

B. PROJECT DESCRIPTION

The subject property is located at 25 East Lane in Chilmark, MA along the southern shore of Martha's Vineyard (Figure 1). The 3.1 acre property was originally developed with a single family dwelling, in 1900, which was reconstructed in the same location in 2006. The south-southeast facing property is situated on the southern flank of an eroding glacial headland and has direct exposure to the open Atlantic Ocean. The property exhibits the classic glacial morphology found along the southern shore of the Island, having steep cohesive bluffs and a predominance of rocks and boulders within the coastal bank and on the coastal beach. Coastal wetland resource areas on the property include coastal beach, coastal bank and a section of coastal dune along the western margin of the property (Figure 2).

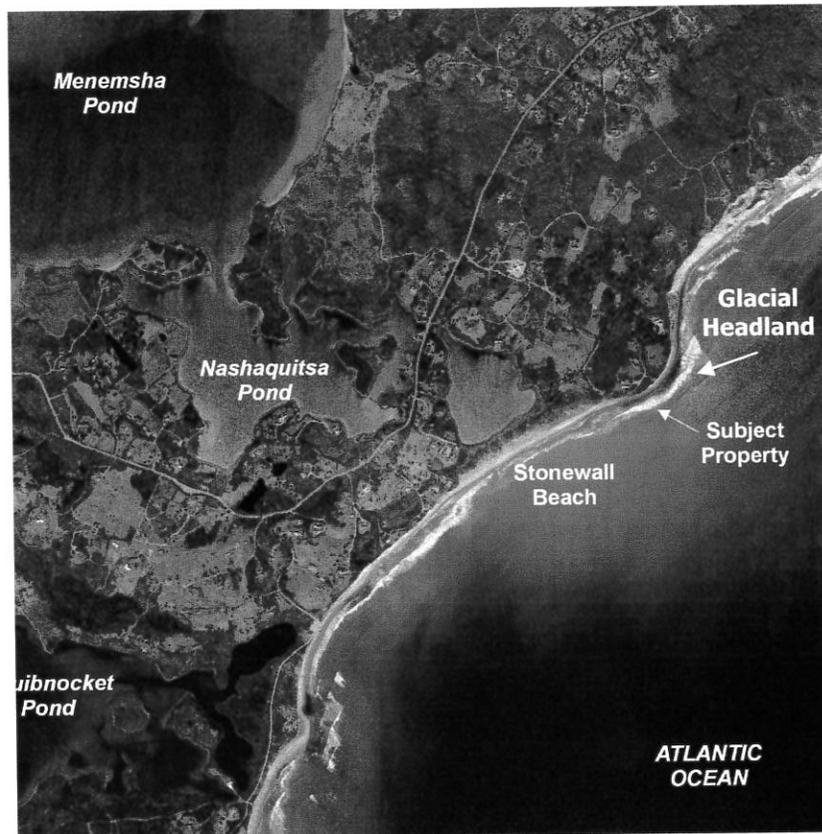


Figure 1. Locus map of the subject property located in Chilmark, MA

The coastal beach on the subject property is relatively steep and narrow. The beach is comprised of 3-12 inch cobble with a medium to coarse grain sandy substrate (Figure 3). The material on the beach is derived directly from the glacial bluffs landward of the beach and characteristic of the beaches along this entire stretch of shoreline. Adjacent to the subject property is the unique Stonewall Beach; a barrier beach that has natural, massive, cobble deposit overlying it. The cobble is several to tens of feet thick and provides protection to Stonewall Pond from elevated water levels and waves during storms as it acts as a natural wave break. The proposed beach nourishment/cobble berm has been designed to mimic the natural cobble berm on adjacent Stonewall Beach (Figure 3E).

