

# I'M in HULL... & GOING to PEDDOCKS

An interdisciplinary Field-Based Unit  
in Ecology  
*Hull High School*  
180 Main St  
Hull, MA 02045



(Aerial photo © MassGIS, 2007)

A unit developed for  
*Approaching Walden, Summer 2015*  
By Sheila Blair

**Abstract**

*I'm in Hull... & Going to Peddocks* is a unit designed for the Ecology of Hull course taught at Hull High School. This course is a one semester, 11<sup>th</sup> and 12<sup>th</sup> grade, field-based science elective course that examines the socioecological system of our town, Hull, MA. Students study the biological, physical, and cultural relationships within the various ecosystems that make up our peninsula.

*I'm in Hull... & Going to Peddocks* is an interdisciplinary unit that consists of science, health/physical education, history, ELA (reading and writing), and art lessons conducted on Peddocks Island in Hull. During this unit, students row to Peddocks Island on two separate days, and examine the cultural and ecological community of the island. Each lesson within this unit was inspired by the field experiences of the *Approaching Walden, 2015* program, and by Henry David Thoreau's love of exploration within his own local town of Concord, MA.

**Hull, MA**

Hull, MA is a small peninsula, seven miles long and one mile wide, that juts into Massachusetts Bay of the Atlantic Ocean. It is the southern border to Boston Harbor and is surrounded by the Boston Harbor Islands. It is the smallest town by land area in Plymouth County, and is the fourth smallest town in the state; however, its population density is within the top thirty towns in Massachusetts (World Media Group, LLC, 2013).

Hull High School is located at the tip of the peninsula in the northernmost region of Hull, called Pemberton or Windmill Point. Situated under one of two wind turbines in our town, Hull High School is located across the street from the busiest search and rescue Coast Guard station in New England (United States Coast Guard, 2013). Directly surrounding the school building is the rocky coast, open Atlantic Ocean, and Hull bay. Views from our classroom window include the Boston city skyline, and several Boston Harbor Islands—one of which is Little Brewster Island, home to Boston Light, which is the oldest lighthouse in the country. Across the street from the high school is Pemberton Pier, from which residents and tourists swim, fish, and take the 20 minute ferry boat ride to Boston, and the Windmill Point Boathouse—site of the Hull Lifesaving Museum's Rowing Program. Directly North of the high school, across Hull Gut, is Peddocks Island.

The Hull peninsula consists of nine hills. The two southernmost hills are composed of volcanic rock created 600 million years ago, and the remaining seven hills are a string of drumlins (hills made of glacial till) formed by the retreat of the last glacier 14,000 years ago, connected by tombolos (tying sandbars). According to geologist D. DePaor, "The volcanic formations in Hull are rare. If there were no houses here, this would be a national park" (personal communication, December 5, 2013). The two northernmost hills enclose historic Hull Village, in which major elements of American history are represented. The Village, an almost island in the heart of Boston Harbor, holds stories from its past as a Native American encampment, a colonial settlement, and a Victorian resort. One of the Village's two enclosing hills, Telegraph Hill, was a lookout for lifesavers and telegraph operators signaling the arrival of ships to Boston merchants. Atop Telegraph Hill, overlooking Boston Harbor, stands Fort Revere, which was used during the American Revolution, the Spanish-American War, and World Wars I and II as a front line of defense for American and foreign troops (Town of Hull, MA, n.d., Fort Revere Preservation Committee section). Fort Revere should be a treasured historical feature in our town, but instead it is plagued by neglect, multiple ownership, graffiti, and vandalism.

Hull has a variety of ecosystems, which include three mile long, sandy Nantasket Beach (and several other beaches); Hull and Hingham Bays; the Weir River Estuary; a salt marsh; the Weir River Woods (a coastal forest); Straits Pond (salt pond); the Atlantic ocean; and rocky coast.

Our school principal, M. Devine, wrote the following about the town of Hull and our high school in an application for the US Department of Education 2012 National Blue Ribbon Award:

Although the community is rich in natural beauty, maritime history, and civic pride, there are some challenges. Hull was once the summer playground of the affluent. It is now a densely populated peninsula with few of the growth opportunities that larger communities enjoy. It has been said that Hull High School is a suburban school with urban problems. Some of its students deal with issues such as poverty, homelessness, addiction, and low expectations at home. Like many towns, Hull has struggled in these tough economic times, but despite this and thanks to the efforts of the entire school community, Hull High School continues to thrive and improve (p. 8).

According to local environmentalist and educator, J. Van Hamm, "Hull is a mixed income community that has been searching for a strong, positive image. It is in many ways culturally isolated, which gives it both a unique personality and a challenge in educating its students. At the same time, the town has a rich history and unique ecology, which offers a source of pride and a remarkable educational resource" (personal communication, August 6, 2013).

### **The Unit—*I'm in Hull...& Going to Peddocks***

This unit consists of six lessons:

Lesson 1 – Pulling Together: Open Water Rowing (Health/Physical Education)

Lesson 2 – Rock and Roll (Geology)

Lesson 3 – Masters of the Marsh (Salt Marsh Ecology)

Lesson 4 – Succession of Fort Andrews (Ecology)

Lesson 5 – A Living History (History)

Lesson 6 – Tiptoe through the Tidepools (Biology)

Each lesson consists of the following: Description, Theme, Objectives, Pre-Visit/Preparation, Materials, Lessons and Events, and Post-Visit/Follow-Up.

Most reading materials and hand-outs are included within each lesson. Large files are included as appendices. PDF files are included as links to websites.

Prior to completing this unit, students will receive a letter home (included below), and a permission slip which must be signed by parent/guardian, and returned in order to participate in the field experience. Additionally, a \$10.00 fee is requested to cover the cost of the activities led by the Hull Lifesaving Museum and the Massachusetts Department of Conservation and Recreation. Funding is available from the Hull Parent Teacher Organization and Hull Boosters Club for students who require financial assistance.

### **Length of Unit**

Two weeks:

- Two separate, seven hour school days – Peddocks Island Visits.
- Four 52 minute class periods for Pre-Visit Activities and Preparation.
- Four 52 minute class periods for Post-Visit and Follow-Up Activities.

### Unit Objectives

- To offer an opportunity for students to learn about the natural and cultural history of Peddocks Island through field experiences.
- To collaborate with, and introduce students to, the Hull Lifesaving Museum (HLM) for future rowing, educational, community service, and/or career opportunities.
- To introduce students to the Harbor Community— Massachusetts Department of Conservation and Recreation (Mass DCR)—for future educational, community service, and/or career opportunities,
- To offer an opportunity for students to learn about and experience the joy and benefits of rowing on the open ocean.
- To enhance the Ecology of Hull curriculum with the addition of a bioregional field experience.

### Unit Standards

The following Common Core and State Standards are supported by this unit:

#### **From the Common Core Standards (2015):**

##### Reading Standards for Literacy in Science, Grades 11-12

1. Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.
2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
5. Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
6. Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.
7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.
8. Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

##### Writing Standards for Literacy in Science, Grades 11-12

1. Write arguments focused on discipline-specific content.
5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
9. Draw evidence from informational texts to support analysis, reflection, and research (Common Core State Standards Initiative, 2015, Science & Technical Subjects; Grade 11-12 sect., para. 1-10).

#### **From the Massachusetts Science and Technology/Engineering Curriculum Framework (2006):**

High School (grades 9-12) Standards

##### Scientific Inquiry Skills

- SIS1. Make observations, raise questions, and formulate hypotheses.  
 SIS2. Design and conduct scientific investigations.  
 SIS3. Analyze and interpret results of scientific investigations.  
 SIS4. Communicate and apply the results of scientific investigations.

*Earth and Space Science (High School)*

- 1.7. Explain the dynamics of oceanic currents, including upwelling, deep-water currents, the Labrador Current and the Gulf Stream, and their relationship to global circulation within the marine environment and climate.
- 3.1. Explain how physical and chemical weathering leads to erosion and the formation of soils and sediments, and creates various types of landscapes. Give examples that show the effects of physical and chemical weathering on the environment.
- 3.6. Describe the rock cycle, and the processes that are responsible for the formation of igneous, sedimentary, and metamorphic rocks. Compare the physical properties of these rock types and the physical properties of common rock-forming minerals.
- 3.7. Describe the absolute and relative dating methods used to measure geologic time, such as index fossils, radioactive dating, law of superposition, and crosscutting relationships.
- 3.8. Trace the development of a lithospheric plate from its growth at a divergent boundary (mid-ocean ridge) to its destruction at a convergent boundary (subduction zone). Recognize that alternating magnetic polarity is recorded in rock at mid-ocean ridges.

*Biology (High School)*

1. The Chemistry of Life Central Concept: Chemical elements form organic molecules that interact to perform the basic functions of life.
- 2.2 Compare and contrast, at the cellular level, the general structures and degrees of complexity of prokaryotes and eukaryotes.
- 2.3. Use cellular evidence (e.g., cell structure, cell number, cell reproduction) and modes of nutrition to describe the six kingdoms (Archaeobacteria, Eubacteria, Protista, Fungi, Plantae, Animalia).
- 2.4. Identify the reactants, products, and basic purposes of photosynthesis and cellular respiration. Explain the interrelated nature of photosynthesis and cellular respiration in the cells of photosynthetic organisms.
- 2.7. Describe how the process of meiosis results in the formation of haploid cells. Explain the importance of this process in sexual reproduction, and how gametes form diploid zygotes in the process of fertilization.
- 3.3. Explain how mutations in the DNA sequence of a gene may or may not result in phenotypic change in an organism. Explain how mutations in gametes may result in phenotypic changes in offspring.
- 4.8. Recognize that the body's systems interact to maintain homeostasis. Describe the basic function of a physiological feedback loop.
- 5.1. Explain how evolution is demonstrated by evidence from the fossil record, comparative anatomy, genetics, molecular biology, and examples of natural selection.
- 5.2. Describe species as reproductively distinct groups of organisms. Recognize that species are further classified into a hierarchical taxonomic system (kingdom, phylum, class, order, family, genus, species) based on morphological, behavioral, and molecular similarities. Describe the role that geographic isolation can play in speciation.
- 5.3. Explain how evolution through natural selection can result in changes in biodiversity through the increase or decrease of genetic diversity within a population.
- 6.1. Explain how birth, death, immigration, and emigration influence population size.
- 6.2. Analyze changes in population size and biodiversity (speciation and extinction) that result from the following: natural causes, changes in climate, human activity, and the introduction of invasive, non-native species.
- 6.3. Use a food web to identify and distinguish producers, consumers, and decomposers, and explain the transfer of energy through trophic levels. Describe how relationships among organisms (predation, parasitism, competition, commensalism, mutualism) add to the complexity of biological communities.
- 6.4. Explain how water, carbon, and nitrogen cycle between abiotic resources and organic matter in an ecosystem, and how oxygen cycles through photosynthesis and respiration.

(Massachusetts Department of Education, 2006, p. 34-58).

**From the Massachusetts Comprehensive Health Curriculum Framework (1999):**

*By the end of grade 12 students will:*

- 2.17. Demonstrate developmentally appropriate competence (basic skills, strategies, and rules) in many and proficiency in a few movement forms and motor skills (team sports, aquatics, individual/dual sports, outdoor pursuits, self-defense, dance, and gymnastics).
- 2.20. Demonstrate exercises in strength training, cardiovascular activities, and flexibility training.
- 2.26. Apply safe practices, rules, procedures, and sportsmanship etiquette in physical activity settings, including how to anticipate potentially dangerous consequences and outcomes of participation in physical activity.
- 2.27. Define the functions of leadership in team sports (increasing motivation, efficiency, and satisfaction).

5.19. Explain positive techniques for handling difficult decisions.

13a. (Law & Policy. Connects with History & Social Science: Geography) Identify the reciprocal relationships among social and economic factors and practices and ecological health

(Massachusetts Department of Education, 1999a, p. 22-43).

**From Massachusetts History and Social Science Curriculum Framework (2003):**

*Concepts and Skills, Grades 8-12:*

3. Interpret and construct timelines that show how events and eras in various parts of the world are related to one another.

4. Interpret and construct charts and graphs that show quantitative information.

5. Explain how a cause and effect relationship is different from a sequence or correlation.

6. Distinguish between long-term and short-term cause and effect relationships.

7. Show connections, causal and otherwise, between particular historical events and ideas

8. Interpret the past within its own historical context rather than in terms of present-day

9. Distinguish intended from unintended consequences.

10. Distinguish between historical fact from opinion

(Massachusetts Department of Education, 2003, p. 49-80).

**From Massachusetts Arts Curriculum Framework (1999):**

PreK–12 STANDARD 6: History, Criticism, Purposes and Meanings in the Arts and Links to Other Disciplines

Students will describe the purposes for which works of dance, music, theatre, visual arts, and architecture were and are created, and, when appropriate, interpret their meanings. Students learn about the history and criticism of visual arts.

PreK–12 STANDARD 7: Architecture, their role in the community, and their Roles of Artists in Communities links to other disciplines.

1.17. Demonstrate an increased ability to work effectively alone and collaboratively with a partner or in an ensemble.

1.20. Demonstrate sensitivity to audience response.

1.11. Explore a single subject through a series of works, varying the medium or technique For example, a student makes a drawing, woodcut, and painting of a still life, landscape, or figure.

3.8. Create representational 2D artwork from direct observation and from grades 9–12 memory that convincingly portrays 3D space and the objects and people within that space.

(Massachusetts Department of Education, 1999b, p. 71-145).

**Sample Letter**

September 3, 2015

Dear Parents/Guardians,

On \_\_\_\_\_ & \_\_\_\_\_ (dates TBD) students in the Ecology of Hull course will row to Peddocks Island to explore the island's ecology and cultural history. This field experience will be led by four faculty members from the high school (myself included), and staff members from the Hull Lifesaving Museum (HLM) and Massachusetts Department of Conservation and Recreation (DCR). It will take place during two separate full school days.

The following lessons will be conducted:

Lesson 1 – Pulling Together: Open Water Rowing (Health/Physical Education)

Lesson 2 – Rock and Roll (Geology)

Lesson 3 – Masters of the Marsh (Salt Marsh Ecology)

Lesson 4 – Succession of Fort Andrews (Ecology)

Lesson 5 – A Living History (History)

Lesson 6 – Tiptoe through the Tidepools (Biology)

**When:** All day, periods A-G, from 7:25am to 2:20pm, on \_\_\_\_\_ and \_\_\_\_\_ (TBD). This trip will take place on two separate full days of school.

