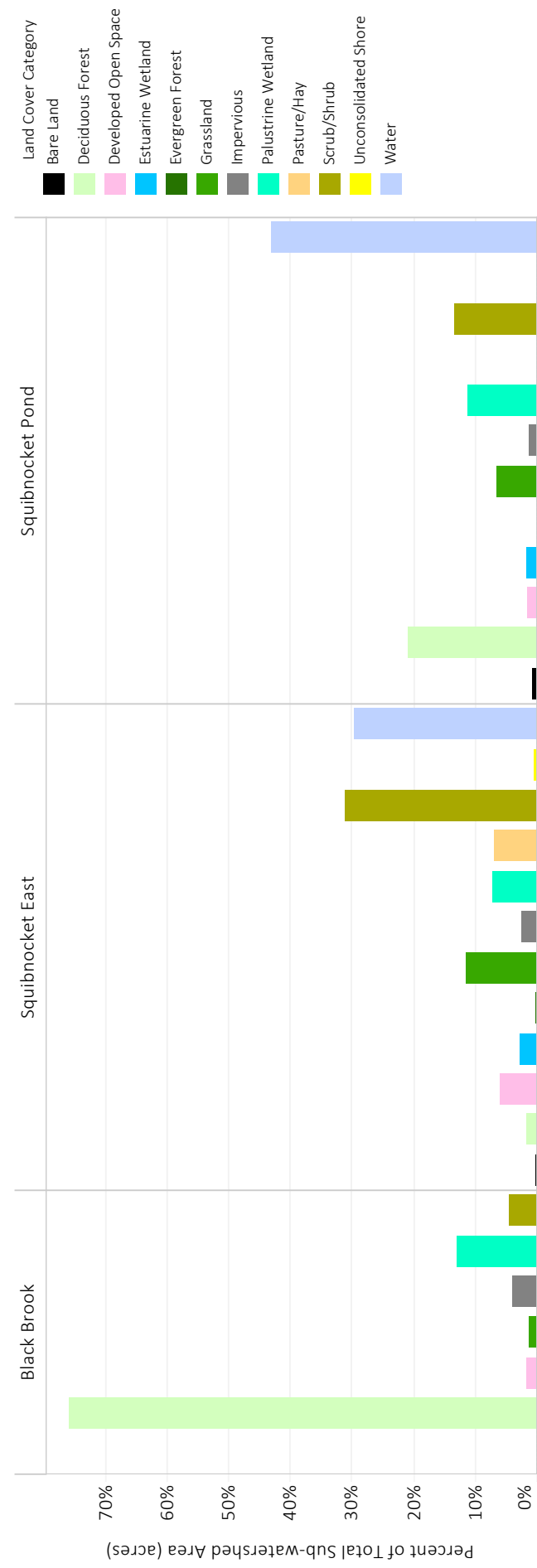


Figure 4. Squibnocket Pond Land Cover Area (acres)

Squibnocket Pond Sub-watershed Land Cover (acres) - 2021





APPENDIX D:

Squibnocket Pond Watershed Hydrolic Soil Group - 2021 Table

|                  |         | % of Total Area (acres) along Hydrolo.. | Area (acres) |
|------------------|---------|-----------------------------------------|--------------|
| Black Brook      | A       | 1.96%                                   | 3            |
|                  | B       | 63.66%                                  | 112          |
|                  | B/D     | 15.80%                                  | 28           |
|                  | C/D     | 13.74%                                  | 24           |
|                  | D       | 4.84%                                   | 8            |
|                  | Total   | 100.00%                                 | 175          |
| Squibnocket East | A       | 39.49%                                  | 106          |
|                  | A/D     | 5.71%                                   | 15           |
|                  | B       | 1.88%                                   | 5            |
|                  | B/D     | 2.92%                                   | 8            |
|                  | Beaches | 0.05%                                   | 0            |
|                  | C       | 15.20%                                  | 41           |
|                  | C/D     | 3.57%                                   | 10           |
|                  | D       | 2.11%                                   | 6            |
|                  | Water   | 29.07%                                  | 78           |
|                  | Total   | 100.00%                                 | 269          |
| Squibnocket Pond | A       | 4.87%                                   | 62           |
|                  | A/D     | 2.30%                                   | 29           |
|                  | B       | 32.08%                                  | 409          |
|                  | B/D     | 9.09%                                   | 116          |
|                  | C       | 1.28%                                   | 16           |
|                  | C/D     | 4.15%                                   | 53           |
|                  | D       | 3.23%                                   | 41           |
|                  | Water   | 43.01%                                  | 549          |
|                  | Total   | 100.00%                                 | 1,275        |

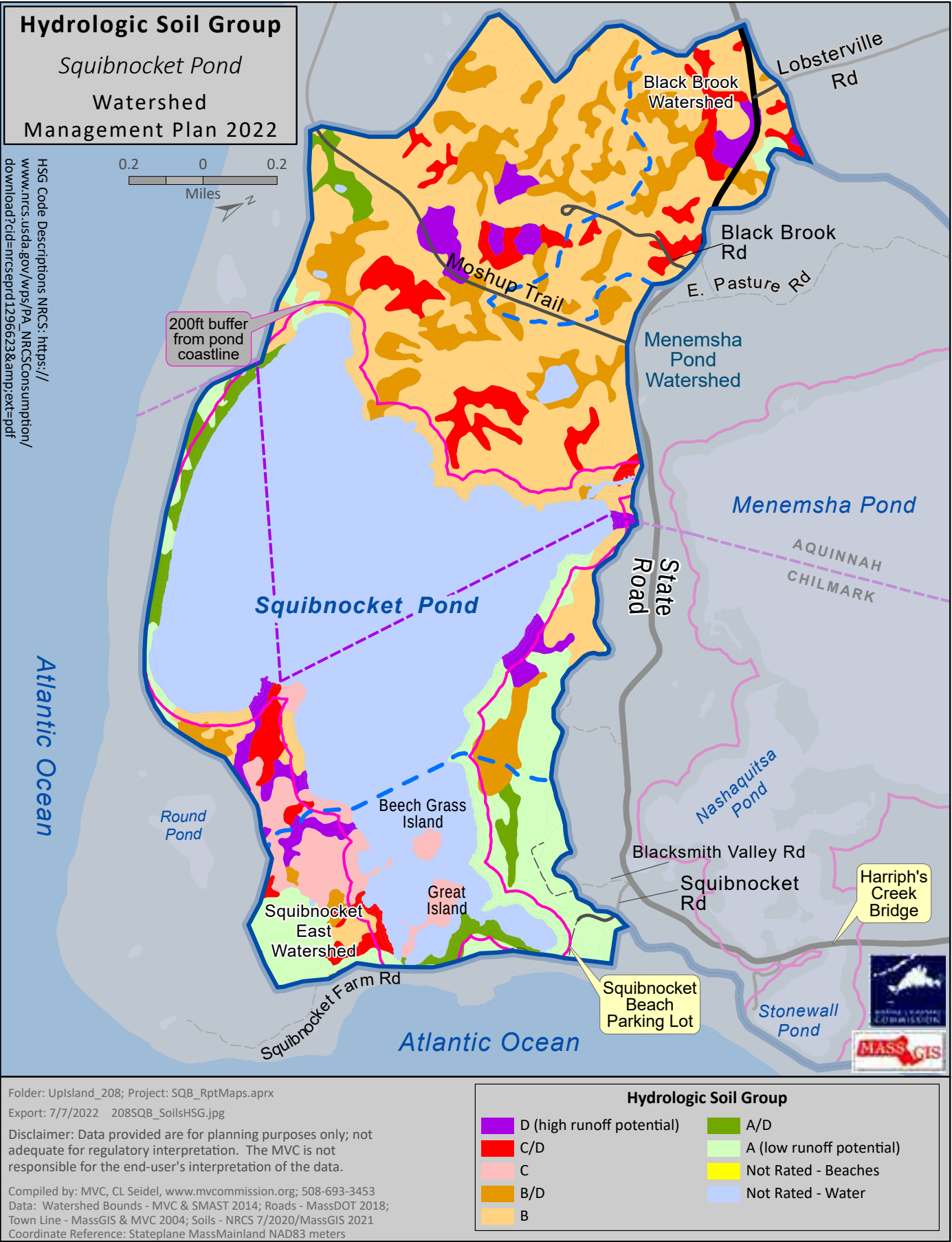
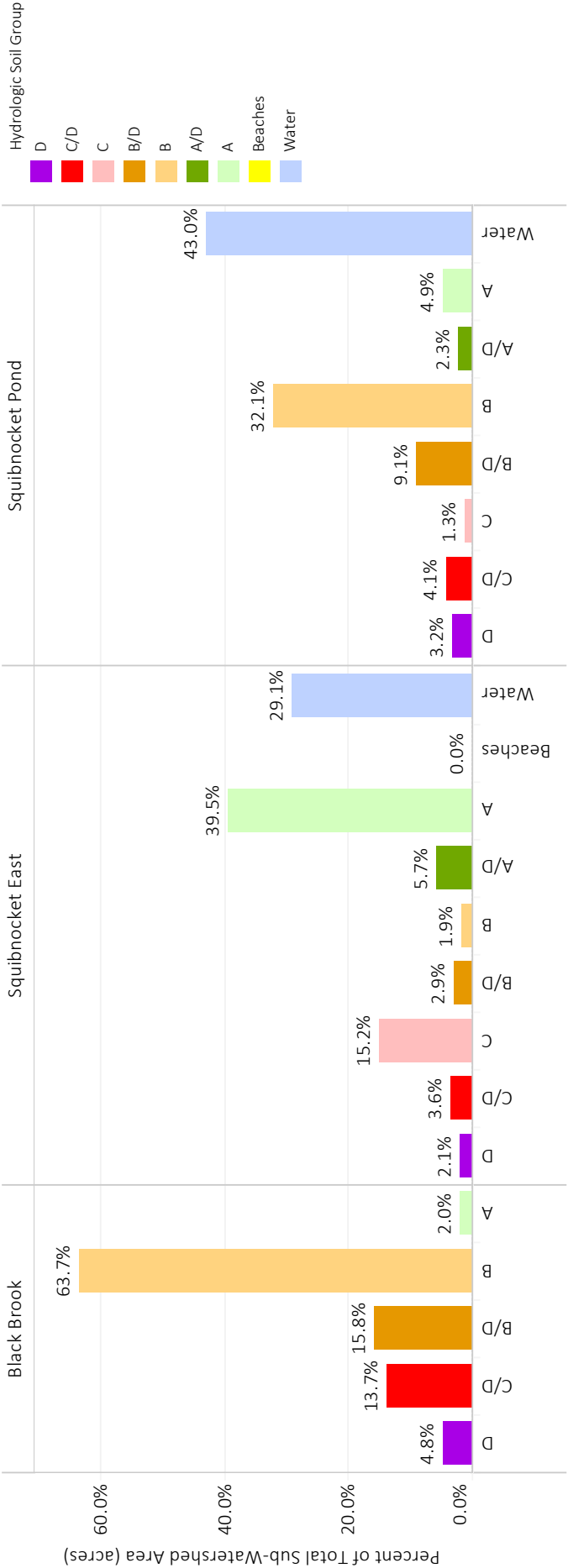
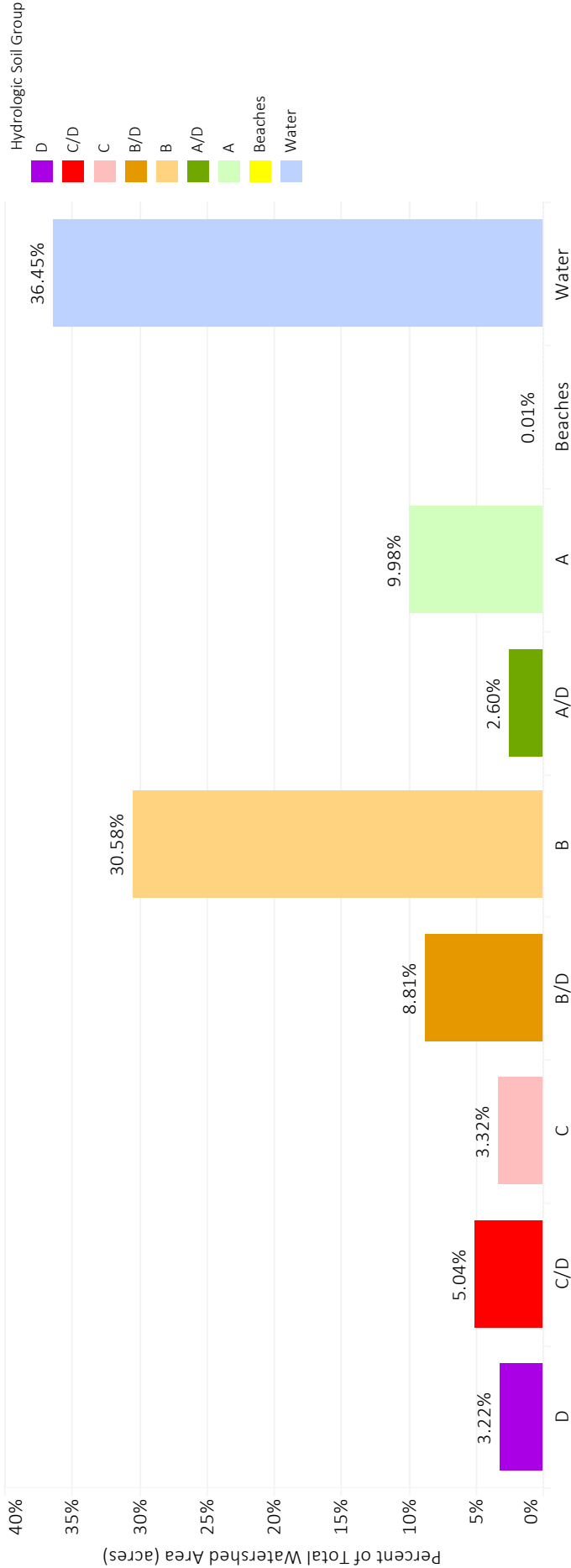


Figure 5. Squibnocket Pond Hydrologic Soil Groups

Squibnocket Pond Sub-watershed Hydrolic Soil Group - 2021



Squibnocket Pond Watershed Hydrolic Soil Group - 2021



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

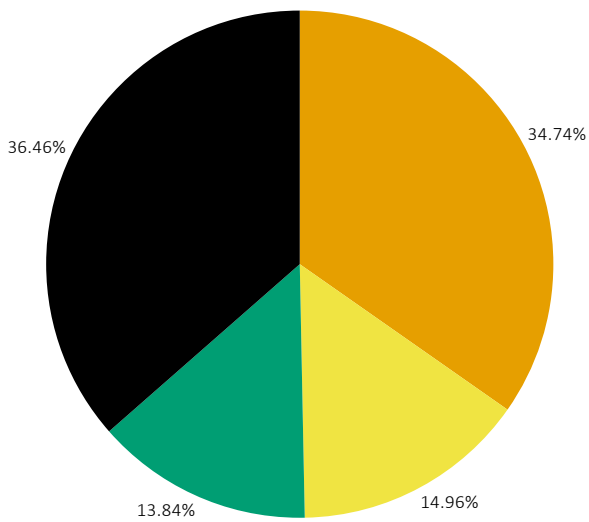


Figure 7. Squibnocket Watershed Nitrogen Leaching Potential

Squibnocket Pond Sub-watershed Nitrogen Leaching Potential of All Soil (% of total acres) - 2021

Note: Areas representing less than 2% of the sub-watershed are not labeled.

