Stop #1 Quartz and fractured schist. Hot water solutions rich in silica filled fractures in the schist (dark) leaving quartz (white) behind. If you look closely you will see a cavity filled with quartz crystals.

Stop #2 Conglomerate or "Pudding Stone". This rock may have come from the Narragansett Basin where pre-existing rock fragments were buried and cemented to form new rock.

Stop #3 Diabase. Notice the fine grain size. This is usually an indication that the molten rock cooled quickly and may indicate that it was near the surface when it cooled.

Stop #4 Granite. This is a good example of what is called granitic pegmatite. Pegmatite refers to the texture, which is very course (grains of individual minerals > 1 cm). Notice the minerals that make up the granite: mica, quartz and feldspar. Because this rock is undeformed and unmetamorphosed. It probably came from the Narragansett Pier Granite suite.

Stop #5 Conglomerate. This rock possibly had a similar origin from the conglomerate specimen at stop #2, but is a different color.

Stop #6 Gneiss. If you look carefully you will see parallel planes of mica that follow the original sedimentary bedding planes of the rock before it was subjected to intense heat and pressure. This gneiss is probably part of the Esmond Plutonic Suite which is Precambrian in age.

Stop #7 Quartz with inclusions. This rock probably formed under similar conditions to the specimen at stop #1, and may have originated from the edge of the Narragansett Basin to the east.

Stop #8 Quartz. This rock probably originated from hot water solutions rich in silica percolating within the country rock to form quartz veins.

About SKLT: The South Kingstown Land Trust (SKLT) is a local non-profit 501c3 organization. We preserve and protect essential places throughout South Kingstown including: open space, farmland, coastal ponds, scenic vistas, cultural landscapes, forests and wetlands. This in turn preserves and protects groundwater, biodiversity, ecosystems, aesthetic, cultural and/or recreational resources. We accomplish land protection with funding from grants and individuals which allows us to purchase land and easements, and create a stewardship fund. In addition, SKLT accepts donations of land and conservation easements. From 1983 to 2018 SKLT completed over 164 land preservation projects protecting over 2,800 acres throughout South Kingstown.

Membership: SKLT relies on the generous financial support of its membership to fund general operating expenses. If you would like to join us visit: **www.sklt.org** or **401.789.0962**

Volunteers: Volunteers assist as active participants in the annual monitoring of the properties; as well as, ongoing removal of invasive exotics, office assistance, and daily care of fields, farms, woodlands and trails. If you would like to volunteer: info@sklt.org

STONE WALL GEOLOGY TOUR AT WEEDEN FARM

South Kingstown Land Trust

Open Space Makes All the Difference

Weeden Farm Past and Present

Weeden Farm, home of the Weeden and Smith families since its purchase by Wager Weeden in 1826, once stretched from Wash and Long Ponds in the Matunuck Hills to the ocean where the South Kingstown Beach and Willow Dell Beach Club are now located.

In 1997, 97 acres of the original Weeden Farm transferred to the South Kingstown Land Trust. In 2001 SKLT added an adjoining 3 acre parcel with a barn for a total of 100 acres. The barn, rebuilt on its original footprint, hosts our annual auction and many other events throughout the year. Local farmers currently lease portions of Weeden Farm for cultivation: 37 acres for corn and hay and 6 acres for the production of vegetables. SKLT also leases 7.2 acres for horse pasture and actively manages the remaining acreage for wildlife habitat.

Through the efforts of the SKLT staff and volunteers, the original stone walls have been uncovered and restored to reveal the natural history of southern RI. The stone wall restoration project began in 2006. To date 9,504 feet of wall have been restored. That's 1.8 miles!

Geologic Overview

Distinction between rocks and minerals:

Mineral: A naturally occurring, homogeneous, inorganic solid substance having a definite chemical composition and characteristic crystalline structure, color, and hardness. (examples: quartz, mica, garnet, also ice - but not water - because it is not a solid) These are the basic building blocks of rocks.
Rock: A naturally formed aggregate of mineral matter

Bedrock Geology

The oldest rocks around here are members of the Blackstone Series dating to about 620 million years (Ma) old and older.

These rocks formed from sand, clay, limestone and volcanic flows that were deposited in a trough between mountain ranges. The oldest rocks around here are members of the Blackstone Series dating to about 620 million years (Ma) old and older. These rocks formed from sand, clay, limestone and volcanic flows that were deposited in a trough between mountain ranges. This material was subsequently deeply buried then recrystallized during metamorphism under intense heat and pressure as tectonic plates collided to form schists, gneisses, marble and other kinds of metamorphic rocks. These rocks were intruded by molten magma at several different times to form igneous rocks; major intrusive events occurred in the Precambrian (610 Ma), the Devonian (370 Ma), the Permian (275 Ma), and the Jurassic (180 Ma). These igneous rocks represent different kinds of geologic events, including island arc-continental crust collision, rifting or continental expansion, and continent-continent collision. Rock representing all of these events and styles occur in the stone walls.

Near the end of the Paleozoic (300 Ma), erosion of the mountains formed from previous tectonic events led to deposition of gravel, sand and silt in a trough or basin between the uplands. We now call this trough the Narragansett Basin. This basin is up to 18 miles wide and extends from the mouth of Narragansett Bay to Hanover Massachusetts, a distance of about 60 miles. Tower Hill marks the Western boundary of the Basin in this area. We will be seeing some rocks from the edge of the Narragansett Basin that were shattered and intruded by younger rocks.

Two hundred and seventy-five million years ago, the mountains had eroded, and intrusions of younger granite rock pushed up through older rocks from Narragansett to Westerly. These are the well known Narragansett Pier and Westerly Granites.