**What and Where:** Rowing from HLM Windmill Point Boathouse across from high school to Peddocks Island. Field experiences will include walking to specific sites on the island. Students will meet in my room, C117, at the start of the school day, and we will walk to the boathouse.

**Proper Dress:** Old, outdoorsy clothes. Layers. Hat. Comfortable walking/hiking shoes. Rain gear, if necessary. Boots will be provided.

**What to Bring:** Back pack with: journal, pen and/or pencil, water bottle, sunscreen. Optional: binoculars, camera.

**Lunch:** Lunch will be provided.

**Cost:** \$10.00 per student. Please contact me if cost is an issue. Funding is available.

**In order to attend this event on two separate school days, students must turn in the following by \_\_\_\_\_ (date TBD):**

- 1) A completed and signed Parental/Student Consent Release Form.
- 2) A completed Field Trip Form signed by parent/guardian and the student's period B-G teachers.
- 3) \$10.00.

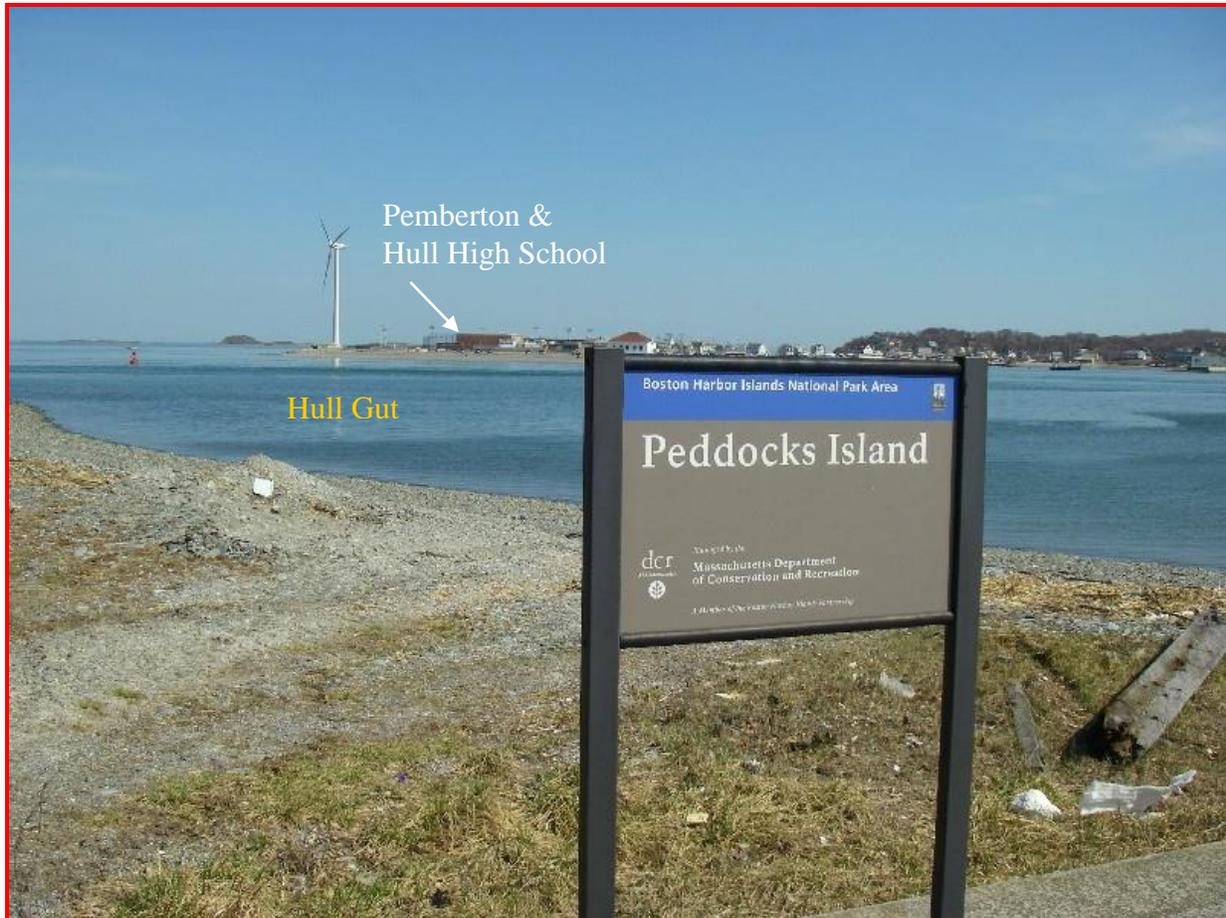
**Please feel free to contact me with any questions, comments, or concerns regarding this event.**

Sincerely,

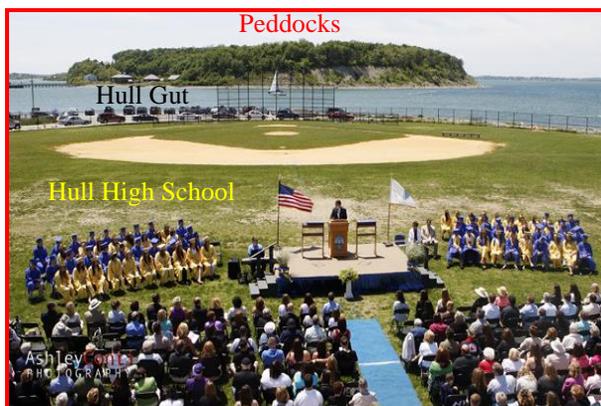
Sheila Blair

### Peddocks Island

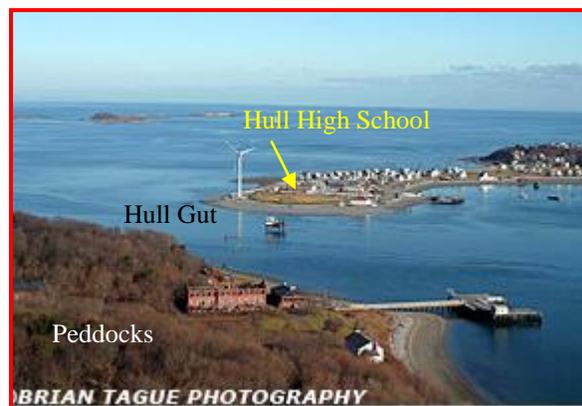
Peddocks Island, Hull, MA is located across Hull Gut from the Pemberton neighborhood of Hull and Hull High School. It is the closest of the Boston Harbor Islands to our school.



(Norm, 2010).



(Conti, 2011).



(Tague, n.d.)

At 184 acres, Peddocks is one of the largest, most diverse islands in the harbor. With the longest shoreline of any harbor island, Peddocks is composed of four headlands, connected by sand or gravel bars called tombolos. Total acreage at low tide is 288 (National Park Service, 2015, Island Facts: Peddocks Island sect., para. 2).

### **Description of Peddocks Island**

Peddocks Island is comprised of five drumlin hills connected by low lying sand flats known as tombolos. The island has four distinct sections: East Head, where the remains of Fort Andrews are found; Middle Hill, which is the location of the old Portuguese fishing village and the current summer cottagers; West Head, which is comprised of a Bird Sanctuary, brackish pond, and a salt marsh; and Prince's Head, which has eroded to having shear sides (Damstra, 2005, p. 2).

The history of Peddocks Island is one of community and challenges. Going back to before the first Europeans arrived in the Boston area, Peddocks was used over the summer by the Native American's of the area as a fishing location. During the first two hundred years after European settlement, most of the Harbor Islands were used by the settlers as pasture land. Beginning in the later part of the nineteenth century, public recreation of the islands became more prominent. Summer Residents and Inn's appeared on Peddocks Island, joining the Portuguese Fishermen that were tenants-at-will of the Andrews' Estate, who owned Peddocks at the time. Beginning in 1898, the United States Army purchased East Head from the Andrews' Estate for the construction of Fort Andrews (named for George Leonard Andrews, the Major General of Volunteers for the US Army during the Civil War) (Damstra, 2005, p. 2).

Throughout the first half of the twentieth century, Peddocks was home to three distinct, yet interconnected communities; the military community of Fort Andrews, the year-round residents of the Portuguese fishing village, and the summer cottagers. Today, the military community is gone, having left with the closure of Fort Andrews; the year-round resident community is extremely small, with one to three year round residents; the summer cottage community is still there; and there is a new community of park visitors that has been steadily growing since the creation of the Boston Harbor Islands State Park in 1970. Each community has their own level of connection the island; they each interact differently and have to overcome different challenges; however they all share a strong connection to Peddocks, and each has their own story (Damstra, 2005, p. 2).

Peddocks features a new pier and hiking trails that pass a marsh, a pond and coastal forests. These varied environments allow visitors to experience a wide range of natural beauty. Since the mid-1990s renewable energy has been highlighted with photovoltaic installations on the island (National Park Service, 2015, Island Facts: Peddocks Island sect., para. 3).

### **Short History**

Used by farmers since 1634, Peddocks Island's proximity to the mainland ensured its prominent military role. Said to be the site of a patriot infantrymen's raid on a Loyalist farm, Peddocks also saw over 600 patriot militiamen stationed on the island in 1776, to

guard the harbor against the return of British troops. Home to Fort Andrews and active in harbor defense from 1904 to the end of World War II, 26 structures remain, including guardhouses, prisoner-of-war barracks, stables, a gymnasium and a firehouse. It is also one of the many harbor islands used by American Indians prior to settlement by Europeans (National Park Service, 2015, Island Facts: Peddocks Island sect., para. 4).

[Return to Rock and Roll Lesson](#)

**Lesson 1: Pulling Together (learn to row & row to Peddocks Island)**

(Hull Lifesaving Museum [HLM], 2008a)

**Description**

Students will receive a boating lesson from the staff of the Hull Lifesaving Museum (HLM). After the boating lesson, students will row to Peddocks Island.

**Theme**

Any goal can be accomplished by pulling together and working as a group.

**Objectives**

- To collaborate with, and introduce students to, the Hull Lifesaving Museum for future rowing, educational, community service, and/or career opportunities.
- To introduce students to the joy and benefits of open water rowing—a backyard activity for community members.
- To learn and experience seamanship, teamwork, and open-water voyaging and navigation skills.

**Pre-Visit/Preparation**

- Students will be introduced to the Hull Lifesaving Museum by reading the following from their website:  
The Hull Lifesaving Museum is so much more than a museum. Founded in 1978, we are an essential part of the community that for 36 years has provided not only crucial lessons from our maritime heritage, but also life-changing and sometimes life-saving youth development experiences. Our mission celebrates the lifesaving spirit of Skills, Courage, and Caring, and the relevance of our history to our constituents' daily lives. As one of our region's leading cultural organizations and agents of social change, HLM challenges its participants to draw the best from themselves by combining social services and experiential education with

historical preservation and interpretation (Hull Lifesaving Museum, 2008b, About Us sect., para. 1).

- Students will be introduced to the activity of open water rowing through an informational question and answer session with the staff of the HLM, and videos of the HLM Youth Rowing Program.
- Students participate in a question and answer session regarding the Hull Lifesaving Museum and rowing.

### **Materials**

- All boating equipment will be provided by HLM and teacher.
- Students should bring an extra layer of clothing, hat, boots or old sneakers (boots are available and on-hand as part of the Ecology of Hull course), sunscreen, and water bottle.

### **Lessons & Events**

- Students walk from Hull High School to the HLM Windmill Point Boathouse, across the street from the high school.
- Staff from HLM conduct and demonstrate/model a boating lesson on the types of row boats, boating equipment, physical and emotional rowing safety, and how to row as a team.
- Staff from HLM explains the seaward navigation route from the boathouse to Peddocks Island.
- Teachers from Hull High School and staff from HLM conduct a question and answer session regarding rowing concerns, safety, navigation, and teamwork.
- Students practice rowing in Hull Bay and receive feedback from staff.
- Students row four 8-man pilot-gigs (row boats) to Peddocks Island. Each boat will include one staff member from the HLM and one staff member from Hull High School.

### **Post-Visit / Follow-Up Activity**

#### *Journal Entry/Reflection:*

During the lesson of *Pulling Together*, students will have participated in an adventure activity in which they worked together to accomplish a group goal. At completion, students will write a self-report on their contributions, based upon observations and student performance.

## Lesson 2: Rock and Roll on Peddocks Island

### Description

Students will take a guided walking tour of Peddocks Island led by a Department of Conservation and Recreation staff member, and stops will be made at specific sites. Students will learn about the process by which Boston Harbor Islands were formed by examining evidence on Peddocks Island of the glacial activity that took place over 10,000 years ago. Topography maps will be used to familiarize the students with geographic and landform features. Topics such as glacial erratics, striation, drumlins, tombolos, and erosion will be covered.

### Theme

The landscape of Peddocks Island is constantly changing.

### Objectives

Students will be able to:

- Identify three landscape features and summarize the development of the island.
- Compare and contrast the geologic features and formation of Peddocks to that of Hull.

### Pre-Visit/Preparation

- Prior to this lesson, students will have studied the types of rock found in Hull, the process by which Hull was formed, completed a topographic map of Hull, and identified the major geologic landform features of Hull ([Appendix A](#)). All lessons are contained within student journals.
- Students read the document about Peddocks Island ([pages 8-10](#)) and answer the following questions regarding the island's geology and land formations:
  1. Where is Peddocks Island located in relation to Hull High School?
  2. In what cardinal direction of our town is Hull High School located (North or South)?
  3. How many acres large is Peddocks? Is there a difference of acreage between high and low tide? If so, please explain.
  4. Explain the geologic make-up of Peddocks Island. How is this similar to the geologic make-up of the peninsula of Hull? How is it different?
  5. List the four distinct regions of Peddocks Island, and include a brief description of each region.
- The reading, and question and responses are discussed.