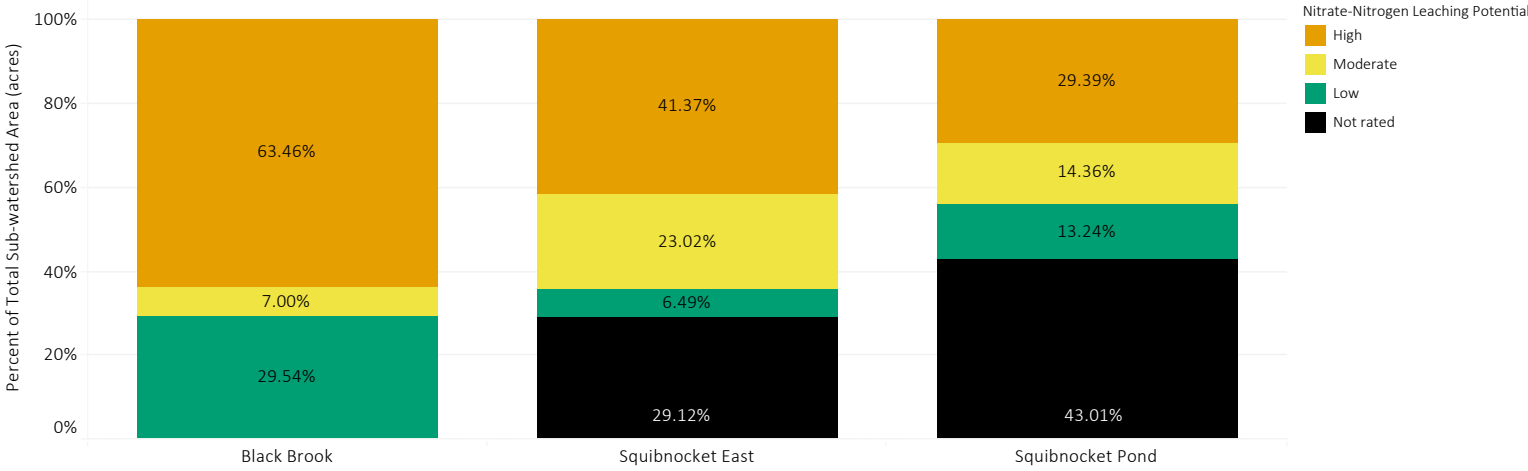


Figure 8. Squibnocket Nitrogen Leaching Potential by Sub-watershed

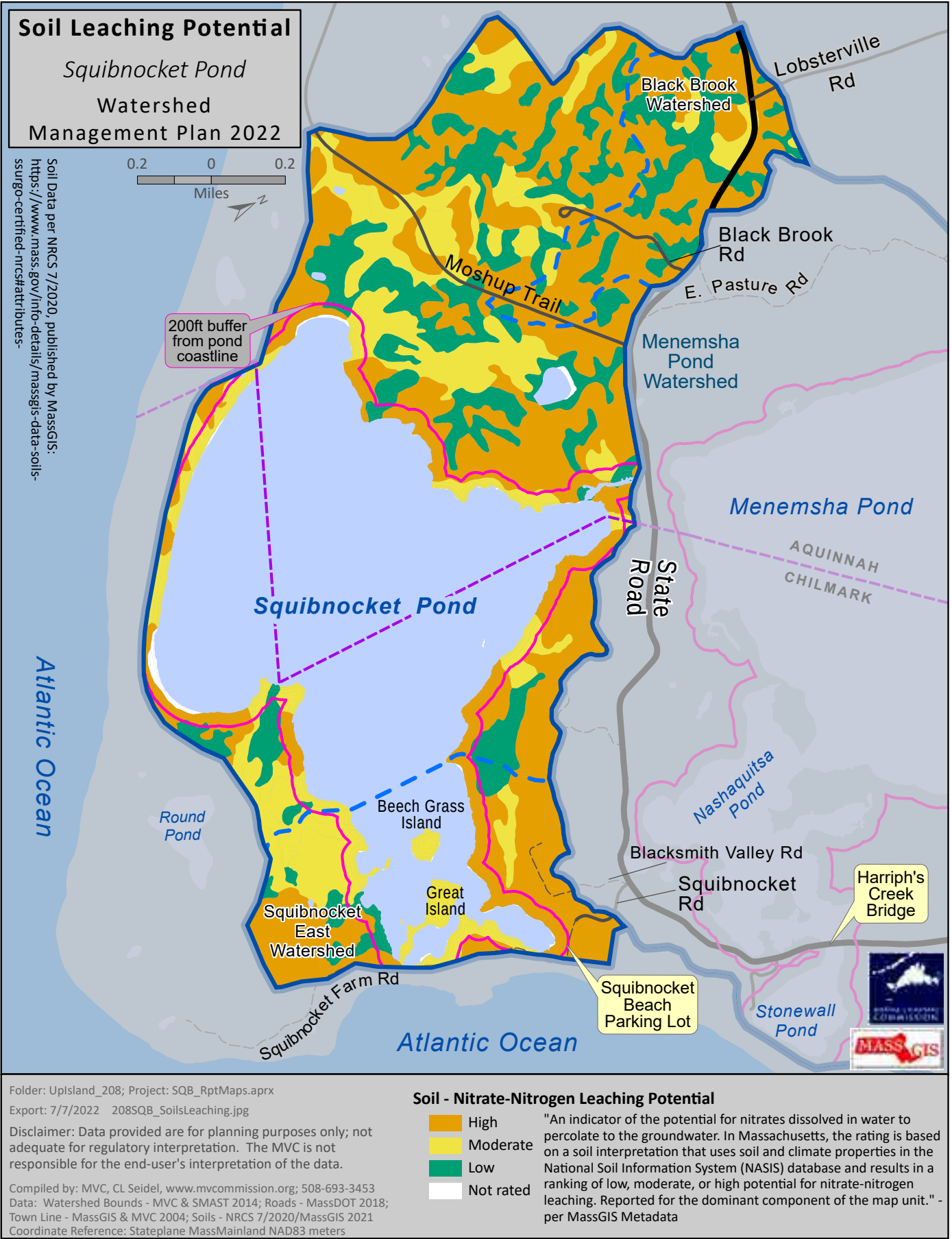
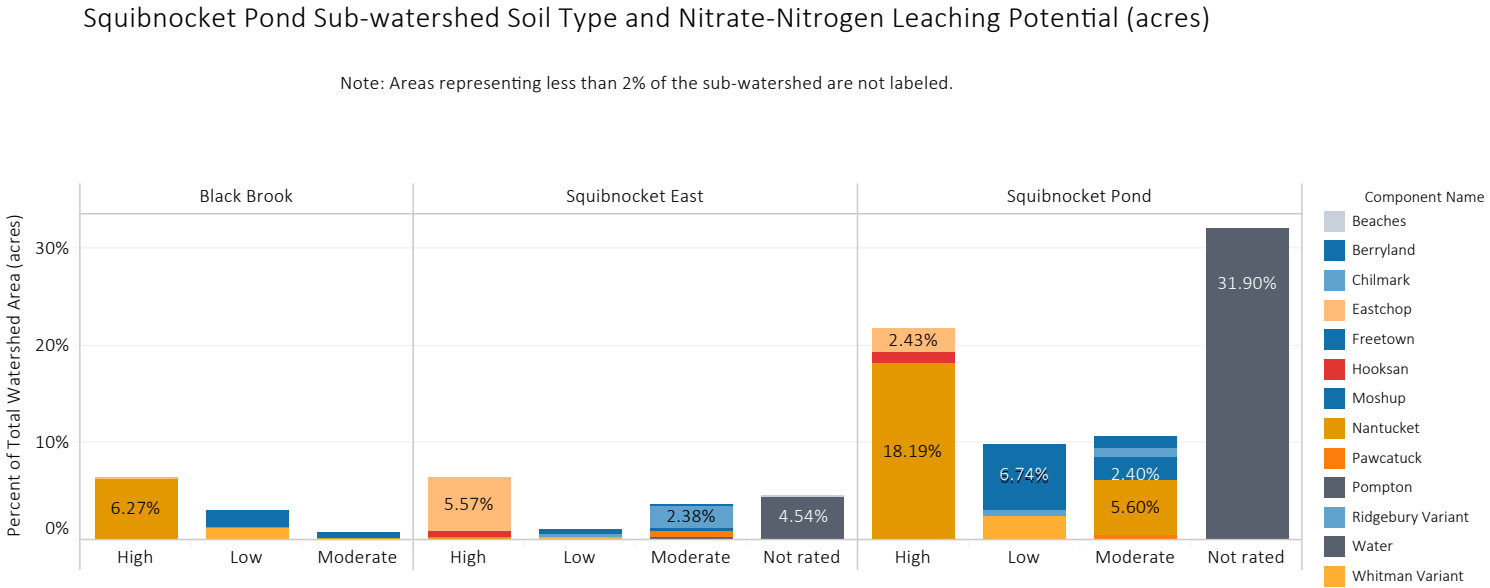
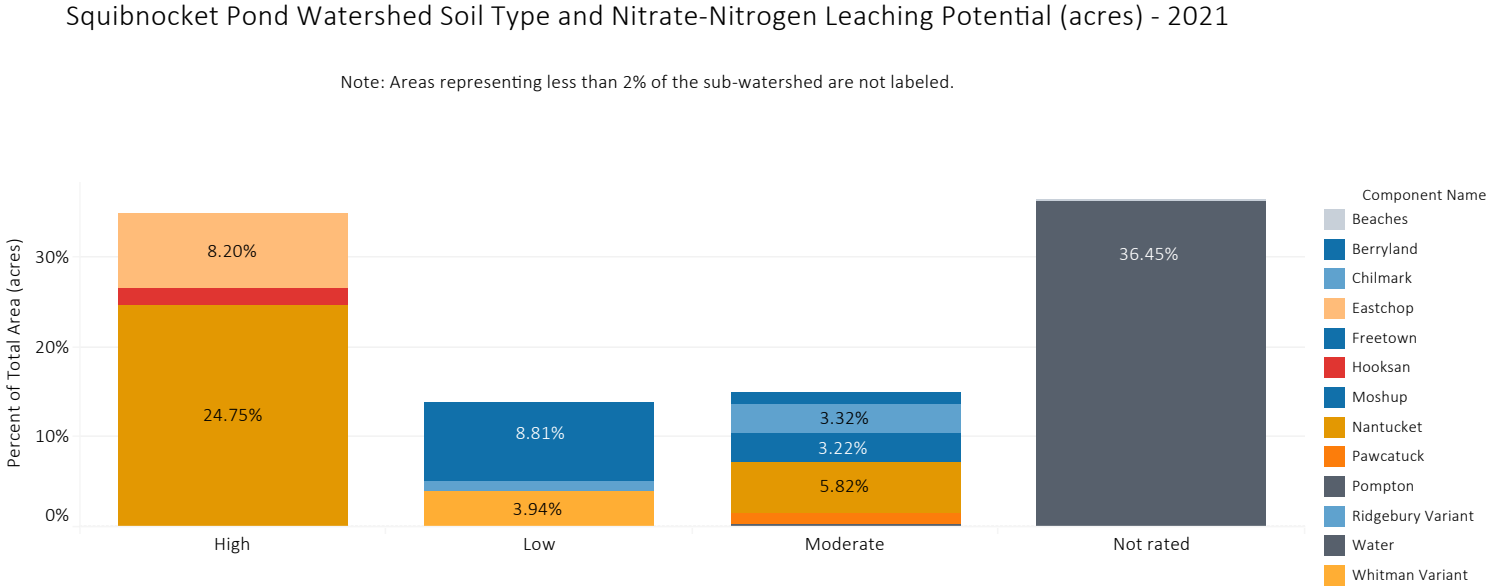


Figure 6. Squibnocket Pond Soil Leaching Potential



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

|                  |                            | High   |        |           | Moderate  |          |        |           |           |         | Low      |                   |                 | Not rated |        |  |
|------------------|----------------------------|--------|--------|-----------|-----------|----------|--------|-----------|-----------|---------|----------|-------------------|-----------------|-----------|--------|--|
|                  |                            |        |        |           |           |          |        |           |           |         |          |                   |                 |           |        |  |
| Black Brook      | % of Total Sub-watershed.. | 1.96%  | 61.49% | Nantucket | Berryland | Chilmark | Moshup | Nantucket | Pawcatuck | Pompton | Freetown | Ridgebury Variant | Whitman Variant |           |        |  |
|                  | Area (acres)               | 3.4    | 107.7  |           |           |          | 8.5    | 3.8       |           |         | 27.7     | 3.4               | 20.7            |           |        |  |
| Squibnocket East | % of Total Sub-watershed.. | 35.63% | 3.87%  | 1.88%     | 0.07%     | 15.20%   | 2.11%  |           | 3.47%     | 2.18%   | 2.92%    | 1.19%             | 2.39%           | 0.05%     | 29.07% |  |
|                  | Area (acres)               | 95.8   | 10.4   | 5.1       | 0.2       | 40.8     | 5.7    |           | 9.3       | 5.8     | 7.8      | 3.2               | 6.4             | 0.1       | 78.1   |  |
| Squibnocket Pond | % of Total Sub-watershed.. | 3.28%  | 1.59%  | 24.52%    | 1.60%     | 1.28%    | 3.23%  | 7.55%     | 0.70%     |         | 9.09%    | 0.96%             | 3.18%           |           | 43.01% |  |
|                  | Area (acres)               | 41.8   | 20.3   | 312.8     | 20.4      | 16.3     | 41.2   | 96.3      | 9.0       |         | 115.9    | 12.3              | 40.6            |           | 548.5  |  |
| Grand Total      | % of Total Sub-watershed.. | 8.20%  | 1.78%  | 24.75%    | 1.19%     | 3.32%    | 3.22%  | 5.82%     | 1.06%     | 0.34%   | 8.81%    | 1.10%             | 3.94%           | 0.01%     | 36.45% |  |
|                  | Area (acres)               | 141.0  | 30.7   | 425.5     | 20.5      | 57.1     | 55.3   | 100.1     | 18.3      | 5.8     | 151.4    | 18.9              | 67.7            | 0.1       | 626.7  |  |



APPENDIX E:

| Sub-watershed Name | Daily Input (ct/day) |
|--------------------|----------------------|
| Black Brook        | 50.001               |
| Squibnocket East   | 54,547               |
| Squibnocket Main   | 207,621              |
| <b>Total</b>       | <b>312,169</b>       |

Table 2. Squibnocket Pond Sub-watershed Groundwater Input

APPENDIX F:

| Water Quality Parameters                                                                                                                               | Regulatory Standards          | MEP Status (2017)*                                                     | MVC Average (2017-2021)                                                     | Standard Sources                                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|------------------------------------------------------------------------|-----------------------------------------------------------------------------|--------------------------------------------------------------|
| Nitrogen                                                                                                                                               | 0.50 mg/L                     | Impaired (0.76 mg/L)                                                   | Exceeds Standard (0.76 mg/L)                                                | 2017 Massachusetts Estuary Project, TMDL                     |
| Temperature                                                                                                                                            | <85°F/29.4°C (At one time)    | Status Not Reported                                                    | Meets Standard Requirements (77°F / 25°C)                                   | Massachusetts Surface Water Quality Standards (314 CMR 4.00) |
|                                                                                                                                                        | <80°F/26.7°C (Max daily mean) |                                                                        |                                                                             |                                                              |
| Dissolved Oxygen                                                                                                                                       | 6.0 mg/L                      | SQB3 was below impairment threshold. SQB1 meets standard requirements. | Meets Threshold Requirements (7.0mg/L)                                      | Massachusetts Surface Water Quality Standards (314 CMR 4.00) |
| Total Pigment Gradient                                                                                                                                 | 10.0 µg/L                     | Meets Threshold Requirements** (7.3 µg/L)                              | SQB3 exceeds requirements (11.1 µg/L)<br>SQB1 meets requirements (8.9 µg/L) | 2020 Martha's Vineyard Water Quality Technical Report        |
| * Values in this column represent an average for data collected from all sampling sites from 1995-2007 and 2011, unless otherwise indicated.           |                               |                                                                        |                                                                             |                                                              |
| ** MEP pigment data was based on chlorophyll-a only. The Total Pigment Gradient data referenced for "MVC Five Year Average" is based on Total Pigment. |                               |                                                                        |                                                                             |                                                              |

Table 3. Squibnocket Pond Water Quality Standards and Thresholds

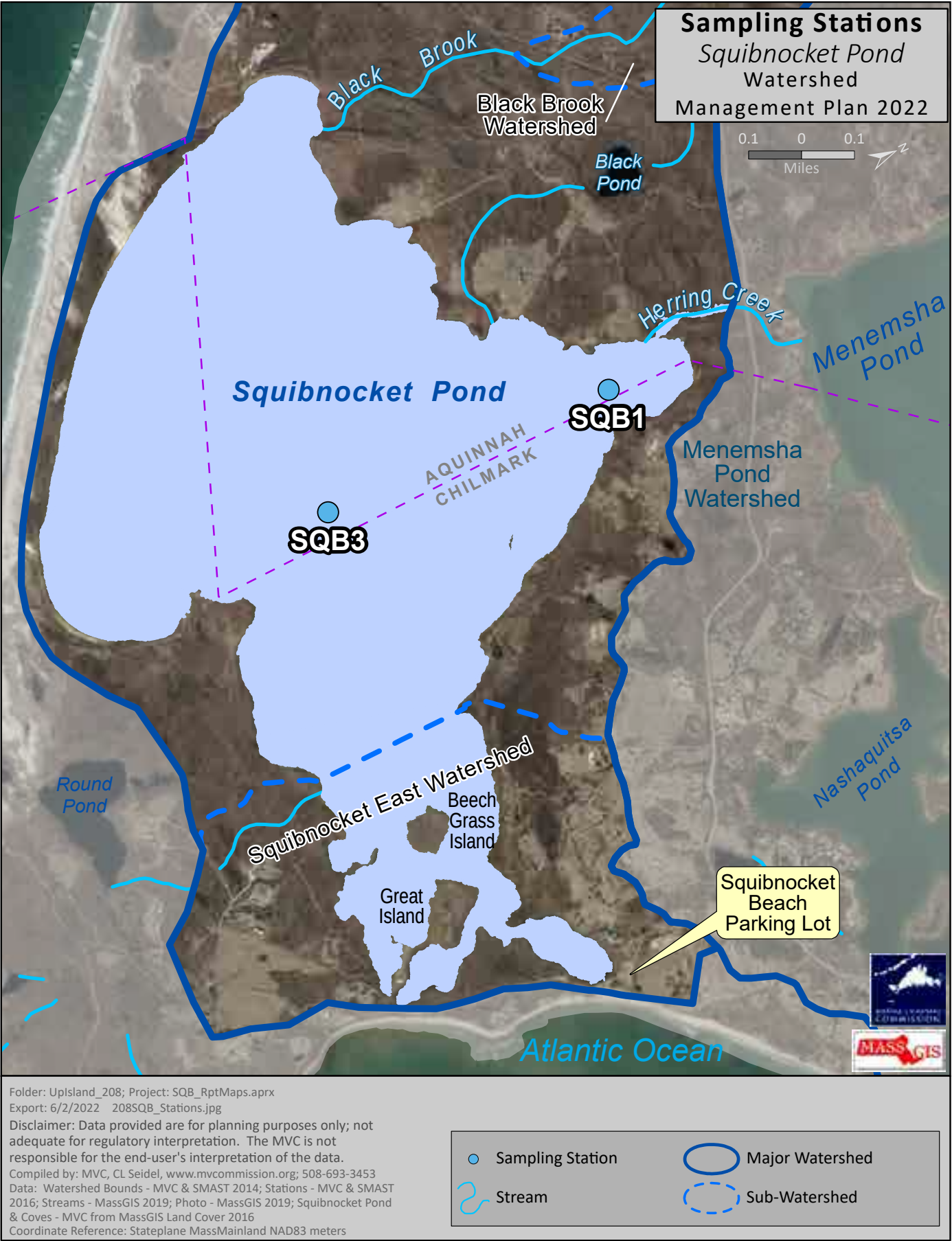


Figure 9. Squibnocket Pond Water Quality Sampling Stations (2017-2021)

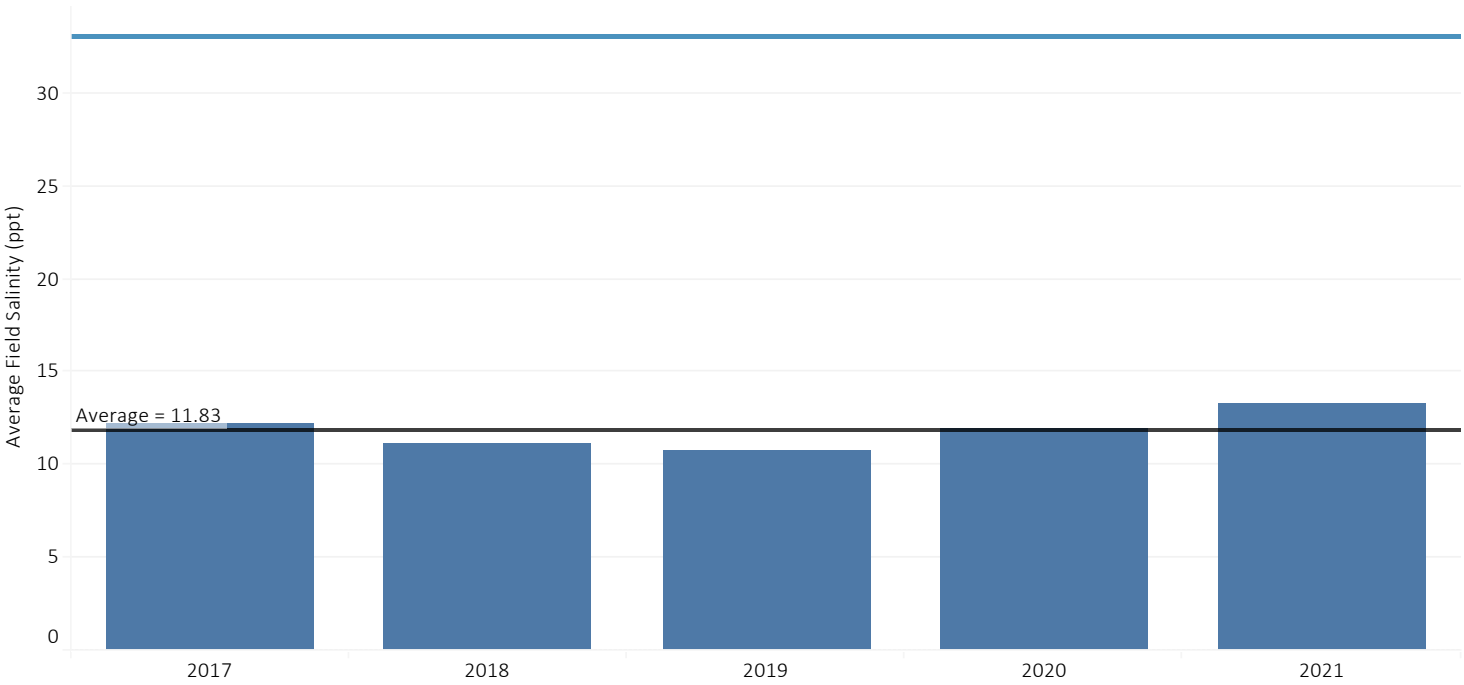


Squibnocket Pond Watershed - Salinity (2017-2021) - Table

|                | 2017   | 2018   | 2019   | 2020   | 2021   | Five Year Average |
|----------------|--------|--------|--------|--------|--------|-------------------|
| SQB1           | 12.190 | 11.086 | 10.638 | 11.938 | 13.247 | 11.820            |
| SQB3           | 12.080 | 11.176 | 10.872 | 11.876 | 13.214 | 11.844            |
| Annual Average | 12.135 | 11.131 | 10.755 | 11.907 | 13.230 | 11.832            |

Squibnocket 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).



Squibnocket Pond Sub-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). The BLACK LINE within the sub-watershed pane indicates the average salinity value over a five year period (2017-2021).