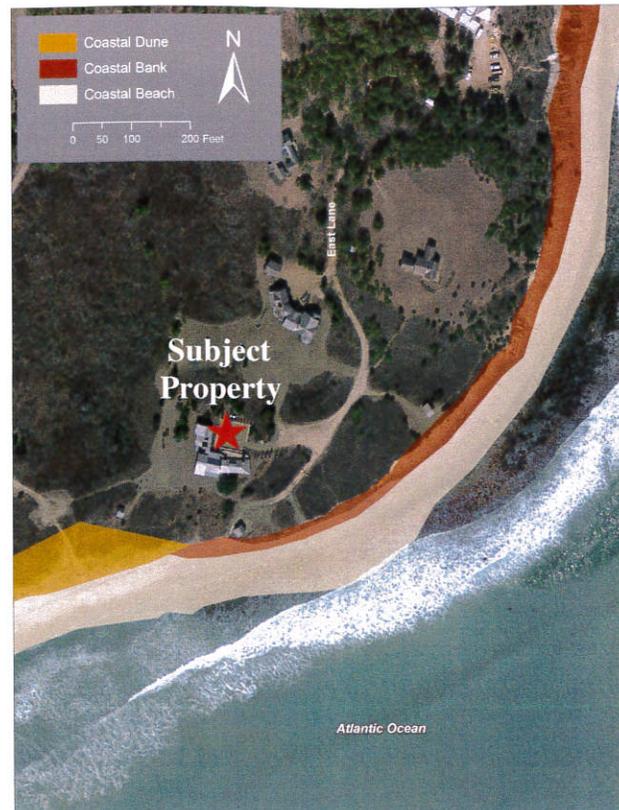


Figure 2. MAGIS Coastal Resource Areas on Fools High Tide, LLC property.

A small section of coastal dune is found along the western edge of the property (Figure 3D). The dune is low-lying and scarped along the seaward side. The dune relief is low and elevations range from 9-12 feet NGVD. The cobble beach extends right up to the front face of the dune and the seaward part of the dune is laced with cobble. Vegetation within the dune is typical and includes mostly beach grass with some small woody shrubs. The proposed project extends to the seaward and eastern edge of the dune, but does not intersect with the dune and should have no impact on the natural function of the dune.

The coastal bank on the Fool's High Tide LLC property exhibits a classic glacial morphology, having steep cohesive bluffs consisting of mixed strata ranging from clay to large glacial boulders (Figure 3). The coastal bank is highest along the eastern end of the property (elevation 20 feet NGVD) and tapers to the west where it ultimately intersects with the coastal dune at elevation ~12 feet NGVD. The coastal bank has been experiencing heightened erosion caused primarily from wave attack along the base of the bank during storms and periods of elevated water levels. During storms, waves scour away the seaward toe of the coastal bank, which leads to instability and slumping within the upper portions of the bank. This type of erosion is typical along many of the unprotected coastal banks on Cape Cod and the Islands. Due to the more cohesive nature of coastal bank sediments, erosion and slumping typically occurs as mass failure, where large quantities of bank material slump and fall from the coastal bank in a single event. Figure 4 shows an excellent example of such slumping on the northern flank of the glacial headland along Wequobsque Cliffs, just east of the subject property.