### Materials

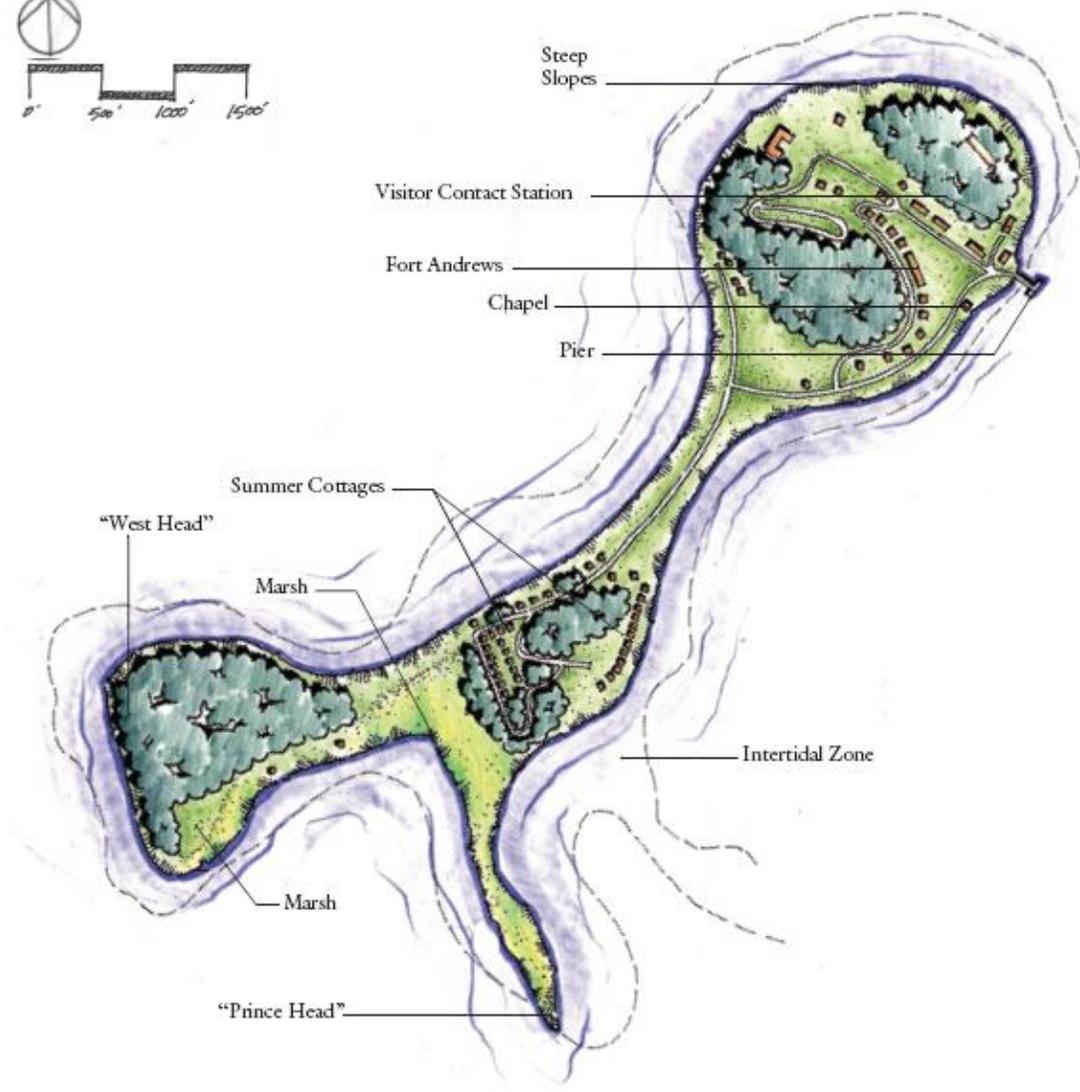
Student journal, pen/pencil, maps/hand-outs:

**PEDDOCKS ISLAND**

210.4 Acres



*Island Accessible by Ferry or Water Shuttle*



(National Park Service, 2005).



(Ekabhishek, 2008)

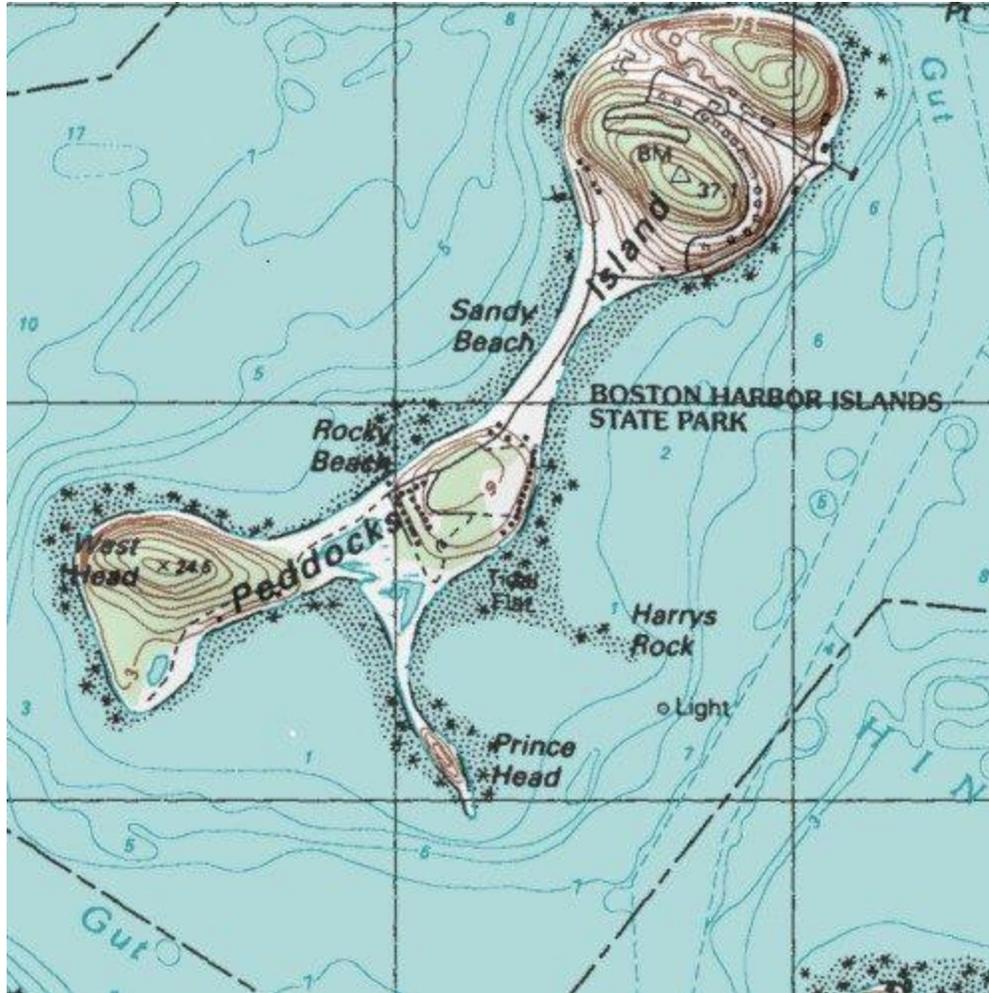
### Lessons & Events

1. **Topic:** Glaciation; **Site:** Visitors Center; **Activity:** Discussion/Question

- One million years ago there was a slight change in the climate, probably worldwide. With cooler climate and more snowfall, the snowfields grew and the Laurentide ice sheets began to move southward.
- 100-200 ft. thick, the liquid mass began to move NW to SE, melting and growing for several thousand.
- The liquid moved along using the easiest path, namely rivers and streams.
- This was the glacier that moved over this area 15-20,000 years ago.

2. **Topic:** Glacial Scour; **Site:** View near Caretakers House; **Activity:** Walk/Map Reading

- As the glacier moved, it dragged sand, rocks, and boulders with it.
- Since rock is harder than ice, the rocks that ground against each other as they were pushed by the ice, left scars on other rocks.
- As the glacier retreated (melted), the ice would deposit glacial till (clay) around resistant rock masses creating hills of up to 250 ft. high. These are called **drumlins**.
- As the water washed around the hills, it smoothed them out and made them oval.
- Aligned in the direction of the ice flow, the steeper blunted ends point in the direction from where the ice came. **Which direction did the ice come from?** (Student responses will be written in student journals).
- Peddocks Island seen on the topographic map, and by this view, has four drumlins connected by tying sandbars called **tombolos**. Note the slopes of the drumlins are on the North or Northwest sides, and the steep rocky sides are on the southern slope.  
 \*\*\*Students should note the following: With Peddocks having four separate drumlins, students should see this as a result of the movement of stopping and starting of the retreating glacier.



(MyTopo, n.d.)

3. **Topic:** Barrier Deposition; **Site:** Past Fence View to West; **Activity:** Walk/Explore/Question
  - Looking toward the shore line one can see a line of deposition from the movement of till by the tides and currents. This deposition of sandy gravel has grown over time.
  - The whole island is constantly being changed by the tides, storms, wind, and rain.
  - **Which way would the current be going in order for this to fill in?**
  - **How long would this take?**
  - **What will it do when it completes the triangle of fill?**
  
4. **Topic:** Glacial Erratics; **Site:** North Side of Cottages; **Activity:** Explore
  - **Glacial erratics** are boulders of “foreign rock” carried by glaciers.
  - This glacial erratic is a conglomerate. A **conglomerate** is a sedimentary rock that consists of a mixed mass of small stone fragments to large boulders cemented together by minerals and chemical processes.
  - This particular erratic is a conglomerate called **Roxbury Puddingstone**. Puddingstone is made up of golf ball to tennis ball size rounded stones, resembling lumpy pudding.
  - Erratics are found many miles from their point of origin.

- This erratic probably came from Roxbury only 10 miles away, where puddingstone is normally found.
  - **Have you seen Roxbury Puddingstone in Hull? If so, where?**
5. **Topic:** Tombolos; **Site:** Prince Head; **Activity:** Chart Comparisons/Walk/Explore
- This formation is called a **tombolo**, which is a sand or gravel bar connecting an island with the mainland or another island.
  - Use historical charts/maps to answer the following questions: **How long has this formation been here? What did it look like 100 years ago? What factors shaped this formation? What factors maintain its structure, or keep it from changing more rapidly?**

### **Post-Visit / Follow-Up Activity**

#### *Journal Entry/Reflection*

Students create a graphic organizer to compare and contrast the physical/geological/landform features between Peddocks and Hull.

## Lesson 3: Masters of the Marsh

### Description

Students will examine the salt marsh ecosystem located west of Middle Head. Students will determine the relationships between the flora and fauna of the salt marsh, as well as the physical and biological health dependency of the marsh on the tides. Concepts such as food webs, tidal movement, edge effect, and the role of the salt marsh as a nursery will be covered.

### Theme

The harsh environment of the salt marsh supports a dynamic ecosystem adapted to extreme environments. This fragile ecosystem plays a vital role as an edge community.

### Objectives

Students will be able to:

- Explain the basic characteristics of a salt marsh ecosystem.
- Understand the life cycles of the marsh.
- List three important features/aspects of the marsh as an edge community.

### Pre-Visit/Preparation

- Prior to the salt marsh activity, students will have been randomly assigned a group.
- Students have previewed and studied the Salt Marsh Ecosystem by reading and color-coding the lesson in New England Aquarium's *Boston Harbor: Seaside Educator's Guide (2<sup>nd</sup> Edition)* p.58-61.  
[http://www.neaq.org/education\\_and\\_activities/teacher\\_resources/classroom\\_resources/teacher\\_guides/documents/CompleteSeasideGuide1.pdf](http://www.neaq.org/education_and_activities/teacher_resources/classroom_resources/teacher_guides/documents/CompleteSeasideGuide1.pdf)

### Materials

- Water Quality Test Equipment is provided by teacher.
- Teacher provides students with Water Quality Index Equipment that tests for:
  - Acidity/Alkalinity
  - Ammonia
  - Carbon dioxide
  - Dissolved oxygen
  - Hardness of water
  - Nitrate and nitrogen levels
  - Phosphate levels
  - Salinity
  - pH
  - Temperature
  - Conductivity
  - Total Dissolved Solids
  - Turbidity (Secchi disk)

### **Lessons & Events**

1. Bathroom break; water refill; etc.
2. Students break into pre-assigned groups. Each group is led by a staff member from HLM, HHS, or DCR.
3. Groups walk westward on Peddocks, and stop at the Salt Marsh before reaching Middle Head. Staff members discuss the formation of the marsh, and the dynamics of the shore line:
  - The currents and the tide create Barrier Beaches (such as Nantasket Beach of the mainland of Hull), with low-lying areas behind them.
  - The ebb and flow of salt water in these low areas creates the wet/dry conditions in which *Spartina sp.* can grow and create the base for a salt marsh ecosystem.
4. The Edge of the Marsh
  - **Students list the basic characteristics of the marsh (wed, dry, windy, salty, etc.).**
  - **Osmosis** is discussed. Plants need to maintain a high salt gradient to maintain water balance in salty conditions. Salt crystals on leaves present an osmotic problem. Plants maintain salt gradients through active transport of salt from **stomata** (tiny openings on leaf surface) and waxy coatings on the leaf surface.
  - **What are some of the other ways plants have adapted to the salty conditions of the marsh?**
5. Into the Marsh
  - Salt marshes are coastal wetlands that are flooded and drained by salt water brought in by the tides.
  - They are “marshy” because the soil may be composed of deep mud and peat.
  - Peat is made of decomposing plant matter that is often several feet thick. Peat is water-logged, root-filled, and very spongy.
  - **Mud Mash/Marsh Mat – use all your senses to explore the detritus, and write/discuss the contents of the marsh mat.** The mat is made of decaying plants, bacteria, and abiotic factors.
  - Because salt marshes are frequently submerged by the tides and contain a lot of decomposing material, oxygen levels in the peat can be extremely low—a condition called **hypoxia**.
  - Hypoxia is caused by the growth of bacteria in environments without oxygen.
  - In the absence of oxygen, bacteria perform **anaerobic respiration** to make energy (ATP).
  - Anaerobic respiration of bacteria produces the *rotten egg*, or *sulfurous*, smell that is often associated with marshes and mud flats.
  - **Methane gas** is produced as a byproduct of bacterial anaerobic respiration, and is responsible for the “Will-O-the-Wisps” (atmospheric ghost light or flickering lamp) of the colonial days.
  - The salt peat gives the marsh its absorption quality, and may be up to 30 ft. thick, depending on the age of the marsh. **Students are asked to jump up and down to demonstrate the thickness of the mat.**
6. Explore Life in the Marsh
  - **Each group of students is assigned to study the following areas in the marsh:**
    - **Group 1: Plants (record types and numbers)**
    - **Group 2: Aquatic Animals (record types and numbers)**

- **Group 3: Birds (record types and numbers)**
  - **Group 4: Terrestrial Animals (record types and numbers)**
  - **Group 5: Physical Characteristics (record dissolved oxygen [D. O.], salinity, air temp., turbidity, weather conditions, soil temp., height of tide, depth of water, and pH of water and soil).**
- Students create a data table in their journals.
  - Students use keys and field guides to identify plants and animals.
  - Each group reports and discusses findings.