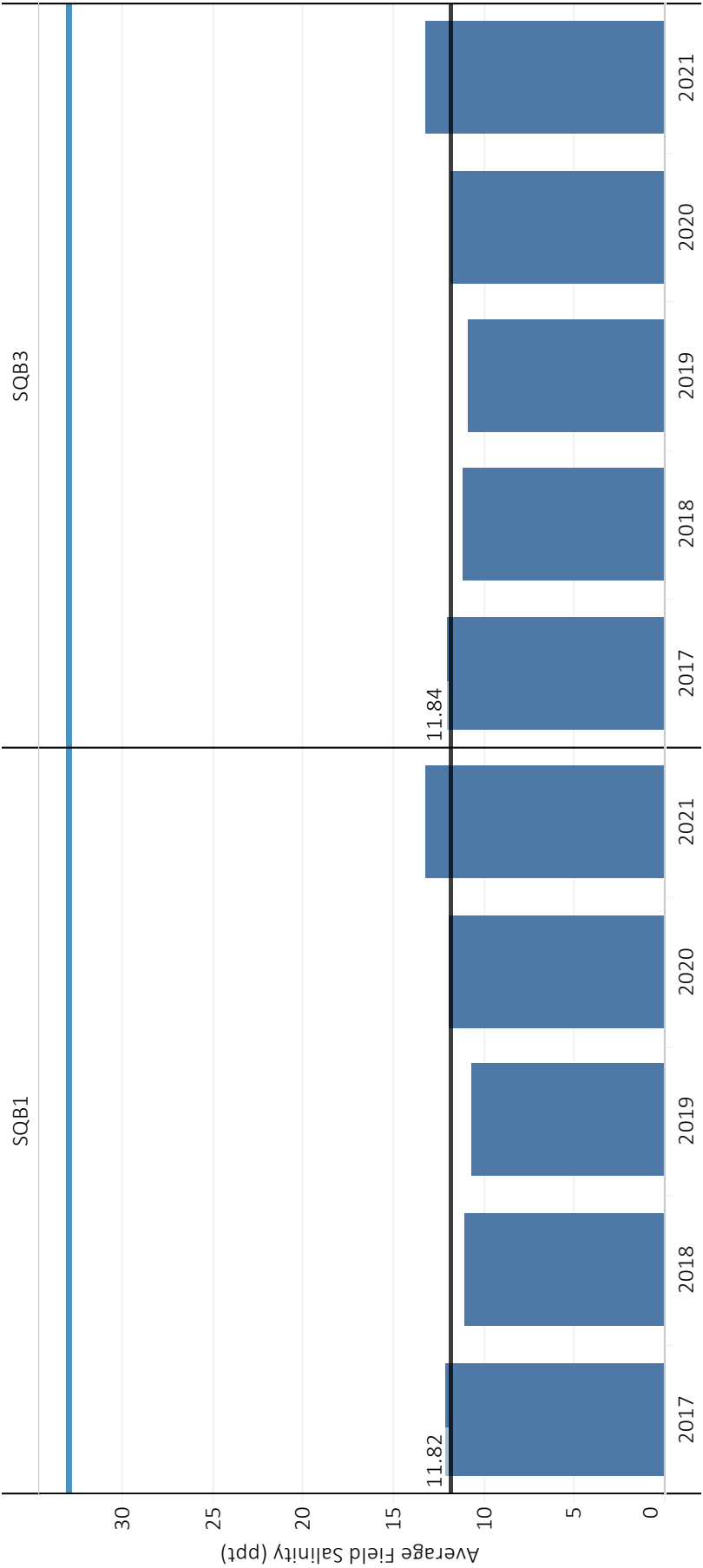


Figure 10. Squibnocket Pond Salinity Data (2017-2021)

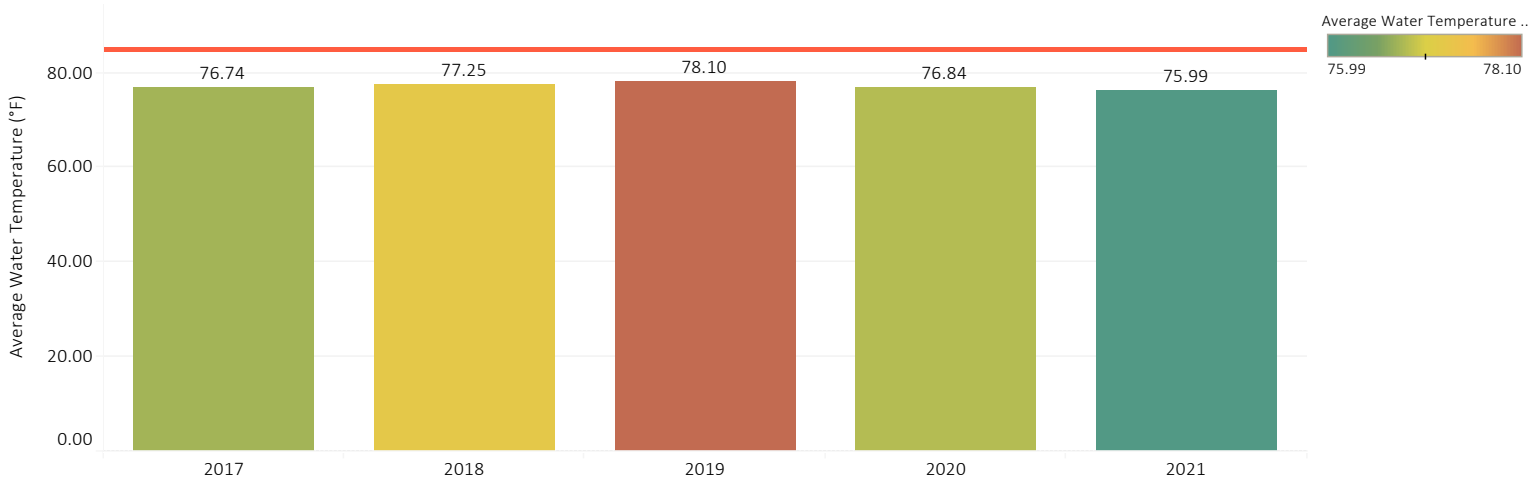
Squibnocket Pond Watershed - Water Temperature (°F) (2017-2021) - Table

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 |
|----------------|-------|-------|-------|-------|-------|-------------------|
| SQB1           | 76.95 | 77.49 | 78.46 | 76.76 | 76.42 | 77.21             |
| SQB3           | 76.54 | 77.02 | 77.75 | 76.92 | 75.56 | 76.75             |
| Annual Average | 76.74 | 77.25 | 78.10 | 76.84 | 75.99 | 76.98             |

Squibnocket 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>



Squibnocket Pond Sub-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>

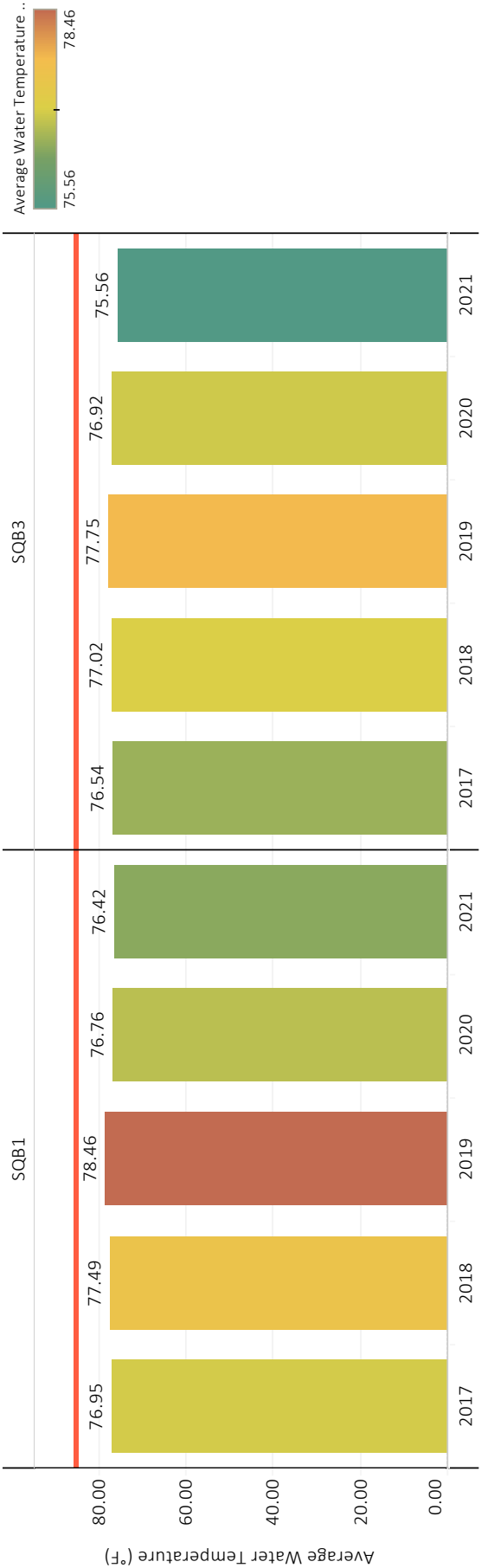


Figure 11. Squibnocket Pond Temperature Data (2017-2021)

| Source                                                                                                                     | Nitrogen Load (kg/year) |
|----------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Wastewater                                                                                                                 | 758                     |
| Landfill                                                                                                                   | 8                       |
| Turf Fertilizers                                                                                                           | 68                      |
| Impervious Cover                                                                                                           | 140                     |
| Water Surface<br>(atmospheric deposits)                                                                                    | 3,308                   |
| Natural Surfaces                                                                                                           | 223                     |
| Buildout*                                                                                                                  | 1,253                   |
| * Buildout loads include: wastewater disposal, fertilizer, and impervious surface additions from developable properties. . |                         |

Table 4. Squibnocket Pond Nitrogen Load Model Inputs (Howes, et. al, 2017)

| Sub-embayment                                                                                                                                                                                                                                                                                                                    | Present Load (kg/year) | Threshold Load (kg/year) | Threshold % Change |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------|--------------------|
| Black Brook                                                                                                                                                                                                                                                                                                                      | 204.4                  | 204.4                    | 0%                 |
| Squibnocket East                                                                                                                                                                                                                                                                                                                 | 273.8                  | 273.8                    | 0%                 |
| Squibnocket West                                                                                                                                                                                                                                                                                                                 | 741.0                  | 580.4                    | -22%               |
| *Comparison of sub-embayment watershed <b>total watershed loads</b> (including septic, runoff, and fertilizer) used for modeling of present and threshold loading scenarios of the Squibnocket system. These loads do not include direct atmospheric deposition (onto the sub-embayment surface), or benthic flux loading terms. |                        |                          |                    |
| ** Information published in Table VIII-3 (Page 175) of the Menemsha-Squibnocket Pond Embayment System Massachusetts Estuaries Project Report (2017).                                                                                                                                                                             |                        |                          |                    |

Table 5. Squibnocket Pond TOTAL Nitrogen Load Reductions Required to Achieve Nitrogen Threshold (TMDL)

| Sub-embayment             | Sampling Station | MEP Observed Total Nitrogen Concentration (2017) (mg/L) | 2017-2021 Average Total Nitrogen Concentration (mg/L) | 2021 Observed Total Nitrogen Concentration (mg/L) | Threshold Total Nitrogen Concentration (mg/L) |
|---------------------------|------------------|---------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------|-----------------------------------------------|
| Squibnocket Basin - North | SQB1             | 0.76                                                    | 0.73                                                  | 0.82                                              | 0.50                                          |
| Squibnocket Basin - South | SQB3             | 0.77                                                    | 0.79                                                  | 0.83                                              | 0.50                                          |

Table 6. Squibnocket Pond Total Nitrogen Data Comparison

Squibnocket Pond Watershed - Total Nitrogen (2017-2021) - Table

|                   | Average Total Nitrogen (mg/L) |      | TMDL Targets | Average Percent Difference |
|-------------------|-------------------------------|------|--------------|----------------------------|
| SQB1              | 2017                          | 0.78 | 0.50         | 56.63%                     |
|                   | 2018                          | 0.65 | 0.50         | 30.62%                     |
|                   | 2019                          | 0.72 | 0.50         | 44.53%                     |
|                   | 2020                          | 0.70 | 0.50         | 39.28%                     |
|                   | 2021                          | 0.82 | 0.50         | 63.40%                     |
|                   | Five Year Average             |      | 0.50         | 46.89%                     |
| SQB3              | 2017                          | 0.75 | 0.50         | 50.73%                     |
|                   | 2018                          | 0.65 | 0.50         | 30.69%                     |
|                   | 2019                          | 1.01 | 0.50         | 101.51%                    |
|                   | 2020                          | 0.72 | 0.50         | 43.41%                     |
|                   | 2021                          | 0.83 | 0.50         | 66.77%                     |
|                   | Five Year Average             |      | 0.50         | 58.62%                     |
| Five Year Average |                               | 0.76 | 0.50         | 52.76%                     |

Squibnocket Pond Sub-watershed - Total Nitrogen Concentration (mg/L) (2017-2021)

The RED LINES indicates concentrated total nitrogen target (mg/L) as established in the MEP (2017).

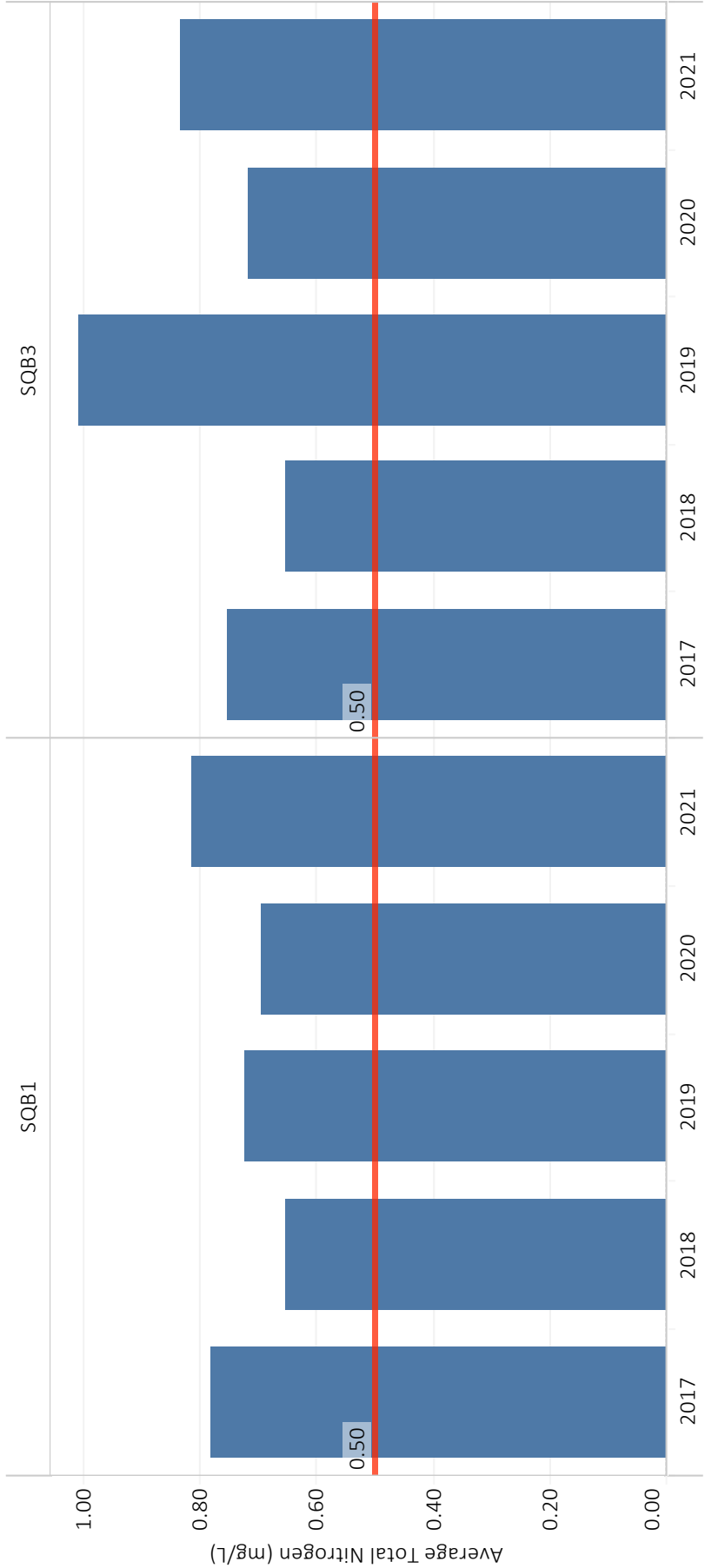


Figure 12. Squibnocket Pond Total Nitrogen by Sub-watershed (2017-2021)



Squibnocket Pond Watershed - Dissolved Oxygen (mg/L) (2017-2021) - Table

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

|      | 2017                 |        | 2018         |              | 2019         |              | 2020         |              | 2021 |                      |
|------|----------------------|--------|--------------|--------------|--------------|--------------|--------------|--------------|------|----------------------|
|      | July                 | August | July         | August       | July         | August       | July         | August       | June | July                 |
| SQB3 | 7.99<br>6.36<br>6.36 | 7.68   | 7.89<br>7.04 | 7.38<br>7.08 | 6.73<br>1.93 | 2.16<br>0.31 | 6.00         | 8.11<br>7.11 | 6.21 | 1.87<br>5.14         |
| SQB1 | 6.17                 | 5.52   | 7.51<br>6.94 | 6.41<br>6.26 | 6.70<br>4.11 | 7.90<br>6.84 | 7.95<br>6.94 | 6.90<br>6.44 | 7.74 | 7.62<br>6.10<br>7.25 |

Squibnocket Pond Watershed - 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.

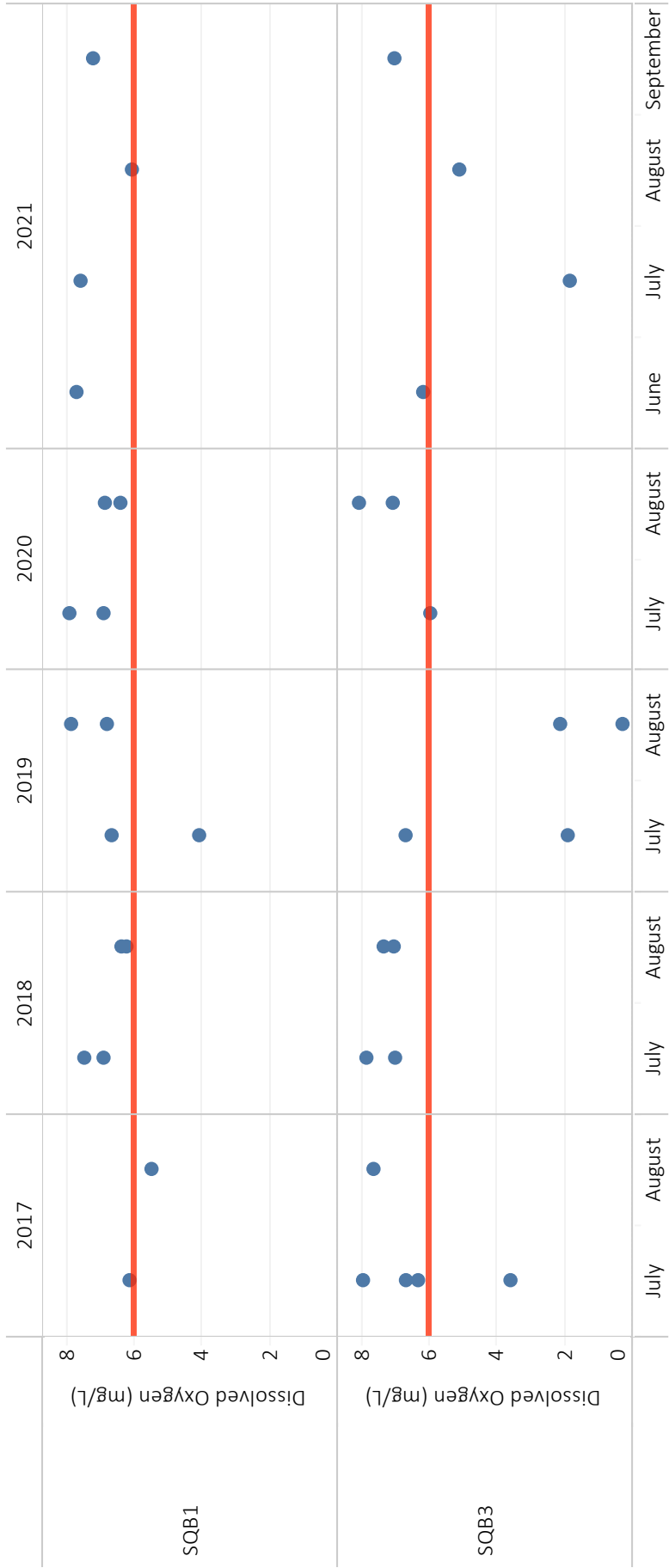


Figure 13. Squibnocket Pond Dissolved Oxygen by Sub-watershed (2017-2021)

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

|                | 2017 | 2018 | 2019  | 2020 | 2021  | Five Year Average |
|----------------|------|------|-------|------|-------|-------------------|
| SQB1           | 6.79 | 7.49 | 4.92  | 2.81 | 13.90 | 7.18              |
| SQB3           | 7.01 | 7.10 | 12.23 | 3.35 | 12.99 | 8.54              |
| Annual Average | 6.90 | 7.29 | 8.58  | 3.08 | 13.45 | 7.86              |

Squibnocket Pond Sub-watershed - Chlorophyll-a (2017-2021)