More recently in geologic history, mafic rock (diabase) intruded at shallow levels in the crust. The diabase is similar to basalt lava flows formed at the earth's surface. This rock is similar to the lava flows so prominent in the Connecticut basin to the west, south of Hartford. It formed when the ancient land mass of Gondwana was breaking up to form the present day Atlantic Ocean basin. In a similar way, hot water solutions rich in silica formed quartz veins. You will see remnants of these veins on your walk.

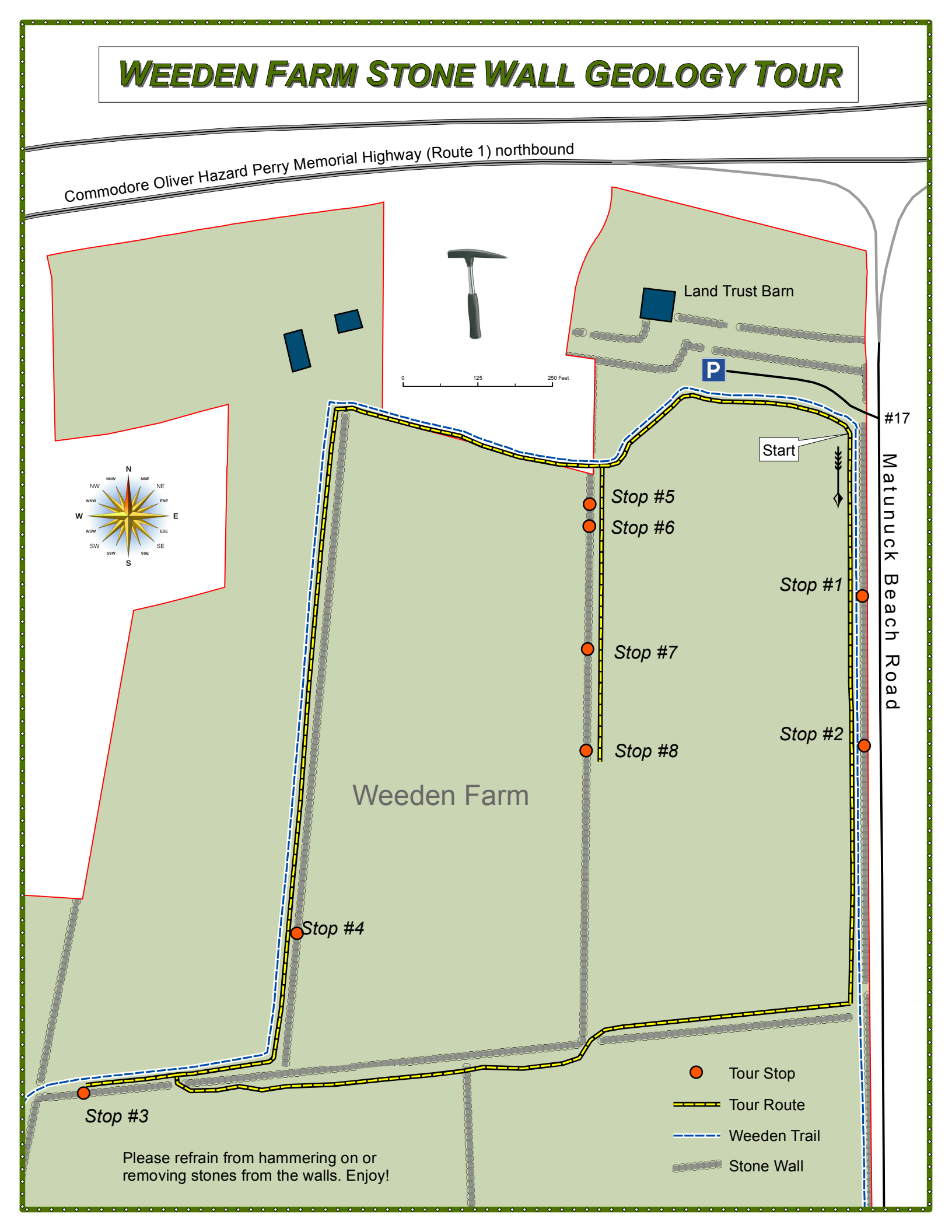
Glacial Geology

Glaciers are responsible for most of the landforms we see today in Southern Rhode Island. Glaciation occurs when the accumulation of snow exceeds its melting. Ice built up to a depth of roughly 180 meters in this area, moving like a conveyor belt carrying everything in its path. During the last glacial episode, the Laurentide Ice Sheet reached its furthest advancement south of present day Rhode Island. As the glacier receded in stages 10–12,000 years ago, braided rivers flowed on a delta plain depositing layers of sand and gravel. The top layer of ground consists of roughly one meter of fine-grained wind deposited material called loess.

The Matunuck Hills are part of the Charlestown Moraine (an end moraine). The hills include kettle ponds and hummocky terrain left from the melting of the glacier. A moraine is an accumulation of unconsolidated glacial debris (sand and gravel) that has been plucked off the valley floor as the glacier advanced. During certain periods in glacial history, the glacier was melting as fast as it advanced. This resulted in rocks and other sediments piling up at the foot of the glacier. You are standing on the outwash plain formed in front of the melting glacier.

Pamphlet design and map by Douglas G. McGovern. A special thanks to O. Don Hermes for providing critical review of this guide.

WEEDEN FARM STONE WALL GEOLOGY TOUR



Please refrain from hammering on or removing stones from the walls. Enjoy!