#### **Post-Visit / Follow-Up Activity**

- Students play **Web Of Life** game (salt marsh ecosystem).
- Students collect samples of water from Hull Bay to complete the **Glass Menagerie** activity from Project Wild Aquatic.

## **Lesson 4: The Succession of Fort Andrews**

### **Description**

Students will tour Fort Andrews and its environmental landscape, and compare photos of the WWI and WWII era with areas of today. Students will survey the landscape by conducting the *Investigating Quadrats* activity. Students will identify physical needs of plants and animals and will be able to describe how the abiotic and biotic components affect each other. The history of Fort Andrews, and the natural changes that have occurred since it was decommissioned in 1947, will be examined.

### **Theme**

The environment of the East Head has undergone many changes over the past 100 years—some of them drastic and others very gradual. Natural and man-made changes of the island's physical properties have caused changes in the floral community, which in turn forces changes in the faunal/animal community. The East Head drumlin is an excellent example of successional changes and ecological zonation.

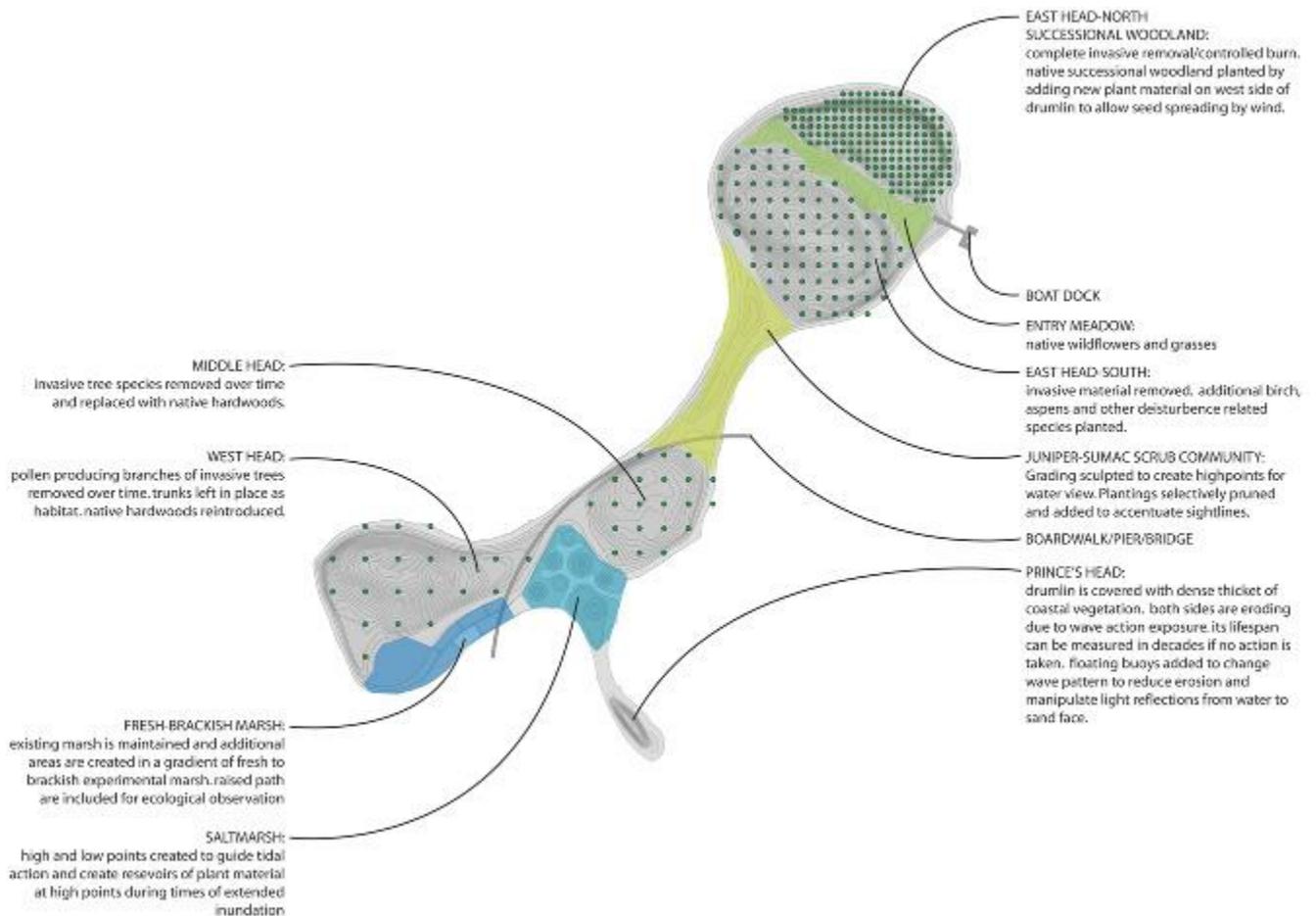
### **Objectives**

Students will be able to:

- Identify the physical needs of plants and animals, and describe how the biotic and abiotic affect each other.
- Identify the vegetative zones of East Head, and list four animals found in each zone.
- Summarize the island's cultural and military history, and explain Ft. Andrews' relationship with the Harbor Defense System.

### **Pre-Visit/Preparation**

- Students examine the map below to determine the climax communities of the East Head region of Peddocks.
- Students explain the successional processes that occurred on the different regions of Peddocks by examining the map below.



(Cooper, n.d.)

## Materials

Journals, pencils, 1 ft. square quadrat, hand lens, string, scissors.

## Lessons & Events

### 1. Tour of Fort Andrews

- Walk through the fort, past batteries to officer's row.
- Discuss the history of Fort Andrews and the changes that have taken place.
- Show pictures – historical pictures provided by Mass DCR.
- Make the following steps:
  - a. Behind Administrative Building; show picture and discuss grass growing.
  - b. Battery Cushing; show pictures and discuss soil building.
  - c. Temporary barracks area; show picture and discuss the stage of growth (old field).
  - d. Officer's row; show picture of P.O.W. barracks and the hill and discuss the forest stage.
  - e. Officer's quarters; examine tree stumps to determine age of tree growth.
  - f. Return to Parade Ground; show photo and discuss the changes that have taken place.

### 2. Review successional stages and the wildlife found in each.

### 3. Discuss the components of habitat, and limiting factors.

4. Wrap up discussion by questioning some of the successional stages found on the island, **“Will the tombolo ever be a forest?”**
5. Students conduct the activity, *Investigating Transects and Quadrats*.

### **INVESTIGATING TRANSECTS and QUADRATS**

**Objective:** Students survey the populations and zonation in the landscape of the East Head of Peddocks.

**Materials:** Journals, pencils, 1 ft. square quadrat, hand lens, string, scissors.

#### **Directions:**

1. Demonstrate how to set up transects, and lay quadrats for surveying the landscape before going out in the field.
2. Once in the field, divide students into small working groups.
3. Give each group a quadrat.
4. Run several transect lines, marking each at every 10 feet (3 m).
5. Lay the quadrat down in one of the designated habitat zones.
6. Count the distribution of organisms and conditions, focusing on just the section within the quadrat.
7. In journal, record data on plants, animals and the conditions found within the survey area.

#### **Questions:**

1. What organisms inhabit each zone?
2. How are the organisms adapted differently?
3. Discuss the distribution changes over the habitat zones.
4. Can you identify zones by color or by the types of organisms found there?
5. Did you see any signs of competition for space?
6. What was common to two different areas? Different? Why?
7. Did you find anything surprising?
8. Did you find anything human-made? If so, where did it come from?
9. What would happen if you moved animals and plants from one area to another?

#### **Post-Visit / Follow-Up Activity**

Students present data regarding plant and animal populations to the class using a graph, map, or mural.

## Lesson 5: Living History

### Description

Characters from Peddocks Island Past will be presented by the Friends of the Boston Harbor Islands.

### Theme

Human relationships with the environment, and with other humans, change over time.

### Objectives

Students will gain insight to the deep and colorful history of Hull, Peddocks, and Boston Harbor.

### Pre-Visit/Preparation

- Students will have read the following excerpt from *An Island Neighborhood – People and Stories of Peddocks Island*:

How did people in the early 20th century deal with day to day life including the complexities of an island community? The community on Peddocks Island was diverse, including Portuguese fishing families, soldiers from the Coastal Artillery Corps with their families, and Italian Prisoners of War during WWII. Living on an island in Boston Harbor required that people were more acutely aware of the science of the sea, weather, and navigation. Residents of Peddocks Island have always needed to be inventive, resilient and adaptive in order to survive. These are traits that the modern residents still embody.

Peddocks Island is comprised of five drumlin hills connected by low lying sand flats known as tombolos. The island has four distinct sections: East Head, where the remains of Fort Andrews are found; Middle Hill, which is the location of the old Portuguese fishing village and the current summer cottagers; West Head, which is comprised of a Bird Sanctuary, brackish pond, and a salt marsh; and Prince's Head, which has eroded to having sheer sides. The history of Peddocks Island is one of community and challenges. Going back to before the first Europeans arrived in the Boston area, Peddocks was used over the summer by the Native American's of the area as a fishing location. During the first two hundred years after European settlement, most of the Harbor Islands were used by the settlers as pasture land. Beginning in the later part of the ninetieth century, public recreation of the islands became more prominent. Summer Residents and Inn's appeared on Peddocks Island, joining the Portuguese Fishermen that were tenants-at-will of the Andrews' Estate, who owned Peddocks at the time.

Beginning in 1898, the United States Army purchased East Head from the Andrews' Estate for the construction of Fort Andrews (named for George Leonard Andrews, the Major General of Volunteers for the US Army during the Civil War). Throughout the first half of the twentieth century, Peddocks was home to three distinct, yet interconnected communities; the military community of Fort Andrews, the year-round residents of the Portuguese fishing village, and the summer cottagers. Today, the military community is gone, having left with the closure of Fort Andrews; the year-round resident community is extremely small, with one to three year round residents; the summer cottage community is still there; and there is a new community of park visitors that has been steadily growing since the creation of the Boston Harbor Islands State Park in 1970.

Each community has their own level of connection the island; they each interact differently and have to overcome different challenges; however they all share a strong connection to Peddocks, and each has their own story (Damstra, 2005, p. 2).

- Students respond, in their journals, to the following questions regarding the reading:
  1. Where is Peddocks Island located in relation to Hull High School?
  2. In what cardinal direction of our town is Hull High School located (North or South)?
  3. How many acres large is Peddocks? Is there a difference of acreage between high and low tide? If so, please explain.
  4. Explain the geologic make-up of Peddocks Island. How is this similar to the geologic make-up of the peninsula of Hull? How is it different?
  5. List the four distinct regions of Peddocks Island and include a brief description of each region.
  6. Describe the use of the Peddocks Island by the following peoples:
    - a. Native Americans
    - b. European settlers/early colonists
    - c. early 19<sup>th</sup> century (1800s) residents
  7. What occurred during the later part of the 19<sup>th</sup> century that changed the dynamics of the island?
  8. When was Fort Andrews purchased? Who purchased the Fort?
  9. For whom was Fort Andrews named? What was his occupation?
  10. What region of the island is home to Fort Andrews?
  11. List the three different, yet interconnected, communities that occupied the island during the first half of the 1900s.
  12. What has happened to these communities today, during the 21<sup>st</sup> century (2000s)? What do these communities have in common today?
  13. List five different ecosystems that may be found on Peddocks (the reading discusses only three, but please remember that the peninsula part of our town was once a string of islands, and consists of many of the same ecosystems as Peddocks).
  14. How has Peddocks Island incorporated sustainable practices within their community?
  15. Why was Peddocks Island a suitable site for a military base?
  16. How was the landscape of Peddocks Island primarily used prior to military containment?
  17. How was Peddocks Island involved in the Revolutionary War (War of Independence)? Cite evidence.
  18. How has Peddocks Island been a part of defending Boston Harbor, after the Revolutionary War?
  19. How many structures remain on the island since WWII? List five memorable sites that still remain on the island.
  20. Please write the last sentence of the reading in your journal. What are your thoughts regarding this sentence?

### **Materials**

Student journal, pen/pencil.

### **Lessons & Events**

- Students will meet with several characters from Peddocks Island past while they are carrying out the island ecology lessons.

- Characters: Portuguese fisherman, George Leonard Andrews (US Army General during the Civil War), soldier from the Coastal Artillery Corps, WWII Italian Prisoner of War, Native American, European settler, summer resident, year-round resident.
- Students will summarize their conversations with each character through sketching, and writing memorable quotes and/or important information.

**Post-Visit / Follow-Up Activity**

- Students take the *Magical History Tour* of the North end of Hull, which includes a walking tour of historic Hull Village, Pemberton/Windmill Point, Telegraph Hill & Fort Revere, and Stoney Beach ([Appendix B](#)).
- Students compare and contrast the ecological/environmental and cultural influences that result in the constantly changing landscape of both Peddocks Island and the town of Hull.

## Lesson 6: Tiptoe through the Tidepools

### Description

Students examine the variety of life forms on the shore and within the intertidal zone. Students will use identification keys and field guides to identify algae forms and tidal creatures. Students will complete the *Coastal Scavenger Hunt*, and will complete the *Tidepool Animal Worksheet/Data Table*, taken from New England Aquarium's *Boston Harbor Seaside Educator's Guide (2<sup>nd</sup> Edition)* (Padawer and Fredrickson, 2000).