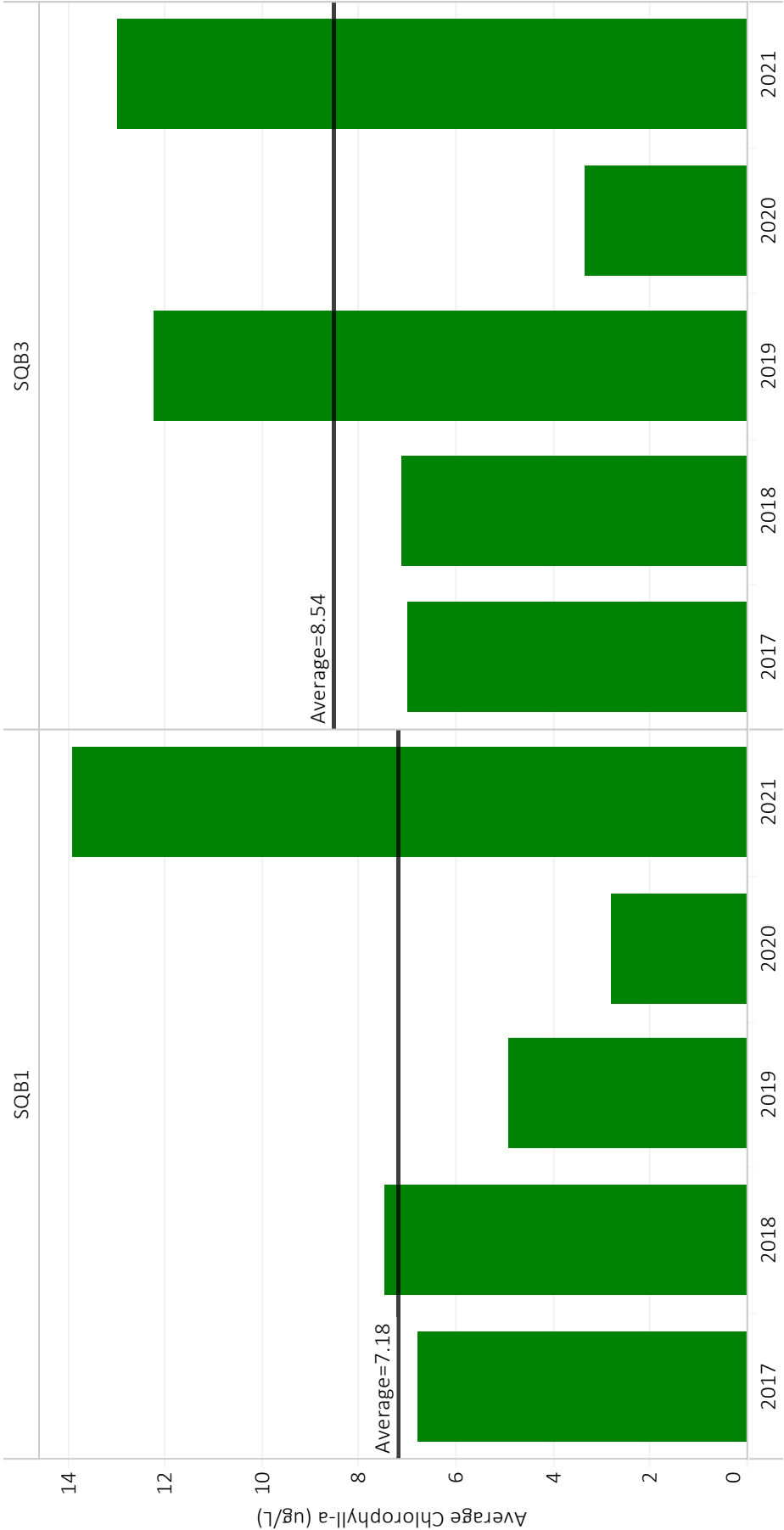


Figure 14. Squibnocket Pond Chlorophyll-a (2017-2021)

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

|                | 2017 | 2018  | 2019  | 2020 | 2021  | Five Year Average |
|----------------|------|-------|-------|------|-------|-------------------|
| SQB1           | 8.88 | 10.13 | 5.75  | 2.89 | 17.20 | 8.97              |
| SQB3           | 7.63 | 9.29  | 17.88 | 3.67 | 17.10 | 11.11             |
| Annual Average | 8.25 | 9.71  | 11.81 | 3.28 | 17.15 | 10.04             |

Squibnocket Pond Sub-watershed - 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. Squibnocket Pond Total Pigment (2017-2021)

APPENDIX G:

Squibnocket Pond Watershed Natural Heritage & Endangered Species Habitats  
Within and Beyond 200ft from Pond Edge - 2021 Table

|                  |              | Priority & Estimated | Priority Only | Neither Priority Nor Estimated | Grand Total |
|------------------|--------------|----------------------|---------------|--------------------------------|-------------|
| Black Brook      | Beyond 200ft |                      | 1.04%         | 22.33%                         | 10.19%      |
| Squibnocket East | Within 200ft | 7.58%                |               | 10.63%                         | 7.85%       |
|                  | Beyond 200ft | 2.94%                |               | 14.66%                         | 7.78%       |
| Squibnocket Pond | Within 200ft | 74.60%               | 38.43%        | 5.15%                          | 38.13%      |
|                  | Beyond 200ft | 14.88%               | 60.53%        | 47.23%                         | 36.05%      |
| Grand Total      |              | 100.00%              | 100.00%       | 100.00%                        | 100.00%     |

Squibnocket Pond Sub-watershed  
Natural Heritage & Endangered Species Habitats - 2021 Table  
Percent of Habitat within the Entire Watershed Area

Note: Areas representing less than 1% of the total area (acres) are not labeled.

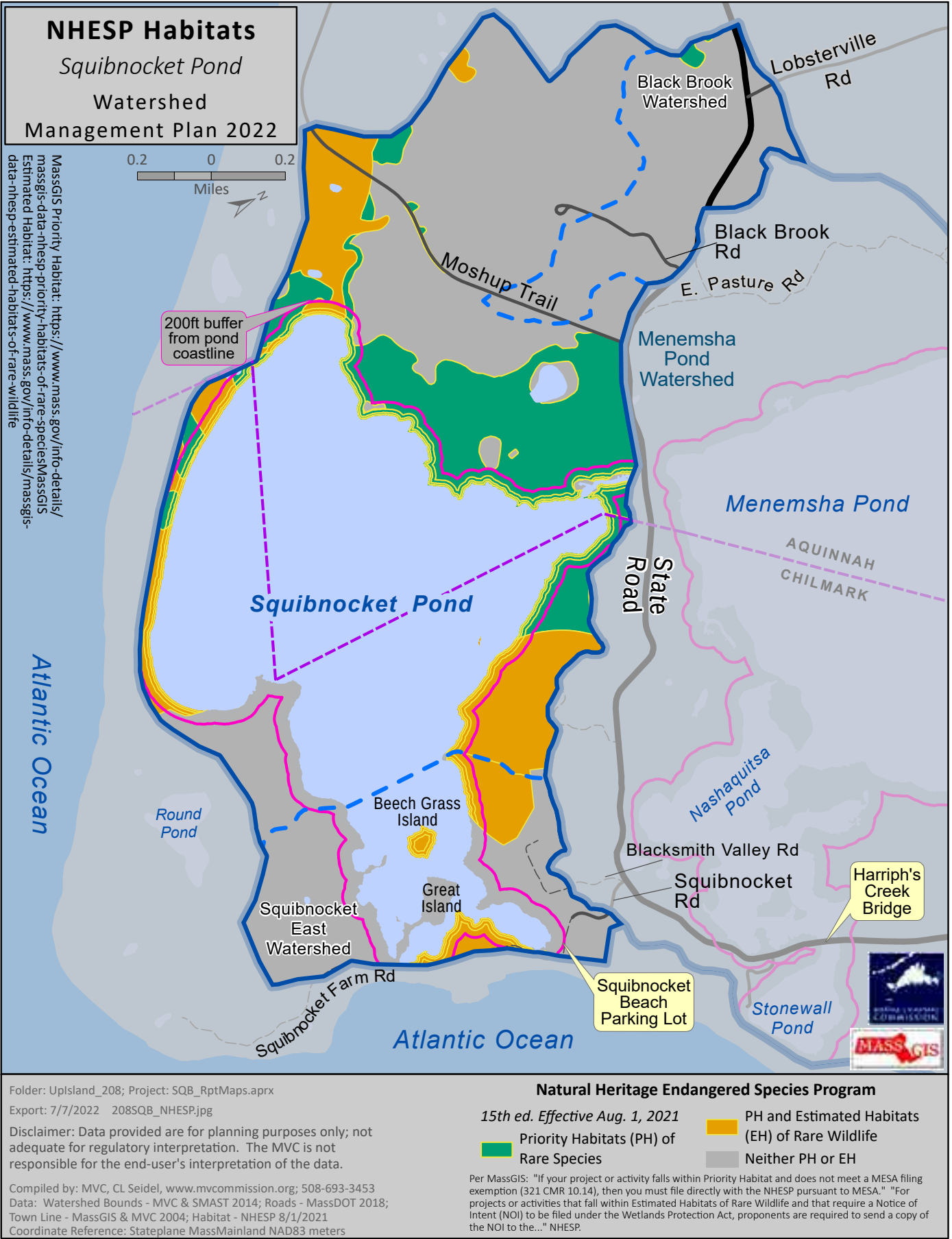
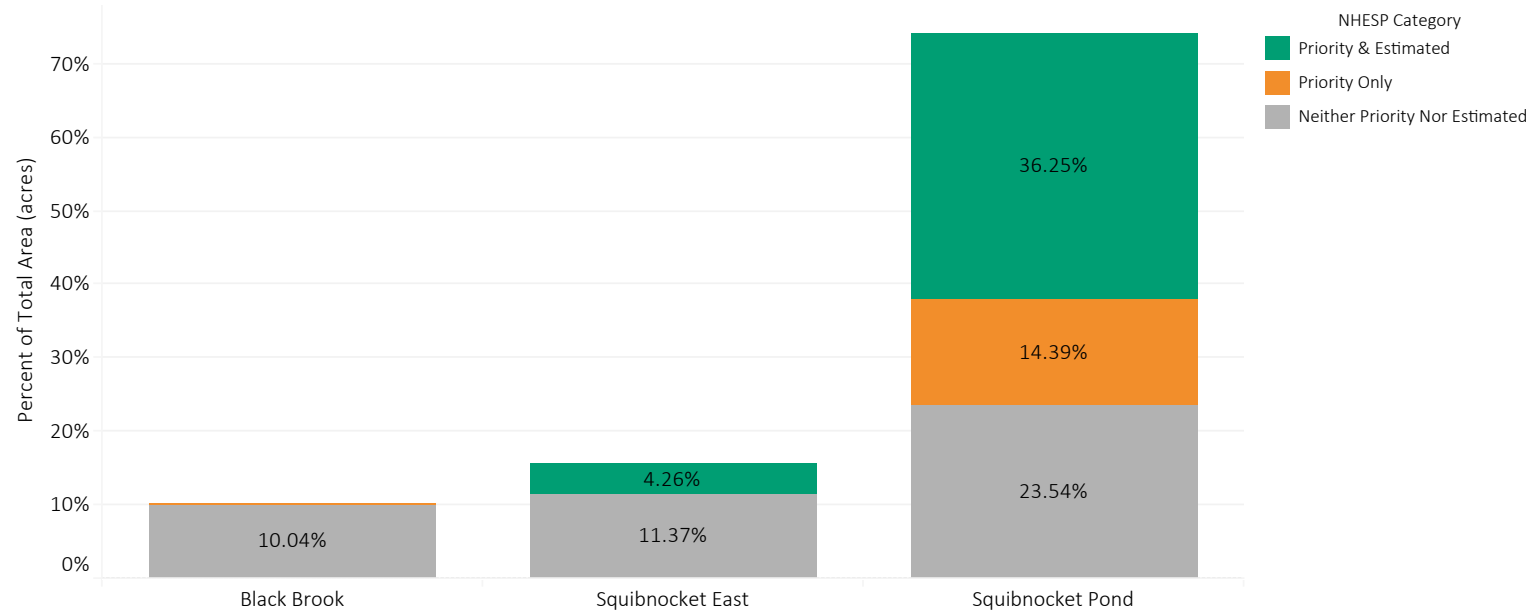


Figure 16. Natural Heritage & Endangered Species Program Map



# Squibnocket Pond Watershed Core Habitat - 2021 Table

|                  |              | Core Habitat Present |
|------------------|--------------|----------------------|
| Black Brook      | Beyond 200ft | 9.56%                |
| Squibnocket East | Beyond 200ft | 7.76%                |
|                  | Within 200ft | 8.07%                |
| Squibnocket Pond | Beyond 200ft | 36.45%               |
|                  | Within 200ft | 38.16%               |

Squibnocket Pond Sub-watershed Core Habitat Within and Beyond 200ft from Pond Edge - 2021

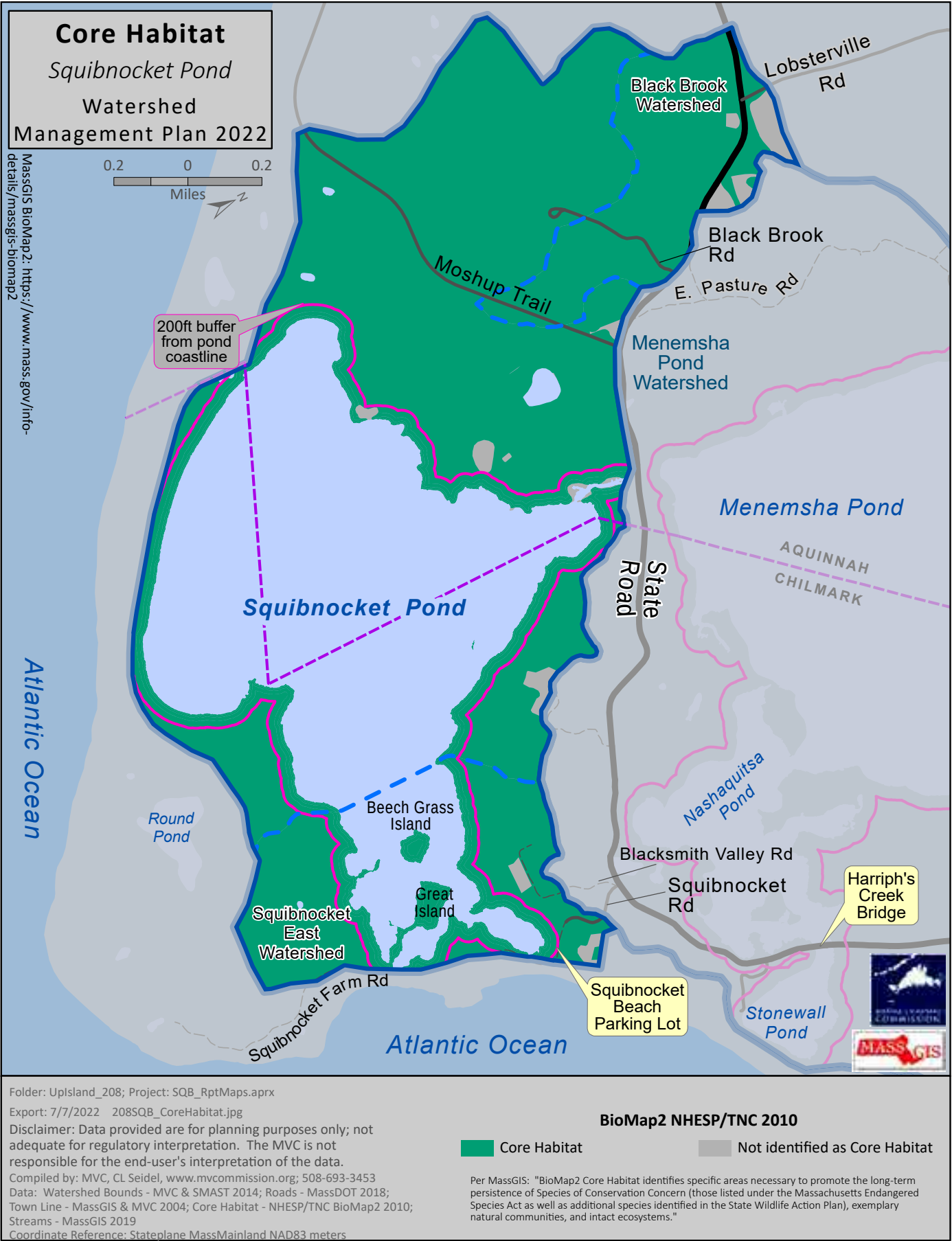
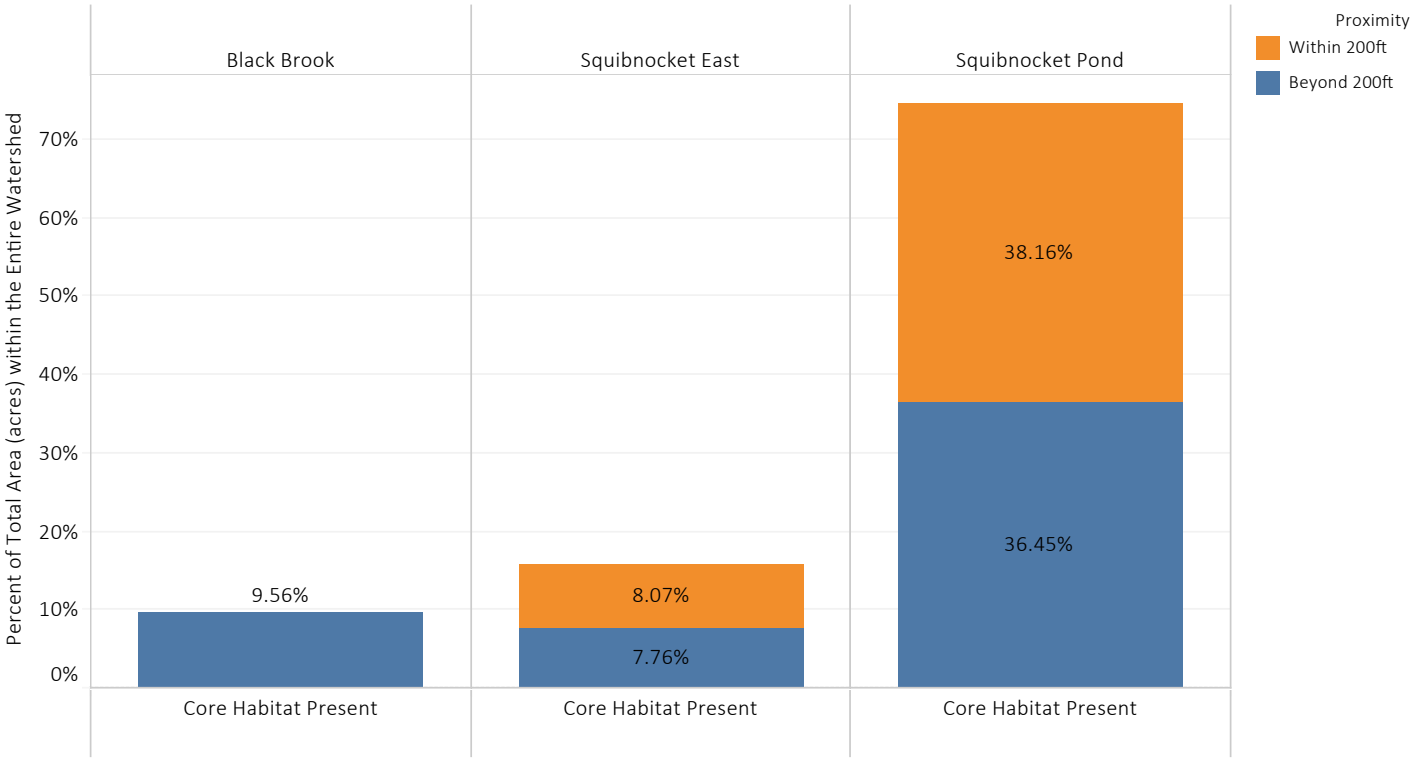


Figure 17. BioMap2 Core Habitat and Critical Natural Landscapes (Note Core IDs correspond with elements list)

Squibnocket Pond Watershed Critical Habitat Within and Beyond 200ft from Pond Edge - 2021 Table

|                  |              | CNL Present |
|------------------|--------------|-------------|
| Black Brook      | Beyond 200ft | 10.51%      |
| Squibnocket East | Beyond 200ft | 5.97%       |
|                  | Within 200ft | 8.07%       |
| Squibnocket Pond | Beyond 200ft | 36.16%      |
|                  | Within 200ft | 39.29%      |

Squibnocket Pond Sub-watershed Critical Habitat Within and Beyond 200ft from Pond Edge - 2021