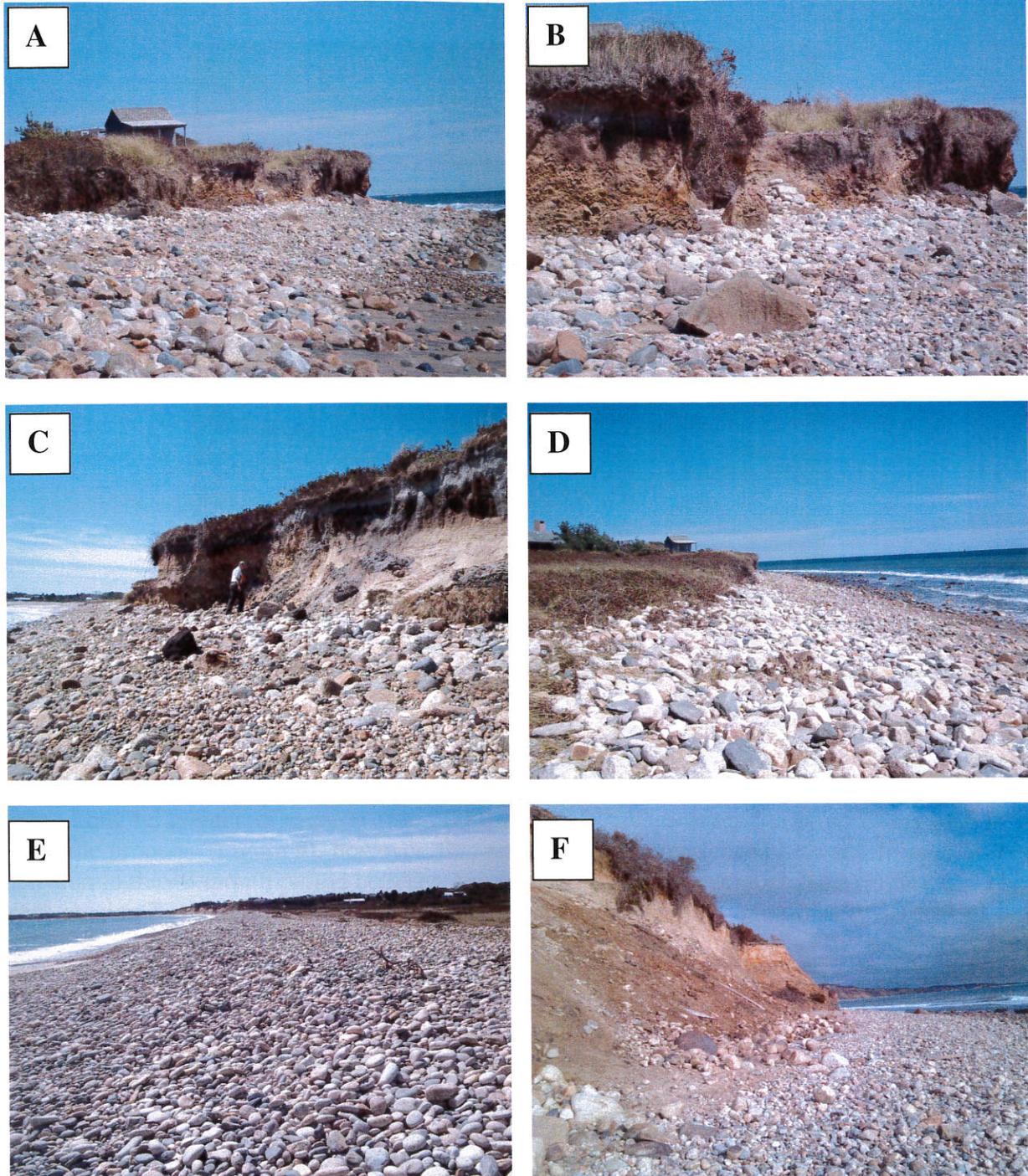


Figure 3. Various photographs of the coastal beach and coastal bank on the subject property. A, B, and C show the steep eroding coastal bank and cobble beach. D shows the low lying coastal dune and the cobble beach that abuts the dune. E is a view of the adjacent Stonewall Beach barrier beach to the west. F shows Wequobsque Cliffs and the cobble beach to the east.



Figure 4. Massive slumping of the coastal bank at Wequobsque Cliffs, just east of the subject property.

Our review of the Massachusetts Coastal Zone Management (CZM) shoreline change database indicates that the shoreline at the subject property has been gradually eroding over the past 106 years. Long-term rates of erosion from 1888 to 1994, have averaged approximately -1.5 to 3 ft/yr at the property (Figure 5), however, this particular site experienced between 17 and 33 feet of erosion in the 13 month period between November 2011 and December 2012 (Figure 6). This recent erosion has caused the coastal bank to cut back to within approximately 80 feet of the existing dwelling and resulting in a loss of over 6,500 square feet of property and removal of 2,400 cubic yards of native material from the coastal bank in just one year. This material is presumed to have spread along and off- shore and reworked by local coastal processes, with the heavier material landing on the coastal beach on the subject property and the finer material spreading to adjacent beaches and offshore.