### Theme

The shoreline and rocky Atlantic coast is teeming with various life forms.

### Objectives

Students will be able to:

- Identify types of marine algae/seaweed: one type of green, red, and brown algae.
- Identify and describe the adaptations/characteristics of marine invertebrates, including mollusks and crustaceans.

### Pre-Visit/Preparation

Students will have read and color coded the informational packets on the following ecosystems: The Rocky Shore, Sandy Beach and Wracklines, Tidal Flats, and Fouling Organisms from New England Aquarium's *Boston Harbor Seaside Educator's Guide (2<sup>nd</sup> Edition)*.

Pages 50-57; 62-67.

[http://www.neaq.org/education\\_and\\_activities/teacher\\_resources/classroom\\_resources/teacher\\_guides/documents/CompleteSeasideGuide1.pdf](http://www.neaq.org/education_and_activities/teacher_resources/classroom_resources/teacher_guides/documents/CompleteSeasideGuide1.pdf)

Click on the link above to access the informational packets on the ecosystems listed above (pages 50-57; 62-67) (Padawer and Fredrickson, 2000, p. 50-57; 62-67).

### Materials

Small collecting buckets, hand lens, identification keys and field guides, clip board with data sheets—*Coastal Scavenger Hunt* (Padawer and Fredrickson, 2000, p. 41), and *Tidepool Animal Worksheet* (Padawer and Fredrickson, 2000, p.44-45), pencil.

### Lessons & Events

1. Discuss and demonstrate safety, site boundaries, site stewardship, beachcombing policy (no keep policy; organisms collected must be returned), beachcombing ethics, observing and handling intertidal animals, and tips on being intertidal detectives.
2. Students complete the *Coastal Scavenger Hunt* (Padawer and Fredrickson, 2000, p. 41) (attached below).
3. Students complete the *Tidepool Animal Worksheet* (Padawer and Fredrickson, 2000, p.44-45) (attached below).

### Post-Visit / Follow-Up Activity

*Apprentice Species*

- Students will choose a species they encountered on the island and create an informational Species Page.

- The Species Page will include the following:
  - Two pages (front and back), each containing hand-drawn sketches and species information.
  - Species information should include habitat, niche/role in ecosystem, limiting factors, present status, and interesting facts.
- An example of a Species Page is included in [Appendix C](#).

**COASTAL SCAVENGER HUNT**

Find the items listed below. You may use the same answer more than once. Please find your items by recording and observing, rather than collecting. If you do pick up an animal or other object, be sure to return it to where you found it. Do not pick any plants or leaves. Ask your group leader before picking up any object you can't identify.

*ON THE SHORE FIND:*

Six different types of human litter and explain how it got here (example: Balloon: floated over)

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

- |   |   |
|---|---|
| <input type="radio"/> Part of an egg or egg case  | <input type="radio"/> A red algae   |
| <input type="radio"/> Three bivalves _____, _____, _____  | <input type="radio"/> A holdfast attached to a rock or shell                    |
| <input type="radio"/> A living crustacean   | <input type="radio"/> A living dog whelk  |
| <input type="radio"/> An animal that spends part of its time in the water and part of its time on land  | <input type="radio"/> A piece of driftwood shaped like an animal                |
| <input type="radio"/> An animal (or parts) found on the beach that was/were tossed in from deeper water | <input type="radio"/> An animal that blends into its surroundings               |
| <input type="radio"/> An animal that uses another animal's empty shell for protection                   | <input type="radio"/> An animal that can regenerate (grow back) missing limbs.  |
| <input type="radio"/> A rock with a white line all the way around it                                    | <input type="radio"/> An animal that might be on the menu at a local restaurant |
| <input type="radio"/> A crab molt   | <input type="radio"/> An animal with spiny skin                                 |
| <input type="radio"/> A sea urchin  | <input type="radio"/> An animal whose mouth is on the underside of its body     |
| <input type="radio"/> A living sea star   | <input type="radio"/> An animal that spends most of its time on the bottom      |
| <input type="radio"/> A living periwinkle   | <input type="radio"/> An animal that is attached to something else              |
| <input type="radio"/> A slipper shell   | <input type="radio"/> An animal that has no bones                               |
| <input type="radio"/> A seaweed with air bladders   | <input type="radio"/> An animal that eats other animals                         |
| <input type="radio"/> Sea lettuce   | <input type="radio"/> An animal that is a scavenger                             |
| <input type="radio"/> The biggest piece of kelp that you can find                                       | <input type="radio"/> An animal that is a filter feeder                         |

<b>ANIMAL NAME</b>	<b>How Does It Move?</b>	<b>What Does It Eat?</b>	<b>How Does It Grow?</b>	<b>Where Is It Found?</b>	<b>Does It Have Eyes? Where?</b>	<b>How Does It Protect Itself?</b>
<b>HERMIT CRAB</b>						
<b>HORSESHOE CRAB</b>						
<b>BLUE MUSSEL</b>						
<b>MOON SNAIL</b>						
<b>PERIWINKLE SNAIL</b>						
<b>DOG WHELK</b>						

<b>ANIMAL NAME</b>	<b>How Does It Move?</b>	<b>What Does It Eat?</b>	<b>How Does It Grow?</b>	<b>Where Is It Found?</b>	<b>Does It Have Eyes? Where?</b>	<b>How Does It Protect Itself?</b>
<b>MUD WHELK</b>						
<b>NORTHERN ROCK BARNACLE</b>						
<b>SOFT SHELL CLAM</b>						
<b>QUAHOG</b>						
<b>ROCK CRAB</b>						
<b>GREEN CRAB</b>						

**Post-Visit / Follow-Up Activity***Apprentice Species*

- Students will choose a species they encountered on the island and create an informational Species Page.
- The Species Page will include the following:
  - Two pages (front and back), each containing hand-drawn sketches and species information.
  - Species information should include habitat, niche or role in ecosystem, limiting factors, present status, and interesting facts.
- An example of a Species Page is included in [Appendix C](#).

### References

- Common Core State Standard Initiatives. (2015). English language Arts Standards. *Science and technical subjects: Grades 11-12*. Retrieved from <http://www.corestandards.org/ELA-Literacy/RST/11-12/>.
- Conti, A. (2011, June 17). Hull High School Graduation [Photograph]. Retrieved from <http://ashleylconti.blogspot.com/2011/06/hull-high-school-graduation.html>.
- Cooper, J. (n.d.). Botany bay: Boston harbor islands masterplan [Photograph]. Retrieved from <http://marginswild.com/Botany-Bay-Boston-Harbor-Islands-Masterplan>.
- Damstra, K. (2005). *An island neighborhood; people and stories of Peddocks Island: A teacher's guide and curriculum unit* [PDF document]. Retrieved from [http://www.nps.gov/boha/learn/education/upload/Island\\_Neighborhood.pdf](http://www.nps.gov/boha/learn/education/upload/Island_Neighborhood.pdf).
- [Ekabhishek](#). (2008, May 18). Peddocks Island (looking southwesterly). The remains of Fort Andrews, on East Head, are on the left. The current boat dock is visible at left, on the southeasterly (far) side of the island. Middle Head takes up most of the rest of the island, including Portuguese Cove. Harry's Rock on the far side [Photograph]. Retrieved from [https://commons.wikimedia.org/wiki/File:Peddocks\\_Island.jpg](https://commons.wikimedia.org/wiki/File:Peddocks_Island.jpg).
- Hull Lifesaving Museum. (2008a). Open water rowing: Join us for learn to row day [Photograph]. Retrieved from <http://www.lifesavingmuseum.org/martimeapprenticeprogram.html>.
- Hull Lifesaving Museum. (2008b). *About us*. Retrieved from <http://www.lifesavingmuseum.org/contactus.html>.
- Massachusetts Department of Education. (1999a). *Massachusetts comprehensive health curriculum framework* [PDF document]. Retrieved from

<http://www.doe.mass.edu/frameworks/health/1999/1099.pdf>.

Massachusetts Department of Education. (1999b). *Massachusetts arts curriculum framework* [PDF document]. Retrieved from <http://www.doe.mass.edu/frameworks/arts/1099.pdf>.

Massachusetts Department of Education. (2003). *Massachusetts history and social science curriculum framework* [PDF document]. Retrieved from <http://www.doe.mass.edu/frameworks/hss/final.pdf>.

Massachusetts Department of Education. (2006). *Massachusetts science and technology/engineering curriculum framework* [PDF document]. Retrieved from <http://www.doe.mass.edu/frameworks/scitech/1006.pdf>.

Massachusetts Geographic Information Systems (MassGIS). (2007). Aerial photo of Hull, MA [Photograph]. Retrieved from <http://www.structuremag.org/article.aspx?articleID=334>.

MyTopo: A Trimble Company. (n.d.) Topographic map of Peddocks Island [Photograph]. Retrieved from <http://www.mytopo.com/locations/index.cfm?fid=614122>.

National Park Service. (2005). Boston Harbor Islands. Map of Peddocks Island [Photograph]. Retrieved from [https://en.wikipedia.org/wiki/Peddocks\\_Island#/media/File:PeddocksIsland.png](https://en.wikipedia.org/wiki/Peddocks_Island#/media/File:PeddocksIsland.png).

National Park Service. (2015). Boston Harbor Islands. *Island facts: Peddocks Island*. Retrieved from <http://www.nps.gov/boha/learn/historyculture/facts-pedd.htm>.

National Park Service. (n.d.). Map of Peddocks Island provided by the National Park Service [Photograph]. Retrieved from [https://en.wikipedia.org/wiki/Peddocks\\_Island#/media/File:PeddocksIsland.png](https://en.wikipedia.org/wiki/Peddocks_Island#/media/File:PeddocksIsland.png).

Norm. (2010, March 22). Weymouth to Peddocks Island – March 20, 2010 [Photograph]. Retrieved from <http://www.wtpaddlers.org/phpBB3/viewtopic.php?f=3&t=1918>.

Padawer, S., & Fredrickson L. (2000). *Boston harbor: Seaside educator's guide (2<sup>nd</sup> Edition)*

[PDF document]. Retrieved from

[http://www.neaq.org/education\\_and\\_activities/teacher\\_resources/classroom\\_resources/teacher\\_guides/documents/CompleteSeasideGuide1.pdf](http://www.neaq.org/education_and_activities/teacher_resources/classroom_resources/teacher_guides/documents/CompleteSeasideGuide1.pdf).

Tague, B. (n.d.) . Hull gut: 260-6081 [Photograph]. Retrieved from

<http://www.briantague.com/Boston%26SouthShoreLights.html>.

Town of Hull, Massachusetts. (n.d.). Boards and commissions. Fort Revere preservation committee. *Fort Revere presentation* [PDF document]. Retrieved from

[http://www.town.hull.ma.us/Public\\_Documents/HullMA\\_Select/Ft.Revere.pdf](http://www.town.hull.ma.us/Public_Documents/HullMA_Select/Ft.Revere.pdf).

United States Coast Guard Station. (2013). *Station Point Allerton*. Retrieved from

<http://www.uscg.mil/d1/staPointAllerton/>.

United States Department of Education. (2012). *2012 National blue ribbon schools program* [PDF document]. Retrieved from

<http://www2.ed.gov/programs/nclbbrs/2012/applications/ma2-hull-high-school.pdf>.

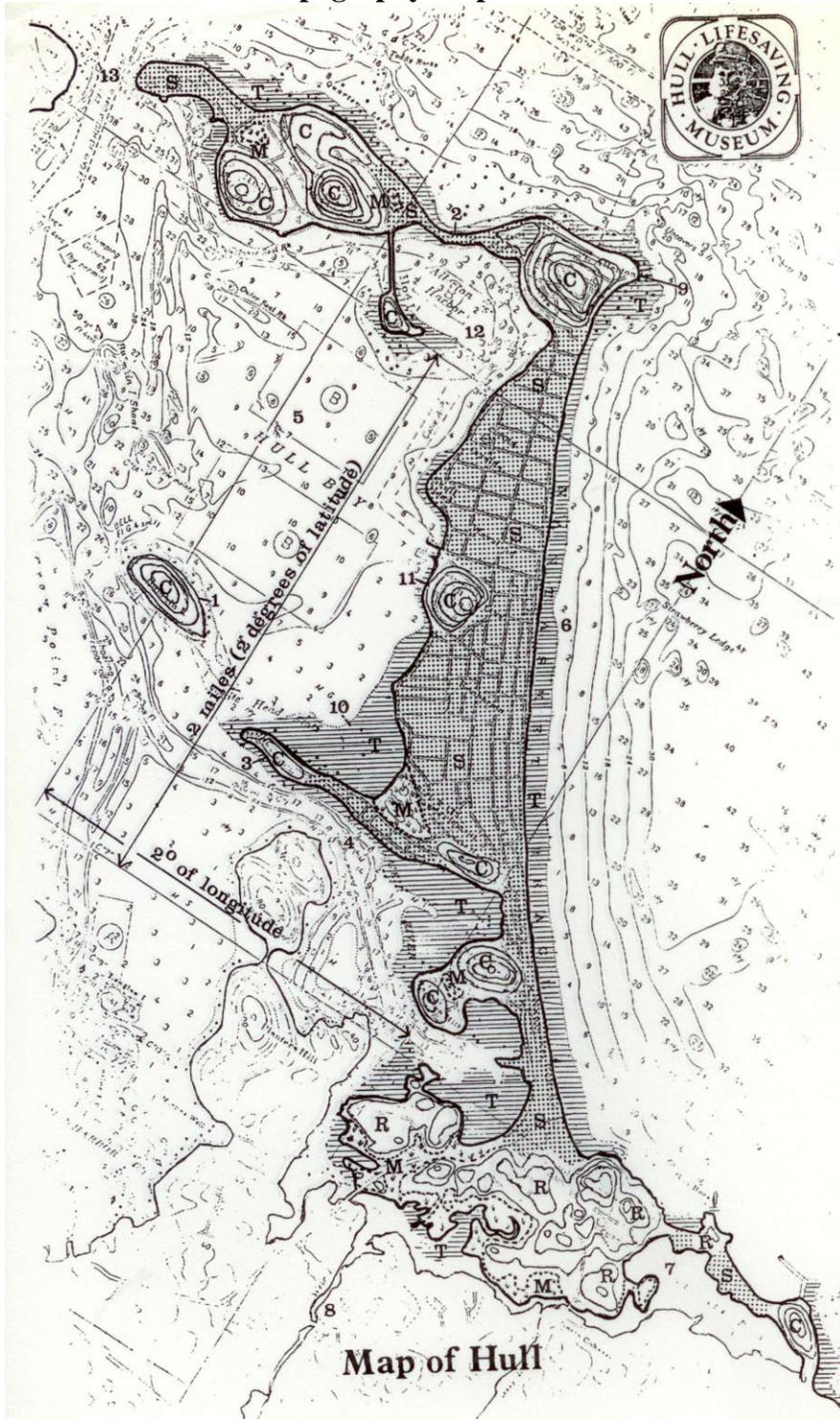
World Media Group, LLC. (2013). USA.com. *Hull, MA population and races*. Retrieved from

<http://www.usa.com/hull-ma-population-and-races.htm>.