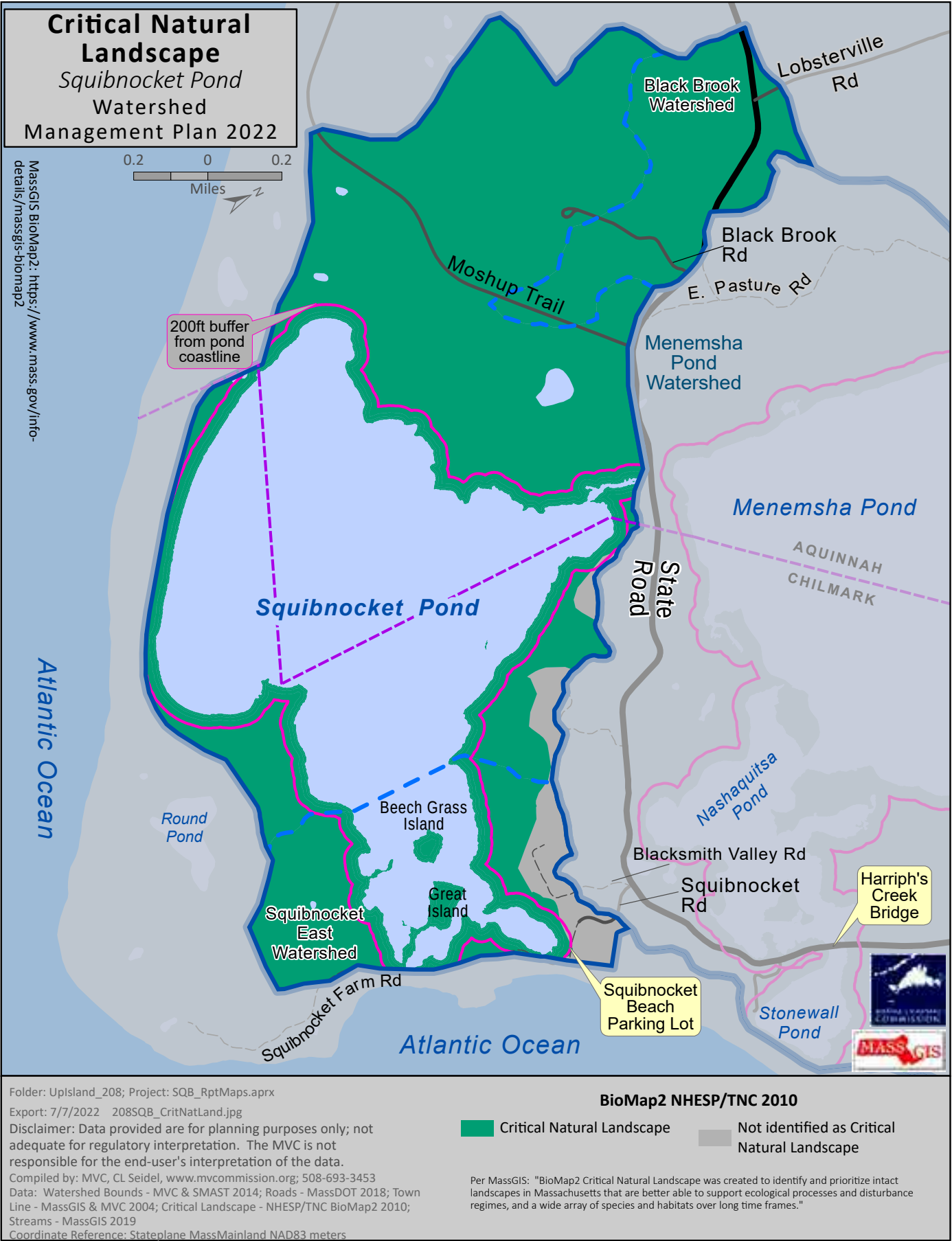
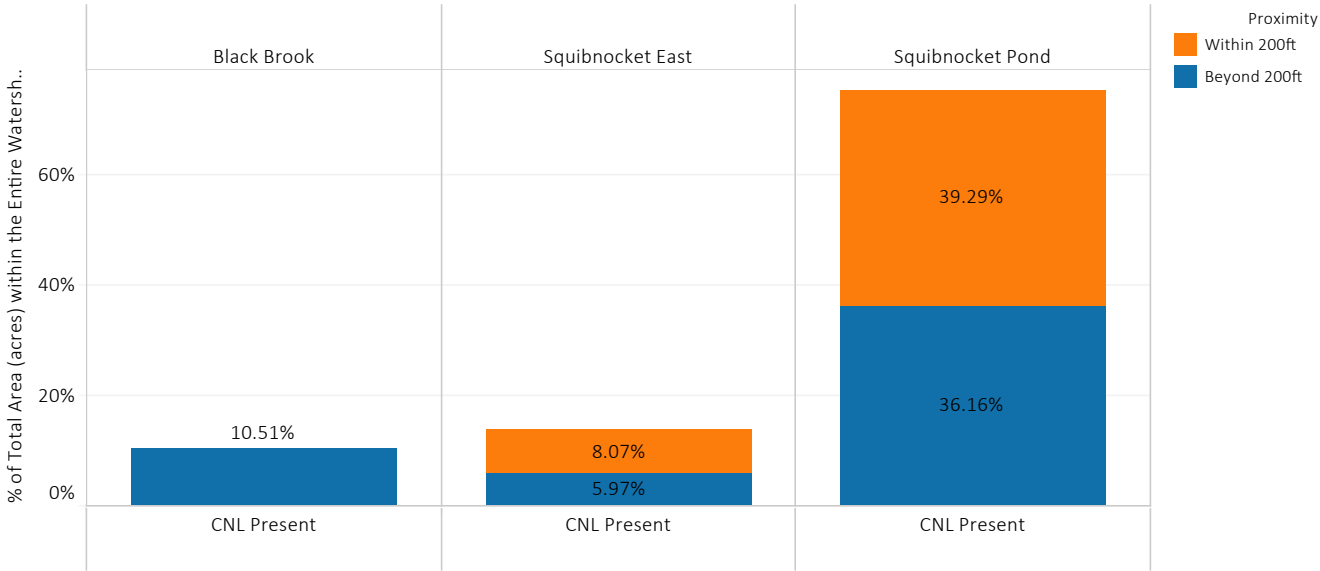


Figure 18. Critical Natural Landscape Map

Squibnocket Pond Watershed Wetland Area (acres) - 2021 Table

|                  | Barrier Beach | Non-Salt Marsh | Not Wetland | Open Water | Salt Marsh | Swamp  |
|------------------|---------------|----------------|-------------|------------|------------|--------|
| Black Brook      |               |                | 89.00%      |            |            | 11.00% |
|                  |               |                | 155.9       |            |            | 19.3   |
| Squibnocket East | 2.74%         | 4.41%          | 59.99%      | 29.12%     |            | 3.74%  |
|                  | 7.4           | 11.9           | 161.2       | 78.3       |            | 10.1   |
| Squibnocket Pond | 2.61%         | 0.38%          | 47.45%      | 43.16%     | 0.02%      | 6.38%  |
|                  | 33.3          | 4.8            | 605.1       | 550.4      | 0.2        | 81.4   |
| Grand Total      | 2.37%         | 0.97%          | 53.64%      | 36.57%     | 0.01%      | 6.44%  |
|                  | 40.7          | 16.7           | 922.3       | 628.7      | 0.2        | 110.7  |

Squibnocket Pond Sub-watershed Wetland Area (acres) - 2021

Note: Areas representing less than 4% of the total area (acres) are not labeled.

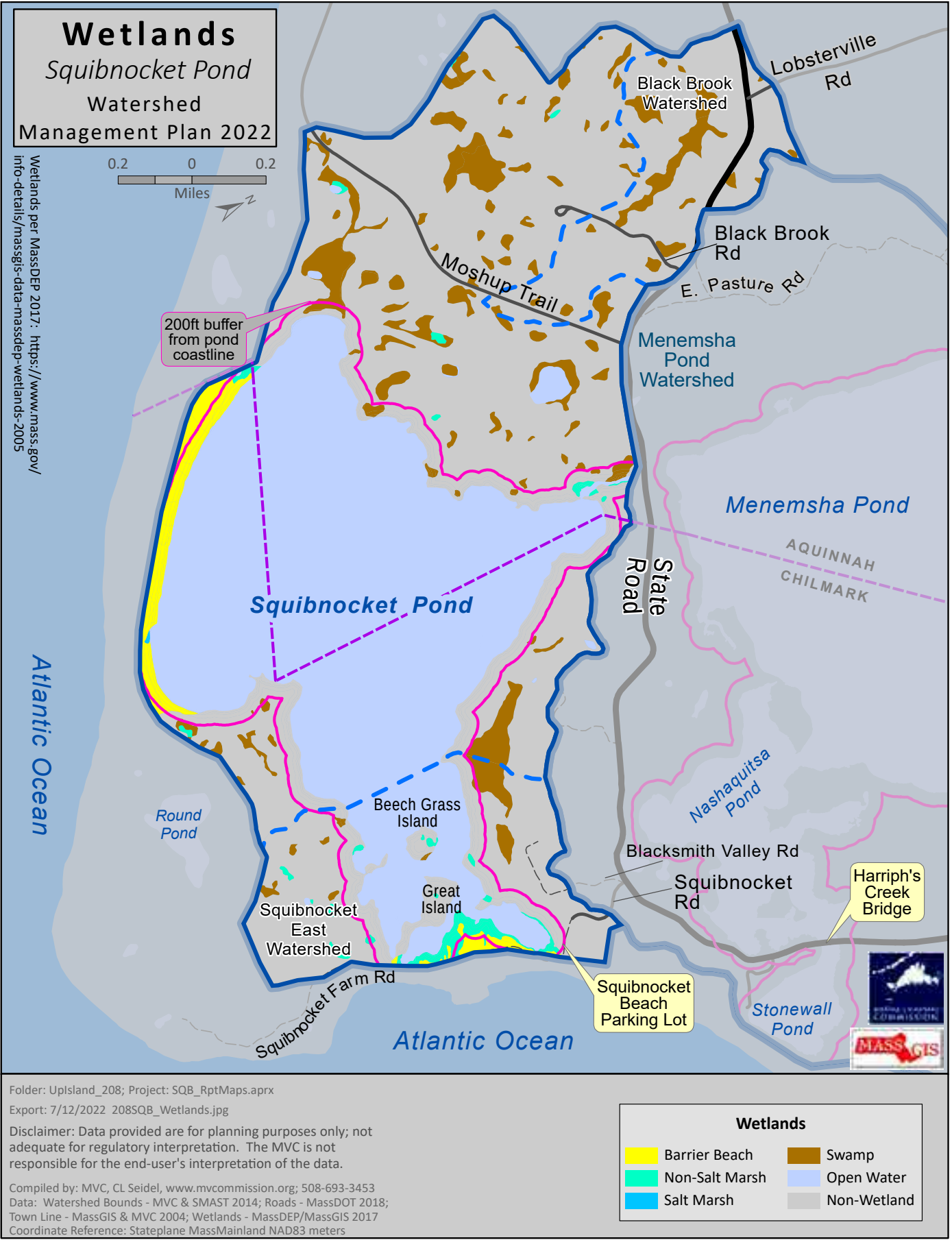
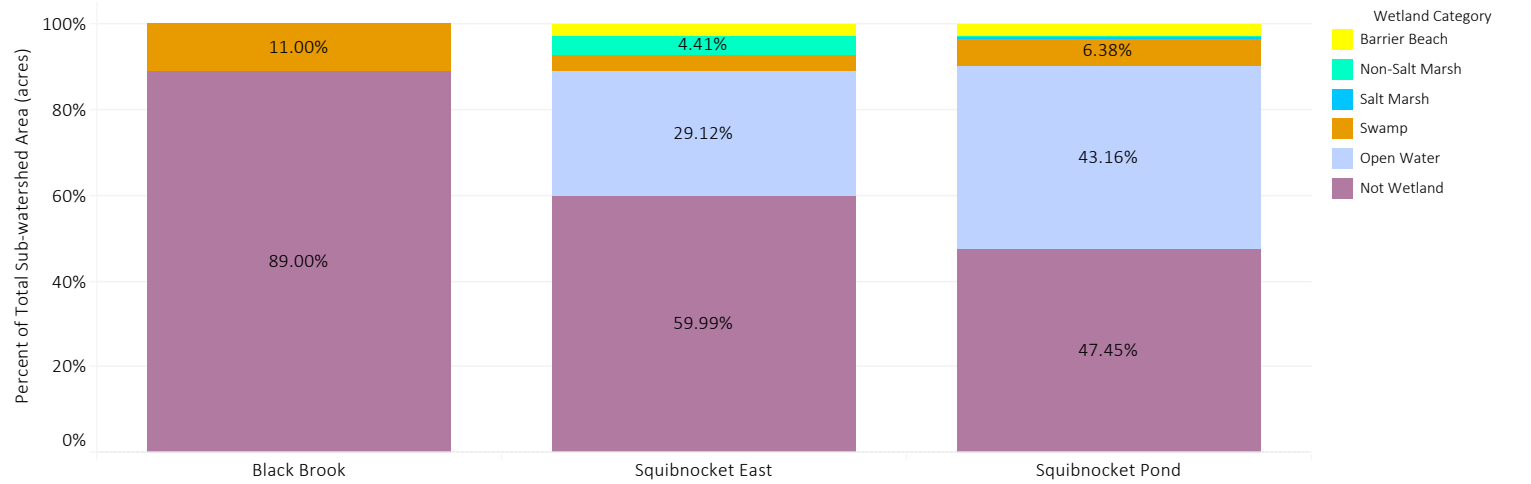


Figure 19. Squibnocket Pond Watershed Wetlands Map

APPENDIX H:

| Town     | Year-round<br>Population<br>1950 | Year-round<br>Population<br>2020 | Total<br>Population<br>% Increase<br>1950 - 2020 | Peak In-<br>season<br>Population<br>2020 |
|----------|----------------------------------|----------------------------------|--------------------------------------------------|------------------------------------------|
| Aquinnah | 88                               | 439                              | 399%                                             | 1,889                                    |
| Chilmark | 183                              | 1,212                            | 562%                                             | 6,530                                    |

Table 7. Squibnocket Pond Watershed Population

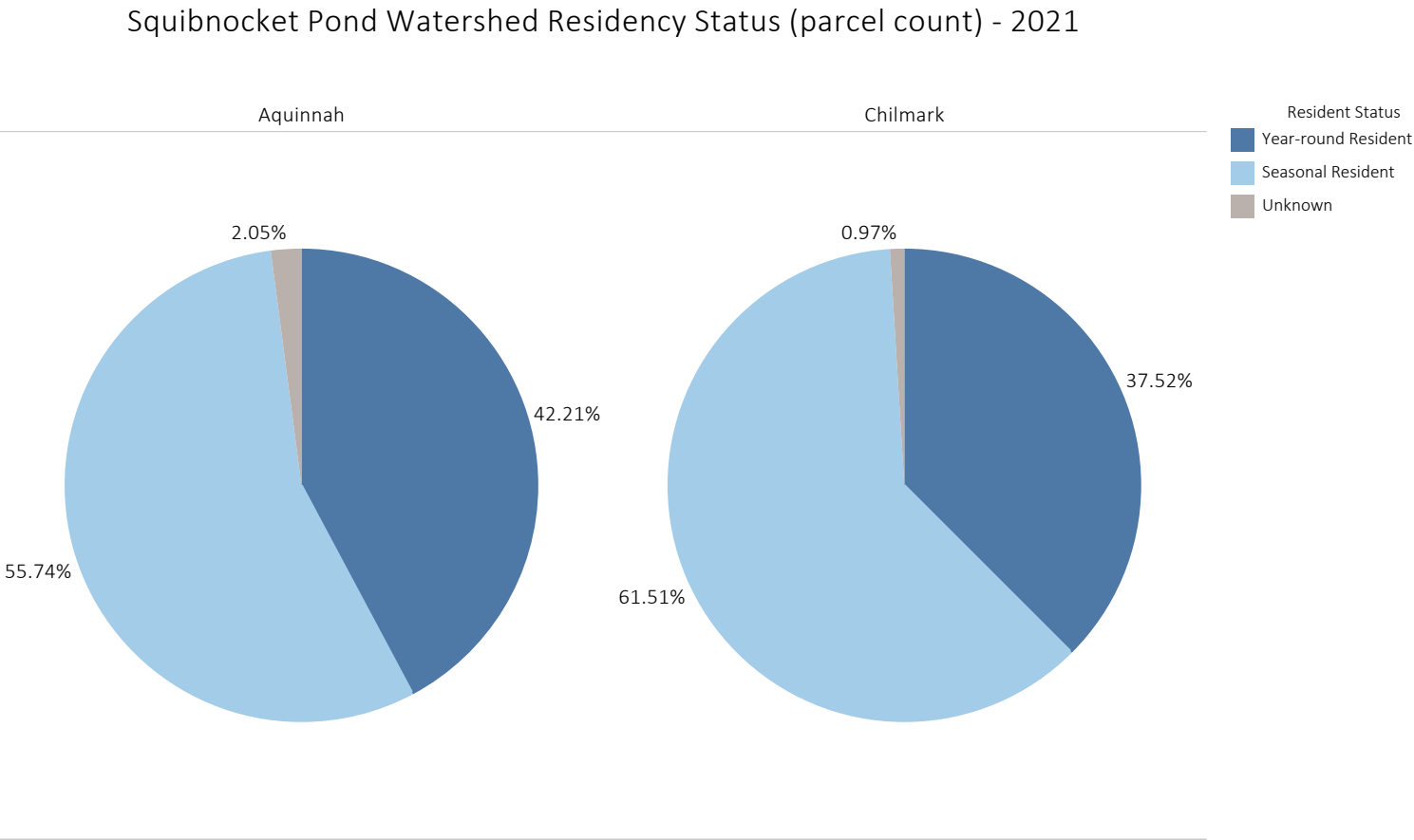


Figure 20. Housing and Residency Status (2021)