This dramatic erosion is quite alarming and has created an imminent threat to the existing infrastructure on the property. As the base of the bank continues to erode, the buffer zone between the top of bank and the dwelling will be further diminished, creating a substantial threat to the existing dwelling and other upland infrastructure. In an effort to minimize erosion of the coastal bank and prevent continued loss of upland property, the homeowners are proposing to install 6,000 yards of beach nourishment in the form of cobble reinforcement, as a natural buffer along the property, to protect against moderately sized storms in the future in compliance with the regulations.

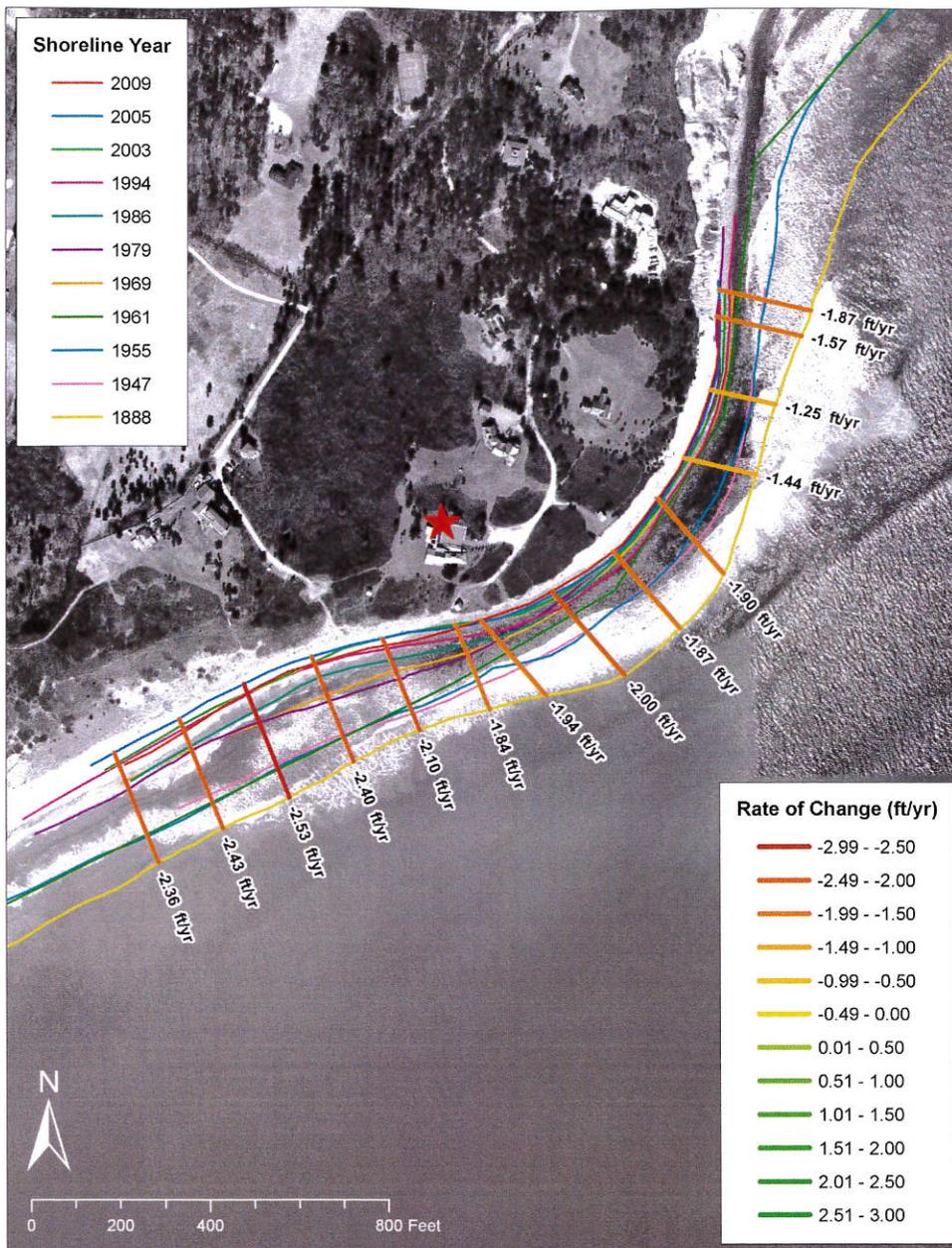


Figure 5. MCZM shoreline positions from 1888-1994, supplemented with Woods Hole Group data from 2003, 2005 and 2009, showing long-term rates of change on the subject property. The subject property is delineated by the red star.