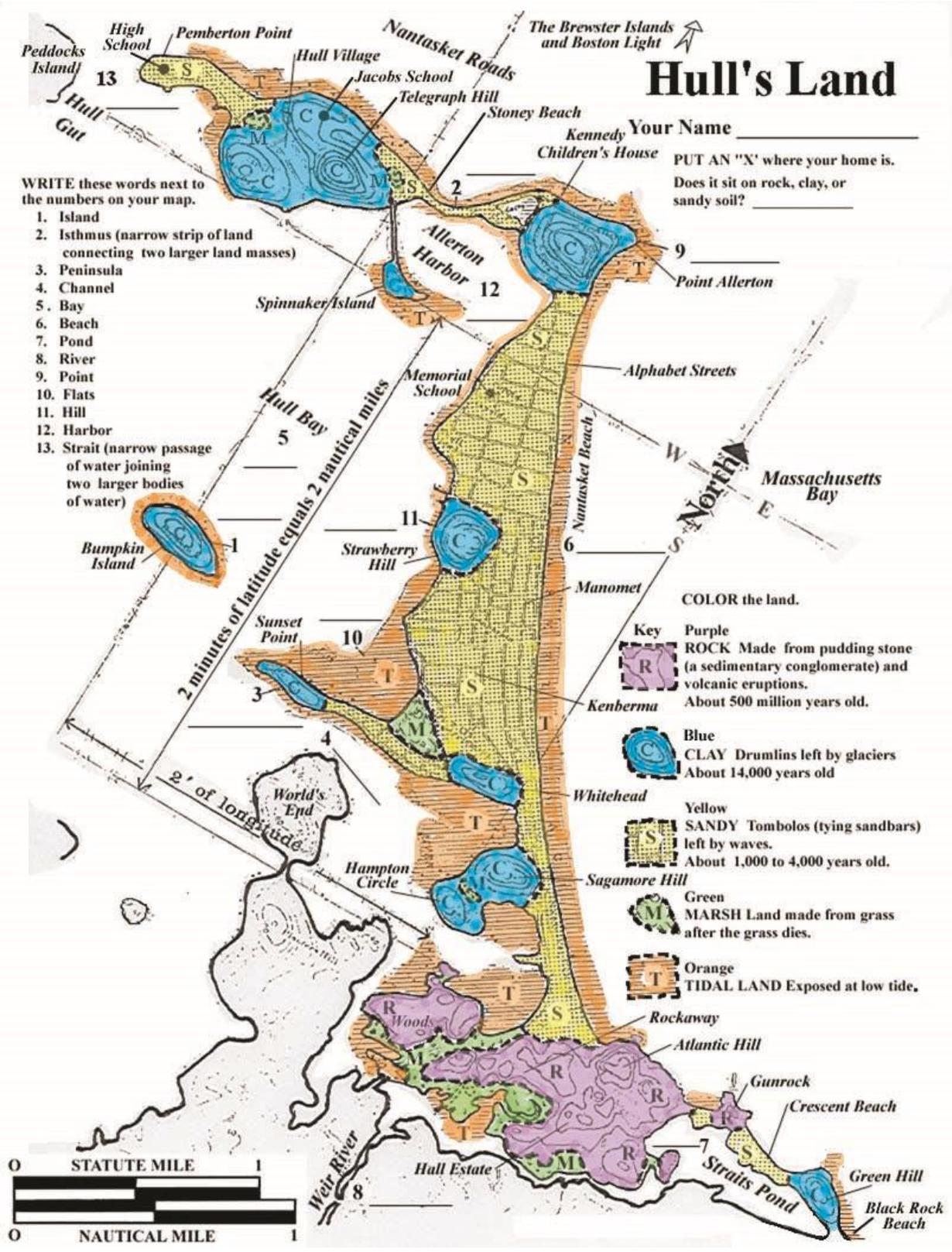
Appendix A

Pre-Visit/Preparation Lessons for Peddocks' Rock and Roll Lesson  
Geology & Landform Formations of Hull, MA

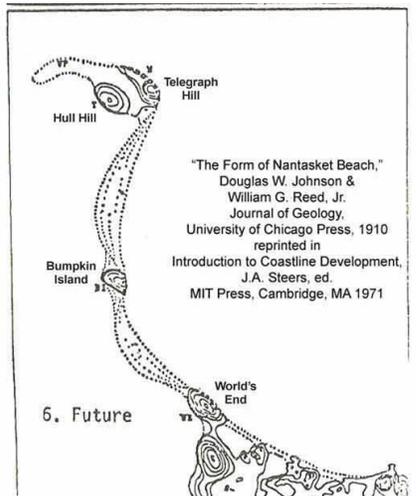
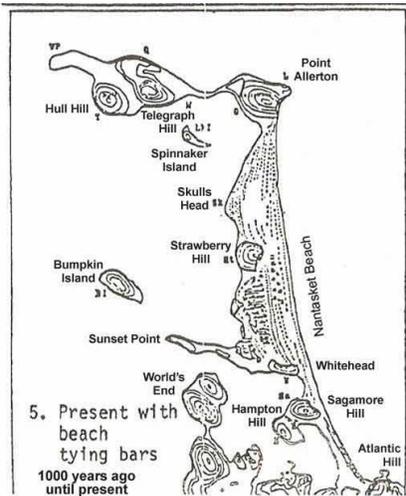
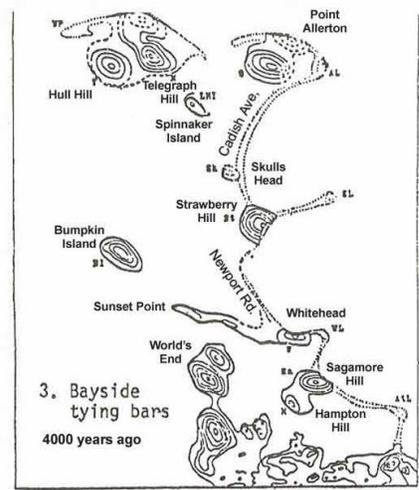
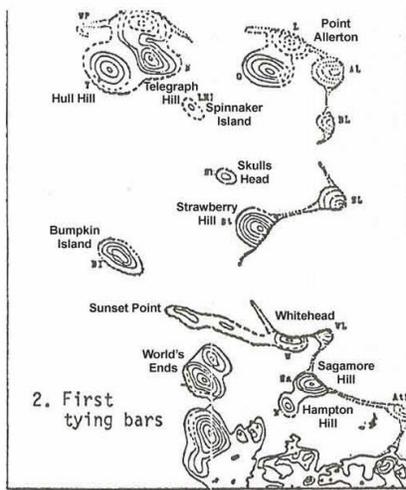
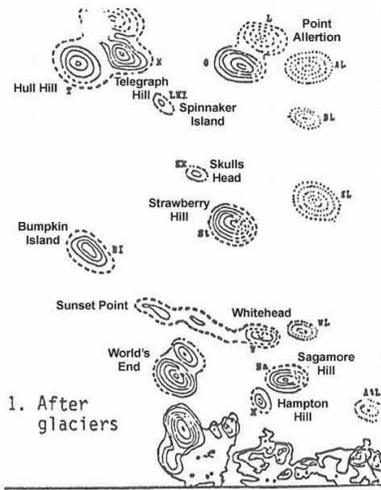
**Topography Map of Hull**



Hull's Land



### Formation of Hull



[Return to original place in document](#)

## Appendix B

### The Magical History Tour of Hull

Ecology/Blair

## SCAVENGER HUNT

### The North End of Hull

(Pemberton, Hull Village, Telegraph Hill, & Stoney Beach)

**Fill in the blanks for each point of interest below:**

1) In very early days, it was the site of a sheep pen, used by proprietors of Peddocks Island. Site of Tudor's Salt Works from 1826-1848. Site of several "**grand hotels**" that catered to the affluent (late 1800s to early 1900s)—site of Mansion House (first resort hotel opened by the Tudor family) built in 1848 & burned in 1871; Mansion House replaced by the Tudor House, burned in 1875; site of the luxurious Pemberton Hotel (considered one of the world's finest hotels), built in 1880 and, due to declining business during the early 1900s, sat closed and boarded up for decades until it was demolished and removed in 1956 to make way for the building of \_\_\_\_\_.

- This northernmost neighborhood of Hull is called \_\_\_\_\_  
or \_\_\_\_\_.

2) Site of **wharves** since 1699; originally called Pemberton **Steamboat** Wharf—as far back as 1818, majestic, elegant, white steamboats provided open-air transportation from the claustrophobic city of Boston to the natural broad, sandy beaches of Nantasket—this was one port of stop for the Hull Steamboat Line. Site of the northernmost **railroad** station in Hull—in 1880, the last portion of the railroad line was constructed, which connected Allerton to Pemberton. This rail system transported people from one end of the town to the other. The original line stretched from Nantasket Pier to Allerton. The rail system of Hull was in operation until 1937. The lethal combination of the Great Depression and the private use of automobiles resulted in the end of the steamboat service and the railroad.

- A \_\_\_\_\_ is a structure on the shore of a harbor where ships may dock to load and unload cargo and passengers.
- This site, formerly a dock for steamboats and a railroad station, is now called \_\_\_\_\_.

3) **Coal Pier.** Used to be called Darcy's Pub – oldest pub in Hull; once owned by Jack and Josephine Darcy – established in 1952; Jack Darcy was a respected man in Hull, and took Jack Kennedy on a tour of Hull.

**Legend says:** In the basement, there is a watertight door that is the entrance to the Boston Harbor Tunnel system. The building at this pier was the control center for the tunnel system from 1922-1952. The tunnel connects Hull Gut to Deer Island (sewage eggs) and several other spots in the harbor.

The Boston Harbor Tunnel system is an outgrowth of two earlier networks of tunnels under the harbor, which reached from Deer Island to Scituate Harbor. The first tunnels were dug in 1764 from Fort Independence to Fort Warren (Georges Island). The system was greatly extended in the 1800s to include 58 miles of tunnels with many large underground structures. One of these structures included a barracks for 2,000 troops. Much of the tunnel system has been sealed off, and today only Great Brewster, Little Brewster (Boston Light), Deer Island, Long Island, and Peddocks Island (two entrances) are served, in addition to Hull Gut, and Weymouth Fore River. There are rumors of buried bodies in and around the basement of this establishment.

**Do you believe it to be true...the tunnel system and buried bodies? Ask someone nearby.**

- Coal pier is now called \_\_\_\_\_.
- This building is now called \_\_\_\_\_.

4) **Pemberton Playground.** Place where the railroad cut across to go around Hull Village because Hull residents did not want the railroad to go right through the center of town.

- Pemberton Playground is more commonly known as the \_\_\_\_\_.

5) **Coast Guard Beach / Outer Beach.** There used to be a bridge here crossing over the point where the water went in and out of the \_\_\_\_\_.

6) **Cleverly Park.** Which flags are flying here, and at what mast? \_\_\_\_\_

- 
- The Cleverly family has been associated with Hull as far back as the early 1800s. Roles include serving in the Civil War and the Hull Police Department.

7) Site of the **original Hull Yacht Club** (founded in 1882 and called the Massachusetts American Yacht Club)—the second largest in the country at the time. This station is the busiest search and rescue station in New England.

- This Coast Guard Station is called \_\_\_\_\_, and has a sister station in \_\_\_\_\_.

8) **Once a Hotel, then a Church, now a Residence.** Site of the Oregon House (grand hotel)—here, before the church—Oregon House built, 1848, from the material of the barracks at Castle Island (Southie, Boston). In 1644 the General Court authorized Boston to cut 150 tons of timber at Nantasket for the fortifications at Castle Island. This hotel (Oregon House) was built on the site of John Stone's house, one of the proprietors of Hull in 1657.

- Address: \_\_\_\_\_

9) **Coastal Wetlands.** Vital ecological importance as spawning/reproduction, nursery, and feeding areas for fish, and as feeding, resting, and wintering areas for birds. Wetlands are beneficial for improving water quality by trapping, filtering, and removing sediment, heavy metals (pollution), and excess nutrients. Hull coastal wetland resources include the ocean, Hull Bay, Weir River, Straits Pond, as well as the extensive intertidal flats, beaches, dunes, rocky intertidal shores, and salt marshes.

- What type of coastal wetland can you see from here?  
\_\_\_\_\_.

- Hull's wetlands, except for the Weir River, are dominated by an **invasive plant species** called \_\_\_\_\_, the common reed, which outcompetes native plants for resources, such as sunlight, water, and soil nutrients.
- Very few vegetative communities have lower value to wildlife than \_\_\_\_\_.

- As you walk along Main St., read the street signs that look “different” from the street signs we are used to (green and white).

10) **Old Village Post Office.** One of Hull's old houses – thought to be 200 years old. Residence of Joseph Pope – first postmaster and telegraph operator in Hull.

- Address: \_\_\_\_\_

11) **First Piazza**, or summer porch, in Hull. Built by a summer resident.

- Address: \_\_\_\_\_

12) **Home of Andrew Galiano**, ship captain and father of lifesavers. Rumor has it that during Prohibition (1920-1933), rum runners used to deliver illegal liquor by bringing a boat up to the back of this house. After Andrew Galiano retired, he made paintings of ships, one of which is in the Life Saving Station. He is buried in the Hull cemetery.