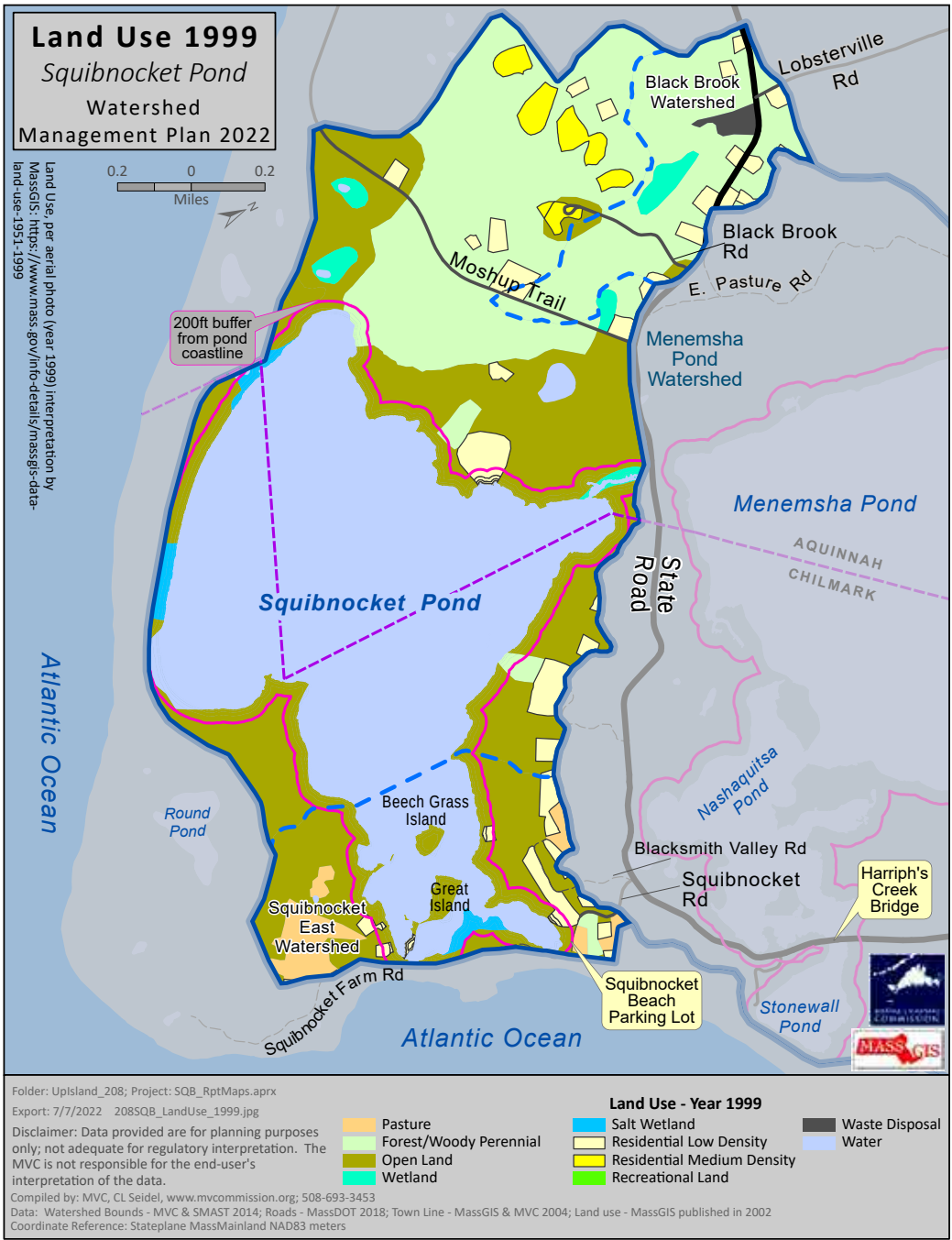
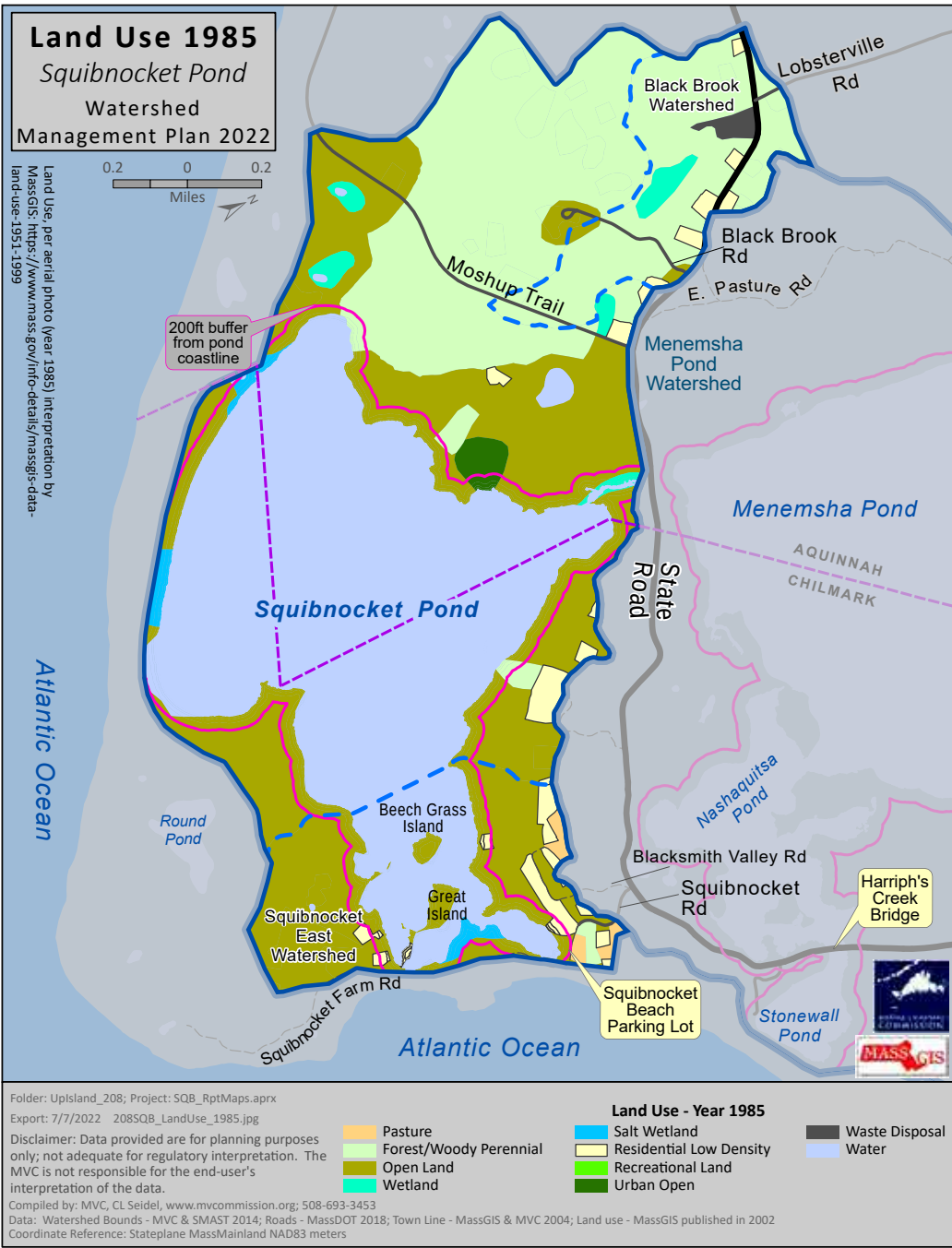
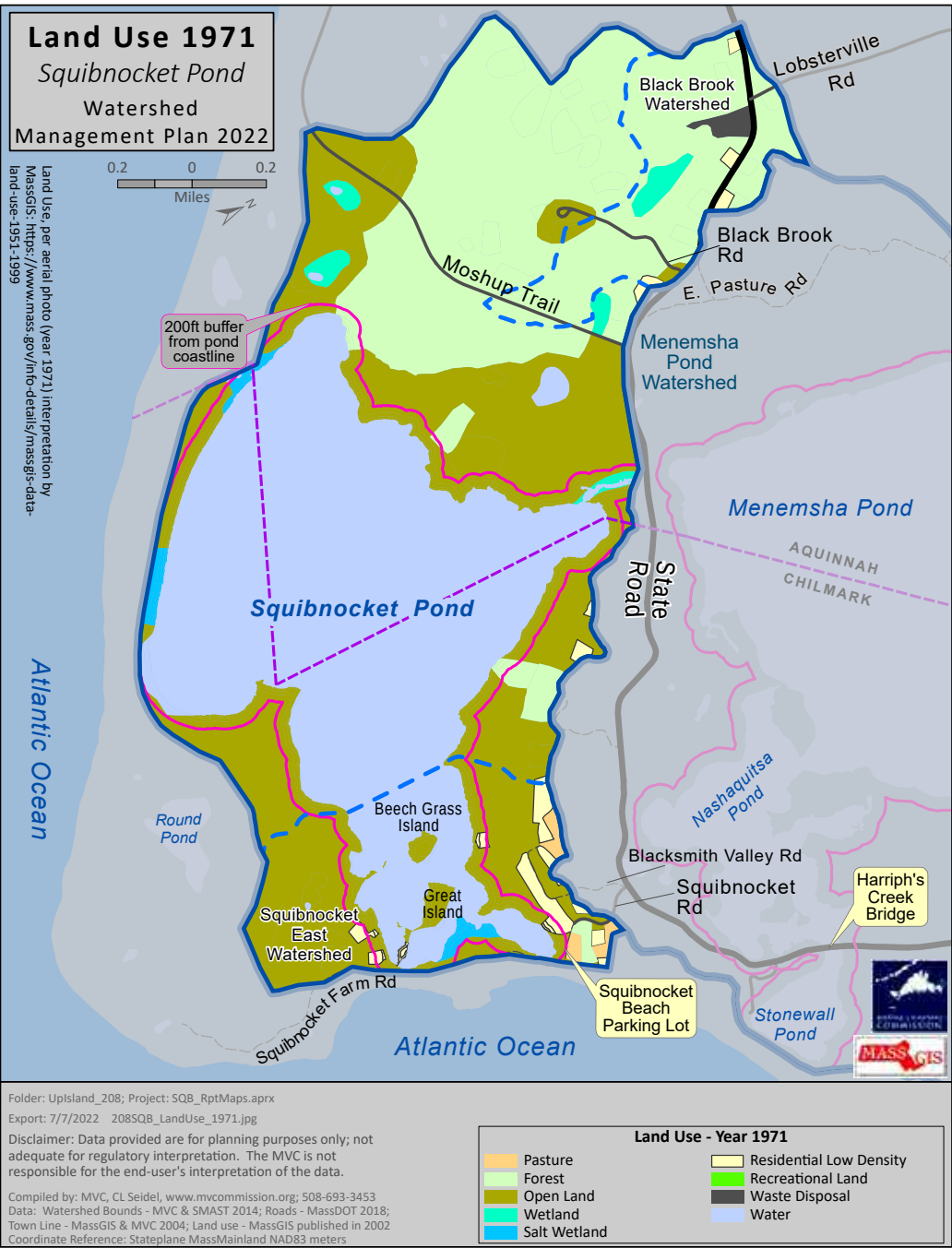


Figure 21. Land Use Map Comparison - 1971, 1985, 1999



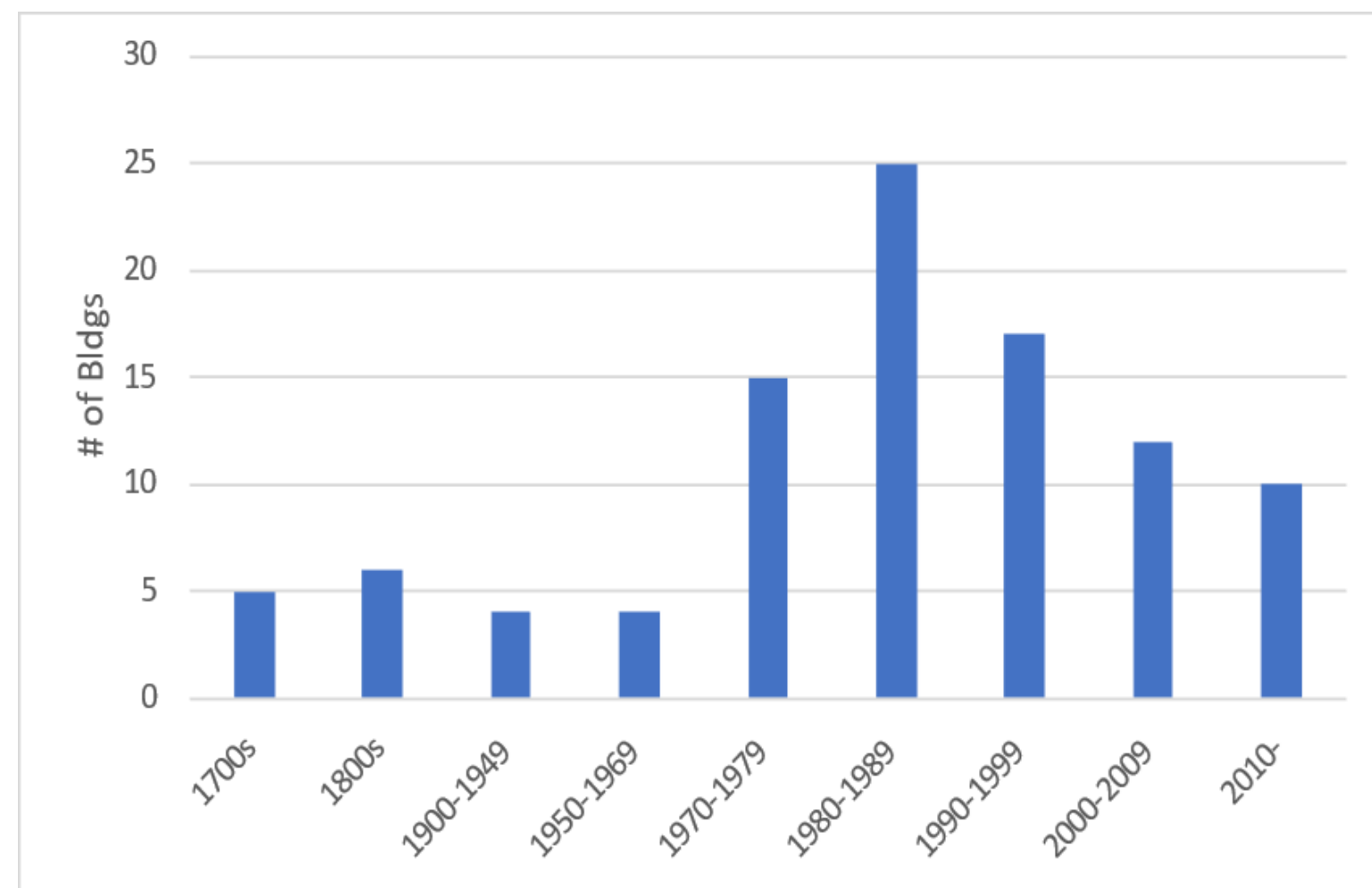


Figure 22. Construction Year of Oldest Building on a Given Parcel In Squibnocket Pond Watershed

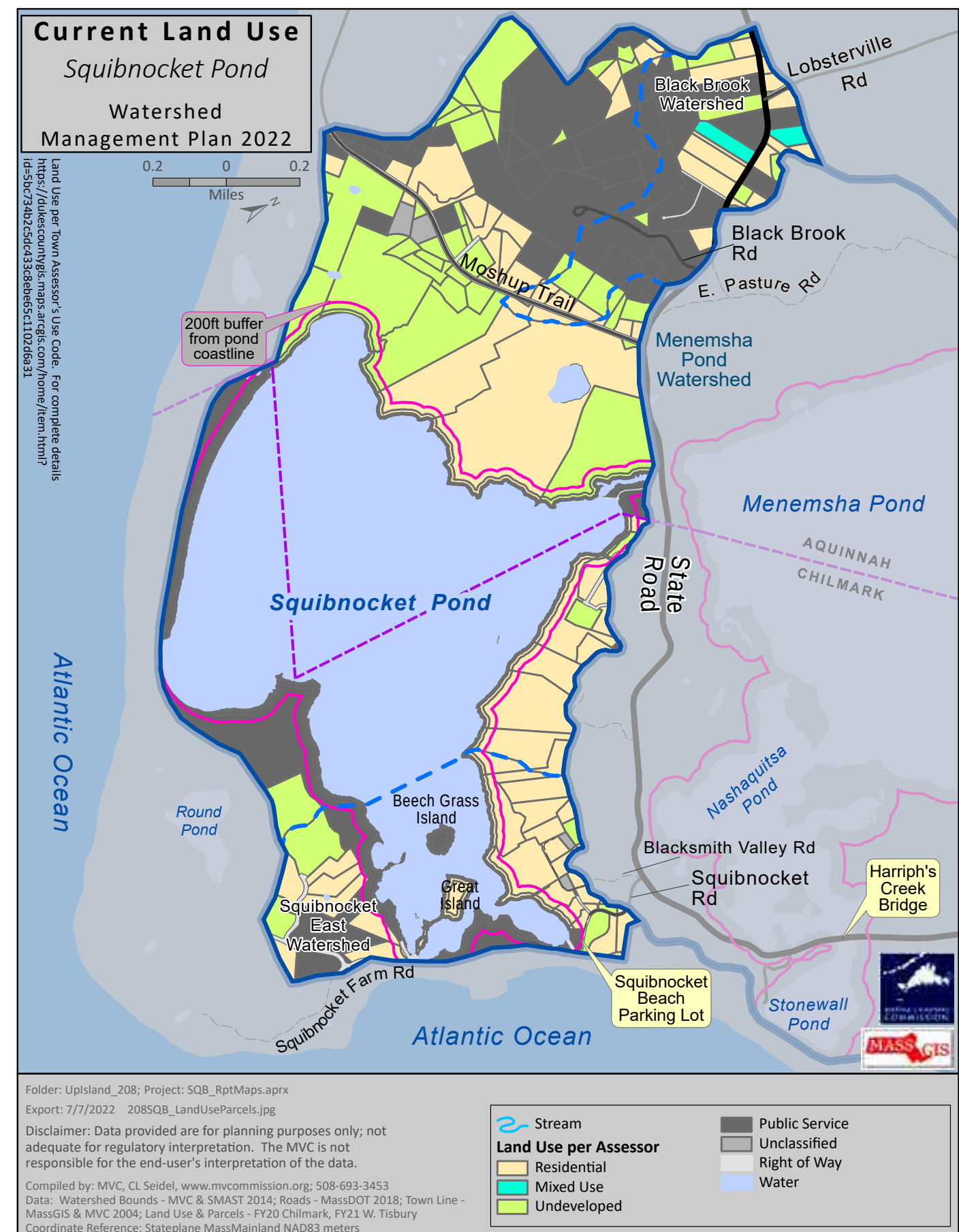


Figure 23. Squibnocket Pond Watershed Land Use Map (2021)

Squibnocket Pond Sub-watershed Land Use - 2021 Table

|                  |                | % of Total Area (acres)<br>along Use | Area (acres) |
|------------------|----------------|--------------------------------------|--------------|
| Black Brook      | Mixed Use      | 4.28%                                | 7            |
|                  | Public Service | 51.71%                               | 91           |
|                  | Residential    | 26.00%                               | 46           |
|                  | Right of Way   | 3.95%                                | 7            |
|                  | Unclassified   | 0.31%                                | 1            |
|                  | Undeveloped    | 13.75%                               | 24           |
|                  | Total          | 100.00%                              | 175          |
| Squibnocket East | Public Service | 29.75%                               | 57           |
|                  | Residential    | 56.14%                               | 108          |
|                  | Right of Way   | 2.46%                                | 5            |
|                  | Unclassified   | 0.75%                                | 1            |
|                  | Undeveloped    | 10.90%                               | 21           |
|                  | Total          | 100.00%                              | 192          |
| Squibnocket Pond | Public Service | 32.14%                               | 233          |
|                  | Residential    | 35.13%                               | 254          |
|                  | Right of Way   | 1.15%                                | 8            |
|                  | Unclassified   | 0.75%                                | 5            |
|                  | Undeveloped    | 30.82%                               | 223          |
|                  | Total          | 100.00%                              | 724          |
| Grand Total      |                | 100.00%                              | 1,090        |

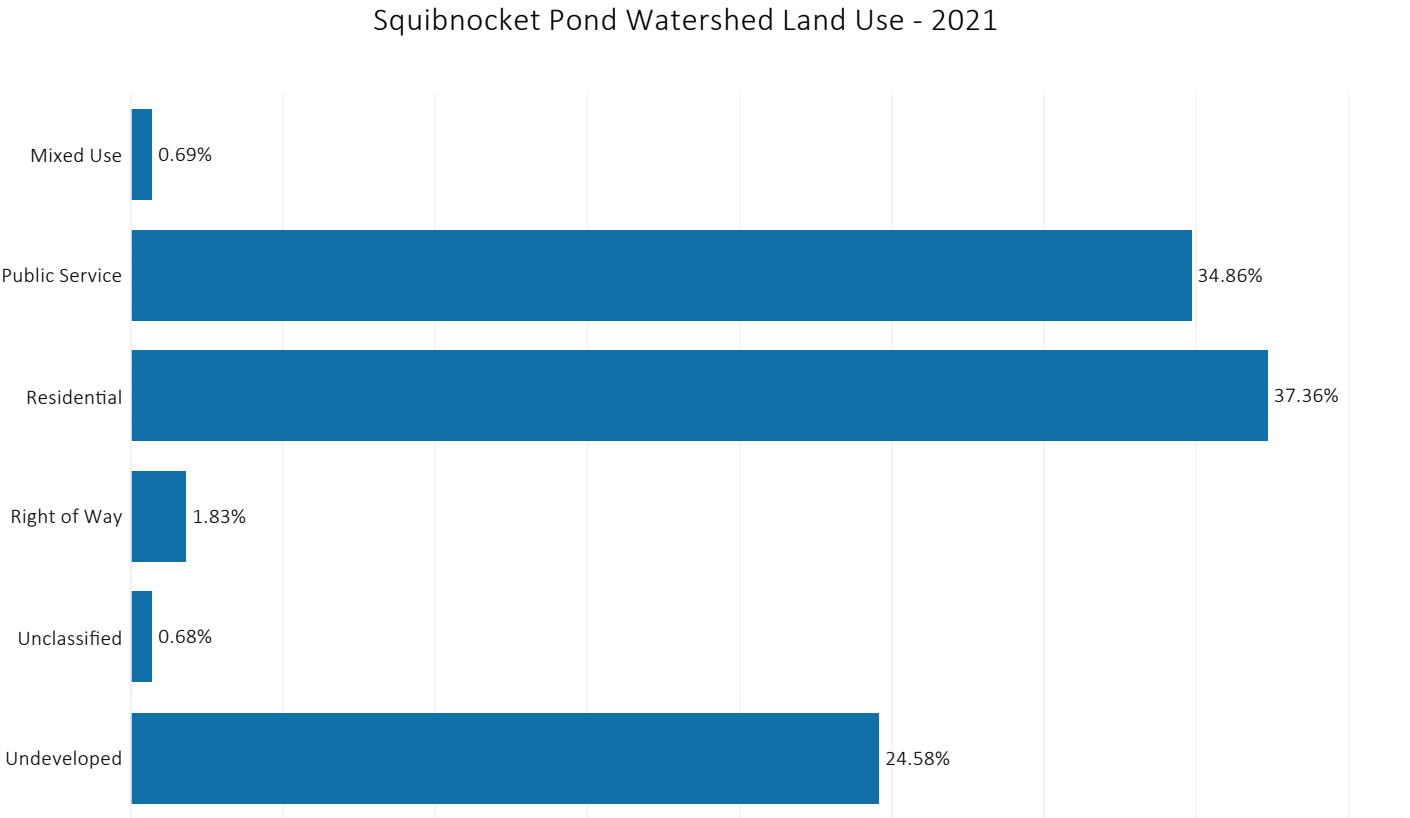


Figure 24. Current (2021) Land Use in Squibnocket Pond Watershed

**Figure 25. Squibnocket Pond Land Use Changes from 2017 to 2021**



**Figure 26. Squibnocket Pond Land Use Categories by Sub-watershed**

APPENDIX I:

Squibnocket 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 |         |             |
|------------------|--------------|-------------------------------------------|---------|-------------|------------------------------------------------------|---------|-------------|
|                  |              | Innovative Alternative                    | Title V | Non-Title V | Innovative Alternative                               | Title V | Non-Title V |
| Black Brook      | Beyond 200ft |                                           | 13.00   | 4.00        |                                                      | 76.47%  | 23.53%      |
| Squibnocket East | Within 200ft | 1.00                                      |         | 2.00        | 4.76%                                                |         | 9.52%       |
|                  | Beyond 200ft |                                           | 6.00    | 12.00       |                                                      | 28.57%  | 57.14%      |
| Squibnock..      | Beyond 200ft |                                           | 17.00   | 7.00        |                                                      | 70.83%  | 29.17%      |

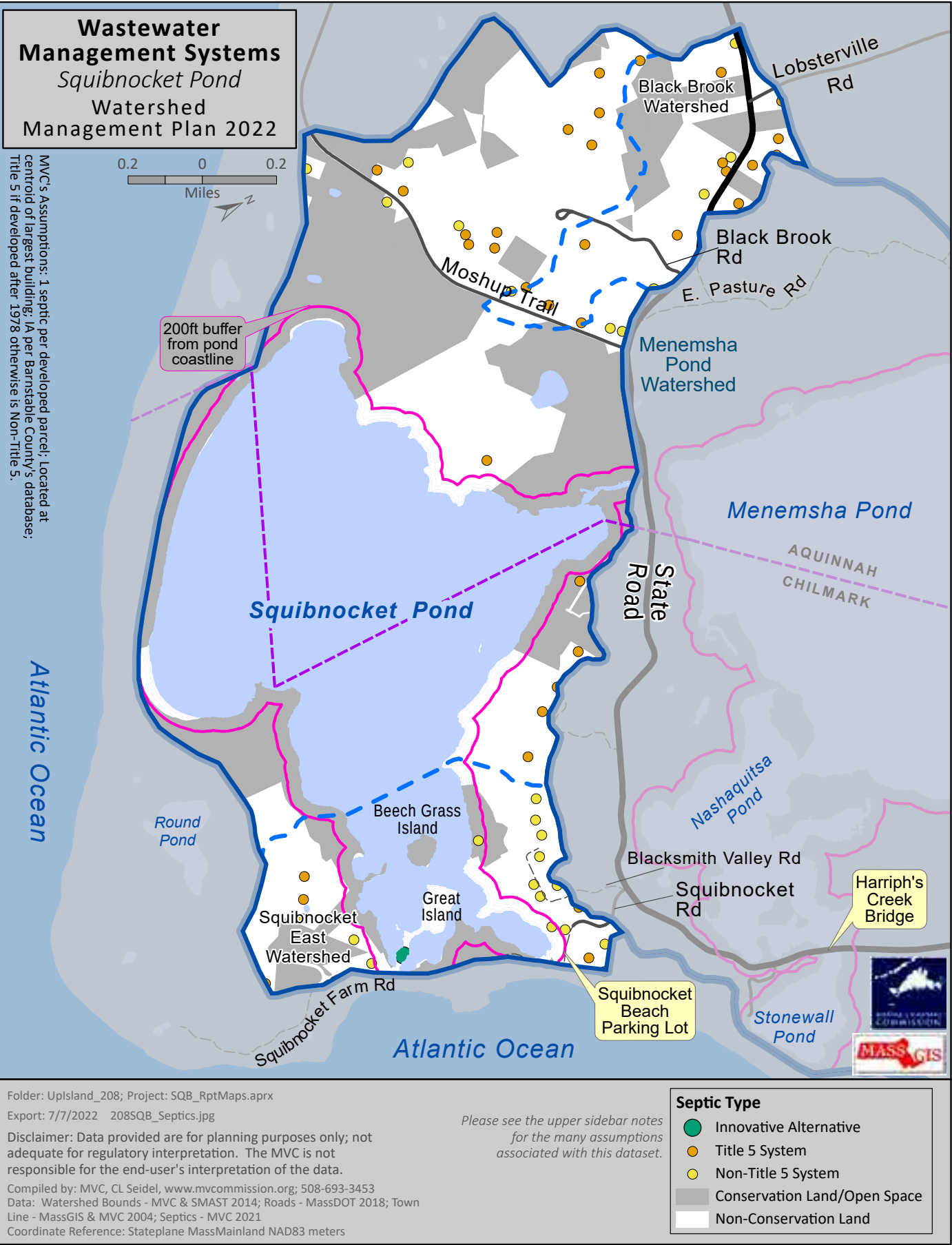
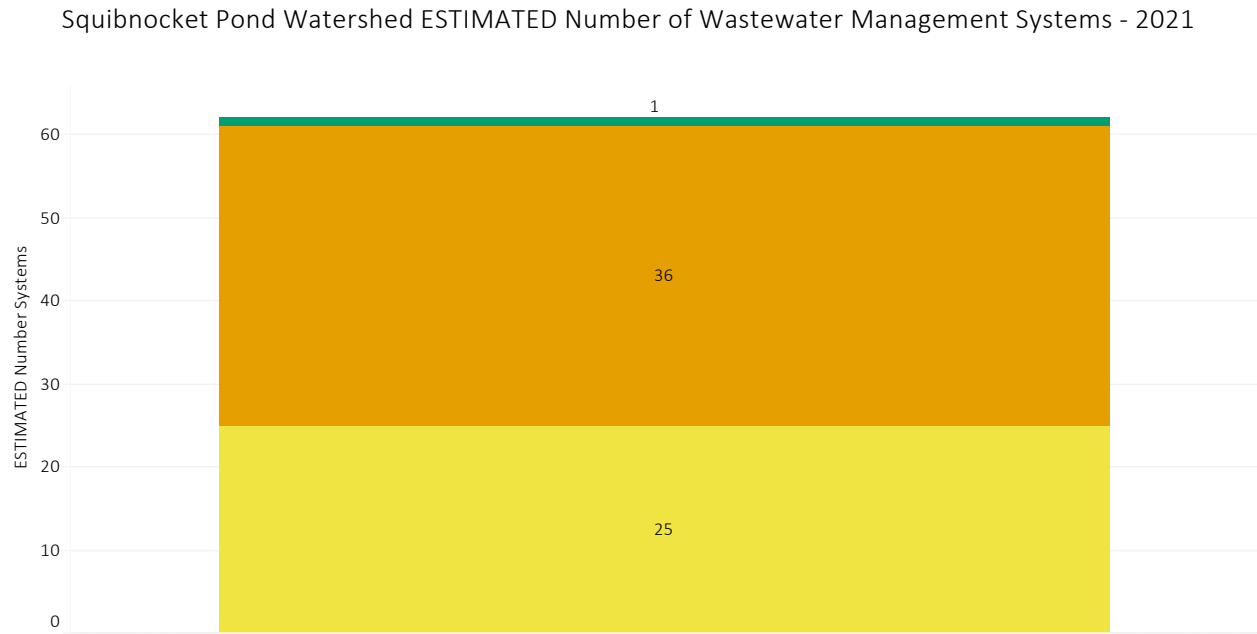


Figure. 27. Wastewater Management Systems in Squibnocket Pond Map

| Sub-embayment                                                                                                                                                                                                                                                                                                   | Present Load (kg/year) | Threshold Load (kg/year) | Threshold % Change |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------|--------------------|
| Black Brook                                                                                                                                                                                                                                                                                                     | 117.5                  | 120.5                    | 3%                 |
| Squibnocket East                                                                                                                                                                                                                                                                                                | 182.5                  | 182.5                    | 0%                 |
| Squibnocket West                                                                                                                                                                                                                                                                                                | 456.3                  | 295.7                    | -35%               |
| <b>System Total</b>                                                                                                                                                                                                                                                                                             | <b>756.2</b>           | <b>598.6</b>             | <b>-21%</b>        |
| *Comparison of sub-embayment watershed <b>septic</b> loads (attenuated) used for modeling of present and threshold loading scenarios of the Squibnocket System. These loads do not include direct atmospheric deposition (onto the sub-embayment surface) or benthic flux, runoff, or fertilizer loading terms. |                        |                          |                    |
| ** Information published in Table VIII-2 (Page 174) of the Squibnocket Pond Embayment System Massachusetts Estuaries Project Report (2017).                                                                                                                                                                     |                        |                          |                    |
|                                                                                                                                                                                                                                                                                                                 |                        |                          |                    |

*Table 8. Squibnocket Pond Total SEPTIC Nitrogen Load  
Reductions Required to Achieve Nitrogen Threshold (TMDL)*



APPENDIX J:

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

|                        |                  | Percent of Total Area (acres) | Area (acres) |
|------------------------|------------------|-------------------------------|--------------|
| Available              | Black Brook      | 29.64%                        | 52           |
|                        | Squibnocket East | 12.22%                        | 23           |
|                        | Squibnocket Pond | 12.97%                        | 94           |
|                        | Total            | 15.52%                        | 169          |
| Potentially Available  | Black Brook      | 26.20%                        | 46           |
|                        | Squibnocket East | 4.98%                         | 10           |
|                        | Squibnocket Pond | 11.82%                        | 86           |
|                        | Total            | 12.93%                        | 141          |
| Fully Developed        | Black Brook      | 16.84%                        | 29           |
|                        | Squibnocket East | 53.62%                        | 103          |
|                        | Squibnocket Pond | 15.91%                        | 115          |
|                        | Total            | 22.69%                        | 247          |
| Conserved              | Black Brook      | 27.07%                        | 47           |
|                        | Squibnocket East | 29.11%                        | 56           |
|                        | Squibnocket Pond | 59.27%                        | 429          |
|                        | Total            | 48.80%                        | 532          |
| Vacant Not Developable | Black Brook      | 0.25%                         | 0            |
|                        | Squibnocket East | 0.08%                         | 0            |
|                        | Squibnocket Pond | 0.02%                         | 0            |
|                        | Total            | 0.07%                         | 1            |
| Grand Total            |                  | 100.00%                       | 1,090        |

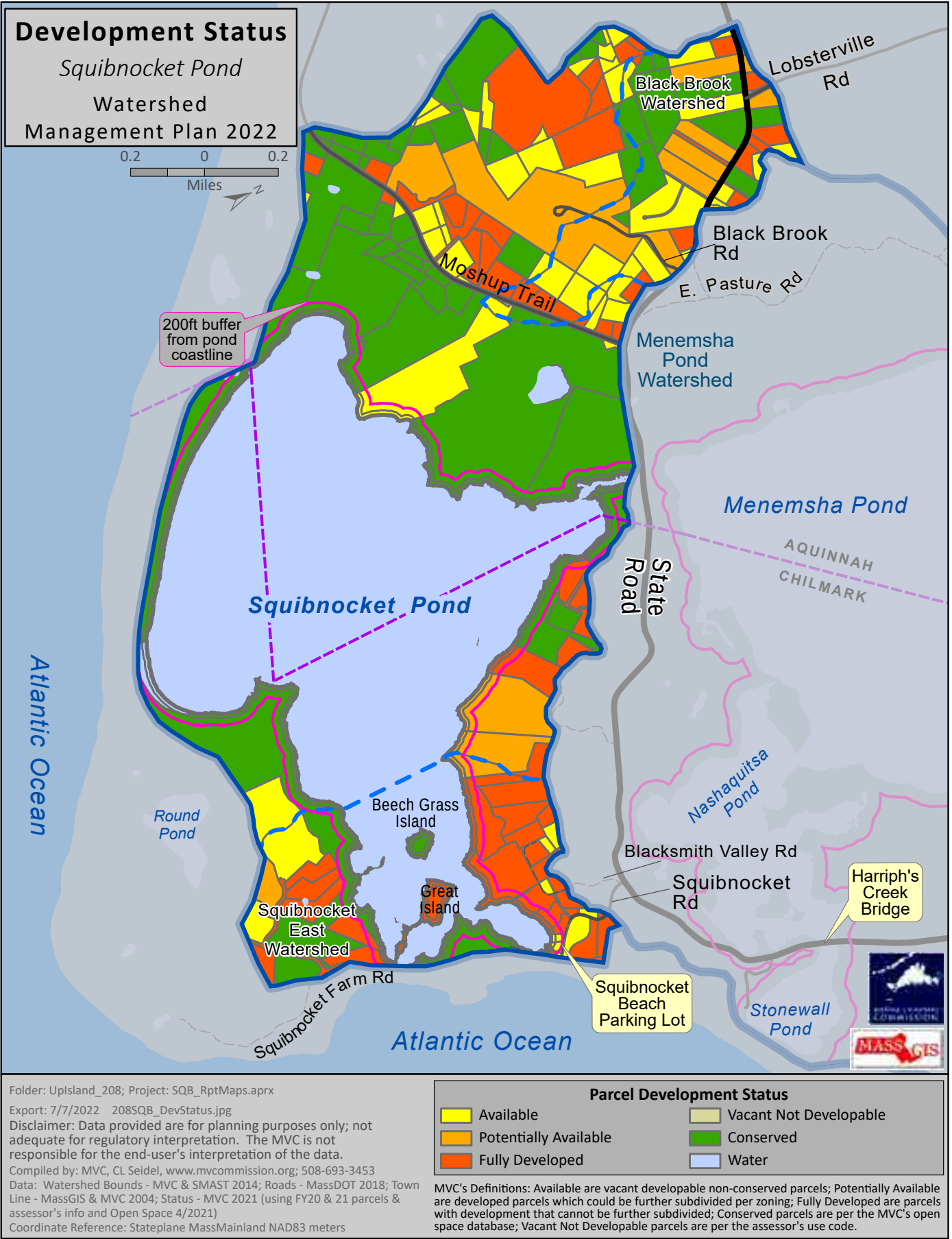


Figure 28. Squibnocket Pond Development Status Map

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

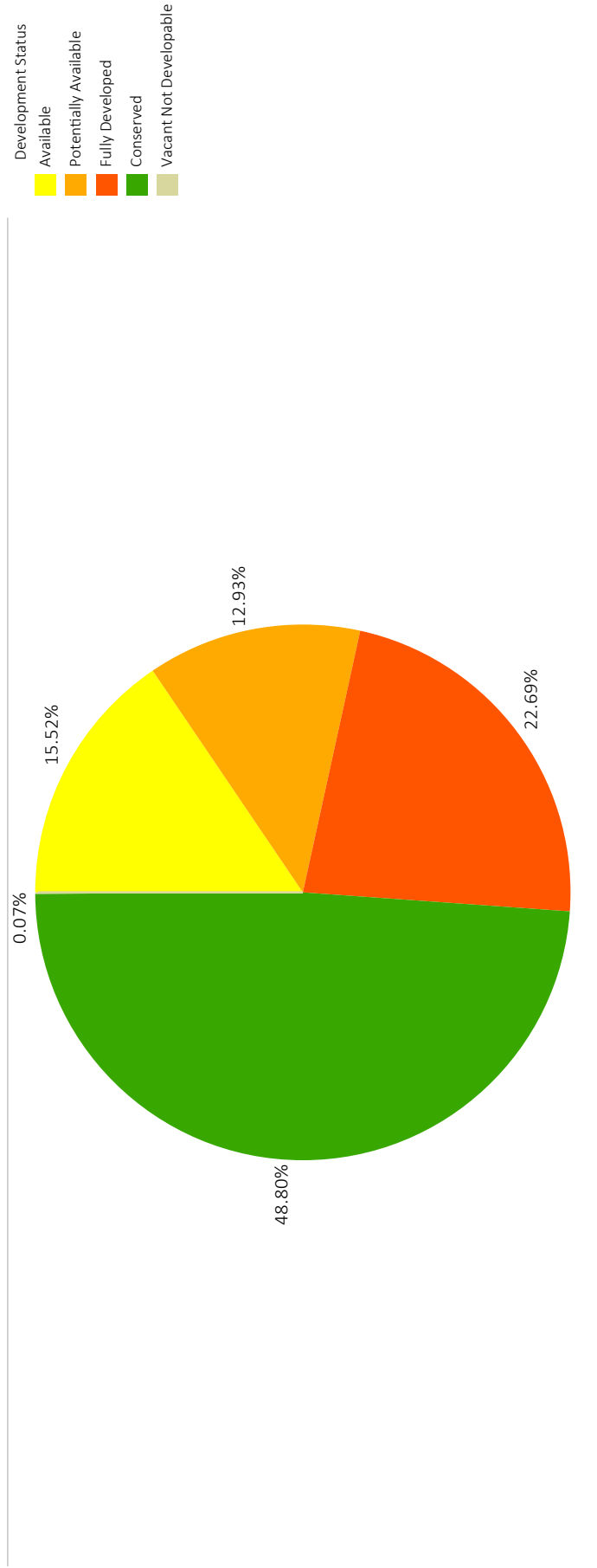


Figure 29. Squibnocket Pond Watershed Development Status/Land Availability

Squibnocket Pond Sub-watershed Development Status (% of total acres) - 2021

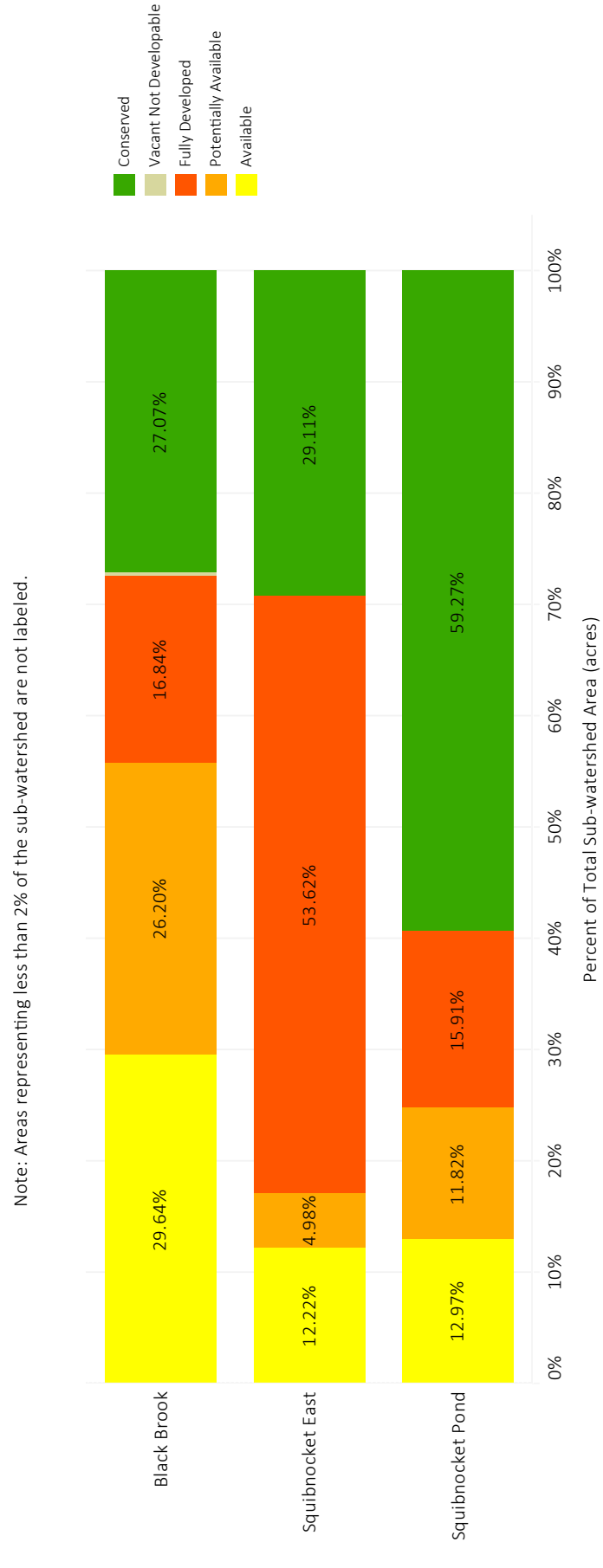


Figure 30. Development Status/Land Availability for Squibnocket Pond Sub-watershed

APPENDIX K:

Squibnocket Pond Watershed Existing Building Density  
(Number of Existing Buildings/Acre) - 2021