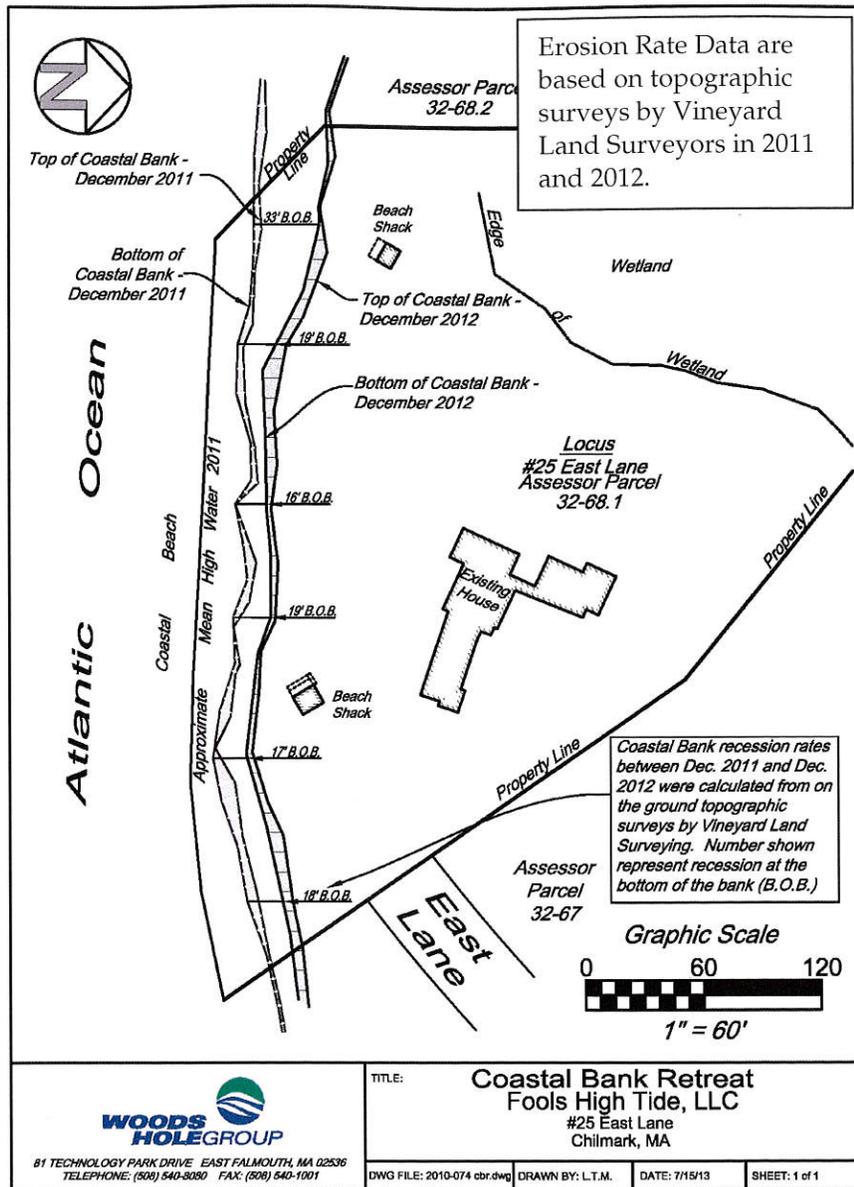


Figure 6. Bank recession map created from on the ground topographic surveys done by Vineyard Land Surveyors in 2011 and 2012.