- Address: \_\_\_\_\_

13) **Home of Alfred Galiano**, son of Andrew, esteemed selectman, steamboat captain, volunteer lifesaver. One of his lifesaving medals is with a picture of him and his steamboat at the Lifesaving Museum. A sculpture of his face is on his gravestone in the cemetery.

- Address: \_\_\_\_\_

14) **The “Wedding Cake” House.** Home of John L. Mitchell, Police Chief when corrupt politician “Boss” John Smith was selectman and owner of Nantasket Coal Company.

- Address: \_\_\_\_\_

15) **Cobb House.** One of Hull's oldest houses. Legend has it that General Lafayette (French general and political leader, who enthusiastically supported the American Revolution—1775 - 1783) slept in this house. Joseph Cobb was the second Keeper of the Massachusetts Humane Society boats in Hull. This house was moved here from another location and used to sit closer to the street. Story: One of the Galiano boys was sitting on the front step, and a bull came running down the street, and its horn cut the boy's neck. He was rushed up to the army doctor at Fort Revere and saved.

- Address: \_\_\_\_\_

16) **Knight's Express (Livery Stable**—a barn where horses and vehicles are boarded and kept for hire). Knight's Express moved summer residents' belongings in and out of Hull. The company used to lend horses to pull the lifeboats to rescues. This company eventually became Daley and Wanzer's Moving Co. There was also a piggery (a place where pigs are raised and kept) in the basement.

- Address: \_\_\_\_\_

17) **Birth place of opera singer Madame Bernice (James) De Pasquali & selectman “Boss” John Smith** (at different times in history).

- De Pasquali was born in Hull on Dec. 7, 1873. She was Joshua James’ neice and became a world famous soprano opera singer and pianist who trained in Italy and New York. She often returned to the small seaside town of her birth, Hull, and on Christmas Eve would sing "Silent Night" in front of the Public Library. She and her husband are buried in the James’ family plot in Hull cemetery.
- “If you lived in Hull, Massachusetts, during the first four decades of the twentieth century, you were susceptible to two forces: the political machinations of Boss John Smith and the vitriolic editorial columns of *Hull Beacon* (now called the *Hull Times*) publisher Floretta Vining. Smith ran the town with an iron fist through fixed elections, padlocked town meetings, kickbacks, graft and bribes. Vining reported on it all and fought it like no other Progressive Era woman could, using newsprint space to lash out at girls who chewed gum in public and small boys who made too much noise at night, and calling for old men over sixty years of age to simply be put to sleep.”  
Hull Times contributor and local historian John Galluzzo brings back the days of Vining and Smith, of steamboats and trains, of Paragon Park and the grand hotels of Nantasket Beach, in his book, *Crime, Corruption & Politics in Hull: The Rise and Fall of Boss Smith's Old Ring*. In this accessible history, the reader gets a ringside seat to some of the most heated political battles in the history of the South Shore, fought in town halls and occasionally spilling into the streets of the once quiet and peaceful Hull Village.
- This is the house where Boss Smith was born. His house as an adult was in Atlantic Hill. It was he who had the current town hall built across the street from his home because he didn’t want to travel far to work. Boss Smith began the paving of the dirt and cobble roads in Hull.
- Address: \_\_\_\_\_

18) **Nantasco Street.** At the end of World War II, the town of Hull changed the names of 8 streets to carry the names of its fallen heroes to the many different wars throughout American history. Don Vautrinot was born in Dedham, grew up in Hull, attended the Hull Village School, and excelled at football at Hingham High. When World War II began, Vautrinot was captured with thousands of other Americans at Mariveles at the southern end of the Bataan Peninsula. He died in a Japanese prison camp on December 23, 1942, after enduring the Bataan Death March at 23 years old. Today, the Hull Memorial School is just what its name implies—a memorial to the eight men from Hull who fought for our country in various wars throughout American history.

- Nantasco Avenue in Hull Village became \_\_\_\_\_ Avenue.

19) **Lovell’s Tavern.** Built over 150 years ago (about 200 years old). The place where people frequently met after town meetings. Half of a mill stone was used for the front step. The tavern has a Gambrel roof. Has a swinging wall between the dining room and kitchen. Has a well in the basement (how the tavern got its water).

- When was Lovell’s Tavern built? \_\_\_\_\_
- How did the tavern get its water? \_\_\_\_\_
- Address: \_\_\_\_\_

20) **John Boyle O'Reilly House.** Site of parsonage house (house provided by church for its parson/clergy) given to Rev. Zachariah Whitman, the first ordained minister of Hull, who settled here in 1670. The home of Mrs. Susanna Rowson, the novelist, author of *Charlotte Temple*. The present house was the summer home of John Boyle O'Reilly. Buried on the grounds, here, is Daniel Carnagon, a British soldier, who was killed July 1775 when the Continentals attacked Boston Light (the Continental Army of the Revolutionary War combined the military of the original 13 colonies – General George Washington was the commander-in-chief).

- This site is now the \_\_\_\_\_.
- What did Native Americans call this place? \_\_\_\_\_  
The word means “place between the tides.” Hull Village was once accessible only at low tide.
- When was Hull settled as a fishing station? \_\_\_\_\_
- When did the Puritans arrive? \_\_\_\_\_
- When was Hull named? \_\_\_\_\_
- The monument to John Boyle O'Reilly describes him as \_\_\_\_\_  
\_\_\_\_\_ Friend of \_\_\_\_\_ and \_\_\_\_\_.
- When was John Boyle O'Reilly's summer “cottage” built? \_\_\_\_\_
- What material are the steps made of? \_\_\_\_\_

21) **Site/Foundation of Nantasket House/Hotel.** Part of this structure was built as early as 1664. The Nantasket House was run by Moses Binney Tower, who was also in charge of the Massachusetts Humane Society lifeboats when Joshua James went on his first rescue. Joshua James learned lifesaving from Moses Binney Tower.

- Location: \_\_\_\_\_

22) **Used to be the James family (Joshua James' Family) boat yard.**

- Joshua James (November 22, 1826 – March 19, 1902) was an American sea [captain](#) and a [U.S. Lifesaving Station keeper](#). He was a famous and celebrated commander of civilian life-saving crews in the 19th century, credited with saving over 200 lives from the age of about 15 when he first associated himself with the [Massachusetts Humane Society](#) until his death at the age of 75 while on duty with the United States Life-Saving Service. During his lifetime he was honored with the highest medals of the Humane Society and the United States. His father, mother, brothers, wife, and son were also lifesavers in their own right.
- Site where Joshua's bother, Samuel James, designed the surfboat *Nantasket*—the famous row boat used by the James family in many shipwreck rescues.
- Address: \_\_\_\_\_

23) **Home of Catherine James Matthews.** Joshua James' oldest sister, who raised him after his mother died in a shipwreck.

On April 3, 1837 Joshua witnessed a pivotal event in his life; he was an eye-witness to the death of his mother and a baby sister in the shipwreck and sinking of the [schooner](#) Hepzibah in [Hull Gut](#), only a half-mile from safe harbor. Mrs. Ester James was returning from a visit to [Boston](#) in the Hepzibah, a paving-stone hauling vessel owned by her son Reinier James. As they were passing through the treacherous Hull Gut, a sudden [squall](#) threw the vessel on her [beam](#);

the Hepzibah filled and sank before Mrs. James and her baby, who were in the cabin, could be rescued. This event was no doubt influential in shaping Joshua's life. His older sister by five years, Catherine, took over the raising the family after the death of their mother.

- This house is known as the “House at the \_\_\_\_\_.”
- A \_\_\_\_\_ is a
- Address: \_\_\_\_\_

24) **John Mitchell’s Counting House.** House made by a salvager from the cabin of a ship.

- A counting house would today be known as an accountant’s office – place where financial transactions occur (paying bills, collecting rent, etc.).
- The house is called “Ship’s \_\_\_\_\_.”
- Address: \_\_\_\_\_

25) **Dill family land.** It became James family land when Joshua’s father married Esther Dill. Esther Dill James was Joshua James’ mother.

- Esther Dill James saved her son, Reinier (Rye’-en-eer) who fell down a well when he was a small child. She later died trying to save two children when Reinier’s boat began to sink in a gale coming home from Boston.
- The Dill family land runs along \_\_\_\_\_.

26) **James Wharf.** Marina dock, where fishing boats were for rent.

- Location: \_\_\_\_\_

27) **Pilings** (visible at low tide). Head of Old Town Pier, built prior to 1682.

- The pilings are the remnants of Hull’s \_\_\_\_\_ port.
- Which Europeans stayed the longest in Hull?
  - a. Viking explorers
  - b. Dissidents from Plimoth Plantation
  - c. Puritans from England

28) **Stream outlet.** Water comes from \_\_\_\_\_.

29) **Seawall.** Used to have a boardwalk. Made from \_\_\_\_\_ (see exposed rock where cement is eroding away).

30) **X-shaped path laid out by the Puritans.** Look at the parking area of the library and the “island” where Spring St. and Main St. meet. Can you see the X shape of the paths laid out by the Puritans? \_\_\_\_\_

31) **Joshua James’ House.** House built around 1650. Joshua James was born about 200 years later.

- Address: \_\_\_\_\_

32) **Peter Luchie’s House.** Luchie was the telegraph operator on Telegraph Hill. Merchants in Boston paid for the operation of the telegraph because they wanted the earliest news possible about cargoes coming into Boston.

- Perer’s sister, Louisa Luchie James, was Joshua James’ wife.
- Address: \_\_\_\_\_

33) **Elm Square.** Site of old shipyard. Site of the staff on which the flag, made by the women of Hull, was raised during the Civil War.

- Location and/or current landmark: \_\_\_\_\_

34) **Loring House.** Oldest house in Hull—approx. 300 years old. Has a black and white chimney.

- House built by Samuel Loring on the lot of John Loring, who was one of the proprietors of Hull, 1657; home to Doctress Jane Loring who cured an infected cut with a balsam salve used by the Natives.
- How many flues are in the chimney? \_\_\_\_\_ What does this mean?  
\_\_\_\_\_
- The side fences show the edges of the two acre \_\_\_\_\_ which ran up over the hill.
- What is in the front yard? \_\_\_\_\_
- Address: \_\_\_\_\_

35) **Loring Barn.** Loring barn and house make up Loring Homestead.

- During colonial times (about 200 years ago), the barn was used for farming. At the turn of the century (about 100 years ago), the barn was used by a lumberyard.
- Location: \_\_\_\_\_
- Color: \_\_\_\_\_

36) **Stream bed.** Drain cover over the stream, which is now in a \_\_\_\_\_. There was a \_\_\_\_\_ here.

- This is the site where all the water collects/accumulates from the Village's \_\_\_\_\_.
- Name the boundaries of this watershed: \_\_\_\_\_  
\_\_\_\_\_
- The common outlet for this watershed is \_\_\_\_\_,  
\_\_\_\_\_ which drains into the \_\_\_\_\_.

37) **First/Old Town Hall and One-Room School House.** School was originally held in the Old Hull Town Hall until the Hull Village School was built in 1889.

- When was the First Town Hall built? \_\_\_\_\_
- Can you go inside? \_\_\_\_\_

38) **Site of the Village Pond.** It is now a \_\_\_\_\_.

- Originally there was a freshwater pond in the center, but it was drained in the late 1800s because it had become polluted from so many people and animals living nearby.

39) **Site of Village Church.** It is now \_\_\_\_\_.

- When was the Village Church built? \_\_\_\_\_

40) **Church Square.** Site of \_\_\_\_\_ and \_\_\_\_\_  
\_\_\_\_\_.

- Old Church was built about 1734. It was shaken badly by the hurricane/"great gale" of 1815 and taken down.
- Hull Village School was the "new" school for grades one through eight. Children who wanted to go to high school went to Hingham until Hull's high school was built in 1957. This building continued to serve Hull until the Memorial School was built in late 1940s, at which time it was torn down.
- What remains from the school at this site?  
\_\_\_\_\_
- The \_\_\_\_\_ from the school connected to the hill behind the school.
- The \_\_\_\_\_ came from Hull Village School and is now at the Memorial School.

41) Find the water running through the storm drain just inside the fence.

42) What road leads out of Hull Village to the mainland? \_\_\_\_\_

43) A **fence**. This marks the edge of \_\_\_\_\_.

44) Find the **bunker** between the water tower and museum.

- A bunker is a defensive military fortification designed to protect people or valued materials from falling bombs or other attacks. Bunkers are mostly below ground.
- This bunker was used during \_\_\_\_\_.

45) Find **King Rock**. This rock is a \_\_\_\_\_.

- This rock was once a landmark for mariners, marking the entrance to Boston Harbor.
- King Rock was also the seventh tee of a golf course called Hull Golf Links during the late 1800s.
- King Rock is the largest glacial erratic in Hull. A glacial erratic is a piece of rock that differs from the size and type of rock native to the area in which it rests. "Erratics" are carried by glacial ice, often over distances of hundreds of miles.

46) Find the **museum**. This building was originally the \_\_\_\_\_  
\_\_\_\_\_.

47) Fort Revere is located on \_\_\_\_\_ Hill.

- 1600s – Telegraph Hill was the spot first considered for military use in the 1630s but was passed over in favor of Castle Island in South Boston (site of star-shaped Fort Independence).
  - Later in the 1600s, Telegraph Hill was the site of a warning \_\_\_\_\_ because it dominated the single original entrance to Boston Harbor. The beacons warned of possible Dutch (Viking) and French naval attacks.