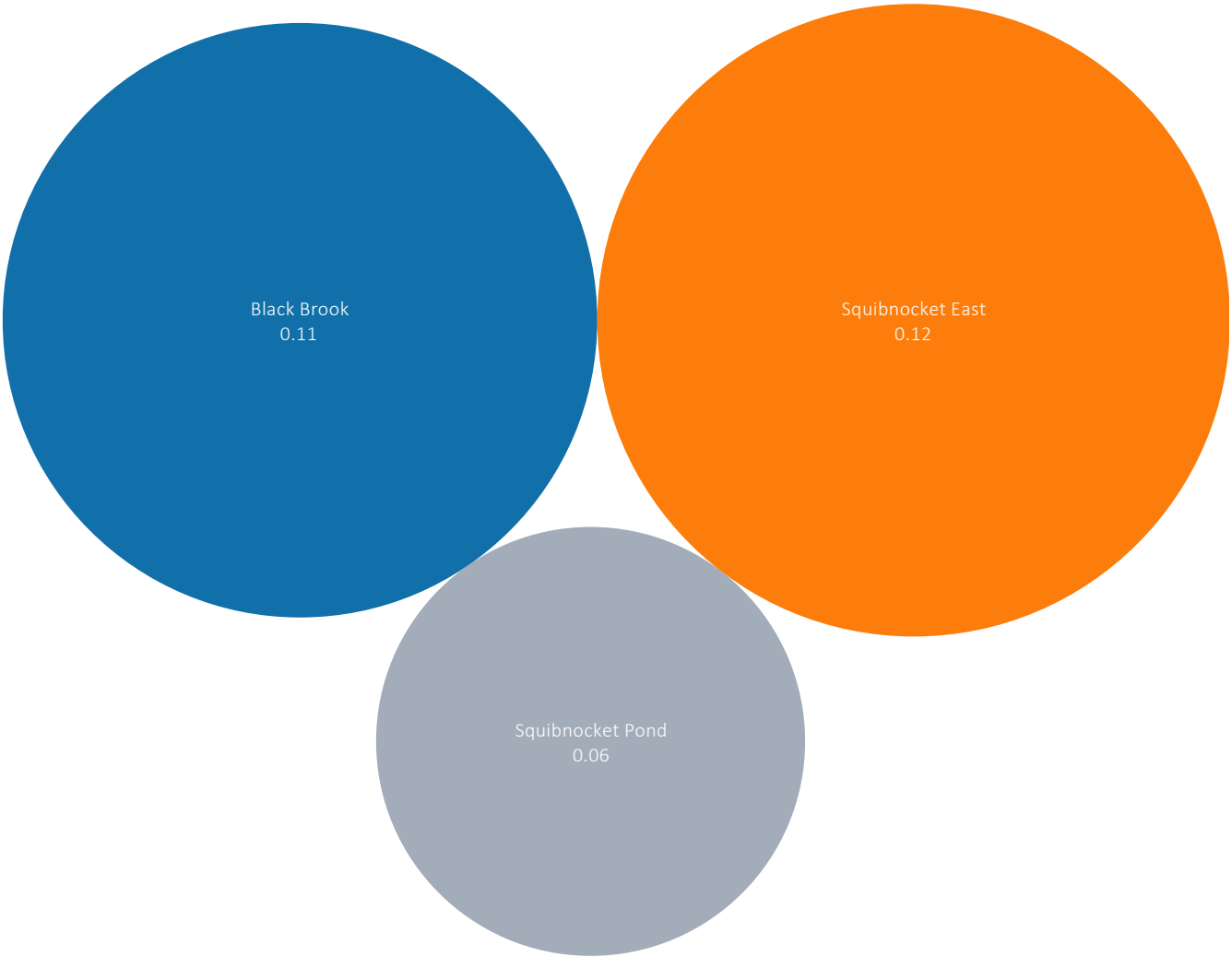


Figure 31. Existing Building Density (# Existing Buildings/Acres)

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

|                  | # of Existing Buildings | Max. Potential # of Buildings | Existing Building Density |
|------------------|-------------------------|-------------------------------|---------------------------|
| Black Brook      | 19.0                    | 27                            | 0.11                      |
| Squibnocket East | 33.0                    | 12                            | 0.12                      |
| Squibnocket Pond | 72.0                    | 89                            | 0.06                      |
| Grand Total      | 124.0                   | 128                           | 0.07                      |

Squibnocket Pond Sub-watershed Existing and Potential Future Buildings - 2021

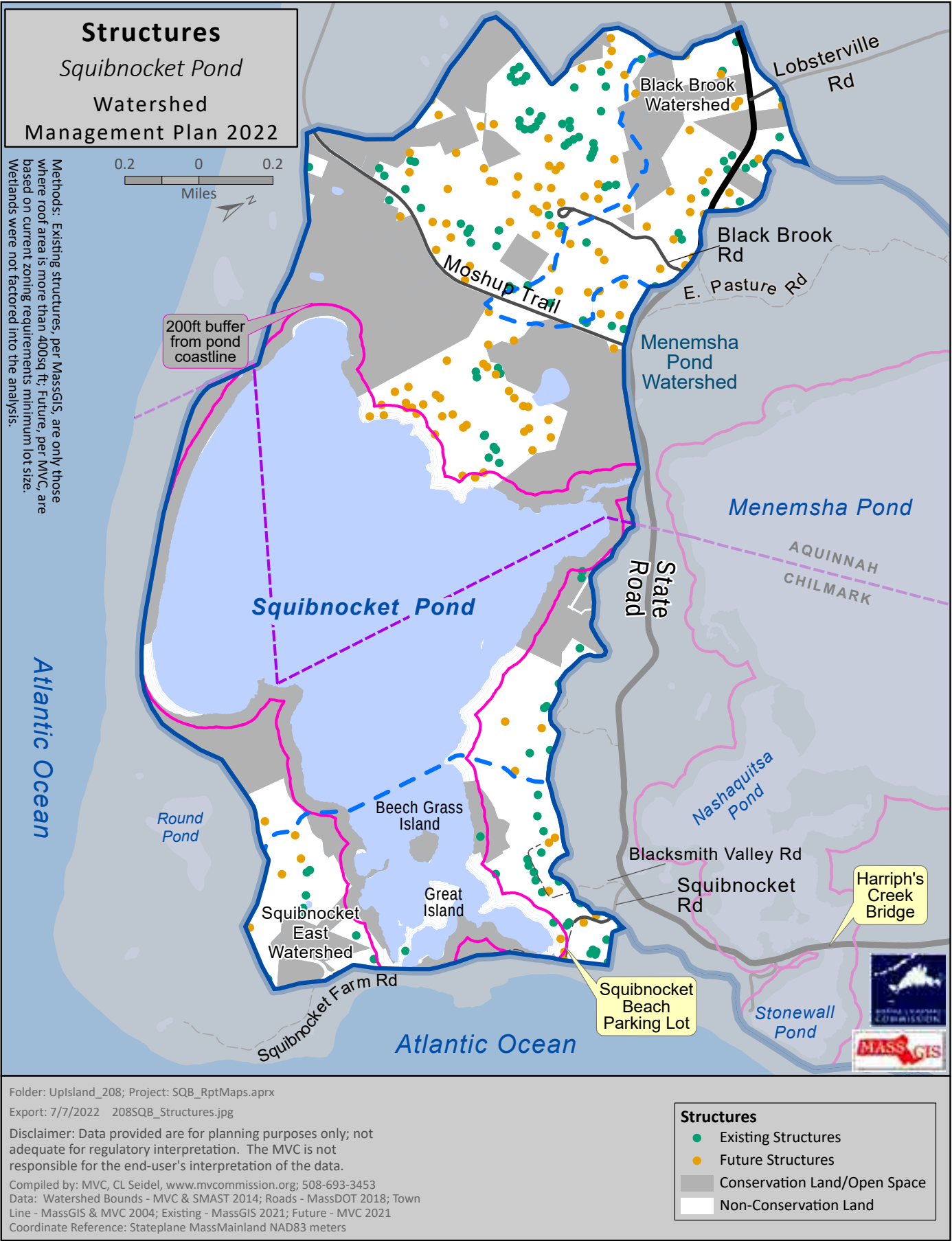


Figure 32. Existing and Potential Structures in Squibnocket Pond Watershed

|                                | Cattle | Equines | Pigs | Sheep | Goats | Poultry | Total |
|--------------------------------|--------|---------|------|-------|-------|---------|-------|
| 2017 MEP Survey                | 0      | 0       | 0    | 0     | 0     | 0       | 0     |
| 2021 Town Survey               | 0      | 0       | 0    | 15    | 0     | 0       | 15    |
| Percent Change                 | 0%     | 0%      | 0%   | 100%  | 0%    | 0%      | 0%    |
| Nitrogen Load Change (kg/year) | 0      | 0       | 0    | 43.8  | 0     | 0       | 0     |

*Table 9. Animal Count (2017 &2021) for the Squibnocket Pond Watershed*



APPENDIX L:

Squibnocket Pond Sub-watershed Conservation Land (Legal Restriction Category) - 2021 Table

|                  |                    | Percent of Total Sub-watershed Area (acres) | Area (acres) |
|------------------|--------------------|---------------------------------------------|--------------|
| Black Brook      | Perpetuity         | 18.43%                                      | 32           |
|                  | Unknown Protection | 7.60%                                       | 13           |
|                  | Non-Conserved Land | 73.98%                                      | 130          |
|                  | Total              | 100.00%                                     | 175          |
| Squibnocket East | Perpetuity         | 24.34%                                      | 65           |
|                  | Limited/Temporary  | 0.06%                                       | 0            |
|                  | Non-Conserved Land | 75.61%                                      | 203          |
|                  | Total              | 100.00%                                     | 269          |
| Squibnocket Pond | Perpetuity         | 28.82%                                      | 368          |
|                  | Unknown Protection | 1.20%                                       | 15           |
|                  | Non-Conserved Land | 69.98%                                      | 893          |
|                  | Total              | 100.00%                                     | 1,276        |
| Grand Total      |                    | 100.00%                                     | 1,720        |

Squibnocket Pond Sub-watershed Conservation Land (Legal Restriction Category) - 2021

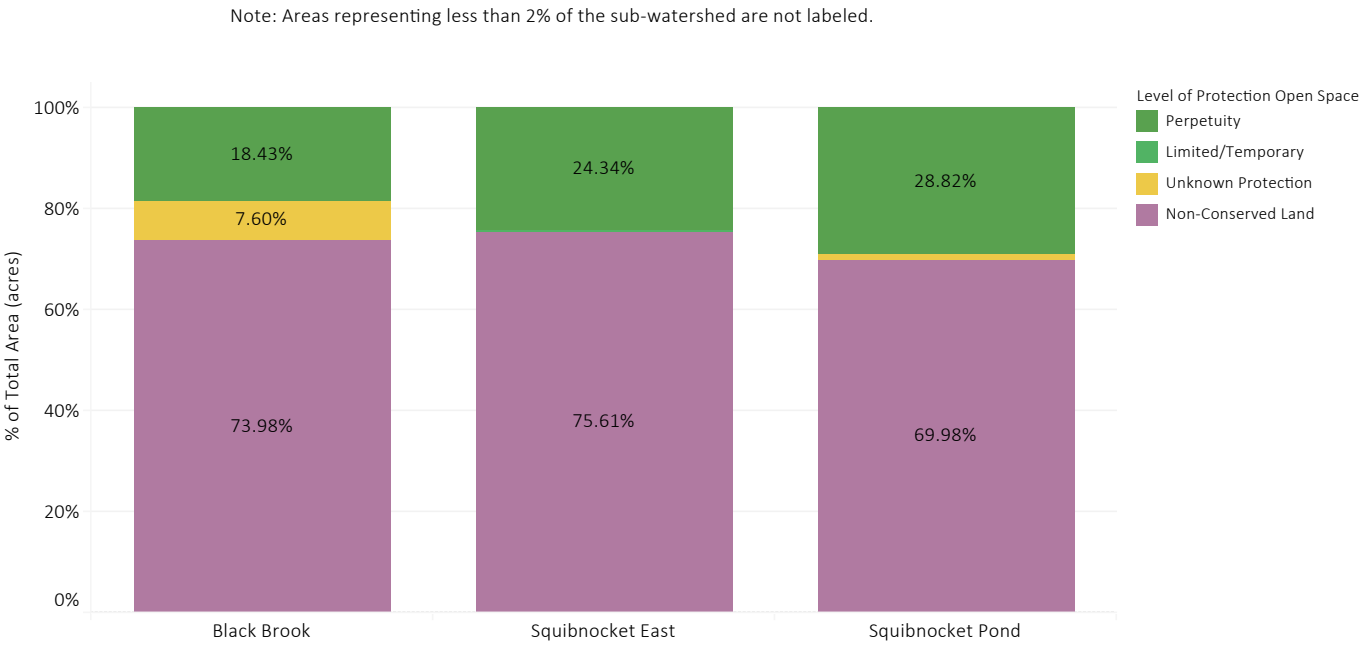


Figure 34. Legal Restrictions for Conservation Land in Squibnocket Pond

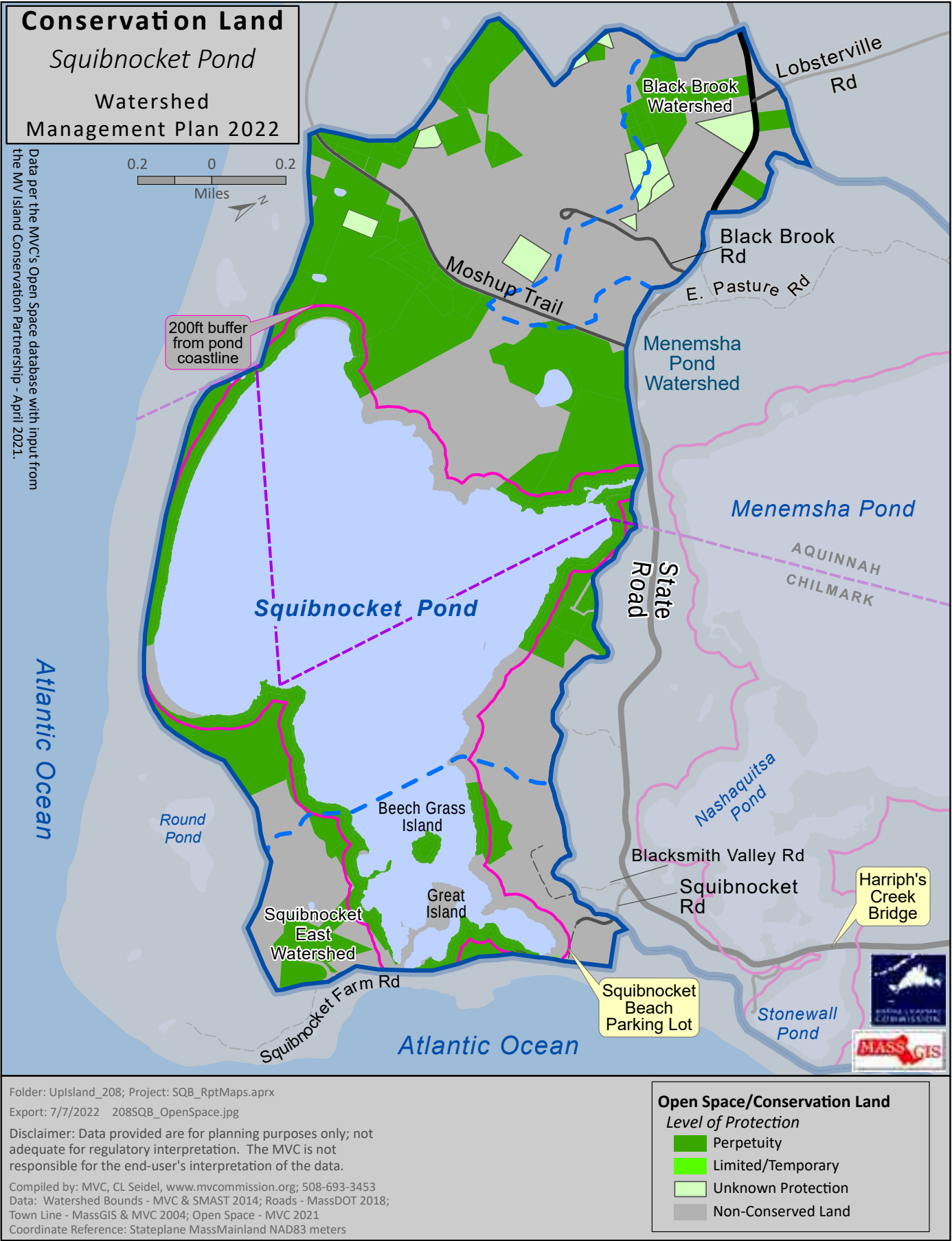


Figure 33. Squibnocket Pond Watershed Conservation Land Map

APPENDIX M

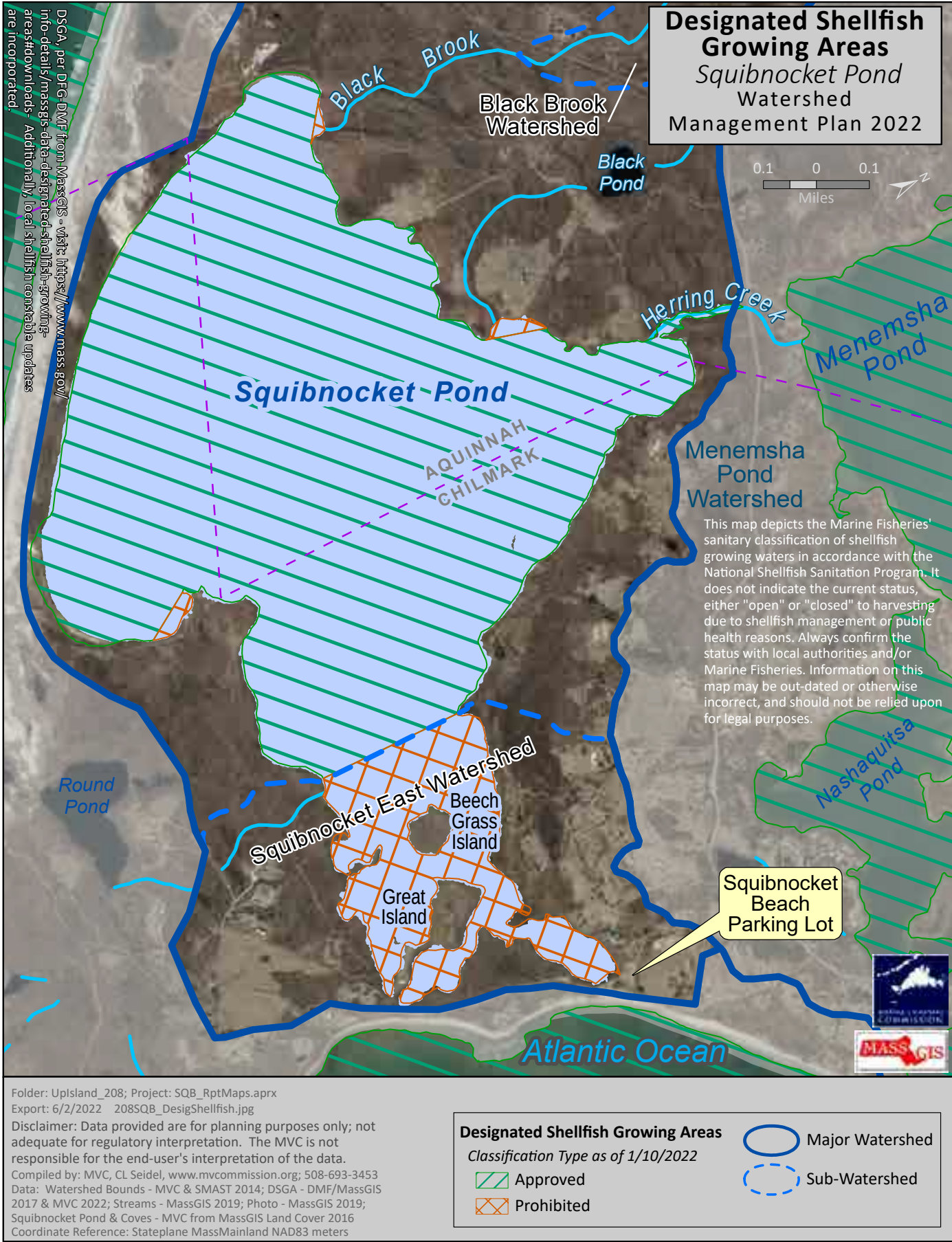


Figure 35. Squibnocket Pond Designated Shellfish Harvest Area