Proposed Project

The proposed project calls for the placement of beach nourishment, in the form of a cobble berm, along a portion of the property at the base of the existing natural coastal bank. A map view showing the aerial extent of the proposed cobble berm is found in Figure 7. Since the coastal bank is composed of glacial till and is subject to ongoing coastal erosion, the proposed cobble berm is designed to reduce the erosion of the coastal bank, while mimicking the natural surrounding cobble beach environment as required by the MA DEP’s coastal wetland regulations. The design is intended to replicate and reinforce the existing, natural cobble berm that exists at Stonewall Beach directly to the west and adjacent to the subject property.



Figure 7. Location and footprint of the proposed cobble berm.

The purpose of the cobble berm is to provide a natural storm buffer to the coastal bank, which has been plagued by dramatic erosion over the past several years. The 6,000 yards of cobble will be compatible with the existing beach and bank material and will be constructed with clean, smooth, rounded cobble with median diameter between 6 and 9 inches, which is similar to the existing cobble on the coastal beach. The project limits are confined to the subject property and extend seaward from the toe of the coastal bank between 100 and 135 feet. The crest of the berm shall be maintained at an elevation of 9.3 feet (NGVD 1929) and taper seaward to elevation -2 feet (NGVD 1929). Both the eastern and western ends of the cobble berm shall taper into the surrounding beach and bank.

The proposed cobble berm has been designed to provide additional natural protection to the toe of the coastal bank by raising the elevation of the coastal beach with the construction of a cobble berm. The cobble berm is designed to dissipate wave energy on the beach before the waves can interfere with the base of the coastal bank during small to moderate storms, thus reducing undercutting of the coastal bank, which has led to slumping and mass failure. The cobble berm has been designed for a 25-year storm level. The specifications for the proposed berm design are included on the attached engineering drawing found in Section I. Storms exceeding the 25-year level will cause increased overtopping and erosion of the cobble berm. The berm is expected to experience profile evolution and erosion over time and it is assumed the cobbles will spread onto adjacent beaches and offshore. As the nourishment/cobble berm is considered to be a mobile feature, we do not expect negative impacts to adjacent beaches or other resource areas. We expect the impacts to be positive in nature as the proposed nourishment will provide compatible material to adjacent beaches. The cobble berm should be inspected on a regular basis, and maintained as necessary.

As a portion of the proposed project is located within MA Natural Heritage & Endangered Species Program (NHESP) estimated and priority habitat, a MESA Information Request was

filed with the NHESP in an attempt to indentify and address the mapped species. The NHESP response letter, dated June 18, 2013, states that Least Terns have previously been found in the vicinity of the site (see Section F for copy of letter). NHESP suggested in further correspondence that a time of year restriction would be imposed to protect the Least Terns nesting season. It is therefore expected that construction of the project will be prohibited between April 1st and August 31st. The Proponet will adhere to this requirement.

Construction Methodology

Construction access will be along the existing path that extends from the end of East Lane to the top of the coastal bank on the Proponent’s property (Figure 8). Dump trucks delivering the cobble stones will be able to turn around at the end of East Lane, where there is an open dirt parking area (Figure 9). The trucks will back down the existing path and dump the stones over the top of the coastal bank onto the coastal beach. A cobble ramp will be constructed over the face of the coastal bank to protect the face of the bank during construction. Direct impacts within the construction access include the removal of existing small, woody plants and grasses. These impacts are temporary and will be restored to pre-existing conditions upon completion of the project. The cobble stones shall be moved on the beach with a front end loader and brought to elevation/grading specifications as indicated on the plans. Barging was considered and immediatley ruled out due to the high energy wave climate and rocky conditions offshore. Construction of the proposed project is expected to take approximately 8-10 weeks and commence during the winter of 2014.



Figure 8. Photographs showing the existing path that extends from the end of East Lane (left) to the top of the coastal bank on the Applicant’s property (right).



Figure 9. Photograph showing the parking area at the end of East Lane, and the pathway leading to the top of the coastal bank.