- 1776-1777 – Telegraph Hill was the site of Fort \_\_\_\_\_, an earthen (dirt) star-shaped fort built during the siege of Boston during the American Revolution/Revolutionary War/War of Independence (1775-1783).
  - Fort Independence stood as the front line of defense for Boston Harbor during the Revolutionary War.
  - Fort Independence was occupied and enlarged by the French in 1778 to protect their fleet anchorage in Nantasket Roads.
  - The French government erected a monument during America's bicentennial in memory of the French sailors and marines who died of smallpox at Ft. Independence during the winter of 1778-1779.
- 19<sup>th</sup> century (1800s) & early 20<sup>th</sup> century (1900s) – Telegraph Hill was the site of two telegraph stations which relayed news of arriving ships to Boston merchants. The first tower went up in 1837. These telegraph stations gave the hill its name. The last tower was demolished by 1938, made obsolete by the arrival of ship-to-shore radio communications.
- 1898 – Spanish-American War – Fort Independence was used again when the First Cadet Corps of Massachusetts (institution that produced officers for new regiments from the Revolutionary War to World War II) was stationed here.
- 1903-1906 – Fort Revere was constructed below the old French fort (Independence). It is a “modern” concrete coastal artillery fort mounting 6” guns.
  - The fort grew to cover nearly seventy acres including gun batteries, barracks, hospital facilities, and ammunition magazines (storage).
  - Ft. Revere was decommissioned in 1947 after service in two world wars.
- 1903 – The federal government built the 120-foot-tall water tower to store water and serve as both a lookout platform and a base for a navigational light. The structure was the first reinforced concrete water tower in the United States and used a pioneering construction technique.
  - The tower was restored in 1975 and again in 1990. The observation deck opened to the public in 1975 and was last open on a regular basis and staffed by volunteers in the summer of 2011. That was when the local building inspector recommended that a structural engineer assess the condition of the tower.

48) Telegraph Hill is \_\_\_\_\_ above sea level.

49) Find the **marker** in honor of the French-American friendship during the \_\_\_\_\_ War.

- This marker is a 1.9 ton granite monument. It was a \_\_\_\_\_ (1976) gift to Hull from France.
- It used to sit on the \_\_\_\_\_ observation deck, but was removed when it began “overstressing” the tower's supports.

50) Find the **memorial marker** for the French military soldiers who died in Hull.

- What did these soldiers die from at Fort Independence? \_\_\_\_\_
- What time period did these deaths occur? \_\_\_\_\_

51) Read the sign that overlooks Boston Harbor.

- Which Boston Harbor Islands can you see? \_\_\_\_\_
- Which lighthouses can you see? \_\_\_\_\_
- The oldest lighthouse in America is located on Little Brewster Island. What is the name of the oldest lighthouse in America? \_\_\_\_\_
- The first lighthouse to be built on the site dates back to 1716, and was the first lighthouse to be built in what is now the [United States](#). The current lighthouse dates from 1783. During the [American Revolution](#), the original lighthouse was held by \_\_\_\_\_ forces and was attacked and burnt on two occasions by American forces. As the British forces withdrew in 1776, they blew up the tower and completely destroyed it. The lighthouse was eventually reconstructed in 1783, to the same 75-foot (23 m) height as the original tower. In 1856 it was raised to its present height of 98 feet (30 m) and a new lantern room was added along with a 12-sided second order [Fresnel lens](#).
- Boston Light is currently undergoing renovations in preparation for the lighthouse's \_\_\_\_\_ celebration in 2016.

52) What sits on one of the star points from Fort Independence? \_\_\_\_\_

- When was Fort Independence built? \_\_\_\_\_
- When was the water tower built? \_\_\_\_\_
- Can you find the other four star points of Fort Independence? \_\_\_\_\_

53) How many gun emplacements are there? \_\_\_\_\_

54) What sat in the large concrete circles? \_\_\_\_\_

55) What were the rooms used for? \_\_\_\_\_

---

### Hike along Stoney Beach

56) Locate the Hull Lifesaving Museum.

- This is the site of the \_\_\_\_\_  
U.S. Life-Saving Station.

As you walk along Stoney Beach, see how many of these you can find and place a checkmark next to each item you find:

57) \_\_\_\_\_ **Wrack line** (marks the high tide line; line of dried seaweed, sponges, insects, organic marine debris and detritus, and litter)

58) \_\_\_\_\_ **Coal** (black rock)

- Look out at Boston Light. Hidden under the water in this area of Boston Harbor lie the remnants of approximately 100 shipwrecks. This whole area is dotted with wrecks. It is a forgotten and invisible history.
- During the heyday of sailing vessels in the 18th and 19th centuries, these waters were as treacherous as any in America. Passage was so treacherous in the harbor because the

Nantasket Roads channel was the only way in, and then ships had to navigate The Narrows to get to Boston. It was like threading a needle in the best of times, worse still in bad weather. Many ships were moored when storms hit, only to have prevailing winds drive them into Point Allerton, Toddy Rocks, or Harding's Ledge.

- During the Great Storm of 1888, Hull rescuers worked around the clock in brutal weather along 5 miles of shoreline to save 29 sailors aboard five schooners and a coal barge that ran aground.
- By 1902, a much wider Presidents Road was dredged, creating a safer way to get to Boston Harbor. And by around 1910, much shipping was done by motorized vessels that had more control and weren't at the mercy of the winds.
- How did the coal get here? \_\_\_\_\_  
\_\_\_\_\_

59) \_\_\_\_\_ **Slag** (pitted brown-black rock)

- Slag is left over from making iron which was used to make the railroad bed flat.

60) \_\_\_\_\_ **Granite rock** (speckled). Granite is an igneous or "fire" rock which cooled slowly so that crystals formed.

61) \_\_\_\_\_ **Bluish sedimentary or "mud" rock**. This is the main type of rock underlying Boston Basin.

62) \_\_\_\_\_ **Roxbury Puddingstone**. This is a sedimentary conglomerate [mixture] that contains many stones cemented together. Look for pinkish, purple, and gray rocks cemented together.

63) \_\_\_\_\_ **Sedimentary rock with stripes**. A rock made from different colored layers of mud.

64) \_\_\_\_\_ **Quartz** (white stone). An igneous or "fire" rock made from melted sand similar to glass.

65) \_\_\_\_\_ **Driftwood**

66) \_\_\_\_\_ **Feather**

67) \_\_\_\_\_ **Piece of clam shell**

68) \_\_\_\_\_ **Piece of mussel shell**

69) \_\_\_\_\_ **Piece of crab shell**

70) \_\_\_\_\_ **Periwinkle snail shell**

71) \_\_\_\_\_ **Sea Glass**

72) \_\_\_\_\_ **Prettiest stone you can find**

73) \_\_\_\_\_ **Concrete stairs** that once led to the platform of the Hull Station (train).

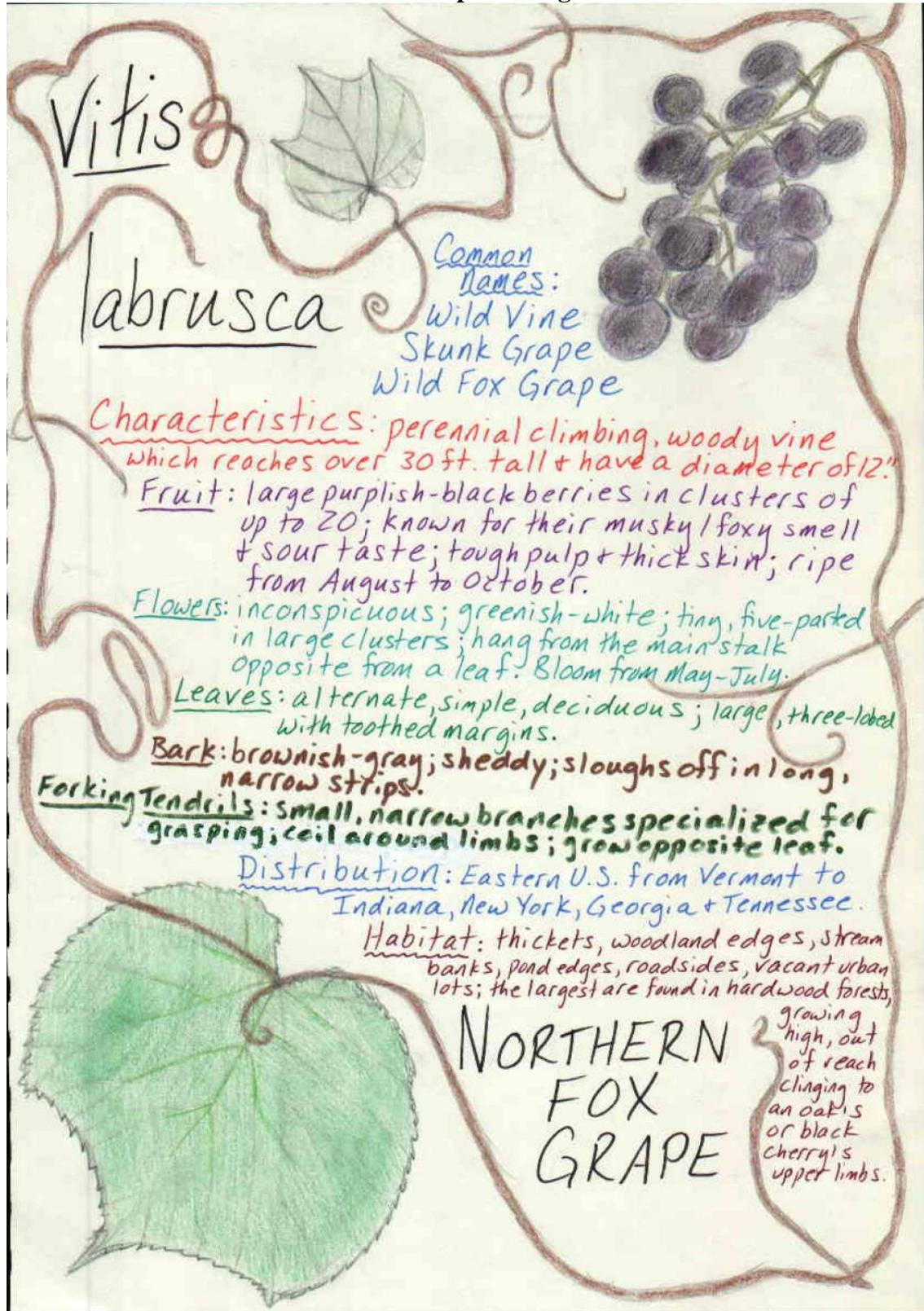
- Trains, first steam-driven and then open-air, ran the length of the Hull peninsula. Construction of the train Tressle began in 1880. The tracks were torn up and dismantled in 1937.
- The track came in stages: from the Nantasket Steamboat Landing to Allerton Hill and then from Allerton Hill to Windmill Point and then from the landing to Hingham, where it connected with the rest of the South Shore.
- The original track ran from the steamboats to the hotels, with no need of contact with the outside world. The second leg took a curious route around the outside of Souther's Hill, rather than taking a more protected trip through the center of Hull Village. Curious, that is, until you learn that the people of Hull wanted no part of a big, noisy, smelly train passing through their quaint village.
- For years, storms tossed boulders onto the tracks, disrupting train service until they could be moved.
- Little remains today to remind us of Hull's locomotive past.
- What island can you see from the stairs? \_\_\_\_\_
- What is the name of the Fort on this island? \_\_\_\_\_

74) \_\_\_\_\_ **Railroad Crossing sign**

- Location: \_\_\_\_\_

[Return to original place in document](#)

Appendix C  
Species Page



Vitis  
labrusca

Common Names:  
Wild Vine  
Skunk Grape  
Wild Fox Grape

Characteristics: perennial climbing, woody vine which reaches over 30 ft. tall + have a diameter of 12."
 

- Fruit: large purplish-black berries in clusters of up to 20; known for their musky/foxy smell + sour taste; tough pulp + thick skin; ripe from August to October.
- Flowers: inconspicuous; greenish-white; tiny, five-parted in large clusters; hang from the main stalk opposite from a leaf. Bloom from May-July.
- Leaves: alternate, simple, deciduous; large, three-lobed with toothed margins.
- Bark: brownish-gray; shedy; sloughs off in long, narrow strips.
- Forking Tendrils: small, narrow branches specialized for grasping; coil around limbs; grow opposite leaf.
- Distribution: Eastern U.S. from Vermont to Indiana, New York, Georgia + Tennessee.
- Habitat: thickets, woodland edges, stream banks, pond edges, roadsides, vacant urban lots; the largest are found in hardwood forests,

**NORTHERN FOX GRAPE** growing high, out of reach clinging to an oak's or black cherry's upper limbs.



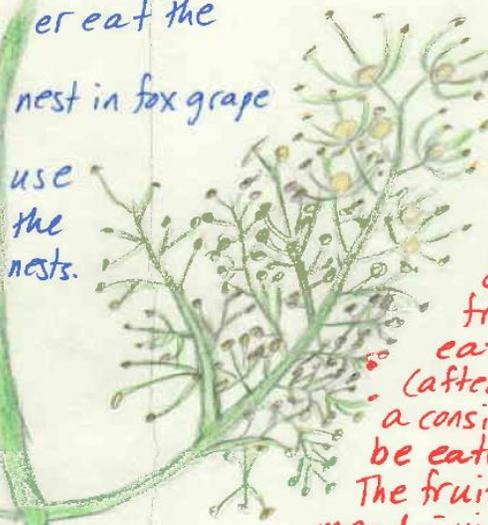
## RELATIONSHIP TO WILDLIFE

- The Fox Grape fruit is very important to wildlife. Animals eat the fruit and help spread the vines by pooping the seeds in new places.
- Animals that eat fox grape fruit include:
  - Birds - Eastern Bluebird, Wood Duck, Tufted Titmouse, Great Crested Flycatcher, Yellow-bellied Sapsucker, Cedar Waxwing, Pileated Woodpecker, European Starling, Purple Finch, Blue Jay, & many more.
  - Red Fox, Eastern Cottontail, Raccoon, Striped Skunk, Virginia Opossum

• White-tailed deer eat the leaves & stem

• Many birds nest in fox grape tangles

• Other birds use the bark from vine to build nests.



## RELATIONSHIP TO HUMANS

- Food - the Fox Grape is one of the most abundant, prolific, & useful fruits on our continent. The early fruit is too sour to pick & eat. It ripens best in Oct. (after first frost) when it develops a considerable sweetness & can be eaten out of hand. The fruit is used to make wine, mead, juice, jelly, pies, & pastries. Several cultivated grape varieties are derived from the Fox Grape including Concord, Isabella, Catawba, Niagara, Chataqua, & Worden.



- Medicine: the leaves are hepatic. They are infused to treat diarrhea, hepatitis, stomach aches, fevers, headaches, thrush.
- Dye: A yellow dye is obtained from the fresh or dried leaves.